

PORT ECONOMIES AND MARITIME TRADE
IN THE ROMAN MEDITERRANEAN:
166 BC TO AD 300

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Abbreviations

<i>AE</i>	<i>L'Année Épigraphique</i>
<i>AEA</i>	<i>Annona Epigraphica Austriaca</i>
<i>CAG</i>	<i>Carte archéologique de la Gaule</i>
<i>CIL</i>	<i>Corpus Inscriptionum Latinarum</i>
<i>CIMRM</i>	<i>Corpus Inscriptionum et Monumentorum Religionis Mithriacae</i>
<i>I.Cret.</i>	<i>M. Guarducci, Inscriptiones Creticae. Rome, 1935-1950</i>
<i>ICUR</i>	<i>Inscriptiones christianae urbis Romae</i>
<i>IG</i>	<i>Inscriptiones Graecae</i>
<i>IEAquil</i>	<i>G. Lettich, Itinerari epigrafici Aquileiesi. Triest, 2003</i>
<i>IvE</i>	<i>Die Inschriften von Ephesos</i>
<i>IKoeln</i>	<i>B. und H. Galsterer, Die römischen Steininschriften aus Köln. Mainz, 2010</i>
<i>InscrAqu</i>	<i>J.B. Brusin, Inscriptiones Aquileiae. Udine 1991-1993</i>
<i>ILJug</i>	<i>Inscriptiones Latinae quae in Iugoslavia</i>
<i>InscrIt</i>	<i>Inscriptiones Italiae</i>
<i>OGIS</i>	<i>W. Dittenberger, Orientis Graeci inscriptiones selectae. Leipzig, 1903-1905.</i>
<i>Pais</i>	<i>E. Pais, Corporis inscriptionum Latinarum supplementa Italica. Rome, 1884</i>
<i>RPAA</i>	<i>Rendiconti della Pontificia Accademia di Archeologia</i>
<i>SupIt</i>	<i>Supplementa Italica</i>
<i>Wagner</i>	<i>F. Wagner, Neue Inschriften aus Raetien</i>
<i>ZPE</i>	<i>Zeitschrift für Papyrologie und Epigraphik</i>

Port Economies and Maritime Trade in the Roman Mediterranean: 166 BC to AD 300

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Abstract

This thesis focuses on the economies of Roman ports and their role in the facilitation and organization of maritime trade, combining both terrestrial and maritime archaeological evidence as well as literary and epigraphic material. The first half of the thesis examines Mediterranean ports from a panoptic level in order to address questions of systems of trade, connectivity and economic development. In doing so, I focus on three particular areas of material culture: ceramics, shipwreck cargoes (typically composed of amphorae, metal ingots or stone) and epigraphy.

The second half of the thesis focuses on two case studies, southern Turkey and southern France. For each region, I explore the economic factors which led to the development of each region and the ways in which ports enabled this development. I consider the impact of landscape, the usage of natural resources and the extent of production for both local consumption and export. Importantly, I examine the regional connections of the two regions and their interactions within the wider Mediterranean. I develop a model for the development of ports along each coastline and their degree of integration into the trading network of the Roman Mediterranean. Building on this, it becomes possible to assess the extent and scale of extra-regional interaction and market integration.

From the evidence presented in this thesis, I argue that ports were at the core of the Roman market economy and that the development of a port network allowed for the integration and interdependence of Mediterranean markets. This allowed for regional economic growth through the specialization in the production of goods for which a region had a comparative advantage.

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INTRODUCTION

Maritime cities also suffer a certain corruption and degeneration of morals; for they receive a mixture of strange languages and customs and import foreign ways as well as foreign merchandise, so that none of the ancestral institutions can possibly remain unchanged. Even their inhabitants do not cling to their dwelling places, but are constantly being tempted far from home by soaring hopes and dreams; and even when their bodies stay at home their thoughts nevertheless fare abroad and go wandering... Many things too that cause ruin to states as being incitements to luxury are supplied by the sea, entering either by capture or import; and even the more delightfulness of such a site brings in its train many an allurements to pleasure through either extravagance or indolence. But nevertheless, with all those disadvantages, they possess one great advantage—all the products of the world can be brought by water to the city in which you live, and all your people in turn can convey or send whatever their own fields produce to any country they like.¹

Archaeological research reveals a highly interconnected Roman world. Whilst ancient cities are often thought of as existing through discrete relationships with their hinterland and closest surroundings,² this was not the case during the Roman period. Rome could not have existed without its constant supply of grain from Egypt and North Africa. Pottery—a commodity which in many ancient societies was usually manufactured locally—was mass-produced and shipped throughout the entire Mediterranean. As in the modern era, certain areas were known for their wine and oil, and such products were specifically cultivated for an increasingly large-scale market. Choice was limited not to what could be obtained within one's immediate surroundings, but rather to what goods could be obtained from the Mediterranean and beyond. These products included both everyday necessities and luxury goods—items as diverse as Gallic and North African pottery, Spanish *garum*, Chinese silks and Indian spices. This connectivity shaped Roman daily life and as the quotation from Cicero exemplifies, they were well aware of this concept—even if it was not always viewed in a positive light.

¹ Cicero, *The Republic* 2.4.

² Weber *et al.* 1978, 1215; Finley 1985, 139; Whittaker 1995.

In terms of modern scholarship, however, the concept of connectivity is relatively new. The idea, and particularly the terminology, has been most influentially advanced by Horden and Purcell in their work *The Corrupting Sea*.³ What Horden and Purcell term ‘dispersed hinterlands’—networks which extend beyond immediate geographical boundaries—are a far cry from the work of scholars such as Finley⁴ who saw the ancient world as being comprised of cities locked within a parasitical relationship with their immediate hinterland.

Some recent work has even gone as far as to refer to the Roman world in terms of ‘globalisation’. For some scholars, globalisation provides an alternative to the controversial term ‘Romanisation’⁵ and for others, it is a concept which indiscriminately applies modern practice to the ancient world.⁶ The application of such terminology is a testament to the growing awareness that the Roman world was connected in a way which was unparalleled in its time. Many factors were involved in creating and sustaining the network in which the Roman Empire existed, but at the centre of this was what has been termed the “principal agent of connectivity”⁷—the Mediterranean Sea.

To some extent, the concept of connectivity has been developed from archaeological material. Horden and Purcell comment, for example, on the “remarkable degree of market penetration” achieved by African Red Slip⁸ pottery and use objects from the categories of metals,⁹ textiles¹⁰ and amphorae¹¹ to illustrate their arguments. The usage of archaeology in this line of research is, however, largely cursory; research has identified what connectivity looks like in the archaeological record but has not probed much further. Connectivity remains a largely theoretical concept in that its implications scarcely have been explored. What does it mean that the Roman world was highly connected? Importantly, what did it mean to the Romans? How did connectivity work on the ground? What were its causes and effects?

³ Horden and Purcell 2000, particularly chapter five.

⁴ Finley 1985, 139.

⁵ Mattingly 1997; Hingley 2005.

⁶ Morley 2007a, 90–102 (Chapter 6: The limits of ancient globalization).

⁷ Horden and Purcell 2000, 133.

⁸ *Ibid.*, 150.

⁹ *Ibid.*, 344–351.

¹⁰ *Ibid.*, 352–363.

¹¹ *Ibid.*, 372–375.

I would suggest that one of the most useful areas in which to pursue these questions is that of the maritime economy. From the marshy Camargue of southern France to the rugged cliffs of southern Turkey to the Sahel of Tunisia, the landscapes and resources of the Mediterranean littoral vary considerably.¹² Perhaps paradoxically, the uneven distribution of resources significantly influenced the prosperity of the ancient Mediterranean and created the high level of connectivity which characterized the Mediterranean throughout antiquity. While Mediterranean connectivity is by no means distinct to the Roman period, I would argue that there are two main factors which set the Roman period apart from what had come before and, indeed, from much of what was to follow, certainly until the Industrial Revolution. Firstly, the scale of connectivity in the Roman period far surpassed that of any previous period. This is not only due to the fact that the entire Mediterranean was unified under the Roman Empire, simplifying the processes of maritime trade significantly, but also the fact that trade beyond the frontiers of the Empire was relatively common.¹³ Secondly, the Romans took the initiative to capitalize on the potential economic returns of their natural environment; resource differentiation has the potential to spur economic development in the form of specialization and long-distance trade, but such development does not occur spontaneously. This thesis illustrates the relative sophistication of certain facets of the Roman economy and argues, particularly in Chapters IV and V, that this was largely due to initiative on the part of the individual.

Ports were the core of the maritime economy, the loci through which goods circulated and by which the Roman world was connected, both economically and socially, and are therefore the central focus of this thesis.¹⁴ Despite the fact that these port cities necessarily functioned as a system, they are rarely examined cohesively. The formation and development of a port

¹² *C.f.* Horden and Purcell 2000.

¹³ For a recent overview of Indo-Roman trade, see Tomber 2008. David Mattingly's work in the Fazzan has been especially informative with regard to trans-Saharan trade (see particularly, Mattingly 2003). A new European Research Council project under the direction of Mattingly, Trans-SAHARA, is specifically investigating trans-Saharan trade and promises to shed further light on the topic (Trans-SAHARA, <http://www2.le.ac.uk/departments/archaeology/research/projects/the-trans-sahara-project>, last accessed September 15, 2012).

¹⁴ It should be noted from the outset that as ports were at the centre of the Mediterranean economy, they represent the zenith of connectivity and economic interdependence. While this is not to say that ports were the only cities to experience connectivity during the Roman Empire, certainly cities on major river and road routes would have been similarly connected, one should not extrapolate the degree of connectivity and economic integration visible along the coastal areas of the Mediterranean discussed in this thesis to the rural areas of Empire.

network during the Roman period will be one of the key themes of this thesis. Furthermore, ports are rarely placed within their economic context. Ports acted as the interface between land and sea and between production and distribution. To understand the economic role of ports in Mediterranean connectivity, it is crucial to understand the wider framework of maritime trade. This contextual approach is, with few exceptions, largely absent from scholarly research. Before detailing the methods and approaches which will be used in the thesis, an overview of relevant past research will be examined.

The State of Research

Harbours and Ports

A harbour is defined by the *Oxford English Dictionary* (definition 3a) as: “A place of shelter for ships; spec. where they may lie close to and sheltered by the shore or by works extended from it; a haven, a port”. A port is defined as (definition 1): “A harbour, and related senses” and then 1. a. “A town or place possessing a harbour which boats use for loading or unloading, or which forms the starting point or destination of a voyage; spec. such a place where charges may be levied under statute or by prescription on boats making use of the facilities”. These basic definitions will be followed in the thesis; when the term harbour is used it refers to the physical harbour structure itself and when the term port is used it refers to the city in which the harbour is located and the associated infrastructure.¹⁵

To date, a comprehensive study of either Roman harbours or Roman ports is conspicuously lacking from scholarly literature. The most detailed survey of ancient harbours is that of Lehmann-Hartleben published in 1923.¹⁶ However, only 56 pages are dedicated to Roman harbours. In 1982, David Blackman published two sequential articles in the *International Journal of Nautical Archaeology* focusing on the technical aspects of harbours, providing an updated bibliography and a useful, albeit brief, synthesis of current research.¹⁷ Furthermore, the latest contribution by Blackman, intended largely as an update to his aforementioned

¹⁵ C.f. Rickman 1985.

¹⁶ Lehmann-Hartleben 1923.

¹⁷ Blackman 1982a; Blackman 1982b.

articles, reads very much like his 1982 publications (as he himself points out).¹⁸ Blackman is the leading expert on the archaeology of ancient harbours, particularly with regard to ship-sheds and has published widely on specific harbours in addition to his synthesis articles.¹⁹

The majority of studies have focused on the technology associated with harbours, that is, construction techniques and the development of harbour infrastructure. The development of hydraulic mortar for harbour construction is one of the most obvious changes in maritime technology during the Roman period and enabled the construction of entirely artificial harbours.²⁰ It is important, however, to remember that regardless of their construction type, harbours constitute a type of maritime technology, and it is therefore useful to focus not simply on the large, artificial harbours but on the entire range of harbours present in the Mediterranean.

I would further argue that in order to understand harbours in the Roman period one cannot simply rely on technical harbour studies; one must not only consider the harbour itself, but also its wider context as a port and how and why it existed. In this respect, this thesis draws from both maritime²¹ and terrestrial archaeology.

Geoffrey Rickman published several influential articles focusing on historical, social and economics aspects of ports.²² His research is important for its focus on ports instead of harbours. Despite his call for more broadly focused port research,²³ few scholars have followed suit. Houston published an article entitled “Ports in perspective”, but this was also in 1988 and is now out-of-date.²⁴ More recently, an article by Andrew Wilson, Katia Schörle and myself attempts to readdress the balance with a focus on the economy and society of ports.²⁵ The collaborative Roman Port Networks Project, associated with the ongoing Portus

¹⁸ Blackman 2008, 638.

¹⁹ Selected articles include, Blackman 1972; 1973; 1988; 1995; 1996; 1999; 2008; Blackman and Lentini 2003.

²⁰ Oleson *et al.* 2004; Oleson 2006; Brandon *et al.* 2005; Brandon *et al.* 2008; Hohlfelder *et al.* 2008; Brandon *et al.* 2010.

²¹ This thesis follows Muckelroy’s definition of maritime archaeology as “the scientific study of the material remains of man and his activities on the sea” and therefore encompassing both nautical archaeology and underwater archaeology (Muckelroy 1978, 4).

²² Rickman 1985; 1988; 1996; 1998; 2002; 2003; 2005 and 2008.

²³ Rickman 1985; 1988.

²⁴ Houston 1988.

²⁵ Wilson *et al.* forthcoming.

Project under the direction of Simon Keay, is aimed at characterizing connections amongst ports through material categories such as ceramics and marbles. This project represents a major step forward in the contextualization of Roman ports, particularly in the western Mediterranean.²⁶

Because maritime and terrestrial archaeology are often considered separate and distinct fields, the research is often poorly integrated. A more comprehensive approach has been developed by Christer Westerdahl for Swedish Norrland to research what was termed the *maritime cultural landscape*.²⁷ The term was developed due to a need for a “scientific term for the unity of remnants of maritime culture on land as well as under water” and encompasses “the whole network of sailing routes, old as well as new, with ports and harbours along the coast, and its related constructions and remains of human activity, underwater as well as terrestrial”. Westerdahl outlines five main aspects of study of the maritime cultural landscape:²⁸

1. Shipwrecks: Indicators of use and dating instruments
2. Land remains: Ancient monuments preserved on the waterfront
3. Tradition of usage: The advantages of local maritime experience and tradition
4. The study of natural topography: Natural havens. Contours on land, depth curves; the effects of silting and isostatic uplift
5. Place names: General considerations of applicability

As this research method was developed for Swedish Norrland, it cannot simply be applied wholesale to the Roman world, but overall, it is a flexible methodology which has been applied to numerous regions and time periods²⁹ and which can be extremely useful for the study of the Roman maritime world.

²⁶ Port Networks Project, <http://www.romanportnetworks.org/introduction/index.html>, last accessed July 20, 2012.

²⁷ Westerdahl 1992.

²⁸ *Ibid.*, 7-9.

²⁹ This theoretical concept has been applied to studies across various geographic areas including (just to cite a few examples) the UK (Parker 1999; McErlean *et al.*, 2002), Central America (Delgado *et al.*, 2011), Australia (Duncan 2004; 2011; Ash 2007) and Africa (Harris *et al.*, 2012). A recent edited volume (Ford 2011) collects case studies from the US, Europe and Australia and includes a conclusion by Westerdahl. The theory has been largely ignored by those studying the Mediterranean world, with some exception amongst scholars of the prehistoric Mediterranean (Knapp 1997; Vavouranakis 2011).

In particular, one simply should not study maritime trade without utilizing both maritime and terrestrial archaeology, yet this often occurs due to the differences in research traditions, datasets and methodology between the two fields.³⁰ This separation has been particularly detrimental to studies of the ancient economy.³¹ On the one hand, Mediterranean maritime archaeologists focus on shipwrecks, harbour infrastructure and ship construction; these are all aspects which are intrinsically linked with the economy, particularly as it concerns the impact of technology, but in general data are presented without interpretation.

To some extent, this is unavoidable. Specialist archaeologists, be they experts in ship-construction or ceramic typologies, are absolutely essential, as are scholars who focus on concepts. Kevin Greene examines this very problem in a 2006 article entitled “Archaeological data and economic interpretation”.³² The challenge is for the two groups to communicate and for those scholars that synthesize to be aware of the data which is at their disposal. This thesis is very much a work of synthesis and as such, I state these issues as those of which I myself must be continually aware.

The work of Pascal Arnaud represents an important step forward in this respect as it combines maritime expertise with both ancient textual material and archaeological evidence.³³ His 2005 book, *Les Routes de la Navigation Antique*, provides the most comprehensive look at Mediterranean sailing patterns and is an invaluable resource. As a sailor himself, Arnaud has an important understanding of the practicalities involved in sailing the Mediterranean and this allows for a more nuanced interpretation of ancient sailing practice.

Recently, William Harris attempted to bridge the disconnect between maritime archaeologists and scholars of the ancient economy at a conference held in Rome in 2009.

³⁰ See Tuddenham 2010 for an up-to-date overview of the separation between maritime and terrestrial archaeology.

³¹ It should be noted that this is a problem particularly in Mediterranean studies. Recent research on the Red Sea, particularly that related to the University of Southampton projects at Myos Hormos and Quseir al-Quadim, is characterized by interdisciplinary research with thorough syntheses (Peacock *et al.* 2006; Blue 2007; Blue *et al.* 2010; Peacock and Blue 2011).

³² Greene 2006.

³³ Particularly relevant articles include: Arnaud 1993; 2007; 2009; 2010; 2011a; 2011b.

The conference resulted in an important publication, *Maritime Technology in the Ancient Economy: Ship-design and Navigation*.³⁴ The conference and subsequent publication were steps in the right direction, though they were not entirely successful in terms of integrating to the two fields of study, as indeed might be expected under what were rather novel circumstances.³⁵ If efforts continue to bring together specialists and synthesists, as well as maritime and terrestrial archaeologists, as they should, knowledge sharing and publication should become increasingly more successful. On this note, let us turn to research on the Roman economy.

The Roman Economy

The study of the Roman economy has been dominated by ancient historians. This is largely a result of the standard archaeological approach which is often to focus on one site, or one set of materials. There are clearly exceptions to this, most of them very recent, but in general, archaeologists collect data, often publishing it in obscure ways with very little interpretation, leaving ancient historians to analyse the data, often not understanding their context. The prominent scholars of ancient economies are therefore ancient historians such as Moses Finley,³⁶ A.H.M. Jones,³⁷ Richard Duncan-Jones,³⁸ Keith Hopkins,³⁹ William Harris,⁴⁰ Elio Lo Cascio⁴¹ and Walter Scheidel.⁴² In some cases, though certainly not all, this has led to

³⁴ Harris and Iara 2011.

³⁵ C.f. A.J. Parker's review of the publication in IJNA (Parker 2012).

³⁶ Finley's 1973 (reprinted in 1985), *The Ancient Economy*, was his most influential work for studies of the Roman economy. He otherwise published on slavery and the ancient Greek economy including Finley 1953/1981 1960, 1980.

³⁷ In particular, Jones 1964, 1974.

³⁸ In addition to his books on the Roman economy (1974; 1990; 1994), Duncan-Jones' primary contributions have dealt with the issue of prices and the distribution of wealth in the Roman world (to cite only a selection: 1963; 1965; 1976; 1977; 1978; 1981; 1997; 1999; 2006).

³⁹ Hopkins' most important contribution to the study of the ancient economy was his taxes and trade model first put forward in 1980. His numerous other contributions developed the model and furthered general discussion on the Roman economy (for example Hopkins 1980; 1983; 1995/6).

⁴⁰ Harris has written extensively on the Roman economy; his most important essays are collected in his 2011 book, *Rome's Imperial Economy*. Also of interest are his edited volumes, Harris 1993; 2005; Harris and Iara 2011.

⁴¹ Lo Cascio is the foremost Italian scholar of the ancient economy and has written on a wide variety of issues, particularly with regard to Italian agriculture, markets, demography and finance. His 2009 book, *Crescita e Declino: studi di storia dell'economia romana*, is a collection of his most important papers. He has also edited several major books dealing with the Roman economy, including Lo Cascio 2000; 2003 and 2006.

⁴² Scheidel is one of the most prolific writers in the field of the ancient economy. He has written widely on demography and slavery, though his work is by no means limited to these topics. Selected works include, Scheidel 1996a; 1996b; 1997; 2004a; 2004b; 2005; 2009a; 2009b; 2011a; 2011b. Important edited works are Scheidel and von Reden 2002; Scheidel *et al.* 2007 and Scheidel forthcoming.

histories being written with a poor understanding of the archaeological evidence and resulted in the substantivist viewpoints of scholars such as Finley. There are, however, a few archaeologists whose work has significantly contributed to the study of the ancient economy such as Kevin Greene,⁴³ André Tchernia,⁴⁴ David Mattingly⁴⁵ and Andrew Wilson.⁴⁶

At its most basic level, the debate over the nature of the Roman economy has been a debate between the substantivist or primitivist and the modernist; it is Finley versus Rostovtzeff.⁴⁷

To some degree, this debate is still ongoing, despite the almost complete consensus that it is no longer useful.⁴⁸ The most comprehensive summary of the history of research on the ancient economy can be found in the introduction to *The Cambridge Economic History of the Greco-Roman world*.⁴⁹ More recently, it has been suggested that scholars narrow the focus and move beyond discussions of *the* Roman economy. For Jeremy Paterson, the best model is that of micro-regional analysis. These micro-regions develop in connection with local economic needs, but their economies are nonetheless dependent upon more extensive markets.⁵⁰

David Mattingly has suggested that we should look at ‘different Roman economies’ composed of “a series of interconnected but discrete structures”.⁵¹ He divides the economy into three different sectors: the imperial economy, the provincial economy and the extra-provincial economy. For Mattingly, the imperial economy includes the army and government infrastructure, taxation, resources exploitation and the supply of the state. Provincial economies are those involved with local emerging markets, networks, production and manufacturing (even when connected to some extent with the state). Extra-provincial economies become involved when trade crosses provincial boundaries, and in this case,

⁴³ Particularly, Greene 1986; 2000; 2006.

⁴⁴ Selections include, Tchernia 1983; 1986; 1989; 1993; 2000; 2011.

⁴⁵ Mattingly has contributed extensively to studies of the Roman economy through his work on olive oil production (1988a; 1988b; 1994; Mattingly and Hitchner 1993), his work at Leptiminus (Ben Lazreg and Mattingly 1992; Stirling *et al.* 2001; Stone *et al.* 2011) and in the Fazzan (2003; 2007b; 2010), as well as through more general studies (2007a; 2011; Mattingly and Salmon 2001).

⁴⁶ Wilson 1999; 2001a; 2001b; 2002; 2004; 2006; 2007; 2008; 2009a; 2009b; 2011a; 2011b; Bowman and Wilson 2009; 2011; Robinson and Wilson 2011.

⁴⁷ Finley 1973; Rostovtzeff 1926.

⁴⁸ See for example the papers of Hitchner and Saller in Manning and Morris 2005.

⁴⁹ Scheidel *et al.* 2007.

⁵⁰ Paterson 1998, 160.

⁵¹ Mattingly 2007a.

imperialy controlled trade is somewhat different as it often included customs exemptions which private trade would not have granted.⁵² While it can be very difficult to disentangle these economies, even attempting to do so immediately highlights the complexities of the economic sphere of the Roman world. Furthermore, state-driven redistribution and imperial demand have often been over-emphasized by those scholars arguing for a primitive economy.⁵³ It is therefore important to keep in mind that the imperial economy can be seen in many respects as a separate phenomenon from the growth of local and regional economies.

The current focal point of archaeological research into the Roman economy is the Oxford Roman Economy Project. Begun in 2005 under the direction of Andrew Wilson and Alan Bowman, this project analyses major aspects of the Roman economy from approximately 100 BC to AD 300 using quantifiable data.⁵⁴ The project has sponsored a series of thematic conferences since 2006 on a range of economic areas including quantification, agriculture, trade, demography and mining.⁵⁵ The conferences resulted in print publications, the first two of which were published by 2011.⁵⁶

Other major synthetic works on the Roman economy in the past five years include William Harris' 2011 *Rome's Imperial Economy*, a book which is largely a collection of essays which were written throughout his career covering a range of economic topics.⁵⁷ *The Cambridge Economic History of the Greco-Roman world*, edited by Walter Scheidel, Ian Morris and Richard Saller⁵⁸ also deals with a wide range of economic topics, and chapters 19 to 27 focus on the Roman world. The forthcoming volume edited by Scheidel, *The Cambridge Companion to the Roman Economy*, will include thematic papers predominantly written by ancient historians, but also contributions from archaeologists and economists.⁵⁹

⁵² *Ibid.*, 221-222.

⁵³ Whittaker 1985; Bang 2008.

⁵⁴ The Oxford Roman Economy Project, <http://oxrep.classics.ox.ac.uk/>, last accessed July 20, 2012.

⁵⁵ *Ibid.*

⁵⁶ Bowman and Wilson 2009; Bowman and Wilson 2011.

⁵⁷ Harris 2011.

⁵⁸ Scheidel *et al.* 2007.

⁵⁹ Scheidel forthcoming.

For the purposes of this thesis, the most crucial works are those that have focused on maritime trade and commerce. In some respects, past research in this area can be divided into pre- and post-1992 as the publication of A.J. Parker's 1992 catalogue of shipwrecks, *Ancient Shipwrecks of the Mediterranean and the Roman Provinces*, containing 1,259 wrecks dating before AD 1500, had a profound effect on studies of ancient trade.⁶⁰ The dataset presented by Parker is both crucial and highly problematic for reasons which will be discussed in detail in Chapter II, but it is a dataset with which scholars must engage. In addition, Parker has published several articles relating to the interpretation of shipwreck evidence.⁶¹

The most comprehensive work on maritime trade during the mid-twentieth century was Jean Rougé's *Recherches sur l'organisation du commerce maritime en Méditerranée sous l'Empire romain*, a publication which remains important for its comprehensive treatment of the structure of Roman Mediterranean maritime trade. Rougé discusses topics such as Mediterranean geography and navigational techniques, ship types, sailing routes, ports, merchants and maritime law, many of which will be addressed in this thesis. His approach is largely textual and he devotes significant space to definitions and nomenclature. In essence, the book outlines the various technical factors involved in maritime trade and it is in this respect that it is a useful resource. What is missing, however, is a meaningful narrative which ties together the information on shipping lanes with the types of ports and the availability, or lack thereof, of maritime loans. There is, for example, little discussion on the scale of commerce and essentially no mention of products of trade. Had Rougé made use of archaeological evidence throughout his book, the lack of interpretation would perhaps be less striking.⁶²

Neville Morley's *Trade in Classical Antiquity*⁶³ is a generally useful book; it offers a summary of past research on trade and the economy and includes numerous ancient literary

⁶⁰ Parker 1992.

⁶¹ Parker 1981; 1986; 1990; 2008.

⁶² His interpretations are occasionally wrong due to a lack of archaeological data. For example, he concludes that Republican period ships were characterized by small tonnage and that it was not until the Imperial period that tonnage increased (492). This was obviously not the case as several Republican wrecks (Madrague de Giens, Albenga, Mahdia) are amongst the largest known from Antiquity (See also Wilson 2011b, 212-213).

⁶³ Morley 2007a.

references about trade. It has two major weaknesses, however. First, Morley refers generally to the evidence provided by archaeology but does not use actual archaeological examples to illustrate arguments. This has led to an underestimation of the scale of trade, particularly during the Roman period. Secondly, Morley attempts to deal with trade across the entirety of antiquity without any chronological separation and in doing so weakens the reliability of his conclusions. To some extent, trade across all periods will have comparable aspects and comparisons are often profitable. But as a whole, the economy of the early Classical period and that of the high Roman period were very different in their scales and generalizations about the entirety of ancient trade are rarely useful.

Despite such problems, Morley's book is a useful read. The same cannot be said for Peter Bang's recent book, *The Roman Bazaar: A Comparative Study of Trade and Markets in a Tributary Empire*.⁶⁴ While the idea of a comparison between India's Mughal Empire and the Roman Empire is intriguing, it is ultimately unsuccessful. Bang prefers to ignore archaeological evidence and in essence argues for a return to Finley's ideas on the ancient economy. The book has been widely discussed since its publication, and unsurprisingly, reviews for the book have fallen rather as expected along the lines of the primitivist-modernist ancient economy debate. On the one hand, it has been poorly reviewed for its lack of data, its misunderstanding of economic theory and its ignorance regarding European history.⁶⁵ On the other, it has been praised for its innovative efforts.⁶⁶ Overall, I disagree with the general tone of the book; the picture presented in this thesis, firmly supported by archaeological material, is fundamentally different from that proffered by Bang.

André Tchernia's 2011, *Les Romains et Le Commerce*, is the most recent single-authored publication relating to Roman trade.⁶⁷ The importance of the book lies in Tchernia's interpretation of the archaeological material and the skill with which he relates the archaeological evidence to historical questions involving Roman commerce. Whether or not

⁶⁴ Bang 2008.

⁶⁵ Temin 2009; Silver 2009; Haklai-Rotenberg 2010.

⁶⁶ Kiiskinen 2009; Morley 2010.

⁶⁷ Tchernia 2011.

one agrees with all of his points, this type of research is essential for furthering of our understanding of the Roman economy.

Three publications resulting from recent archaeologically-focused conferences on trade are also worthy of attention. The first is the 2007 publication, *Supplying Rome and the Empire*, edited by Emanuele Papi.⁶⁸ The contributions are largely focused on particular categories of traded supplies, from animals to finewares to coinage, and the supply mechanisms through which they were distributed. *The Maritime World of Ancient Rome*, edited by Robert Hohlfelder⁶⁹ and *Maritime Archaeology and Ancient Trade in the Mediterranean*, edited by Damian Robinson and Andrew Wilson,⁷⁰ both significantly advance efforts in combining the research fields of maritime and terrestrial archaeology.

Otherwise, there are chapters on trade in two of the compilations books mentioned above. While there is not a chapter specifically on trade in the *Cambridge Economic History of the Greco-Roman World*, there are three relevant chapters on the early Roman Empire: “Production” by Dennis Kehoe, “Distribution” by Neville Morley and “Consumption” by Willem Jongman.⁷¹ These chapters are necessarily brief and present a fairly conservative outlook on the economy of the early Roman Empire. For Morley, the key question is:

...not therefore whether there was significant trade and exchange under the Roman empire, but how far distribution under the empire differed in volume and nature from the constant “Brownian motion” of cabotage and periodic rural markets that had long characterized the Mediterranean region.⁷²

In general, he concludes that there was considerable long-distance trade in staple (as well as luxury) goods, but he attributes the vast majority to the state (largely the army and Rome), and the elites. Moreover, he argues that while trade and general economic prosperity expanded rapidly during the Republican period, such prosperity stagnated and then declined

⁶⁸ Papi 2007.

⁶⁹ Hohlfelder 2008.

⁷⁰ Robinson and Wilson 2011.

⁷¹ Jongman 2007; Kehoe 2007; Morley 2007b.

⁷² Morley 2007b, 589.

relatively early under the Empire. This argument seems to rest largely on his misunderstanding of what Parker's 1992 shipwreck graph⁷³ actually shows; while Morley acknowledges that there are problems with the graph, he fails to adjust for these in his interpretation.⁷⁴

The financial aspects of Roman trade are not discussed in detail in this thesis; while finance is a matter of obvious importance, it has been covered in great detail by numerous scholars.⁷⁵ The foremost concern of this study is the interpretation of archaeological material and as discussions of finance and banking rely predominantly on textual evidence, it is not within the scope of this thesis to consider these matters in detail.

Economic Theory

Market Exchange and Integration

“ancient society did not have an economic system which was an enormous conglomeration of interdependent markets”⁷⁶

“ancient Rome had an economic system that was an enormous conglomeration of interdependent markets”⁷⁷

It should be stated from the outset that this thesis operates under the assumption that Rome had a market economy.⁷⁸ At the basis of any discussion of markets is, of course, the work of Polanyi and his three modes of economic integration: reciprocity, redistribution and market exchange.⁷⁹ Polanyi defined market exchange very narrowly and believed that this form of exchange did not emerge until the rise of capitalism in nineteenth-century

⁷³ Parker 1992. This graph will be discussed in detail in Chapter II.

⁷⁴ Morley 2007b, 589.

⁷⁵ The most comprehensive overview of Roman finance is Andreau 1999. See also Lo Cascio 2003 and 2009; Verboven *et al.* 2008. Particularly important articles on the role of credit are Rathbone 2003 and Harris 2006. The tablets of the Murecine archive are the most important ancient documents for our understanding of the world of Roman finance, specifically with regard to maritime loans.

⁷⁶ Finley 1985, 22.

⁷⁷ Temin 2001, 181.

⁷⁸ An informative article on the archaeological view of market exchange in preindustrial societies from Mesoamerica to the Mediterranean was published in 2010 and provides a good review of the theoretical and methodological issues at the heart of the debate (Feinman and Garraty 2010).

⁷⁹ Polanyi 1977, 35-36.

England.⁸⁰ Finley's economic views were largely influenced by Polanyi and thus resulted in the view that the ancient world did not have market exchange.⁸¹ To some extent, this viewpoint continues to be perpetuated. In 1985, Whittaker put forward four objections to the market model: 1. *Annona*; 2. Supplementary cargoes and transport; 3. The military market; 4. The aristocracy.⁸² In 2007, Morley still considered at least some of Whittaker's objections to be credible.⁸³ Many scholars, however, now accept (though to varying degrees) that goods moved within a market sphere.⁸⁴ In 2001, the economist Peter Temin argued rather conclusively from the point of view of modern economics for the existence of a market economy in the early Roman Empire.⁸⁵

The question for the majority of scholars is not whether market structures existed, but rather whether the degree of integration between various markets across the Roman Empire might be described as high or low.⁸⁶ Erdkamp, writing largely from the point of view of the grain market, asserts that a market system existed, but suffered from weak integration, an opinion which he bases partially on comparison with early modern Europe (another poorly integrated market by his reckoning),⁸⁷ and partially due to instances of imperial or municipal intervention in the market (e.g. the *annona* or *sitonai*).⁸⁸

For Tchernia, however, the question of an enormous conglomeration of interdependent markets is a *fausse piste*, a red herring.⁸⁹ His reasons for such a declaration lie in the initial misinterpretation of what was a quotation from economist Eric Roll; Finley interpreted Roll's interdependent markets as referring to spatially disparate markets when Roll was actually referring to interdependency amongst specific market goods and services.⁹⁰ This clarification, while enlightening, is perhaps pedantic. Regardless of whether or not Finley

⁸⁰ Polanyi 1944, 30.

⁸¹ Temin 2001, 169; Feinman and Garraty 2010, 172.

⁸² Whittaker 1995.

⁸³ Morley 2007a, 6.

⁸⁴ Fulford 1987; Paterson 1998; Erdkamp 2005; Morley 2007a; 2007b; Roman and Dalaison 2008; Harris 2011, 147-148; 293-300.

⁸⁵ Temin 2001.

⁸⁶ Finley 1985, 22; Temin 2001; Erdkamp 2005, 143-205; Harris 2011, 293-300.

⁸⁷ "early modern Europe is characterised by a low degree of market integration. It seems unlikely that the grain market in the Roman world performed any better..." (Erdkamp 2005, 144).

⁸⁸ Erdkamp 2008.

⁸⁹ Tchernia 2011, 101.

⁹⁰ *Ibid.*, 106-108.

misinterpreted the quote, we must contend with the forty years of scholarship since Finley first published his remarks on the subject. Furthermore, regardless of whether one is speaking of geographically separated markets or product specific markets, the question of integration remains important. Indeed, much of this thesis is concerned with market integration and the subsequent effects on production and distribution.

Modern Economics

While the collection and synthesis of archaeological data forms the core of this thesis, it is crucial that the archaeological data also be interpreted; it is useful to turn to economic theory in order to make sense of the archaeological evidence. Placing the archaeological evidence within a theoretical economic framework will aid in the understanding of the historical significance of the economic development of the Roman Empire. As there are several theories and approaches which have been applied to the ancient world to some degree, I will give a brief introduction to the major theories before arguing for their varying applicability to this thesis.

New Institutional Economics

New Institutional Economics (NIE), most prominently associated with the scholarship of Douglass North, studies institutions, both formal and informal, and their effects on economic performance.⁹¹ According to NIE, “the performance of a market economy depends upon the formal and informal institutions and modes of organization that facilitate private transactions and cooperative behavior.”⁹² As of late, the approaches of NIE have become very popular amongst ancient historians. NIE features prominently in the *Cambridge Economic History of the Greco-Roman World* and appears in other publications by scholars such as Kehoe, Kessler and Temin, Lo Cascio, Harris, Scheidel and Verboven.⁹³

⁹¹ For a review of the upsurge of NIE dominated analysis, see Boldizzoni 2011.

⁹² Ménard and Shirley 2005, 1.

⁹³ For example, Kessler and Temin 2007; Kehoe 2007; Lo Cascio 2006; Harris 2011; Scheidel 2011a; Verboven 2011a; 2011b.

NIE provides a framework for evaluating the role of the state and formalized institutions, such as taxation and various laws, as well as more informal institutions, such as *collegia*, freedmen and the ability to incorporate societal norms into the equation. In terms of this thesis, for example, it can aid in the understanding of the state and merchant communities in reducing overall transaction costs. There are, of course, weaknesses in the theory, perhaps the most significant one being that it does not necessarily allow for factors other than institutions—technology, for example—to play a role in economic development.⁹⁴ A prime example of this comes from a recent article by Walter Scheidel where he argues that “imperial state formation was the single most important determinant of the scale, structure and productivity of maritime commerce in the Roman period....Technological change in ship design and navigational techniques, if it occurred at all, was an endogenous function of these powerful framing conditions”.⁹⁵

It is not at all surprising that the proponents of NIE are primarily ancient historians. It is after all, an economic argument which focuses on institutions—precisely the type of evidence which historians can focus on through literature and epigraphy. But where does it fit in terms of the archaeological evidence of the Roman world? Did the Roman economy owe its vitality largely to its institutions? Or do some of the institutions develop after the initial economic expansion, and if so, what does this mean? We will come back to this.

Absolute and Comparative Advantage

International trade is not about competition, it is about mutually beneficial exchange. Even more fundamentally...imports, not exports, are the purpose of trade. That is, what a country gains from trade is the ability to import things it wants. Exports are not an objective in and of themselves: the need to export is a burden that a country must bear because its import suppliers... demand payment.⁹⁶

⁹⁴ *C.f.* Harris 2011.

⁹⁵ Scheidel 2011a. I disagree with this statement for reasons explored in Chapter II.

⁹⁶ Krugman 1993a, 24.

Two major economic theories related to trade and production costs were developed in the late eighteenth and early nineteenth centuries. The first, and best known, is the principle of absolute advantage described by Adam Smith in the *Wealth of Nations*.⁹⁷ This principle states that an entity (individual, nation, region, etc.) has an absolute advantage in a product which they produce more efficiently than another nation. Specialization allows for division of labour, which allows for a greater output of production. Trade becomes beneficial when the said entity specializes in the production of the good for which they have an absolute advantage and trades surplus products with entities specializing in other products. This principle, while clearly important, is limited by its one-to-one relationship. The theory works as long as one entity is always clearly more efficient than another entity at producing at least one good, but this is, of course, not always the case. This is where the principle of comparative advantage comes in.

Concisely put, comparative advantage may be gained when an individual, region or nation can produce a good with a lower relative cost or opportunity cost when compared to other potential production locations. This economic principle was developed in the early 1800s and is primarily credited to David Ricardo.⁹⁸ Advancing the principle of comparative advantage is the Heckscher-Ohlin theory,⁹⁹ which proposes that trade can only be beneficial when economic resources are unequally distributed among countries or regions. Comparative advantage results in mutually beneficial exchange when trade occurs between two regions with a comparative advantage in different products. The importance of this principle lies in the distinction between comparative advantage and absolute advantage. As defined by a current macroeconomic textbook, “even if one country is at an absolute disadvantage relative to another country in the production of every good, it still has a comparative advantage in making the good at which it is least inefficient (compared with the other country).¹⁰⁰ Of course in order for the principles of absolute and comparative advantage to function, there must be sufficient trade.

⁹⁷ Smith 1789 (particularly Book IV).

⁹⁸ Ricardo 1817, chapter 17.

⁹⁹ Heckscher and Ohlin 1991.

¹⁰⁰ Baumol and Blinder 2012, 359.

Methods and Approaches

Geoffrey Rickman called for a change in focus to a study not simply of harbours, but of ports so as to encompass not only technical features, but also social and economic aspects:

Harbours should not be studied just as structures, but in relation to the purposes which they served. They have to be seen as part of a network of ports, fulfilling a function in the Roman world. To their study, therefore, we have to bring not just archaeological techniques, but the questions and skills of the social and economic historian. Why were ports positioned where they were, in relation to geography, population, manufacture or political need? Who paid for them and why? What governed their success and how were ports used?¹⁰¹

It is in this vein that this thesis is written; it is not primarily concerned with the infrastructure of ports, though this is certainly a part of the discussion. Rather, it seeks to explore the economic function of ports in the Roman Mediterranean. The thesis is divided into two sections. The first section examines Mediterranean ports from a panoptic view in order to address questions of systems of trade, connectivity and overall economic development. Importantly, what was the role of ports in the development of the Roman economy; how effectively did they facilitate maritime trade? This thesis combines both maritime and terrestrial archaeology as it attempts to contend with the Roman *maritime cultural landscape*. The first chapter is specifically terrestrially focused, the second maritime focused. From there, the aim is to fully integrate the two. Maritime trade was not an isolated phenomenon, but rather the mechanism which connected large-scale production with consumption. This thesis will not simply consider the distribution of traded goods—it will also necessarily examine the issues of production and consumption.¹⁰²

It is the goal of the first section of this thesis, therefore, to investigate the mechanisms through which these ports were connected and to explore the social and economic implications of these connections. The date range of the thesis is designed to establish this period of connectivity within its historical context. I have selected a commencement date of

¹⁰¹ Rickman 1985, 105; 1988, 257. Quote from Rickman 1988, 257.

¹⁰² *C.f.* Feinman and Nicholas 2010, 87.

166 BC, the date by which the historian Polybius regarded the Romans as having gained control over the known world,¹⁰³ to allow for the examination of changes between the Republic and the Empire. The end point of AD 300 was chosen in order to examine the changes in trade and economic activity over the course of the early development of the Roman Empire, its peak and the purported crisis of the third century AD.

The second section involves two case studies, southern Turkey and southern France. This section is designed to test the wider models developed in the first section of the thesis and to explore the effects of Mediterranean connectivity on a local and regional level. These two regions have been chosen to incorporate the eastern and western Mediterranean. What were the geographic and economic factors which led to their development and how did harbours facilitate this development? To help answer this question, we will follow Paul Krugman's advice: "One of the best ways to understand how the international economy works is to start by looking at what happens inside nations...if we want to understand international specialization, a good place to start is with local specialization".¹⁰⁴ Applied, this suggests that in order to understand the wider Roman economy, one should first study the local and regional economies' development and interactions.

By examining two very different regions in detail, I will outline the various ways in which regional economies evolved and how they contributed to wider economic growth in the Roman world. Did integration into a larger trading network vary based upon the size of the port, its facilities, or the productive capabilities of its hinterland? Importantly, can one see changes in development throughout the Roman period? In answering these questions, I will apply an interdisciplinary approach encompassing archaeological, historical and epigraphic evidence, as well as considering modern economic theory, geography, geology and hydrography in an attempt to fully elucidate the complexities of each study area.

In his introductory chapter to *Trade in Classical Antiquity*, Morley questions the ability of archaeology to shed light on the mechanisms of trade:

¹⁰³ *The Histories* 3.4.2-3.

¹⁰⁴ Krugman 1993b, 3.

The problem arises when one tries to go beyond acknowledging the existence of inter-regional connections and the widespread distribution of goods to assess their economic significance. Briefly, archaeology shows that goods are being moved, but rarely by whom, or in what context. No historian would now follow Finley's wholesale rejection of archaeological evidence, on the basis of the fact that thirty-nine sherds of terra sigillata scattered over a 400-metre area on the Swedish island of Gotland were eventually found to belong to the same bowl (1999: 33), but it is difficult to refute Whittaker's equally sceptical argument that the distribution of wine amphorae in the Roman period might simply represent aristocrats moving their own produce between different estates rather than market trade (1989)Tens of thousands of pottery sherds confirm their belief in the high development of ancient commerce, but they are insufficient to dismiss the arguments of the primitivists as to why trade could not have been large-scale or economically significant in a pre-industrial society with limited demand (Tchernia 1989).¹⁰⁵

However, despite Morley's doubts, this thesis will, I believe, show rather conclusively that archaeology, particularly when used within the interdisciplinary framework mentioned above, can not only illustrate that there was economically significant large-scale trade during the Roman period, but can also begin to answer questions regarding the contexts of trade. It will also demonstrate that Whittaker's objections to market trade (*annona*, supplementary cargoes, the military market and aristocratic redistribution) are simply incongruent with the archaeological record.¹⁰⁶ The synthesis of data presented in this thesis includes not only tens of thousands of pottery sherds, but also information gleaned from shipwrecks, from agricultural and non-agricultural production, epigraphy, harbour investment, customs policies and urban wealth; the aim is to provide a nuanced picture of Roman maritime trade.

¹⁰⁵ Morley 2007a, 6.

¹⁰⁶ Whittaker 1985; 1989.

CHAPTER I: PORTS AND CONNECTIVITY: CERAMIC ASSEMBLAGES

As noted in the Introduction, simply indicating that imported objects are present at a site is not sufficient evidence to argue for a connected, much less, a global world. In order to apply the principles of connectivity to the Roman world justifiably, we must demonstrate not only that various regions of the Empire were in contact with each other, but also that these contacts were significant and sustained. There are several ways in which the archaeologist might attempt to illustrate such ideas, perhaps the most obvious of which is through the ceramic assemblages of various sites. As some of the most durable and well-studied artefacts of antiquity, ceramics have the potential to reveal significant information concerning the trading connections of the ancient world. This chapter, therefore, looks at the amphorae and finewares from a variety of coastal sites around the Mediterranean in an attempt to gauge their relative connectedness with the wider Mediterranean and to assess the geographical limitations of such connections (Figure 1).



Figure 1. Map of Sites Discussed in Chapter I (author).

This type of research is not new; in the 1980s, Fulford published two formative articles which address the degree of interdependence amongst port cities through material assemblages.¹⁰⁷ The first article examined ceramic assemblages from Berenice, Carthage and Ostia.¹⁰⁸ His 1989 article, 'To East and West',¹⁰⁹ compared the material evidence (largely ceramics, but also coinage and marble) for trade in the cities of Sabratha in Tripolitania and Berenice in Cyrenaica, arguing that each region traded preferentially with areas towards their north as opposed to engaging in east-west trade across the Gulf of Sirte. The primary reasons for such a conclusion lie in the striking differences between the amphorae assemblages at the two sites. At Sabratha, the imported amphorae are consistently from western sources, whilst the imports at Berenice are predominantly of eastern origin.

Fulford ended his 1987 article with the following appeal,

The meticulous analysis and quantification of archaeological assemblages has barely been started in the Mediterranean and it is urgent that this continues alongside careful stratigraphic excavation so that the hypotheses put forward here can be tested further. Such data will not only enable comparison to be made within the Mediterranean but across the empire as a whole, thus providing us with a valuable general insight into the processes of urban formation and decay.¹¹⁰

Since the publication of his articles, numerous quantified ceramic studies have been performed, though there has not yet been a detailed synthesis of them. It is therefore now useful to widen the scope beyond Fulford's original study. While one of the stated goals of this thesis is to compare the eastern and western Mediterranean, this chapter is nevertheless biased towards assemblages from the western Mediterranean. This is unfortunately impossible to remedy with the current state of ceramic report publications from the majority of eastern Mediterranean sites. Sites which were excavated prior to the twenty-first century often did not keep coarse wares such as amphorae unless they were stamped (e.g. the Athenian Agora¹¹¹), and even today many publications included only selective pieces of

¹⁰⁷ Fulford 1987; 1989.

¹⁰⁸ Fulford 1987.

¹⁰⁹ Fulford 1989.

¹¹⁰ Fulford 1987, 72.

¹¹¹ Lawall 2005.

pottery and do not produce quantified reports. A pottery report of Paphos highlights the regrettable situation: “Since only a very small proportion of unstamped amphora sherds were retained during the initial sorting of the finds from the site, it is not possible in this volume to indicate the relative proportions of wares at a given period with any accuracy.”¹¹²

This situation should improve in the near future with the publication of the ceramic reports of Beirut and Butrint, both of which are in the early stages of processing under the direction of Paul Reynolds. Where quantified assemblages from the eastern Mediterranean are available, they are often small assemblages from very specific contexts and provide snapshots into various individual periods of a site, but not broad chronological information. One exception to this is the site of Elauissa Sebaste in Rough Cilicia. The assemblages discussed here are therefore divided into two groups. The first addresses those sites which easily fit a chronological span with regard to both amphorae and finewares: Carthage, Berenice, Ostia and Elaiussa Sebaste. The second group consists of assemblages which have a more limited chronological timeframe and range of material, but nonetheless provide valuable insights into consumption and trading patterns.

Amphorae

Berenice

At Berenice (Sidi Khrebish, Benghazi), quantified amphorae studies were carried out by Riley following the excavations of 1971–1976 by the Libyan Department of Antiquities and the Society for Libyan Studies.¹¹³ The amphorae discussed here were collected from the stratigraphic excavations of several houses and buildings throughout the town. For the purposes of this chapter, the amphorae have been grouped according to source (if known), and graphed to indicate relative proportions of imports to local wares over time and to elucidate the regions from which amphorae are imported. It should be noted that there is a certain amount of residual material in the assemblages discussed. With regard to finewares from Berenice (which come from the same contexts as the amphorae), residual vessels have

¹¹² Hayes 1991, 85.

¹¹³ Riley 1979.

been removed from consideration. This is possible with finewares because they are more narrowly dated, but is not possible with the amphorae. The reader should thus be aware of the possible bias of residual wares in the following discussion.

When the amphorae are analysed in this manner, a number of clear patterns emerge. Beginning with the Augustan period assemblage (Figure 2), 69% of the amphorae are imports. Unfortunately the majority of these (54%) are of unknown type.¹¹⁴ Italic amphorae are fairly common at 6% (Campanian Dressel 2–4 and Dressel 1) and noticeable amounts of North African (Tunisian and Tripolitanian) and Aegean amphorae are present as well. Locally made amphorae are significant at 31%.

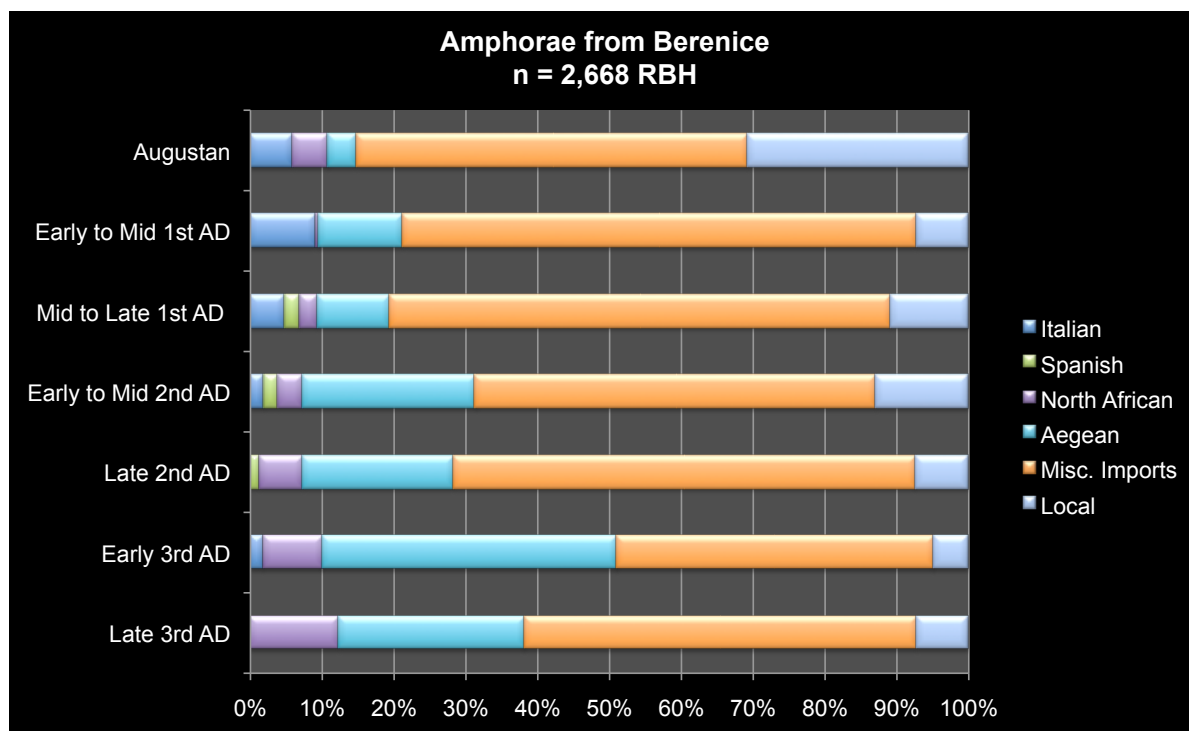


Figure 2. Amphorae from Berenice (author's graph, data from Riley 1979).

By the early to mid-first century AD, locally made amphorae constitute only 7% of the deposit. The percentage of unidentified imported amphorae is extremely high at 71%. Aegean amphorae surpass the number of Italian amphorae with Aegean amphorae

¹¹⁴ The miscellaneous category consists entirely of imports, containing primarily unidentified amphorae as well as small numbers of identifiable amphorae which make up less than one percent of a given assemblage.

comprising 12% of the assemblage and Italian 9%. The predominant Aegean import is the Crétoise 2, manufactured in Crete, which belonged to the same province as Berenice (Crete and Cyrene). In the mid- to late-first century AD, Aegean amphorae continue as the most frequent type of known imported amphorae, comprising 10% of the deposit. Miscellaneous imports are still by far the majority at 70%. Spanish amphorae appear in noticeable quantities for the first time at 2%. Italian amphorae account for 5% of the assemblage and North African imports are at 2%. The percentage of locally made amphorae is 11%.

In the early- to mid-second century AD, the percentage of Aegean amphorae increases to 24%. The percentage of local amphorae rises slightly to 13%. Spanish, Italian and North African imports are roughly similar at 2-3% each. By the late second century AD, identifiable Italian amphorae are not present. Aegean amphorae are still the largest category of identifiable imports (21%). The percentage of North African imports has increased to 6%.

The early third century AD sees the peak of Aegean imports at 41%. The majority are Crétoise 1, followed by Kapitän II.¹¹⁵ North African imports comprise 8% of the deposit. Locally-made amphorae account for only 5% of the assemblage. By the mid-third century AD, two import types clearly dominate: Aegean and North African. The percentage of Aegean amphorae has dropped to 26% (predominantly Kapitän II followed by Crétoise 1—the opposite of the early third century) and the percentage of North African amphorae has risen to 12%. The amount of locally made amphorae is still low at 7%.

Owing to the high proportion of unidentified imported amphorae from every period—reaching as much as 71% of the first-century AD assemblage—it is not possible to draw straightforward conclusions regarding the trading connections of Berenice. Indeed, the unidentified imported amphorae probably conceal major connections, leaving us with only a partial picture of the trading patterns. Despite this, however, there are several general patterns which are distinguishable over time.

¹¹⁵ The production area of the Kapitän amphorae (I and II) is still unknown, though they are generally regarded as Aegean and have been classified as such for the purposes of this chapter. See Bezeczky 2005 for a discussion of the evidence.

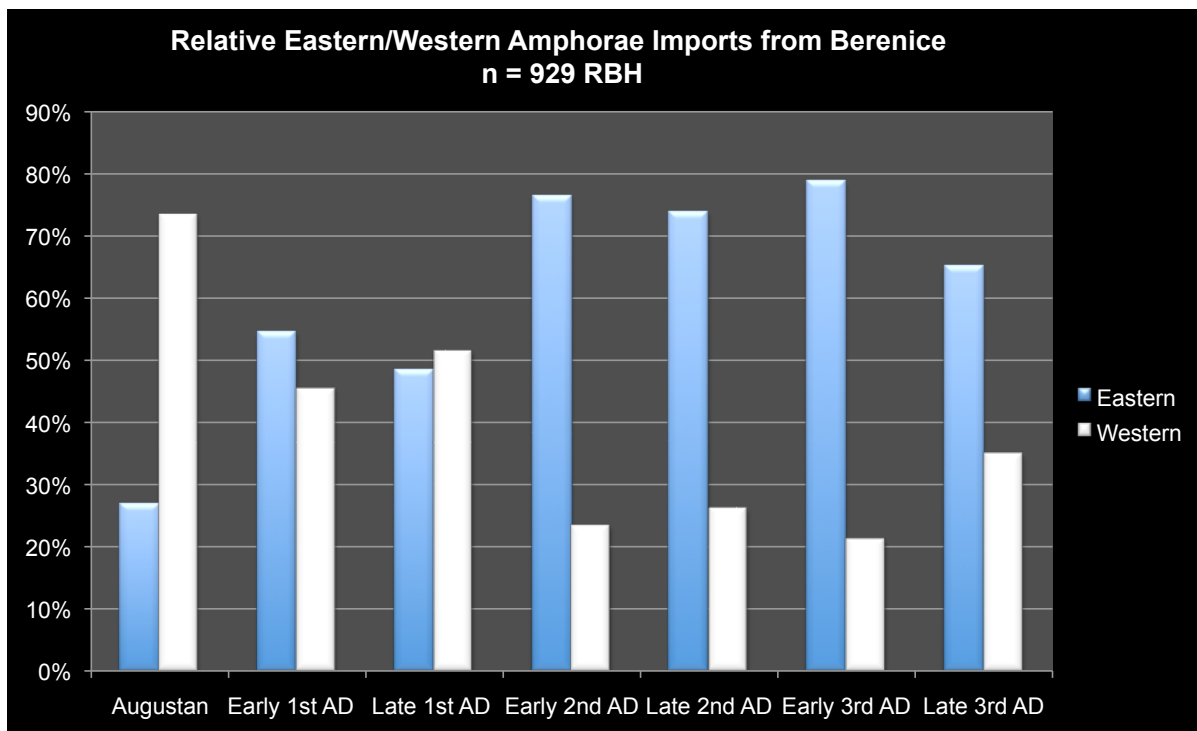


Figure 3. Relative Eastern / Western Amphorae Imports at Berenice (author's graph).

After the Augustan period, the number of locally made amphorae decreases and remains relatively low for the remainder of the Imperial period. While Berenice could be becoming more reliant on imports, it is also probable that local products are being held in other containers.¹¹⁶ North African (Tripolitanian/Tunisian) amphorae increase gradually in number to a peak in the third century AD. Most prominently, eastern imports gain increasing importance, particularly from the second century onwards. A graph of the relative percentages of identifiable imports over time (Figure 3) shows a clear change with western imports dominating the Augustan period to a fairly even distribution for the first century AD, followed by the dominance of eastern imports beginning in the second century AD and continuing through the third century.

¹¹⁶ The housing of local products is perhaps seen in the assemblages from the Clos du Lombarde at Narbo Martius, discussed in Chapter V, and is probably the case for the low quantities of Italian amphorae in the mid-Imperial assemblages at Ostia and Rome, but does not seem to be the case at Berytus (discussed below) where local amphorae are highly visible in the ceramic assemblages.

Carthage

At Carthage, quantified ceramic studies were carried out in the 1980s both as part of the British excavations of the Circular Harbour¹¹⁷ and as part of the German excavations of insula blocks.¹¹⁸ While the excavations from the harbour produced a much larger quantity of ceramics, both the assemblages from the harbour and from the habitation zones will be examined to investigate if there is a difference between the commercial and domestic settings.

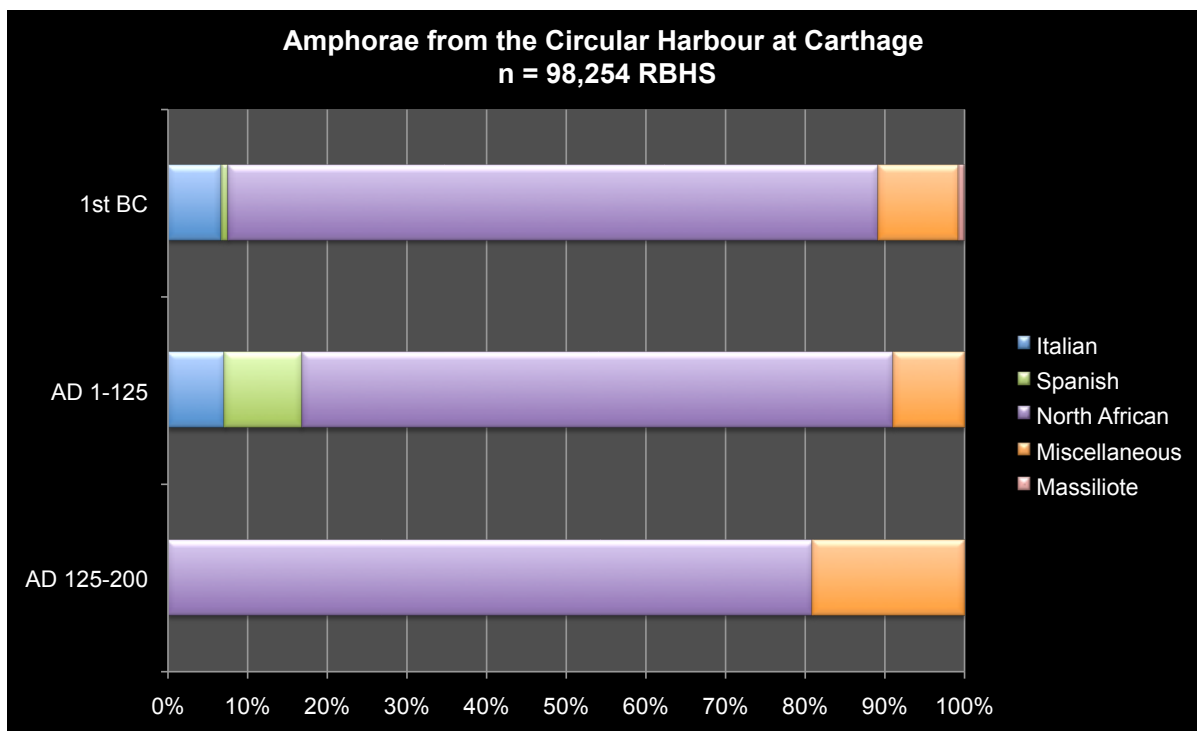


Figure 4. Amphorae from the Circular Harbour at Carthage (author's graph, data from Hurst *et al.* 1984).

We will begin with the amphorae from the Circular Harbour. The ceramics from each layer were counted and weighed, and the results—including RBHs and body sherds—were weighed and counted. The number of ceramics retained is large (over 98,000 sherds), and many of the assemblages contain highly residual material. In order to reduce the error caused

¹¹⁷ Hurst *et al.* 1984.

¹¹⁸ Rakob 1991.

by such residual material, some deposits have not been considered in this discussion. These deposits will be noted in their appropriate sections.

The first period of interest, the late first century BC, has the most variety of any of the relevant Carthaginian deposits (Figure 4). The material is overwhelmingly dominated by North African amphorae (81%), both those of Punic tradition as well as Roman forms. The next most common identifiable category is that of Italian amphorae.

The second period, AD 1–125, shows a continuing dominance of North African amphorae (74%).¹¹⁹ Spanish and Italian amphorae are imported in significant quantities, 10% and 7% respectively. Compared with the other sites discussed there are relatively few unidentified sherds, forming only 9% of the extant sherds.

In the final period, AD 125–200, North African amphorae dominate solidly at 81% of all sherds, whereas the remaining 19% consists of amphorae of unknown origin.¹²⁰ However, although these are identifiable as African amphorae, their exact origins have not been determined and many of the amphorae could have been moved from production sites in Tunisia and Tripolitania up to several hundred kilometres away.

The assemblage from the Circular Harbour presents a very different picture from Berenice in that North African amphorae always dominate the assemblages. The first century BC and the first century AD see moderate concentrations of Italian amphorae. The first and early second centuries AD exhibit the largest variety amongst amphorae sources, with a significant percentage of Spanish amphorae in addition to the Italian amphorae, but the overwhelming majority of amphorae are again North African. Of course, by the later second century there is no apparent competition for the North African amphorae, and no other sources are present, though 19% of the assemblage consists of unidentified amphorae.

¹¹⁹ As analysed here, this period consists of deposits 4.4, 4.7a, 4.7b, 4.7c, 4.7e, 4.8, 4.10, 4.12a, and 4.12b. Deposits 4.6, 4.14a, and 4.15c, dated to this period stratigraphically, have been removed from consideration due to the high degree of residual pottery.

¹²⁰ This period consists here of deposits 4.16a, 4.16b, and 4.18. Deposits 4.13a, 4.14b, and 4.17 were removed for residual contents. By this period, the sources of imports are not as varied.

Turning to the results of the German excavations, the amphorae from the habitation zones show a very different picture (Figure 5).¹²¹ For the sake of highlighting the imports, the North African amphorae have been removed. Unfortunately, the publication does not specify the exact number of removed amphorae; it simply states that the author examined approximately 900 amphorae in total, 762 of which were imports, thus suggesting approximately 140 (15%) removed North African amphorae.¹²² The number of imports (762) is thus considerably higher than the North African types. The first assemblage dates between 40/20 BC and AD 30 and includes 527 amphorae (RBH) of considerable variety. Italian amphorae dominate, comprising 56% of the amphorae. These are primarily Campanian in origin (179), but Adriatic amphorae are also common (95). The second most common origin is Spain with 21% of the assemblage. Imports from the eastern Mediterranean are also well-represented making up 15% of the assemblage.

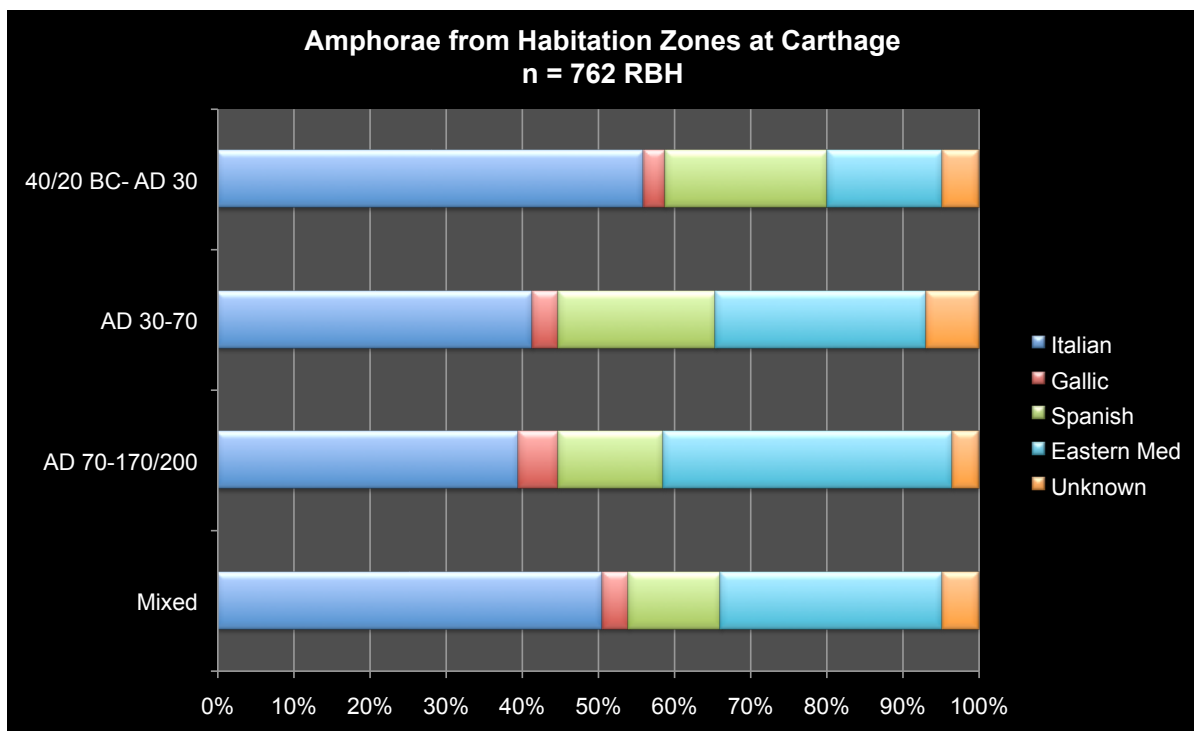


Figure 5. Amphorae from the habitation zones at Carthage with North African amphorae removed (author's graph, data from Martin-Kilcher 2005).

¹²¹ Martin-Kilcher 1993; 2005.

¹²² Martin-Kilcher 2005.

There were considerably less amphorae recovered for the period of AD 30-70 (only 29 in total), but the relative percentages are similar to those of the earlier period. Italian amphorae are the majority, again largely from Campania, but also from Sicily and the Adriatic. In this phase, however, there are more amphorae from the eastern Mediterranean (28%) than from Spain (21%). The Spanish imports are from Tarraconensis.

The final phase dates from AD 70-170/200. Italian amphorae are only slightly more numerous than amphorae from the eastern Mediterranean at 40% and 38% respectively. The Italian amphorae are primarily from Campania and Sicily. The eastern amphorae are predominantly from Crete. Spanish amphorae, mostly from Baetica, account for 14% of the assemblage during this phase.

There are relatively few North African amphorae in the habitation deposits (15% overall), a very drastic contrast when compared with the amphorae assemblages in the Circular Harbour. Two major conclusions may be drawn. First, the port's purpose was not only to import goods for local consumption, but also to tranship goods from elsewhere in North Africa. Secondly, it suggests that when/if regional products were consumed locally, they were not acquired in amphorae. This trend can also be verified by assemblages from domestic contexts at Narbonne which show essentially no local amphorae.

Ostia

The Ostian assemblages discussed here are from the Italian excavation of the *Terme del Nuotatore*, published in *Ostia I-IV*.¹²³ The amphorae were collected from the excavations of various rooms within the bath complex and the diagnostic sherds were quantified.

The earliest strata with substantial quantities of amphorae are dated between AD 80–90 (Figure 6).¹²⁴ In this period there are two primary regional sources of amphorae: Spain (25%) and Italy (23%). Overall, Italian Dressel 2–4 wine amphorae comprise the largest

¹²³ Carandini and Panella 1969; 1970; 1973; 1977.

¹²⁴ Carandini and Panella 1973, 91.

single concentration of sherds. The predominant Spanish amphorae are the Dressel 20 oil amphorae and Dressel 2–5 wine amphorae.

During the first half of the second century AD (AD 90–155/160), there are three primary regions visible in the imports: Gaul (24%), Spain (21%) and Italy (12%). This period has the greatest variety of imports in the period spanned by the *Terme del Nuotatore* excavations. The amphorae from Gaul are predominantly Ostia L (the most numerous single amphora type in this period) and Gauloise 4. Dressel 20 are the most prominent Spanish amphorae, though there are still substantial numbers of Dressel 2–5. The Italian amphorae are almost entirely Dressel 2–4. Amphorae from the Aegean and North Africa also begin to appear in more substantial numbers during this period. Miscellaneous amphorae account for 28% of all sherds.

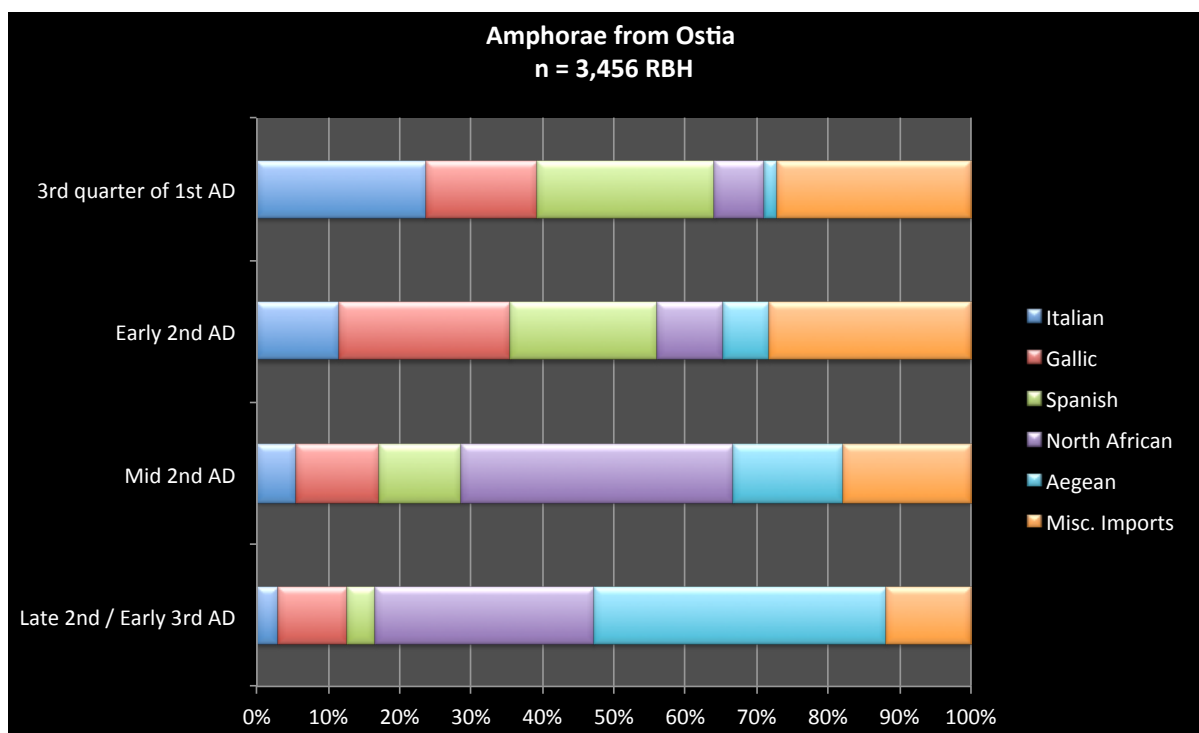


Figure 6. Amphorae from Ostia (author's graph, data from Carandini and Panella 1973; 1977).

The second half of the second century AD (AD 155/160–190) marks a significant change in the imported amphorae. Imports of Gallic, Spanish and Italian amphorae decline and are

replaced by imports from North Africa (38%) and the Aegean (15%). Gallic and Spanish amphorae are the next most frequent types, both at 12%.

This pattern is echoed fairly closely in the material of the early third century AD (AD 190–235/240) for which there is a much higher number of sherds (2,228 RBH). Again, the two primary types of amphorae are those from the Aegean and North Africa. Aegean amphorae comprise 41% of the deposit with the predominant amphorae being Kapitän I and Kapitän II. The North African amphorae (30%) comprise two primary types, Africana I and Africana II. Amphorae from Gaul, primarily Gauloise 4, make up 10% of the assemblage while amphorae from Italy and Spain are negligible at 3% and 4% respectively.

The material from Ostia allows for more detailed conclusions owing largely to the fact that there are far fewer unidentified amphorae; the percentage of unidentified amphorae never reaches 30%. At Ostia, the first century AD is dominated by Western imports with fairly even proportions of Spanish and Italian amphorae. In the early second century AD, the Western dominance remains: Gallic amphorae are found in higher quantities than the Spanish and Italian, though these are still present in significant amounts. Indeed, the early second century sees the greatest diversity in the sources of amphorae and eastern amphorae do appear. The later second century AD witnesses the rise of Aegean and North African imports, with an initial dominance of North African amphorae until the third century, when amphorae from Aegean sources are dominant, with North African amphorae a close second. The prevalence of North African imports is also shown in the fourth-century destructions level of room XVI at the *Terme del Nuotatore* where North African amphorae account for 55% of the entire assemblage.¹²⁵

¹²⁵ Carandini and Panella 1977 (Table 6, 249-252).

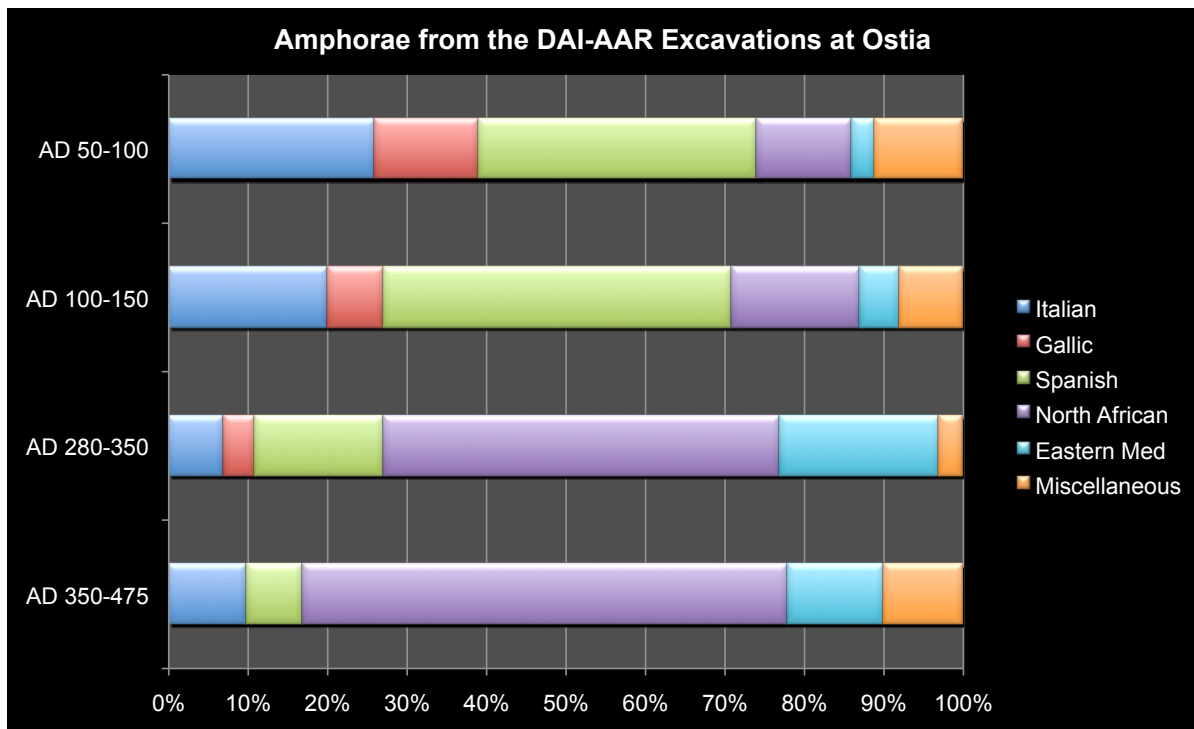


Figure 7. Amphorae from the DAI-AAR excavations at Ostia (author's graph, data from Martin 2008).

More recent amphora evidence from the DAI-AAR excavations at Ostia complements and enhances the picture (Figure 7).¹²⁶ A total of 16,133 sherds were collected from a series of 37 sondages across Ostia. These were processed according to various quantification methods including minimum number of vessels by rim sherds, estimated vessel equivalency, total sherd count and total sherd weight.¹²⁷ The percentages discussed here are based on Martin's averages of the total quantifications.¹²⁸ As in the *Terme del Nuotatore*, Spanish and Italian products dominate the assemblage between AD 50 and 100. The picture for the second century varies between the two excavation areas—whereas Gallic and Spanish amphorae are present in relatively similar quantities from the *Terme del Nuotatore*, Spanish amphorae solidly dominate the assemblage from the DAI-AAR excavations (44% of the amphorae). Mid- to late-second century levels were absent from the DAI-AAR excavations, missing the peak in Aegean amphorae visible in the baths. The DAI-AAR excavations have produced more substantial evidence on the later levels at Ostia. From AD 280 onwards, North African imports dominate (50% of imports AD 280–300; 61% 350–475). Eastern Mediterranean

¹²⁶ The results are published in detail by Martin 2008.

¹²⁷ Martin 2008, 105.

¹²⁸ *Ibid.*

amphorae do, however, account for 64% and 55% of all wine amphorae respectively in these two phases.

Portus

The first publication of amphorae from excavation contexts at Portus supports the proposition seen from the Carthage assemblage that transshipment zones have a more restricted range of amphora types. The amphorae are from a stratum of redeposited ceramics in the so-called *Palazzo Imperiale*, a monumental complex relating to the Trajanic harbour basin; the context dates to the later second / early third century AD and has a *terminus ante quem* of c. AD 250/300.¹²⁹ The amphorae are predominantly North African in origin. Indeed, North African amphorae account for 81.8% of the amphorae with the next most frequent category being Aegean and eastern Mediterranean amphorae which account for only 7.6% of the assemblage. Furthermore, the majority of the North African amphorae are Tripolitanian (Mau XXXV, Tripolitanian II and III).¹³⁰ A high percentage of North African amphorae at Portus is also attested by the finds from field-walking.¹³¹

The connection between North Africa and Portus is expected, nonetheless, the especially high percentage of amphorae from North Africa, and particularly Tripolitania, is striking. This is noticeable when compared with assemblages in Ostia and Rome, as Sabrina Zampini has done briefly in her publication of the assemblage.¹³² The most chronologically relevant examples from Rome come from the Antonine deposits of Meta Sudans,¹³³ and late second-century deposits from the Forum of Caesar.¹³⁴ In neither of these deposits do North African amphorae dominate the assemblage. In fact, Aegean and eastern Mediterranean amphorae are more common in the Forum of Caesar and the percentages of Italian, North African and Aegean / eastern Mediterranean amphorae from Meta Sudans are relatively equal (24.6%, 23.7% and 22.3% respectively). Many of the Tripolitanian amphorae would, however, have

¹²⁹ The ceramics are published in Zampini 2011. For the context of the assemblage, see Keay *et al.* 2011.

¹³⁰ Zampini 2011, 95.

¹³¹ Keay *et al.* 2005.

¹³² Zampini 2011, 96-98.

¹³³ Rizzo 2003, 178-184.

¹³⁴ Ceci 2006.

been intended for Rome, where Tripolitanian III amphorae form the majority of North African amphorae at Testaccio.¹³⁵

As discussed above, the amphorae at Ostia during the late second and early third centuries are also considerably more varied (see Figure 4). Aegean amphorae were the most common, followed closely by North African amphorae. In contrast to Portus where the majority of amphorae studied thus far are Tripolitanian, the North African amphorae at Ostia are mostly of Tunisian manufacture.

The most obvious explanation for the overwhelming dominance of North African amphorae is that Portus, like Carthage, did not simply import products, but also functioned as a transshipment point. This provides a parallel to the suggestion that the distribution of ARS was due to redistribution out of Portus as opposed to direct trade between ARS production centres and consumption sites.¹³⁶ Moreover, the concentration of Tripolitanian amphorae at Portus and Tunisian amphorae at Ostia suggests that trade links between specific ports were both important and consistent.

Telo Martius (Toulon)

Chapter V contains several amphorae assemblages from southern Gaul, but as Telo Martius provides assemblages from both the harbour area and habitation zones, it is worth initially considering the assemblage in this chapter. In the harbour zone (Figure 8), Gallic amphorae, mostly the Gauloise 4 and the Gauloise 5, dominate all periods between AD 50 and 225. Between AD 50 and 100, Gallic amphorae account for some 70% of the assemblage, while 23% of the amphorae are of Spanish origin (primarily Dressel 20 and Beltrán 2A amphorae, but the Dressel 20 dominate by the end of the first century).¹³⁷ Gallic and Spanish amphorae are more closely distributed between AD 100 and 150 with Gallic amphorae comprising 50% of the assemblage and Spanish 42%. Gallic amphorae are particularly dominant again during

¹³⁵ Zampini 2011.

¹³⁶ Fentress and Perkins 1988, 213; Bonifay 2003; Fentress *et al.* 2004, 157–8. See also fineware discussion below.

¹³⁷ Brun 1992, 125.

the latter half of the second century AD at 72%. Spanish amphorae account for 12% and African amphorae (primarily the Africana I oil amphora) appear in significant numbers for the first time at 9% of the assemblage. The number of African amphorae surpass the number of Spanish amphorae by the early third century 3 to 1 (18% African to 6% Spanish), and Gallic wine still thoroughly dominates at 73% of the assemblage.

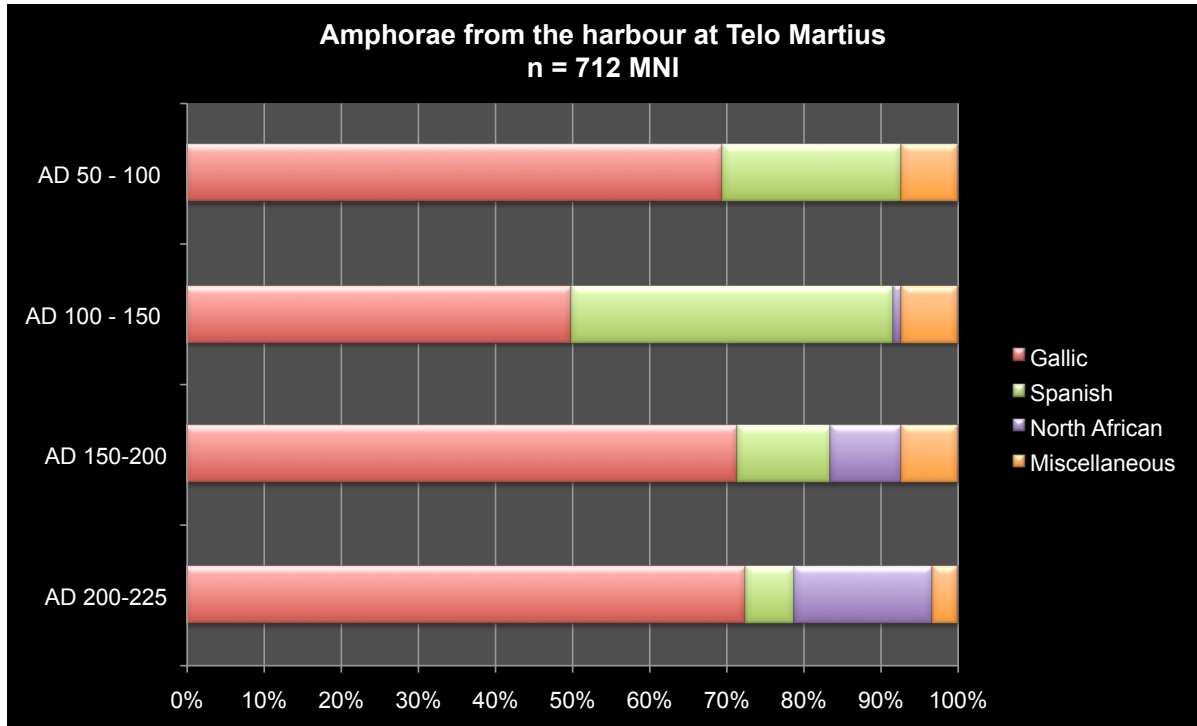


Figure 8. Amphorae from the harbour at Telo Martius (author's graph, data from Brun 1992).

While the port assemblage shows a relatively limited range of amphorae dominated by the major western types, the amphorae from the habitation zones, while still dominated by Gallic amphorae, are generally more diverse (Figure 9). During the latter half of the first century, Gallic amphorae comprise 63% of the assemblage with Massaliote amphorae as well as Gauloise 4, Gauloise 5 and Dressel 2-4 types from Narbonensis. Spanish amphorae are the second most represented amphorae at 23% (both Dressel 20s and Tarraconensian Dressel 2-4s). There are also small numbers of African (6%, Ostia LIX) and Italian amphorae (5%, Pompeian Dressel 2-4). During the second century, Gallic amphorae are dominated by the Gauloise 4 (56 of a total 66% amphorae of Gallic origin) with small numbers of the Gauloise

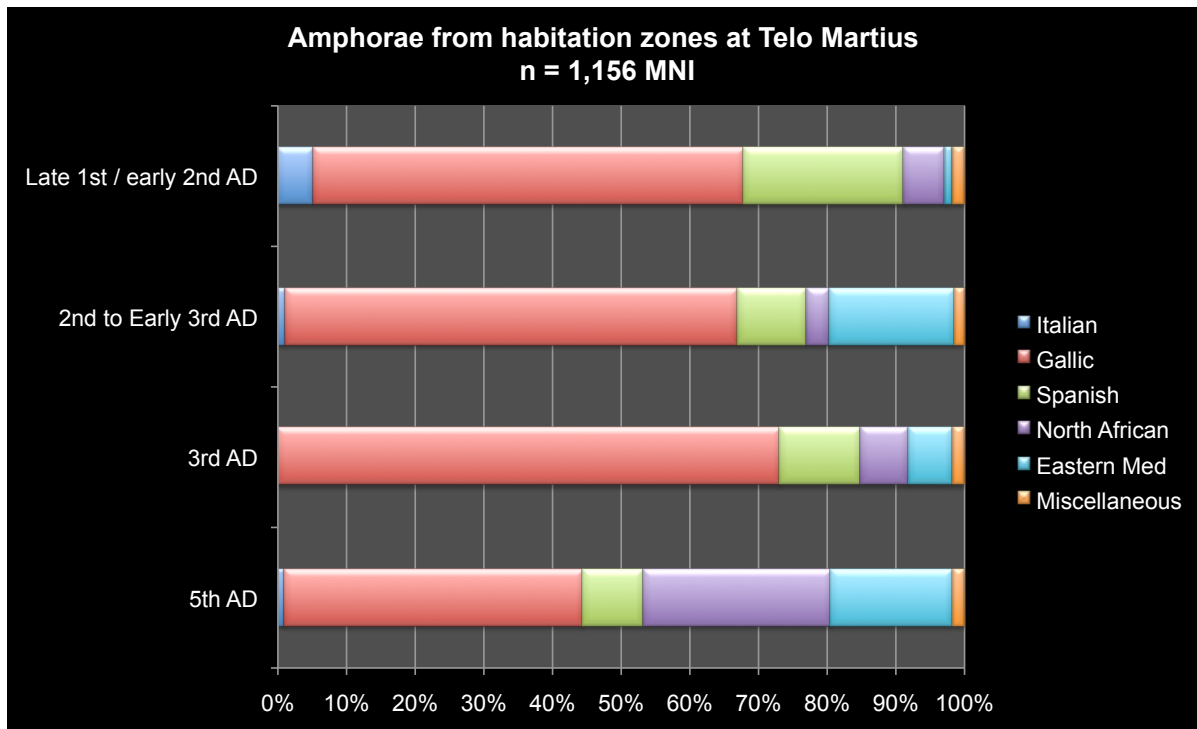


Figure 9. Amphorae from habitation zones at Telo Martius (author's graph, data from Brun 1992).

5 and a very few Gauloise 1s. The second most prominent amphorae are Aegean types at 18% including primarily Knidian types, but also Rhodian and Cretan amphorae. Dressel 20s are also reasonably well represented (10% Spanish). In the third century, Gauloise 4 amphorae account for the vast majority of amphorae at 66% of the total assemblage. There are also several residual amphorae; the only other major amphorae groups come from Spain where various amphorae were used for salted fish products (Beltrán 2A and 2B, Almagro 50 and Dressel 14 *similis*) account for approximately 6% of the assemblage. North African types such as the Africana I, II A and C and Tripolitanian types account for a further 7%. The Aegean amphorae are mostly residual by this phase. Late Antique amphorae are predominantly African (Keay LXI and LXII) and Eastern (LR 1, 2, 3, 4, 5) types.¹³⁸

The difference between the two assemblages is interesting in that, like Carthage and Portus, it provides a look at the types of products that were moving through the port, versus the products that were being imported for consumption within the city. As expected, Gallic wine amphorae dominate both the commercial traffic and the local consumption. During the

¹³⁸ Brun 1992, 126-127.

second century, however, the habitation zones contain a relatively high number of Aegean wine amphorae (MNI = 110). This would seem to indicate that while the residents of Telo Martius were importing Aegean wine, it was coming into the city for direct consumption and was not generally being transhipped, as was probably the case for the Spanish and Gallic products.

Elaiussa Sebaste

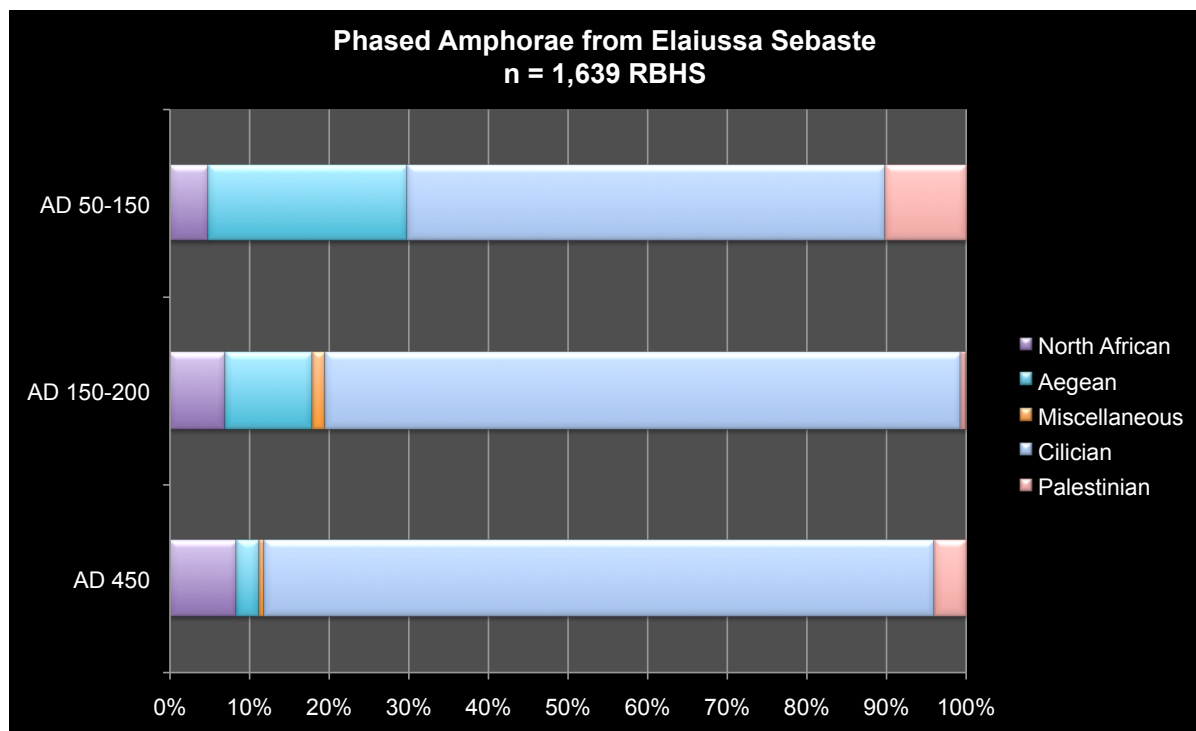


Figure 10. Amphorae from Elaiussa Sebaste (author's graph, data from Equini Schneider and Morselli 2010).

Quantified ceramic reports from Elaiussa Sebaste in southern Turkey were produced by the Italian excavations under the direction of Equini Schneider between 1995 and 2009.¹³⁹ This site will be discussed in detail in Chapter IV, but as this is one of the few sites in the eastern Mediterranean for which a quantified ceramic publication exists, it is worth considering in the context of this chapter. The ceramics presented here are from the Roman agora, and the ceramic material has been divided into four phases, three of which will be considered here.

¹³⁹ Equini Schneider 1999; 2003; Equini Schneider and Morselli 2010.

As can be seen from Figure 10, the material shows an overwhelming prominence of Cilician amphorae. In Phase 1, the phase with the lowest percentage of Cilician amphorae, there are relatively few amphorae in total (20), making any type of secure conclusion difficult. During Phase 2, Cilician amphorae comprise nearly 80% of the amphorae. These include a high number of amphorae produced in local clay, but otherwise unidentified, Anemurium A¹⁴⁰ (Agora G199), Agora M54¹⁴¹ and Pompeii 5 and Dressel 2-4 in local fabrics. Aegean amphorae in this phase consist primarily of unknown types in recognized Aegean clays and Late Roman 3.¹⁴² North African amphorae are the best represented during this phase but are primarily unidentified types. During Phase 3, the Cilician amphorae are primarily residual Anemurium A and Late Roman 1 types. Palestinian Late Roman 4 wine amphorae appear in small numbers (17 sherds). Interestingly, there are 41 fragments of Africana II amphorae.

Berytus

While the full range of quantified ceramics from Berytus (modern Beirut) are currently being prepared for publication, the amphorae from the third century AD have been recently published (Figure 11). The amphorae are divided into three phases. The first phase, AD 200-230 (RBH = 2,208) is heavily dominated by the local wine amphorae, which comprise 70% of the assemblage. The remaining 30% consists of a wide variety of imports. Of these, amphorae from the Levant are the most common (9% overall, 30% of imports), in particular those from northern Palestine and Gaza. Aegean amphorae account for the second most common category (6% overall, 20% of imports), followed by those from the Black Sea (6% overall, 18% of imports) and then Cilician (4% overall, 14% of imports). The remaining imports are primarily of western origin, with amphorae from Baetica, Tunisia and Northern Italy being the most common.

The second phase, AD 230-250 (RBH = 724) is less dominated by local amphorae, though they still comprise 40% of the entire assemblage. Again, the majority of imported amphorae

¹⁴⁰ These amphorae occur both with and without a visible pitch lining, suggesting that they could have held both oil and wine.

¹⁴¹ These are believed to have held wine and possibly fruit (Reynolds 1997-1998; 2005, 564).

¹⁴² Despite the name, this type originates during the first century BC. It was produced in western Asia Minor and its contents are thus far unknown.

are from the Levant (32% overall, 53% of imports), primarily from northern Palestine. As with the preceding phase, the second most common amphorae imports are from the Aegean (14% overall, 24% of imports), followed again by those from the Black Sea (5% overall, 8% of imports) and Cilicia (4% overall, 7% of imports). By this phase, Baetican amphorae are the only western amphorae present in any real quantity.

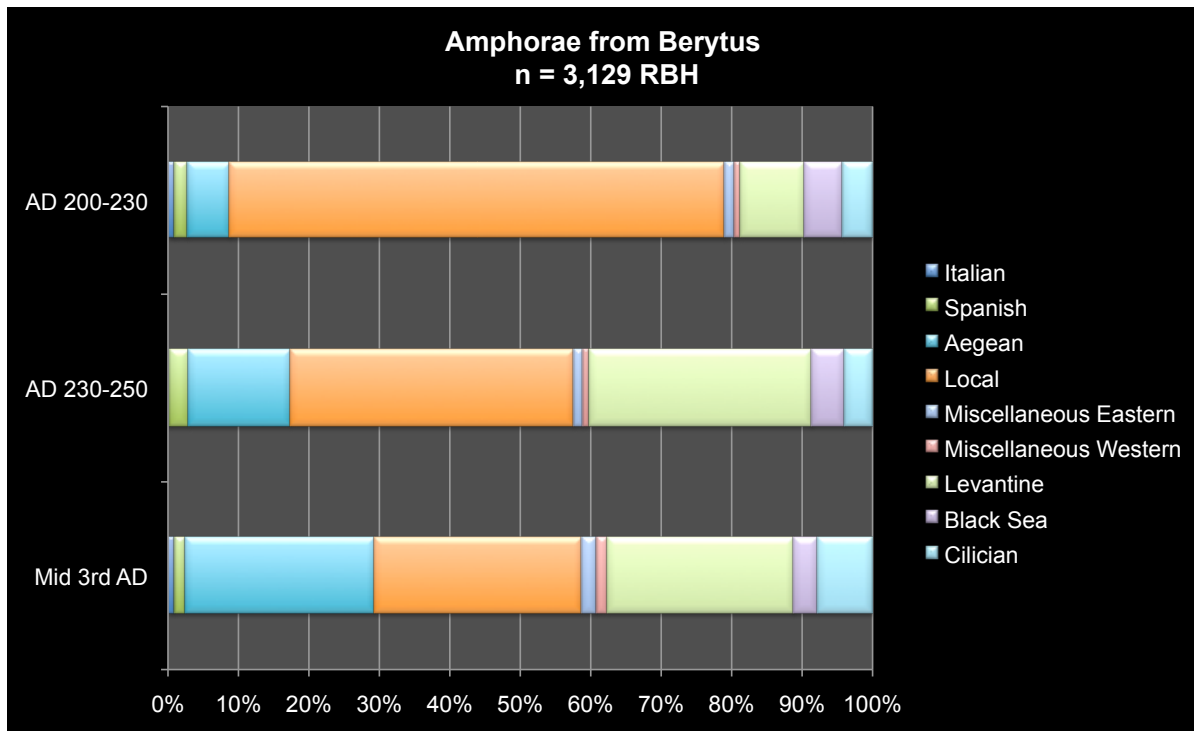


Figure 11. Amphorae from Berytus (author's graph, data from Reynolds 2010).

The third phase, dated to the mid-third century, contains only 197 RBH. By this phase, local amphorae, those from the Levant and those from the Aegean, are present in relatively equal numbers; local amphorae account for 29% of the assemblage, Aegean for 27% and Levantine for 26%. Cilician amphorae are also now more common than those from the Black Sea (8% and 4% respectively). Western amphorae are extremely rare.

Corinth

At Corinth, imported amphorae make up approximately 85% of all amphorae.¹⁴³ This percentage remains approximately the same throughout the periods of this study's focus,

¹⁴³ Slane 2003, 327.

with slight decreases occurring only in the Antonine period and late fourth century AD.¹⁴⁴ Interestingly, no single source region of amphorae dominates the assemblage, though there are fluctuations over time.¹⁴⁵ This phenomenon is perhaps due to Corinth's role as an entrepôt connecting the Aegean and the Adriatic. During the Augustan period and early first century AD, there are substantial numbers of Italian Dressel 6 amphorae and some Dressel 2–4. During the second century, Micaceous Water Jars (equivalent to Benghazi MR Amphora 3) are prominent, as are some Corinthian fabric amphorae. Dressel 6 amphorae continue and there are also a small number of Italian Forlimpopoli amphorae. Spanish amphorae, primarily Dressel 7–11, are also present.¹⁴⁶ The third century sees the arrival of Kapitän II amphorae and an increasing majority of Micaceous Water Jars.

Sabratha

At Sabratha, the number of amphora sherds available for study from the excavations by Kenyon and Ward-Perkins (1948–1951) is too low for any type of reliable quantitative analysis.¹⁴⁷ For the entirety of the site from 25 BC to AD 300, only 337 rims were available for analysis. Of these, 88% were North African with 47% being Tripolitanian and 41% Tunisian varieties. Only 12% were imported, and only one sherd originated in the East.¹⁴⁸

Amphorae Contents

Considering the contents of the amphora-borne commodities is useful at this point, if perhaps slightly tangential. The major products were indubitably wine, oil and fish products, but determining which amphorae held which products is not necessarily straightforward. The only secure way to identify contents is through *titulli picti*, which appear only on limited numbers of amphorae, or chemical or biomolecular analysis.

¹⁴⁴ *Ibid.*, 328.

¹⁴⁵ *Ibid.*, 328.

¹⁴⁶ Slane 2000, 300.

¹⁴⁷ Furthermore, only the sherds which could be brought to England from the excavations were studied. These sherds were not necessarily representative of the excavated sample as the selection criteria for those sherds brought back are unknown (Dore and Keay 1989, Preface).

¹⁴⁸ Dore and Keay 1989, 68–69.

Research methodologies have progressed substantially during the last decade. For example, DNA analysis has been carried out on amphorae by scientists at the Woods Hole Institute.¹⁴⁹ DNA analysis allows the detection of genetic fragments related to past contents based on their absorption into the ceramic fabric, allowing analysis even in the absence of surface residues. Nicolas Garnier maintains a lab devoted to the analysis of organic archaeological materials.¹⁵⁰ He specializes in a variety of analytical techniques, both chemical and biomolecular, including DNA analysis.

At present, residue analysis, which can be performed on significant quantities of amphorae at a lower cost, is more widespread. Residue analysis on North African amphorae by Nicolas Garnier in collaboration with Michel Bonifay has clarified the contents of several types of Africana amphorae.¹⁵¹ Patrick McGovern of the Biomolecular Archaeology Laboratory at the University of Pennsylvania also devotes much of his research to residue analysis and the identification of ancient liquids.¹⁵²

One of the initial and most straightforward determinants for contents is the presence of a visible pitch lining. Pitch¹⁵³ is widely thought to have been used for lining amphorae to be filled with wine (it is in fact mentioned numerous times in the ancient sources)¹⁵⁴ or a brine such as fish-sauce in order to prevent the permeation of the liquid into the ceramic fabric; it is also commonly believed that this it would not have been necessary for oil.¹⁵⁵ This has been recently contested by chemical analysis of late Roman amphorae from Sagalassos, and by experimental archaeology. The results show that oil does permeate ceramic matrices and that several amphorae showed markers of both pitch and oil, though in this case it was walnut oil.¹⁵⁶ Very recent biomolecular analysis done by Nicholas Garnier, however,

¹⁴⁹ Foley *et al.* 2012; Hannson and Foley 2008.

¹⁵⁰ Laboratoire Nicolas Garnier, <http://www.labonicolasgarnier.eu/presentation.html>, last accessed July 20, 2012.

¹⁵¹ Bonifay 2007.

¹⁵² Patrick E. McGovern Biomolecular Archaeology Laboratory, <http://www.penn.museum/sites/biomoleculararchaeology/>, last accessed July 20, 2012.

¹⁵³ The product used to line amphorae is specifically resin, but it is constantly referred to as pitch in the scholarly literature and therefore will be referred to as such here also.

¹⁵⁴ Columella, *On Agriculture* 12.22-24; Pliny, *Natural History* 16.22; Heron and Pollard 1988.

¹⁵⁵ Bonifay 2007; Peña 2007; Romanus *et al.* 2009; Mattingly *et al.* 2011, 245.

¹⁵⁶ Romanus *et al.* 2009.

confirms that olive oil amphorae were also pitched.¹⁵⁷ Olive oil reacts with pitch in a way that dissolves any visible lining, thus explaining why there are no visible signs of pitch on known oil amphorae such as the Dressel 20. Fortunately, this means that it is still largely possible to attribute amphorae with visible pitch linings to wine or fish products. What is not yet understood, however, is the length of contact time required for olive oil to erode the visible traces of pitch. The most considerable implications stemming from the discovery that all amphorae were pitched relate not to contents analysis, but to the production and trade of pitch. More detail concerning the production and trade of pitch is given in Chapter IV, but suffice it to say here that pitch was an expensive commodity and not uniformly available.

Amphora reuse¹⁵⁸ is certainly a major contributor to the problems of contents analysis and can cause mixed identifications when using chemical analysis, though interpretation is generally possible.¹⁵⁹ Despite the unknowns, there are numerous amphorae about whose contents we can be fairly certain.

While not all of the assemblages discussed can provide a detailed look at the contents, significant trends are observable. De Sena has broken down the amphorae from the DAI-AAR excavations at Ostia in a very detailed manner by estimating the capacity of amphorae of each major production region and then calculating the maximum volume of imports of wine and oil for the period AD 100-150.¹⁶⁰ His calculations show a much larger import of wine than olive oil; the maximum volume of wine imports is 167,000,000 litres versus 20,000,000 litres of olive oil. There is also a much larger range of suppliers of wine with the majority of imports coming from Italy, Narbonensis, the Adriatic and Anatolia, but also Tarraconensis, the Aegean, Tripolitania and Egypt, whereas olive oil is imported from only two major regions, Spain and North Africa (specifically Baetica and Zeugitana/Byzacena).¹⁶¹

¹⁵⁷ Personal communication with Michel Bonifay.

¹⁵⁸ Peña 2007.

¹⁵⁹ Pecci *et al.* 2010.

¹⁶⁰ De Sena 2005.

¹⁶¹ *Ibid.*, 3.

Wine also accounts for the vast majority of imports in the habitation zones at Carthage, with wine amphorae accounting for 80-90% of all amphorae.¹⁶² This is, of course, to be expected at Carthage where olive oil and salted fish products would have been easily available from the nearby hinterland. It is more indicative that wine amphorae also make up the majority of imports at Berytus and various sites in southern Gaul (see Chapter VI), areas where wine was produced on a very large scale. At Berytus, local wine amphorae comprise between 66% and 91% of the total number of amphorae during the first two centuries AD.¹⁶³

Discussion: Amphorae

To distinguish wider Mediterranean trading patterns, I have considered the amphora assemblages from eight sites across both the eastern and western Mediterranean collectively; several deductions may be made from this analysis. First, wine is, by far, the most frequently imported amphora-borne product. This is perhaps unsurprising; trade is, as stated in the Introduction, demand-based, and Roman literature leaves no doubt that wines varied considerably in quality and taste.¹⁶⁴ The widespread demand for wine and subsequent high volumes of trade in a variety of vintages should be kept in mind when discussing the economics of trade,¹⁶⁵ particularly for the implications with regard to production for export, a topic which will be discussed in detail in Chapters IV and V.

Second, there is a difference in the material which enters a harbour to be transhipped and the material that enters a harbour to be imported and consumed within its city. While there are few sites for which we can even begin to address this issue, it is adequately demonstrated by Carthage, Telo Martius and Portus / Ostia.

¹⁶² Martin-Kilcher 2005, 211.

¹⁶³ Reynolds 1997-1998, 51.

¹⁶⁴ For example, Pliny dedicates much of Book 14 of his *Natural History* to describing not only the extensive number of available wines, but also the varying quality of wines on the market. Strabo discusses the widespread fame of Caecuban wine (*Geography* 5.3.6), as well as Falernian, Statanian, Calenian and Sorrentine wine (*Geography* 5.4.3).

¹⁶⁵ See Tchernia 1980; 1986; 1997, 2000 and Brun *et al.* 2004 for general overviews of wine consumption and trade in the Roman world.

Amongst the amphorae assemblages considered, those from the Circular Harbour at Carthage initially seem to be the exception in their lack of diversified imports, but the North African material may conceal a range of imports from along the North African coast. The pattern from the harbour at Carthage, dominated by many regionally produced amphorae, is closest to that seen at Sabratha—although as just mentioned, it is difficult to draw secure conclusions from Sabratha. Given that Africa Proconsularis produced significant quantities of major amphora-borne products (certainly oil and fish products, but also wine),¹⁶⁶ it stands to reason that the majority of the amphorae at Carthage would originate from this region, as the size of the province meant that there would still be a variety of imports. Nonetheless, trade is not *only* about supplying the items of necessity, but about providing a selection of goods; and therefore this assemblage is initially puzzling given the role Carthage played as a major trading centre. However, the enigma resolves itself when one considers the amphora assemblage from the habitation zones within the city of Carthage and particularly when one compares these against the harbour assemblages from Telo Martius and Portus. The harbour assemblages exhibit less variety because they do not represent the full range of their cities' consumption habits, but rather what was being handled in the port, most likely the material destined for further transport. This provides an interesting glimpse of the emporium function of Roman ports, a role which will be elaborated upon in more detail in Chapter III.

A third point is that while clear, regionally-focused distribution patterns are apparent in the assemblages, particular amphorae types have a much wider circulation. Looking at western exports, at Berenice, Ostia, Corinth and even Carthage, there is a very clear presence of Italian amphorae during the early Empire. The assemblages from both Berytus and Elaiussa Sebaste date after the apex of Italian exports and are therefore not indicative. Spanish amphorae also reached the cities discussed, including Corinth, Berenice and Berytus, though in lesser quantity than the Italian amphorae. They account for a substantial portion of the limited imports at Carthage and a very small proportion of the amphorae at Berenice. Spanish amphorae also appear at Corinth, though in unknown proportions. On the other hand, Gallic amphorae, which appear in significant quantities at Ostia in the early second century AD, do not appear in significant quantities at Carthage or the eastern sites. By the

¹⁶⁶ Bonifay 2007.

third century AD, North African amphorae form a substantial part of the western assemblages: they are however scarce in eastern assemblages; only relatively small numbers of North African amphorae were found at Berenice (though how much of this is skewed by unidentified amphorae is impossible to know at this time), and they only appear in small numbers at Corinth.

Eastern amphorae were widely exported from the second century AD onwards. At Berenice they comprise high percentages of the assemblages by the beginning of the second century AD and by the middle of the second century are found in large quantities at Ostia. Corinth, as might be expected, also sees large quantities of eastern amphorae, but eastern amphorae are also common in the domestic assemblages of Carthage. As I will demonstrate in Chapter V, they are not altogether uncommon in southern Gaul either. Furthermore, the variety of eastern amphora types present at Elaiussa Sebaste and particularly at Berytus speaks to extensive production and distribution across supra-local regions.

Indeed, it is worth specifically considering the distribution pattern of the eastern Kapitän amphorae (I and II), as they appear to be one of the few amphorae that were widely distributed across both the eastern and western Mediterranean. Figure 12 shows the distribution of the Kapitän II; the map is outdated and numerous find spots could be added, but the widespread distribution is obvious. As such, it is all the more unfortunate that their origin is not more specifically known. Their content is also unknown, but they are usually thought to have contained wine. Without knowledge of either their exact origin or content, it is difficult to understand why these amphorae had such a wide distribution. Bonifay has suggested on the basis of two wrecks, the *Ognina* and the *Porticcio*, that, at least occasionally, the Kapitän I and II amphorae were redistributed out of North Africa.¹⁶⁷ Both the *Ognina* wreck (dated to the first half of the third century) and the *Porticcio* wreck (dated to the mid-third century) contained principal cargoes of North African amphorae and complementary cargoes of Kapitän amphorae.¹⁶⁸ While the absence of third-century assemblages at Carthage means that there were no Kapitän I and II amphorae documented in

¹⁶⁷ Bonifay 2007, 257.

¹⁶⁸ *Ibid.*, 257.

the reports discussed, Kapitän amphorae are well attested at Nabeul and El Djem in Tunisia.¹⁶⁹

Figure has been removed due to copyright restrictions

Figure 12. Distribution map of the Kapitän II amphora (Peacock and Williams 1986, Figure 113).

While there are clear regional patterns visible in the amphorae assemblages discussed, there are also trends which occur across the Mediterranean. The majority of amphorae from the harbour at Carthage were produced within its province. At Berenice, the main amphorae that do not appear in the west are the Crétoise 1 and 2—again, part of the same province. These regional variations affect Ostia less than other cities, a fact which may be expected for the major centre for the supply of Rome. The one amphora type which does appear in significant quantities at Ostia, but not the other sites, is the Gauloise 4. This amphora is primarily distributed in the west and northwest¹⁷⁰ and can best be explained as an amphora designed for regional riverine export, as opposed to one being limited to the western Mediterranean.

¹⁶⁹ *Ibid.*

¹⁷⁰ See Chapter V for a thorough discussion of the Gauloise 4 amphora.

At this point, however, it is useful to turn to finewares to examine whether the same patterns exists as with the amphorae.

Finewares

Finewares are, unfortunately, not often published in quantified studies to the same level of detail as the amphorae; the only sites for which truly quantified reports of fineware exist are Carthage, Elaiussa Sebaste and Emporiae. At Berenice, quantified finewares were not reported within their stratigraphic context in the initial publication,¹⁷¹ though they were broken down by period in a later article by Kenrick.¹⁷²

Berenice

Owing to the significant amount of residual pottery in the initial deposits, Kenrick did not quantify the finewares according to strict stratigraphic confines. Rather, he looked at the ceramics ‘through the type series listing all the sherds that are intrinsically datable’. As a result, the periods are very large, but basic trends are certainly discernible. It is these numbers that are considered here.

From the period from 25 BC to AD 125, 3,824 sherds were examined (Figure 13). By far the majority of finewares (60%) are Italian Terra Sigillata (ITS). A portion of these were initially categorized as Tripolitanian sigillata (615 out of 2,338 sherds), but it is now clear that these are actually Italian. The next most common fineware is Eastern Sigillata A (produced near Antioch) at 26%. The remaining 14% of finewares are comprised of a large variety of different wares including Eastern Sigillata B (from the Maeander Valley) and Pontic Sigillata.

The second century AD saw a drastic change in the dominant finewares with African Red Slip (ARS) now comprising 55% of all finewares. Eastern Sigillata B has replaced Eastern

¹⁷¹ Kenrick 1985.

¹⁷² Kenrick 1987.

Sigillata A in importance making up 14% of the assemblage. ITS is still fairly significant at 13%. Çandarlı wares account for 11% of the finewares. The remaining 7% of wares are

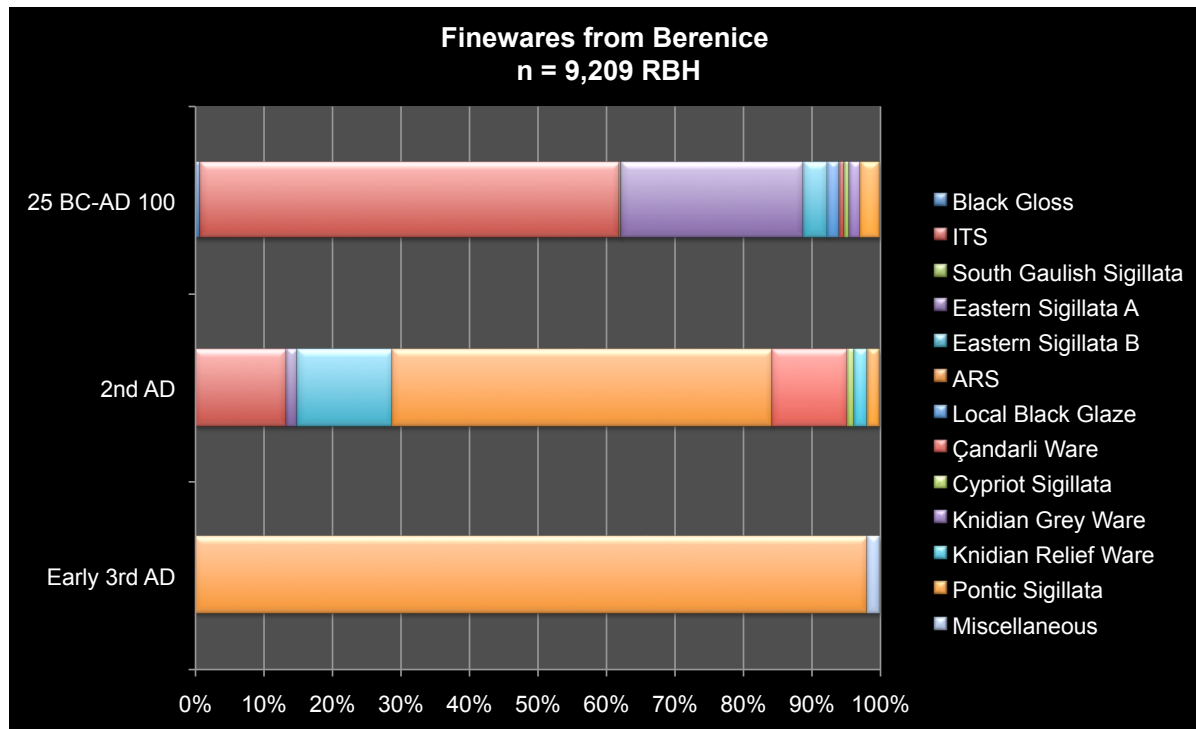


Figure 13. Finewares from Berenice (author's graph, data from Kenrick 1987).

made up of Pontic Sigillata, Eastern Sigillata A, Knidian Relief Ware and Cypriot Sigillata. The early third century AD shows a different view, with ARS completely dominating at 98%. The remaining 2% consists of Çandarlı wares and Corinthian Relief Bowls.

Over the course of the Imperial period, western sources supply the majority of finewares at Berenice. Italian imports dominate the first century AD, which are gradually replaced in importance by ARS over the course of the second century. By the third century, ARS completely dominated the market. Eastern imports never appear again in significant quantities and gradually decrease over time after their peak in the first century AD. This is the *opposite* pattern from that shown by the amphorae. Whereas the principal origin of amphorae becomes predominantly eastern in the second century AD, eastern finewares lose importance in this period only to disappear in the third century AD. Essentially, the early third century AD sees the zenith of imports of eastern amphorae and the nadir of eastern sigillata.

Carthage

The finewares from Carthage discussed here are from the same assemblages as the amphorae discussed above. During the late first century BC (Figure 14), the finewares at Carthage are dominated by black gloss ware, with 40% of all finewares being black gloss wares of unknown origin and 25% Italian Campanian black gloss. The other dominant fineware of this period is Eastern Sigillata A, which comprises 30% of all finewares of this period. As with the amphorae, the deposits dated to AD 1–125 contain a large amount of residual material. Those deposits which clearly contain a large amount of residual material have been removed from consideration, but it is not possible to remove all residual material. Black gloss wares still comprise 18% of all finewares in the first-century AD deposits, despite the fact that they were no longer manufactured during this period. As may be expected, ITS dominates the finewares of this period, comprising 49% of all wares. Thin-walled wares, most of which were imported from Italy, make up 14% of the assemblage. ARS first appears

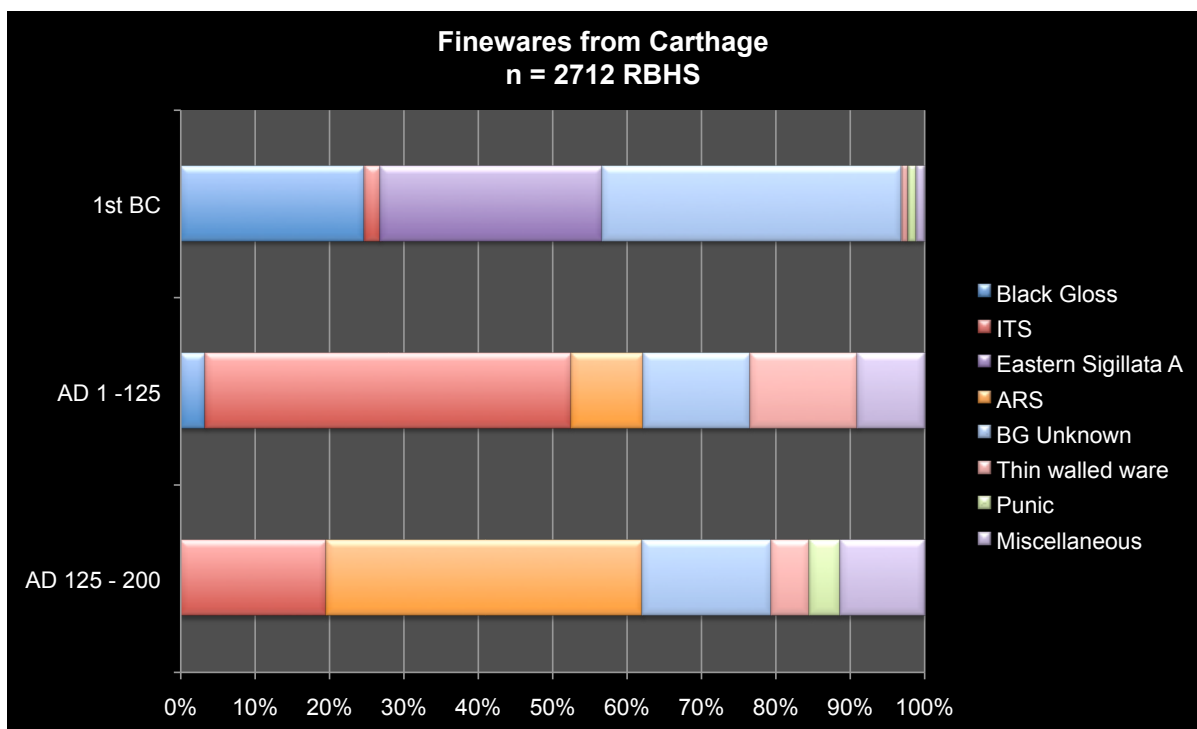


Figure 14. Finewares from the circular harbour at Carthage (author's graph, data from Hurst *et al.* 1984).

during this period, accounting for 10% of the finewares considered, a figure that underplays its true importance during the period when it was produced, given that ARS production began *c.* AD 60, by which time black gloss ware production had ceased.

By the second century (AD 125–200), ARS is the dominant fineware at 43%. ITS still comprises a substantial portion of the finewares, though some of these may be residual by this time. Certainly residual are the 17% of black gloss wares. Thin-walled wares only account for 5% of the finewares during this period. The remainder of the finewares consist of some residual Punic wares and unidentified wares.

Overall, Carthage is dominated by western finewares. Eastern Sigillata appears in substantial quantities in the Augustan period, but it is rapidly replaced by the western wares. During the first century AD imports were dominated by ITS until approximately the early second century AD, when it was replaced by ARS.

Ostia

At Ostia, fully quantified reports were not produced for the finewares as they were for the amphorae. With regard to the *Terme del Nuotatore* excavations, quantified results were given for the dominant finewares: ITS, South Gaulish Sigillata, and ARS. While this is not ideal, it is interesting to consider the changing proportions of these major wares over time. In the last quarter of the first century AD, 83% of the finewares documented were ITS. South Gaulish Sigillata accounts for only 16%, with the remaining 1% being ARS.

ITS dominates during the first half of the second century AD, accounting for 75% of those finewares under consideration. South Gaulish Sigillata remains at 16%, and ARS wares now comprise 9% of the reported assemblage. However, by the latter half of the second century AD, ARS has become the dominant fineware, accounting for 80% of recorded wares. ITS still accounts for 16% of finewares, whereas South Gaulish Sigillata has dropped to a paltry 4%. By the third century AD, ARS accounts for 99% of the finewares.

A more recent study of the finewares by Martin considers the wider variety of finewares which appear at Ostia from not only the *Terme del Nuotatore*, but also from more recent excavations as well.¹⁷³ His work reveals much the same picture as the results discussed above, but he addresses the presence of Eastern Sigillatas in greater detail. Eastern Sigillata A, B and C all appear at Ostia, though never in significantly large quantities. Of these, Eastern Sigillata B is the most common, primarily during the second century AD. The other primary difference apparent in Martin's study is that by the early second century AD, ARS has already replaced South Gaulish Sigillata as the second most common fineware. As his calculations consider an additional section of the *Terme del Nuotatore* in addition to that included in the publication by Carandini and Panella, his results are more representative.

Ostia mirrors what has been seen elsewhere in the West. ITS is the most prevalent fineware of the first century AD and early second century. From the middle of the second century AD, ARS floods the market. The only point at which eastern finewares make a significant appearance is during the second century AD, when Eastern Sigillata B is at its peak.

Emporiae

At Emporiae (modern Ampurias or Empúries) in Catalonia, excavations from the Roman forum have produced extremely high numbers of ceramics, with counts totalling 159,522 sherds and a minimum number of 25,455 of vessels.¹⁷⁴ There is not yet a detailed publication of the amphorae, but a quantified and stratified report on the finewares has been recently published.¹⁷⁵

The assemblages do contain substantial amounts of residual material, particularly in the form of Black Gloss. Figure 15 shows the assemblages with the Black Gloss. For the sake of accuracy, however, I have removed the Black Gloss from Figure 16, which shows the assemblages without the residual Black Gloss. Three main finewares are present in the

¹⁷³ Martin 2006.

¹⁷⁴ Aquilúe *et al.* 2005.

¹⁷⁵ *Ibid.*

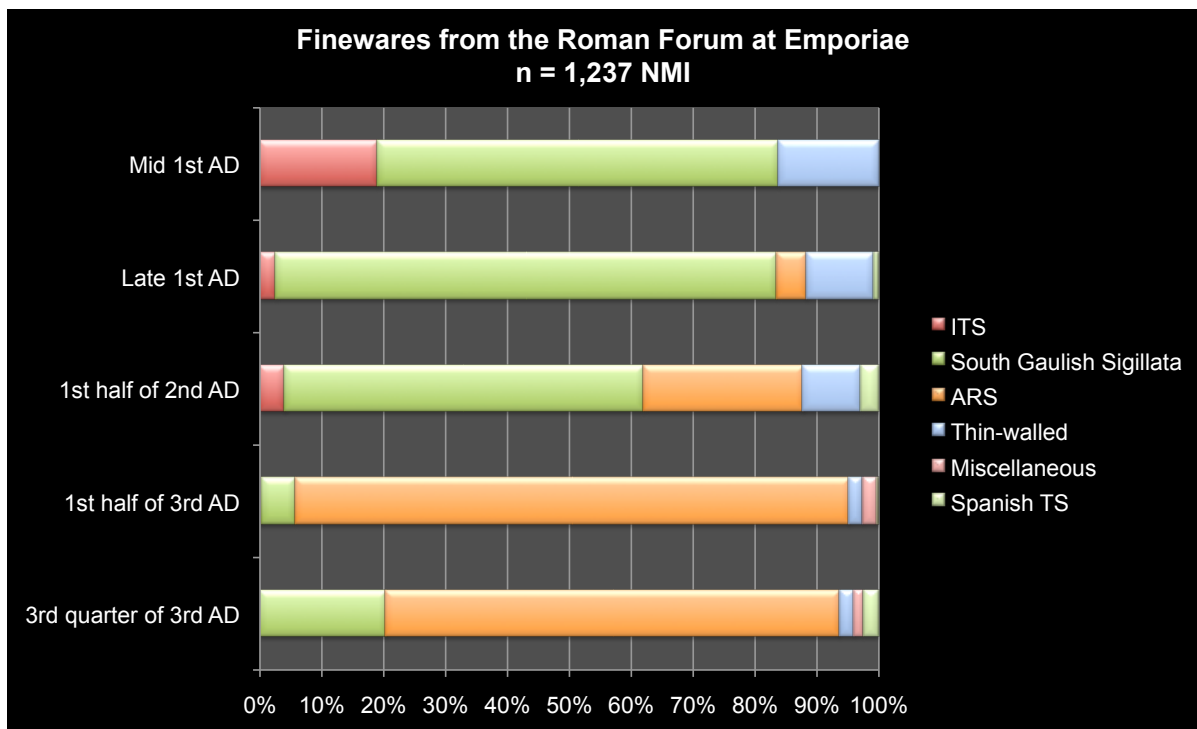


Figure 15. Finewares from Emporiae with Black Gloss removed (author's graph, data taken from Aquilúe *et al.* 2005).

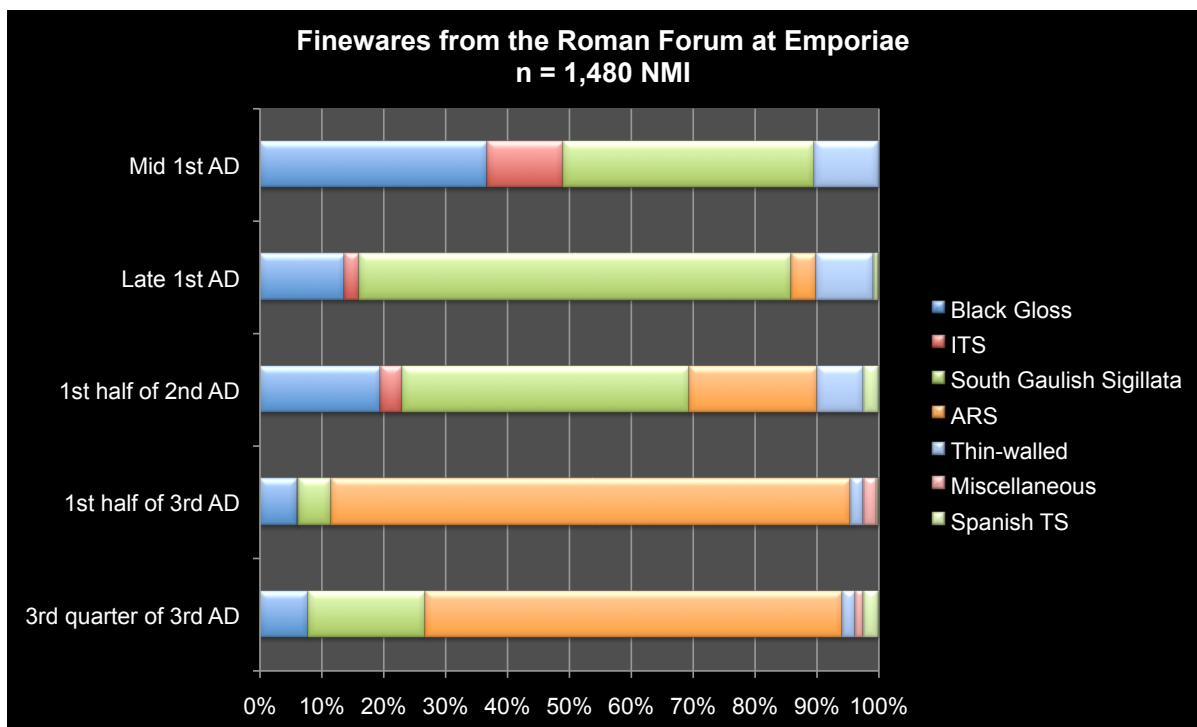


Figure 16. Finewares from Emporiae including Black Gloss (author's graph, data taken from Aquilúe *et al.* 2005).

assemblage of the the mid-first century AD— South Gaulish Sigillata dominates at 65%, followed by ITS at 19% and Thin-walled wares at 16%. By the late first century AD, South Gaulish Sigillata comprises 81% of the finewares. There are small amounts of Thin-walled wares (10%), but relatively few ITS wares. Early forms of ARS appear during this period. By the first half of the second century AD, ARS is increasing and accounts for 26% of the total assemblage. South Gaulish Sigillata is still thoroughly dominant, however, at 58% of the assemblage and Thin-walled wares account for only 9%. As is to be expected, by the third century AD, ARS is by far the most prevalent ware at 90% of the assemblage. The final phase, dating to the third quarter of the third century, marks the abandonment of the site. ARS remains the most prominent ware, but at a slightly lower percentage (73%) compared with the beginning of the third century AD. Residuality is particularly apparent in this phase as South Gaulish Sigillata make up 21% of the assemblage.

While I have excluded the Black Gloss from the previous percentages, it is interesting to return to Figure 17 and consider the overall picture. The number of Black Gloss wares, even though residual, are always higher than that of ITS. Emporiae is the only site discussed with such high numbers of South Gaulish Sigillata; this is not surprising given the close proximity of Emporiae to the production site of this sigillata. More widespread trading connections between southern Gaul and Spain will be discussed in Chapter II and in Chapter V.

Elaiussa Sebaste

At Elaiussa Sebaste, the phased and quantified finewares from the agora are relatively limited. The phasing is the same as the amphorae: Phase 1 dates from the second half of the first century AD to the middle of the second century AD. Phase 2 dates to the second half of the second century AD. Phase 3 dates to the middle of the fifth century AD but contains significant amounts of residual material dating in large part to the third and fourth centuries. Eastern Sigillata A is the primary fineware type found in all phases (Figure 17). The second most common type of fineware is Cypriot Sigillata. The overwhelming dominance of Eastern Sigillata A is somewhat surprising given that the other sites have shown a greater

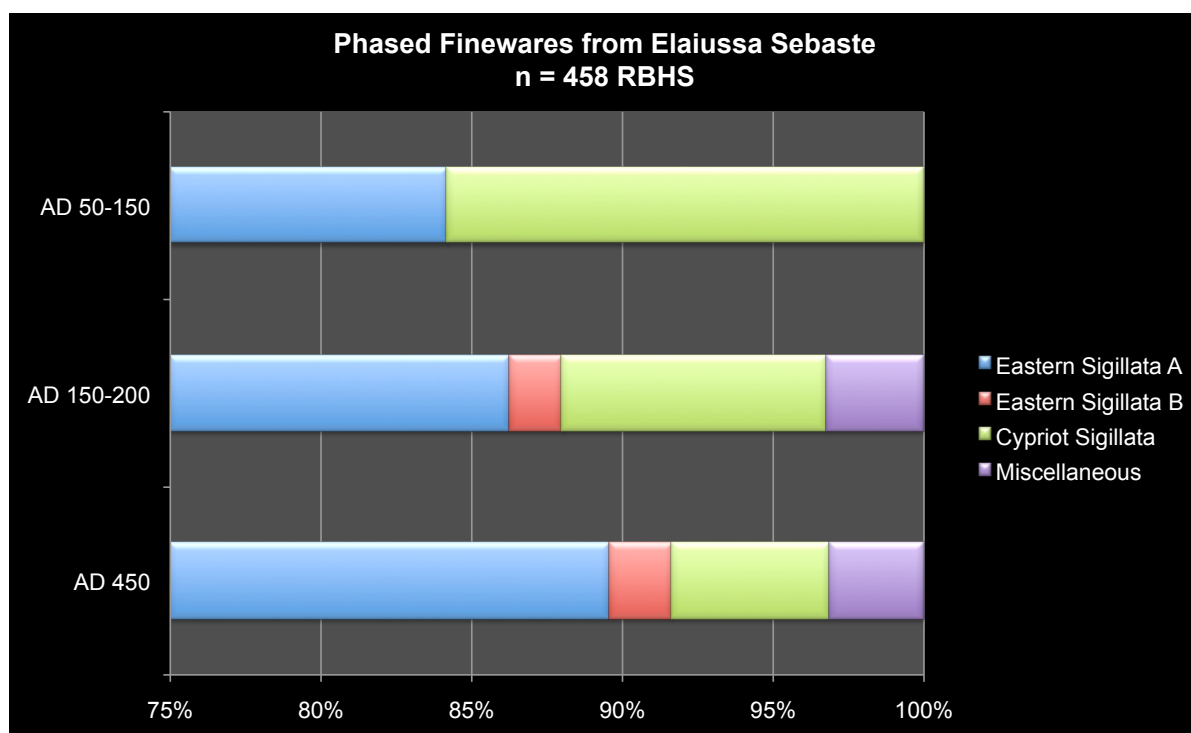


Figure 17. Phased finewares from Elaiussa Sebaste (author's graph, data from Equini Schneider and Morselli 2010, 186-224).

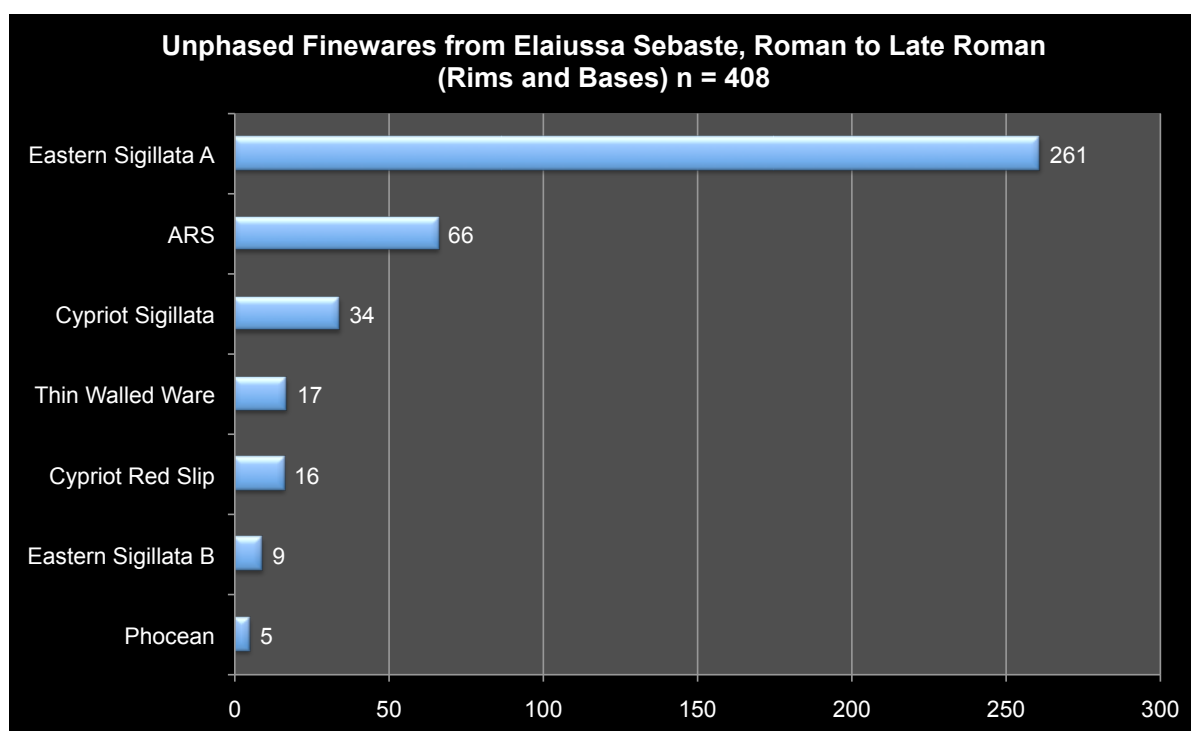


Figure 18. Unphased finewares from Elaiussa Sebaste (author's graph, data from Equini Schneider 2003, 649-661).

diversity of finewares, particularly if we also consider unphased finewares which have been collected from excavations outside of the agora.

The unphased fineware assemblage (Figure 18) shows similar trends to the phased assemblages in that the finewares are primarily eastern Mediterranean in origin and the dominant type is Eastern Sigillata A. The second most common type in the unphased assemblage is, however, ARS of which there are 66 total rims and bases. The western Thin-walled ware is also present with 17 rims and bases. In the unphased assemblage, western finewares therefore account for some 20% of the assemblage.

Corinth

As with the amphorae, some detail can be given with regard to additional sites, though not as precisely as with Carthage and Berenice. At Corinth, Slane quantified a significant amount of finewares, predominantly material from the excavations of 1981 to 1988 in an area east of the theatre.¹⁷⁶ Although the raw data from her studies have not been published, the information concerning general trends is useful here. In contrast with the amphorae discussed from Carthage, only 30%-35% of all finewares at Corinth were imported between the Augustan and Severan periods.¹⁷⁷ Imports were at their lowest during the Augustan period and generally increase in number over the Roman period.¹⁷⁸

During the Augustan period, as may be expected, the primary imported fineware was Italian sigillata¹⁷⁹ ITS remained the primary import during the late Flavian and early Hadrianic periods, though a significant number of Eastern sigillatas (Eastern Sigillata B, Çandarlı, Pontic Sigillata, etc.) appear in the city. Furthermore, a small number of ARS vessels (Hayes forms 8 and 9) make a showing.¹⁸⁰ The period *c.* AD 200–225/250 is characterized by a

¹⁷⁶ Slane 2000, 299.

¹⁷⁷ Slane 2003, 330.

¹⁷⁸ *Ibid.*

¹⁷⁹ Slane 2000, 299.

¹⁸⁰ Slane 2003, 300.

more restricted range of shapes and sources. The two fineware types Çandarlı and ARS are prevalent, but ARS is the more common of the two.¹⁸¹

Corinth is also largely characterized by western finewares. With the exception of the second century AD when Eastern Sigillata B was the most common fineware, the first and third centuries AD were dominated by ITS and ARS respectively.

Discussion: Finewares

The overall fineware trends are considerably more straightforward than those of the amphorae. Indeed, with the exception of Elaiussa Sebaste, the evidence discussed above reveals an almost complete saturation of western wares, first with regard to ITS and then ARS, in both the western and eastern port cities studied. Even Elaiussa Sebaste, which is otherwise dominated by the Syrian Eastern Sigillata A, has ARS. The only eastern ware which managed to permeate westwards to any significant degree is Eastern Sigillata B, and this is best seen during the second century AD at Corinth. The sites of Emporiae and Elaiussa Sebaste are both dominated by regional wares with otherwise more limited distributions on an Empire-wide scale than ITS or ARS, but both sites also have significant numbers of the major wares.

If we consider the evidence from the amphorae and the finewares together we are faced with a different set of patterns. This is probably a result of the different mechanisms involved in the transportation of amphorae and finewares. Whereas amphorae were transported as the primary cargo of a ship, finewares seem to have most frequently been complementary cargoes, an occurrence which is clearly illustrated in the wreck of the *Madrague de Giens*.¹⁸² It has been suggested that ARS travelled from North Africa along with grain ships and was redistributed outwards from Portus as return cargoes on ships that had brought other

¹⁸¹ Slane 2000, 308.

¹⁸² The *Madrague de Giens* ship (60–50 BC) was carrying a cargo of some 6–7,000 Dressel 1B amphorae upon which were packed crates of Campanian finewares (Tchernia *et al.* 1978).

¹⁸³ Fentress and Perkins 1988, 213; Bonifay 2003; Fentress *et al.* 2004, 157–8.

goods to Rome.¹⁸³ ARS does not seem to have travelled with African amphorae, as they do not appear together on shipwrecks of the Imperial period.

Conclusions

The amphora and fineware evidence suggests a Mediterranean which was highly connected with regular trade flows. As expected, there is clearly some variation between regions; it is only practical that cities should depend on their neighbouring regions for a supply of particular goods. However, there are always products which are present in significant quantities all over the Mediterranean. Amphorae manufactured in Italy, Africa and the eastern Empire were exported across the entire Mediterranean. Western finewares also permeate east and west.

The data have made it quite clear, however, that finewares and amphorae were being traded with a different economic logic. Why do finewares permeate Empire-wide while amphorae are typically more regionally restricted? It is most puzzling that there are only two known wrecks with ARS, *Dramont E* and *Port-Miou*.¹⁸⁴ Is it that ARS travelled with luxury goods or grain, as has been suggested by Fentress, Bonifay and others? Cargoes of textiles, spices and grain would not have survived, and although the finewares themselves would survive, they are less likely to be found as they are neither as bulky nor as easily recognizable as amphorae.¹⁸⁵ Perhaps the somewhat more limited distribution of amphora-borne products is related to the fact that these vessels often carried staple goods which could be obtained close to one's own region (as discussed previously with regard to Carthage). This would seemingly explain the limited import of olive oil outside of areas with very specific demands (e.g., Rome and the the northwestern provinces). However, this does not apply to all products traded in amphorae, for it is known that certain wines and fish sauces were traded because of their high quality and distinctive flavour, and the scale of traded wine has already been emphasized.¹⁸⁶ Furthermore, one must allow for the possibility that obtaining a product

¹⁸⁴ Bonifay 2003, 121.

¹⁸⁵ See Parker 1986 on the probable over-representation of amphorae wrecks.

¹⁸⁶ Pliny the Elder includes a section on the best and most widely regarded *garum* in his *Natural History* 31.43). On wine, see footnote 163.

produced in bulk could be cheaper than a product produced on a smaller scale, even factoring in transport costs.

While it is difficult to explain fully the different movements of amphorae and finewares in the Roman period, two hypotheses are apparent from this study, however, and bear emphasis. First, amphorae and finewares were traded by means of separate and distinct strategies; this stresses the high level of organization present in maritime trade in the Roman period. Second, to return to the opening of this chapter, there is little doubt as to the connected nature of the Roman Mediterranean. The variety of amphorae found at the sites discussed illustrates the range of goods such as wines, oils and fish sauces available for purchase and consumption within many Roman cities. The evidence of the finewares, particularly the ITS and ARS, illustrates that the Roman world was connected to such an extent that a low value, mass-produced product penetrated the coastal markets¹⁸⁷ of the entire Empire. Furthermore, this connectedness was not a short-lived phenomenon; by looking at such distributions chronologically it is clear that bulk, long-distance trade was consistent and sustained over the course of several centuries.

¹⁸⁷ Ports obviously represent the pinnacle of market connectivity. While it is not within the scope of this thesis to discuss patterns of hinterland distribution, it should be noted that the degree to which products were traded further inland depends both on the transportation routes (river and road connections) and the type of product. African cookwares, for example, are found primarily at coastal sites in the western Mediterranean and only occasionally further inland (Leitch 2011, particularly Chapter 7). ARS is not as limited to the coast, but does appear to decline in frequency as one moves further inland (see Fentress *et al.* 2004 for a brief look at the available data on ARS distribution for Sicily and North Africa). Bonifay provides a thorough discussion of both coastal and inland distribution patterns of African amphorae, finewares and cookwares (2004, 445-462).

CHAPTER II. SHIPWRECK CARGOES AND THE ORGANIZATION OF MARITIME TRADE

Chapter I illustrated that ports were supplied with a consistent selection of amphora-borne products and finewares, and also demonstrated that products were not always traded according to the same patterns (e.g., amphorae and finewares). In this chapter, I will analyse shipwreck cargoes to learn how these products arrived in their ports. There are numerous questions which I hope the data gleaned from these wrecks will answer: What do the cargoes of wrecks reveal about the ways in which goods (primarily amphora-borne goods) were traded? Can we identify various patterns in the way in which products were exported and the stages between initial export and final destination? To what extent can the cargoes indicate whether the ship was engaged in tramping versus directed trade? Can the cargoes of these wrecks in any way reveal how and perhaps even where ships were loaded and to what extent they may have been unloaded and re-loaded during a particular voyage? What does this reveal about the ways in which Roman producers, merchants, shippers, and buyers coordinated their transactions? In the following chapter, the cargoes of twelve wrecks will be used to help provide the answers to these queries concerning Mediterranean trade.

The Viability of Shipwreck Evidence in Studies of the Economy

Before beginning this detailed analysis, it is important to discuss the nature of the shipwreck data and the caveats with their use, particularly with regard to studies of Roman trade. Shipwrecks and studies of the ancient economy have gone hand-in-hand, at least since 1992.¹⁸⁸ Yet as mentioned in the Introduction, the shipwreck dataset has its problems. It is worth a brief excursus here, however, to clarify the ways in which shipwreck data are understood and used for the purpose of this thesis.

The ability to engage with shipwrecks as a coherent category of data was made possible in large part by A.J. Parker's 1992 catalogue, *Ancient Shipwrecks of the Mediterranean and the*

¹⁸⁸ See Wilson 2009a, 219-229 and Wilson 2011a for an overview of the ways in which shipwreck data have been used in past research.

Roman Provinces.¹⁸⁹ This catalogue includes 1,259 wrecks that date before AD 1500, 1,189 of which are in the Mediterranean. In the nearly 20 years since this catalogue was published, many further wrecks have been discovered and documented. An important update of eastern Mediterranean and Black Sea wrecks by Julia Strauss raises the number of wrecks to 1,646 and by 2008, a still-ongoing Harvard project under the direction of Michael McCormick had added 220 new wrecks dating between the third century AD and AD 1500 to Parker's total.¹⁹⁰ Parker's catalogue, however, remains the most comprehensive collection of information on ancient shipwrecks.

Perhaps the most discussed facet of Parker's catalogue is his Figure 1, a graph of Mediterranean wrecks by century, showing a drastic increase in the number of wrecks leading up to and peaking in the first century BC and decreasing in the second century AD before a steep drop in the third century AD (Figure 19).

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Figure 19. Parker's graph of Mediterranean wrecks by Century (Parker 1992, Figure 1).

¹⁸⁹ Parker 1992.

¹⁹⁰ Jurišić 2000; Strauss 2007; McCormick 2012, 81.

Since its publication, this graph has been reproduced by numerous scholars, occasionally with great liberty, to argue for periods of peak and decline in maritime trade.¹⁹¹ But as Parker made clear in his 1992 publication, the chronological and geographical distribution of wrecks is affected by numerous distortion-causing factors.¹⁹² Some areas, such as Italy and France, have been subject to frequent investigations and therefore can be examined in statistically meaningful ways, while some such as North Africa and various parts of the eastern Mediterranean have been poorly explored and create large gaps in the overall distribution of wrecks.

Shipwreck data are also limited in that they only reveal information about a limited range of products; shipwrecks are primarily a record of heavy, durable cargoes—first and foremost this includes amphora-borne goods, but also stone, metal ingots, and to a lesser extent, other categories of ceramics. Cargoes of textiles, grain and other organic materials certainly existed in antiquity, yet these are rarely visible. The primary surviving cargo of the majority of ancient shipwrecks is amphorae.¹⁹³ Amphorae are extremely durable and will survive in a variety of circumstances under which many artefacts will have deteriorated. They are also large and fairly recognizable, even to amateurs, and are therefore probably over-represented.¹⁹⁴

Stone is another long-lasting cargo and stone wrecks are relatively well-documented, though they are still far fewer in number than amphorae wrecks. Interestingly, when looked at in isolation, they present a different chronological distribution from Parker's graph of total

¹⁹¹ Hopkins 1980, 105-106; Whittaker 1989; Gibbins 2001a, 273-283; Erdkamp 2005; Saller 2005 (referring to Hopkins' use of Parker's material); Morley 2007a, 98; Tchernia 2011, 160-162; Holleran 2012, 23-24, 39-40.

¹⁹² Parker 1992, 7.

¹⁹³ Parker 1986, 35.

¹⁹⁴ A further concern with regard to amphorae is their potential for reuse. Several wrecks have exhibited evidence for the reuse of amphorae including the Roman wrecks: *Maïre A*, *Culip D* and the *Grado*. The *Maïre A* wreck contained Apulian amphorae filled with pozzolana and sealed with stoppers cut from old amphorae (Parker 1992, 254). The *Culip D* wreck contained Dressel 20 amphorae which have very loose stoppers and are therefore assumed to have been reused (Parker 1992, 157). The *Grado* wreck contained Africana I and Tripolitanian I amphorae, typically used for oil, and Dressel 5 amphorae from Cos, believed to have contained wine. Investigation showed, however, that all of these were filled with fish products (Auriemma 2000). In each of the cases, the reuse of the amphorae is obvious, and Parker suggests that the chance of amphora reuse contaminating the archaeological record is slim, a view which is seconded by Peña in his discussion of amphora reuse in the archaeological record (Peña 2007). However, it still must be kept in mind as it is entirely likely that an amphora could be emptied and refilled without any obvious visible indication.

wrecks (Figure 20).¹⁹⁵ 73 wrecks with stone cargoes dating between the second century BC and the seventh century AD have been collected in a 2011 article by Russell. Stone wrecks increase steadily from the second century BC peaking in the third century AD, followed by a sharp decline in the fourth century AD.¹⁹⁶

Parker's graph should in no way be used as a representation of the realities of ancient maritime trade, nor was it ever intended to be. This does not, however, mean that we should disregard the shipwreck data, or the graph, but rather that the evidence must be treated

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Figure 20. Graph of stone wrecks by century (Russell 2011, Figure 3).

meticulously. One of the major issues with Parker's graph is the way in which he handled the dating of the wrecks. In order to graph the shipwrecks, Parker assigned a date based on the mid-point of each wreck's date range. This is particularly problematic in terms of the generically dated 'Roman' wrecks which have a potential date range of 650 years (150 BC to AD 400). These wrecks therefore have a mid-point of AD 125, resulting in an overrepresentation of second-century AD wrecks. In order to combat the impreciseness of mid-point dating, Wilson has re-graphed the wrecks according to probability per annum (Figure 21).¹⁹⁷ Graphing according to probability per annum implies that there was an equal probability that a ship would sink in each year within its date range and the probability is then accumulated by time period.¹⁹⁸

¹⁹⁵ Wilson 2011a, 37.

¹⁹⁶ Russell 2011, figures 3 and 4. See also Wilson 2011a, 38.

¹⁹⁷ Wilson 2009a, 2011a.

¹⁹⁸ For a detailed explanation, see Wilson 2011a, 34.

This statistical adjustment produces an even more drastic picture; as expected, there is still a rise in the number of shipwrecks in the Republican period, but the overall peak now occurs in the first century AD. What is surprising is that the initial drop now occurs in the second century AD,¹⁹⁹ which is even more unexpected than the third-century drop in Parker's graph. While a drop in the number of shipwrecks (interpreted as an actual decline in the number of ships at sea) in the third century AD had been correlated with the third-century crisis (incorrectly, I believe), the decline in the second century AD is at striking odds with terrestrial archaeological evidence. The ceramic assemblages presented in Chapter I alone make this fact very obvious.

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Figure 21. Wilson's graph of Mediterranean shipwrecks by half-century, using probability per annum (Wilson 2011a, Fig. 2.3. Data collected by Julia Strauss).

Several reasons for this seemingly premature decline have been proposed including barrels, underdeveloped amphora typologies for later periods, import replacement, improved technology and the absence of evidence from the coastline of North Africa and the eastern

¹⁹⁹ Wilson graphs according to century, half-century, quarter-century and 20 year increments, all of which show slightly different peaks, but the overall trends are largely the same across the different graphs (2009a, 223-225).

Mediterranean.²⁰⁰ Wilson argues that a switch to the barrel as the preferred container for maritime shipment is a major factor in the visibility of Roman wrecks.²⁰¹ I would argue that we should not be looking initially at barrels as a replacement for amphorae, but as a replacement for *dolia*. This still affects our visibility, but of a much smaller proportion of wrecks for the Roman Imperial period. McCormick's additions in terms of later wrecks to the dataset has improved both the chronological and geographic distribution of wrecks, particularly in the eastern Mediterranean (Figure 22).²⁰²

Despite these additions, however, data are still very scarce for the North African and eastern Mediterranean coastlines. This is not due to the actual lack of shipwrecks, but rather to a

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Figure 22. Map of wreck sites for wrecks up to AD 1500 (Digital Atlas of Roman and Medieval Civilizations, <http://darmc.harvard.edu/icb/icb.do?keyword=k40248&pageid=icb.page188868>, last accessed July 20, 2012).

scarcity of documentation and systematic research. For example, in 1992, the Department of Underwater Antiquities in Greece was aware of some 1,000 documented wrecks, less than

²⁰⁰ Wilson 2009a, 220-226; 2011a, 37-39, 44; McCormick 2012, 85.

²⁰¹ Wilson 2009a, 220-226; 2011a, 37.

²⁰² McCormick 2012, 77-89.

100 of which have been publicly recorded.²⁰³ The combination of this with the fact that the rise in North African and eastern Mediterranean products begins at precisely the time in which the overall wrecks decrease suggests to me that the lack of underwater investigation in these areas is one of the most important factors in the shape of the shipwreck graph. Amphorae assemblages from Ostia and elsewhere demonstrate the drastic rise in North African and Eastern Mediterranean imports in amphorae beginning in the second century AD (see Chapter I).

An alternative explanation for the decline is that the development of a harbour network in the Roman period reduced the number of ship losses. This is an explanation which can only be surmised from regional studies in those areas where we have sufficient data both in terms of shipwrecks and harbour studies. At present, only two areas have such data—France and the western coast of Italy (particularly the central Tyrrhenian coast). The argument in support of the role of harbours in the reduction of ship losses will be presented in detail using the evidence from both France and Italy in a forthcoming paper by Damian Robinson, myself and Katia Schörle.²⁰⁴ The evidence for France will be examined in Chapter V of this thesis.

The usage of shipwrecks in understanding some facets of the Roman economy is therefore limited by the uneven distribution of archaeological evidence. This is, however, the case for most, if not all, categories of archaeological data. These caveats are highlighted not to argue that shipwrecks cannot contribute to the study of the economy, but rather that their limitations must be recognized and that the information must be used critically. In 1986, Parker wrote, “...it is important not to try to establish laws about the ancient economy on the basis of simple generalizations”.²⁰⁵ Even with the advances in the field and the numerous subsequent publications advancing our knowledge of ancient shipwrecks since this was written, this statement still holds true; shipwrecks simply cannot be used to support sweeping statements with regard to the nature of the Roman economy. They can, however, inform discussions of certain types of Roman trade with a level of detail most often unattainable from terrestrial archaeology. Shipwrecks provide a snapshot of the ways in

²⁰³ Parker 1992, 6.

²⁰⁴ Robinson *et al.* forthcoming.

²⁰⁵ Parker 1986, 39.

which specific goods travelled, namely the amphora-borne products and other heavy cargoes mentioned above. The food commodities (predominantly wine, oil and salted-fish products) that travelled in the amphorae were one of the major categories of traded goods in the Roman world and as such, are precisely the types of products whose transport is crucial to an understanding of the process of maritime trade.

What is of particular interest to this discussion as it relates to the broader study of ports and coastal economies are the processes involved in the movement of goods from the point of export to the point of consumption. To what extent can shipwrecks elucidate the organization of this maritime trade?

Two fundamental models have been proposed for maritime trade in the ancient world, tramping (often referred to as cabotage in English literature)²⁰⁶ and directed trade through emporia.²⁰⁷ While the majority of scholars argue that directed trade between major emporia was responsible for the vast movement of goods throughout the Roman world, both within and outside the Mediterranean, there are some that continue to argue for the primacy of tramping.²⁰⁸ This is not a question of whether ships sailed along the coast or out of sight of land,²⁰⁹ but rather a question of the scale of trade, the level of forethought and planning which went into the composition of the cargo, and the degree of available information with regard to markets. While numerous types of evidence can, and have been, used to argue for directed trade, shipwrecks provide the most relevant category of evidence. It is therefore the intent of this chapter not simply to argue for directed trade, but to provide a nuanced view of the processes behind maritime trade as they can be ascertained from shipwreck cargoes.

²⁰⁶ Cabotage is used in English and French scholarship with very different implications. In English scholarship, cabotage is used to refer to tramping (Horden and Purcell 2000; Morley 2007a), while in French it simply means sailing along the coast, or cape to cape. Coastal sailing and tramping are not the same thing; the first implies a sailing technique while the second indicates a particular mode of trade. *C.f.* Arnaud 2011a, 62; Wilson 2011a, 53.

²⁰⁷ See Nieto 1997 who argues for an emporia-based model of re-distribution amongst primary and secondary harbours where cargoes are shipped from smaller ports into major emporia where they are collected and re-distributed. See also Wilson *et al.* forthcoming.

²⁰⁸ See Bang 2008, 141 and Horden and Purcell 2000, 142.

²⁰⁹ As emphasized by Arnaud, directed trade does not rule out coastal sailing, but rather includes a combination of sailing out of sight of land along with coastal sailing (Arnaud 2005; 2007; 2011a).

The Wrecks

In his 1992 catalogue, Parker distinguishes 98 shipwrecks whose cargoes have been “well preserved and thoroughly investigated and reported”.²¹⁰ These wrecks formed the starting point for the following analysis. While not all of the wrecks included in this chapter were taken from this selection, namely because they have been published after 1992, this selection provided a useful starting point for assessing patterns present in Roman period shipwrecks.

Three broad patterns are detectable in these wrecks: ships with local cargoes, ships with cargoes from one region and ships with cargoes from multiple regions. These categories will be illustrated by twelve wrecks spanning the first century BC through the third century AD (Figure 23). These twelve wrecks were selected first of all because they represent the wrecks with the most thoroughly published cargoes and secondly because they allow for discussion of all major wreck categories (amphorae, stone and metal).



Figure 23. Map of Wrecks Discussed (author).

²¹⁰ Parker 1992, 20.

Local Cargoes

These wrecks typically represent the most straightforward patterns. While they are of a localized origin, it is rare that they actually come from only one source: rather, they represent one type of cargo, most frequently amphorae, which are usually combined from a fairly localized production region. While it is probable that they have already undergone some type of short-distance shipment, they are in the first major stage of maritime export.

Cap del Vol (late first century BC/early first century AD)

The *Cap del Vol* wreck, discovered off the coast of Spain, contained a cargo of Pascual 1 amphorae transporting Layetanian wine.²¹¹ The ship was some 18-19 meters in length and the wreck is dated to the end of the first century BC/beginning of the first century AD by a piece of black gloss belonging to the crews' provisions and also manufactured locally. The initial assumption was that the amphorae were fairly homogeneous,²¹² but work on the amphorae stamps has shown that this was not the case. In fact, the majority of the amphorae come from at least five production sites, three of which are located in the Llobregat river valley, one from Barcino and one from Baetulo (Figure 24). One can either see this as a ship which was loaded in three steps—at the mouth of the Llobregat river, at Barcino and then at Baetulo, or one can imagine it being loaded in one shipment at either Barcino or Baetulo.

This shipload represents the initial export of this wine, and I would argue that it was loaded as a single shipment. Perhaps the best support for this can be seen in the recently discovered amphorae deposits from Baetulo. In 2004, excavations at Baetulo revealed two large dumps of Roman amphorae, as well as three *dolia*.²¹³ The deposits were located near previously identified docking facilities and have been interpreted as coming from a harbour loading zone.²¹⁴ The combination of amphorae and *dolia* are common elements of harbour warehouses in the western Mediterranean.²¹⁵ The first deposit encompassed an area of 12 m²

²¹¹ Foerster 1980, 245.

²¹² Parker 1992, 102.

²¹³ Comas and Padrós 2008.

²¹⁴ *Ibid.*, 83.

²¹⁵ See Chapter V sections on Lattara and Massalia.

and consisted of over 3,000 ceramic sherds, 90% of which were amphorae. The second deposit was circular and measured 3 m in diameter and 4 m in depth. It contained over 10,000 ceramic sherds, 95% of which were amphorae.²¹⁶ Both deposits span the late first century BC through the first century AD and have primarily Tarraconensian amphorae.

Figure has been removed due to copyright restrictions

Figure 24. Map of sites in the Llobregat river valley (Carreras forthcoming, Figure 1).

The first deposit contained 72% Tarraconensian amphorae, which includes 54% Pascual 1 and 18% Dressel 2-4. Interestingly, 8% of the amphorae were Gauloise 4, which may or may not have been imported; they could be local imitations. There were also Dressel 7-11 amphorae from both Baetica and Tarraconensis and Dressel 20s from Baetica.

The second deposit contained 74% Tarraconensian Dressel 2-4 and only 15% Pascual 1 amphorae. The remaining 11% were primarily Baetican (Dressel 20 and Dressel 7-11). What is particularly interesting about the second deposit is that six amphorae stamps and six graffiti were recovered. While not all were readable, three of the amphorae stamps indicated the production sites of the amphorae. Two stamps (AC and M) are associated with the

²¹⁶ Comas and Padrós 2008.

production site of Can Tintorer and one (NI or IN) with the site of Can Pedrerol, both of which were located in the Llobregat river valley (See Figure 24). These deposits are significant as they provide evidence that the products of different production sites were assembled near the harbour before being loaded onto ships. While this is an obvious assumption, the stamps in particular confirm that this was an accepted method of arranging items for export.

Plemmirio B (c. AD 200)

The *Plemmirio B* wreck was discovered at a depth of 22-47 meters near Capo Murri di Porco in south-east Sicily and was excavated between 1983 and 1987. The wreck was spread across the talus of a cliff and is, therefore, fairly scattered with little of the hull remaining. The area of the galley, however, was distinguishable.²¹⁷ The ship itself seems to have been quite small and is estimated to have had a capacity of about 13 tonnes. The wreck is dated to approximately AD 200 on the basis of the cargo of African amphorae.²¹⁸

On board the ship, there were two types of African amphorae—Africana I and Africana IIA. Africana I amphorae typically contained olive oil and indeed one of those recovered from the site contained olive pits.²¹⁹ Africana IIA amphorae have been shown to contain salted fish products.²²⁰ It is estimated that there were approximately 200 amphorae on board. Instrumental Neutron Activation Analysis (INAA) demonstrated that the majority of amphorae from the *Plemmirio* wreck were from the same source, one matched most closely by kiln sites in the region of Sullethum.²²¹ A central Tunisian survey revealed a number of kilns at the coastal site of Sullethum.²²² The signatures from this wreck are mostly closely aligned with four kilns located on the coast (sites labelled El Hri I, El Hri II, Salakta and Catacombs) which were clearly producing Africana I and Africana II A.²²³

²¹⁷ Gibbins 2001b, 312.

²¹⁸ *Ibid.*, 313.

²¹⁹ *Ibid.*, 315.

²²⁰ Bonifay 2007.

²²¹ Gibbins 2001b, 326.

²²² Peacock *et al.* 1990.

²²³ Gibbins 2001b, 327.

Furthermore the ship contained a consignment of approximately one tonne of small iron bars. As no analysis has been done on the iron bars, it is impossible to know their origin. While there are active iron mines in Tunisia at present, they are located deep in the interior and it is not known whether or not the Romans exploited these mines.²²⁴ The coastal city of Leptiminus was engaged in primary metalworking despite the fact that there were no nearby sources of iron ore and it has been proposed that the iron ore was being brought from abroad as a return cargo.²²⁵ The overseas transport of iron ore from mining sites to production sites is attested by Diodorus:

For the island [Elba] possesses a great amount of iron-rock, which they quarry in order to melt and cast and thus to secure the iron, and they possess a great abundance of this ore. For those who are engaged in the working of this ore crush the rock and burn the lumps which have thus been broken in certain ingenious furnaces; and in these they smelt the lumps by means of a great fire and form them into pieces of moderate size which are in their appearance like large sponges. These are purchased by merchants in exchange either for money or for goods and are then taken to Dicaearchia [Puteoli] or the other trading-stations, where there are men who purchase such cargoes and who, with the aid of a multitude of artisans in metal whom they have collected, work it further and manufacture iron objects of every description...these are then carried by merchants to every region and thus many parts of the inhabited world have a share in the usefulness which accrues from them.²²⁶

It is plausible therefore that the iron bars aboard the *Plemmirio B* wreck could have been “locally” manufactured in Tunisia. This ship again represents a very straightforward loading pattern. While it is unknown where the cargo of iron bars originated, they would have been loaded on the ship prior to the amphorae (due to their weight) and it is most probable that this took place at Sullethum. Based on the location of the wreck, the ship was probably on its way to Italy.

²²⁴ See Schröder-Kolb 2011.

²²⁵ Mattingly *et al.* 2001, 80. See Schröder-Kolb 2011 for the most thorough discussion of iron production at Leptiminus.

²²⁶ Diodorus Siculus 5.13.1-2.

Regional Cargoes

More complex cargoes are far more common in the archaeological record than those with the relatively straightforward assemblages discussed above. When examining wrecks broadly one can see a very clear pattern of wrecks with regional cargoes.

La Madrague de Giens (70-50 BC)

Discovered on the north of the Giens promontory in France, the *Madrague de Giens* wreck was extensively excavated between 1971 and 1983.²²⁷ The *Madrague de Giens* is one of the largest shipwrecks yet excavated, originally carrying approximately 350-450 tons of cargo including some 6-7,000 amphorae (Figure 25).²²⁸ Dressel 1B wine amphorae make up the bulk of the cargo.

In total, there are four variants of Dressel 1B present on the wreck, most of which are the second variant.²²⁹ Many of these are stamped with P.VEVEI.PAPI.²³⁰ These stamps, along with others, allow the origin of the amphorae to be pinpointed to southern Latium where the production kilns for these amphorae have been identified.²³¹ This variant of the Dressel 1B amphorae was made at San Anastasia, whereas variants one and three were made at Canneto.²³² The fourth variant appears in a significantly smaller quantity than the first three variants.²³³

Figure has been removed due to copyright restrictions

Figure 25. The *Madrague de Giens* wreck (Tchernia *et al.* 1978, Plate XXVII).

²²⁷ Parker 1992, 249.

²²⁸ *Ibid.*

²²⁹ Parker 1992, 249.

²³⁰ Tchernia *et al.* 1978, 36-38.

²³¹ Parker 1992, 249.

²³² Tchernia *et al.* 1978, 40.

²³³ Parker 1992, 249.

The only other amphora type found in significant number was Dressel 1A, of which there were approximately 15. The number is large enough to imply that these amphorae were intentional cargo, perhaps a specific consignment. The cargo also contained a group of Campanian finewares, of which hundreds of fragments were recovered. Along with the Campanian wares were large numbers of coarse ware vessels including plates, lids, jars and so on.²³⁴ The number of these vessels and the fact they were apparently packed into crates and stored on top of the amphorae confirms that these were indeed part of the cargo. Furthermore there was a cargo of pozzolanic sand in the aft section of the ship.²³⁵

In addition to the verifiable cargo, multiple other amphorae appear in small numbers (1-3), including Lamboglia 2,²³⁶ Pascual 1, Dressel 26, Apulian, Baetican, Chian, Rhodian, Thasian, Koan and Punic.²³⁷ These were found mostly in the stern and were therefore perhaps part of the crew's provisions. It is also possible that these amphorae represent a small complementary cargo in the form of a mixed 'case' of wine and oil. While it is often assumed that all assorted amphorae which were not part of the main cargo were crew's provisions, one should question how much would have actually been carried in terms of provisions. In other words, how many amphorae worth of wine and oil did the crew need for the journey between Italy and France? Whether or not these amphorae belonged to the crew or were part of the cargo, they are indicative of the variety of wine and oil available within a port.

The *Madrague de Giens* wreck certainly represents the Republican wine trade between Italy and Gaul at its peak.²³⁸ With this wreck we have the rare advantage of knowing roughly where the ship originated and possibly its destination, seemingly a port in France. All indicators point to the ship being loaded in a single instance and intended for a single journey. Seemingly the amphorae as well as the finewares and cookwares would have been collected at one port and then loaded onto the ship, with the amphorae being loaded first and

²³⁴ Liou and Pomey 1985, 562.

²³⁵ Parker 1992, 250.

²³⁶ The contents of this amphora have been chemically analysed and shown to be wine. See Formenti *et al.* 1978.

²³⁷ Tchernia *et al* 1978, 46; Parker 1992, 250.

²³⁸ See Chapter V.

the fine and coarse wares being placed on top. The sheer number of amphorae from southern Latium indicates that they were most likely loaded at a port in the area, perhaps Terracina. The amphorae were seemingly on their initial stage of maritime export, while the finewares were on at least their second phase of maritime export, having previously arrived in Latium from Campania.

Chiessi (AD 60-85)

The *Chiessi* wreck was discovered approximately 500 meters off the coast of Elba at a depth of 50 meters.²³⁹ The cargo consisted of some 5-7,000 Spanish amphorae of four different types. 90% of these were Beltrán 2A while the remaining 10% were Beltrán 2B, Dressel 20 and Haltern 70 amphorae. ²⁴⁰Beltrán 2A amphorae were produced in Baetica, most commonly in the region around Cadiz and generally contained fish sauce. Indeed, those recovered from the *Chiessi* wreck contain traces of pitch and numerous fish bones.²⁴¹ The Beltrán 2B amphorae were very similar in form to the Beltrán 2A and they were also pitched and probably contained some type of fish product. There were also Dressel 20 olive oil amphorae from Baetica. Finally, six Haltern 70 amphorae were recovered, produced in the same region as Dressel 20 amphorae.²⁴² The most commonly recorded product on the basis of painted inscriptions and contents analysis is *defrutum*.²⁴³

Thus in this situation we have a wreck which contains a cargo from several locations within a single region. While the majority of the cargo—the Beltrán 2A amphorae—were probably one consignment, the other amphorae would seemingly have been loaded onto the ship at the same time as the Beltrán 2A. It is logical that the Dressel 20s would have been transported downriver to the coast to a port such as Cadiz where they could have been easily mixed with a cargo of Beltrán 2 amphorae. Furthermore, if we consider the weight of even 25 Dressel 20s holding a combined total of approximately 1,750 litres,²⁴⁴ and how this would affect that

²³⁹ Rossi 1982a, 128.

²⁴⁰ *Ibid.*, 129.

²⁴¹ Rossi 1982b, 80.

²⁴² Carreras 2003, 86.

²⁴³ See Carreras 2003, 88 for a discussion of the debates concerning the contents of Haltern 70 amphorae.

²⁴⁴ The average capacity of a Dressel 20 is thought to be 70-75 litres (<http://ads.ahds.ac.uk/catalogue/resources.html?amphora2005>), thus 25 amphorae at 70 litres each would equal 1,750 litres of wine.

balance of the ship, they surely must have been accounted for in the original loading of the ship and not added as a part cargo along the way.²⁴⁵

Punta Scifo A (early third century AD)

The *Punta Scifo A* wreck was discovered off Punta Scifo in southern Italy near Crotone. The wreck was first identified in the early 1900s and partially published in 1911 and 1921.²⁴⁶ The most thorough publication is that of Pensabene in 1978.²⁴⁷ The original accounts suggest that there were well over 30 pieces of marble from the wreck accounting for over 150 tons, but by 1975, Pensabene was only able to locate 27 pieces.²⁴⁸ The cargo predominantly consisted of two types of marble, *pavonazzetto* (also referred to as Phrygian, Synnadic or Docimean), a purple and white marble from the quarries at Docimium in Phrygia, and Proconnesian marble, a white marble from Proconnesus (the modern island of Marmara).²⁴⁹ The majority of the cargo is *pavonazzetto*, and extant pieces include five basins, four stands, eight columns of two major sizes (12 and 20 Roman feet) and five blocks ranging from 15 to 60 Roman cubic feet. There was also a block of white marble from the nearby quarry at Synnada.²⁵⁰ Four pieces of Proconnesian marble were recovered including two large rectangular blocks measuring 60 and 69 Roman cubic feet along with two statue bases or altars.²⁵¹ Quarry inscriptions from a column and block of the *pavonazzetto* marble include consular dates of AD 197 and AD 200 thereby allowing the wreck to be dated to this fairly narrow time span.²⁵²

The marble from Docimium and Synnada would have had to travel some distance overland before being transported either down the Maeander river to Miletos, or the Sangarius river towards the Black Sea with a final journey overland to Nicomedia. The marble from Proconnesus would have initially been shipped out of the harbour on the island. The two

²⁴⁵ See McGrail 1989 for a discussion of stability and stowage issues related to the loading of ships.

²⁴⁶ Orsi 1911; 1921.

²⁴⁷ Pensabene 1978.

²⁴⁸ *Ibid.*

²⁴⁹ *Ibid.*, 105-106.

²⁵⁰ *Ibid.*, 108.

²⁵¹ *Ibid.*

²⁵² Catalogue numbers 5 and 6 in Pensabene 1978.

marbles most probably were loaded onto the *Punta Scifo A* ship at the same time due to the practical issues of transporting and stabilising a heavy cargo such as marble. Given the predominance of the *pavonazzetto*, it seems probable that the cargo was assembled near the first maritime export port, either Nicomedia or Miletos. The Proconnesian marble could have easily been shipped to either of these ports during its initial export. Ephesos and Cyzicus are also possibilities for the origin of the *Punta Scifo A* wreck in which case both marbles would have already been subject to some degree of maritime export. Regardless of the port, however, the Proconnesian and *pavonazzetto* were seemingly combined in a single port on the coast of Asia Minor for their intended export to Italy.

The presence of a stone wreck with more than one type of stone is relatively uncommon, with only 11 wrecks out of Russell's earlier-mentioned sample of 73 stone wrecks having cargo from more than one quarry, though it seems probable that this number will increase with more detailed site publications.²⁵³ Furthermore, the presence of a wreck containing such a variety of types of marble objects is rare.²⁵⁴ As it stands at present, the evidence suggests that most stone was shipped directly from a harbour closely associated with its quarry to the consumer.²⁵⁵ This makes the *Punta Scifo A* wreck particularly interesting as it reveals a pattern which, while not the norm for stone cargoes, appears to be the standard for numerous other products traded in the Mediterranean.

***Dolia* Wrecks**

Within the broader category of regional wrecks a very specific group of wrecks—*dolia* wrecks—provide particularly detailed information. *Dolia* wrecks, often referred to as 'bateaux-citernes' or 'tankers', are a particular class of wrecks spanning a fairly limited time period between the late first century BC and the end of the first century AD.²⁵⁶

²⁵³ Russell 2011, 148.

²⁵⁴ Russell singles out only the *Mahdia*, *Paros*, *Şile* and *Punta Scifo A* wrecks as having very mixed types of stone objects. In contrast, 28 stone wrecks have only one type of object (*Ibid.*).

²⁵⁵ *Ibid.*, 149-150.

²⁵⁶ The number of *dolia* wrecks depends on the qualifications used to determine whether the ship was an actual tanker-style wreck, or simply a wreck with *dolia* on board. Heslin (2011) provides a comprehensive list of all possible *dolia* wrecks and considers there to be 13 certain tanker-style wrecks. At the very least, I consider the nine wrecks (listed in Table 1) which have both multiple *dolia* and additional cargo in the form of Dressel 2-4 amphorae to be securely identifiable as tanker-style wrecks.

Through stamps on the *dolia*, these wrecks have been connected to the Piranus family of Minturnae.²⁵⁷ As the Piranus stamps appear only on the *dolia*, it is not known if the Piranus family was involved solely with the production of *dolia* or if they were also involved in the construction of the ships.²⁵⁸

These wrecks are generally well discussed²⁵⁹ and are indeed the subject of a 2008 dossier in *Archaeonautica*,²⁶⁰ therefore I will not examine each wreck in detail. Of direct interest to this discussion is the additional cargo of these wrecks, for this cargo has the potential to shed light on the trading routes in which these were engaged.

Wreck Name	Date	Cargo Amphorae	Wreck Location	Piramus Stamp
Grand Ribaud D	9 – 1 BC	Italian Dressel 2-4	France	Yes
Ladispoli	Late 1 early 1	Italian Dressel 2-4	Italy	Yes
La Giraglia	c. AD 20	Tarraconensian Dressel 2-4	Corsica	Yes
Les Sorres III	AD 25 - 100	Tarraconensian Dressel 2-4	Spain	Unknown
Petit Congloué	Mid 1	Tarraconensian Dressel 2-4	France	Yes
La Garoupe	Mid 1	Italian Dressel 2-4	France	Yes
Île Rousse	Mid 1	Tarraconensian Dressel 2-4	Corsica	Yes
Diano Marina	c. AD 50	Tarraconensian Dressel 2-4	Italy	Yes
Formiche di Grosseto	10 BC - AD 40	Dressel 2-4 of unknown origin	Italy	Yes

Table 1. *Dolia* wrecks with Dressel 2-4 cargoes (author).

²⁵⁷ Marlier 2008, 122-124.

²⁵⁸ Marlier 2008, 122-124; Heslin 2011, 165-166.

²⁵⁹ See Corsi-Sciallano and Liou 1985, particularly 169-174. More recently, see Heslin 2011.

²⁶⁰ *Archaeonautica* 15, 113-197.

Nine of these wrecks have secure evidence of additional cargo in the form of amphorae (Table 1),²⁶¹ and in all but one case²⁶² the amphorae cargo consists solely of Dressel 2-4 wine amphorae. What is of interest is that some of these are Italian (highlighted in yellow in Table 1), and some of these are Tarraconensian (highlighted in blue in Table 1, though these never occur in the same ship. Let us briefly consider one example of each.

Grand Ribaud D (9-1 BC)

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Figure 26. Hull Arrangement, *Grand Ribaud D* (Hesnard *et al.* 1988, 133, Figure XLIX).

The *Grand Ribaud D* wreck (Figure 26) was discovered at a depth of 19 meters at the northwestern point of the islet of Grand Ribaud.²⁶³ The cargo consisted of *dolia* and amphorae. Eleven *dolia* were recovered, one of which was stamped with C.PIRANUS/SOTERICUS.F.²⁶⁴ Two of the *dolia* bore graffiti relating to their volume. One graffito—

²⁶¹ A tenth *dolia* wreck, the *Ouest Giraglia 2*, with a cargo of Tarraconensian Dressel 2-4 amphorae has been reported very recently, but as it has not yet been dated or published it has not been included here. The preliminary report can be found at Arkaios, <http://www.arkaios.fr/spip.php?article56>, last accessed July 20, 2012.

²⁶² The *Petit Congloué* wreck also contains a small cargo of no more than 10 Gallic wine amphorae (Corsi-Sciallano and Liou 1985, 35).

²⁶³ Hesnard *et al.* 1988, 16.

²⁶⁴ *Ibid.*, 41.

LXIII (63)—is interpreted as specifying that this particular *dolium* contained 63 amphorae worth of wine (or 1,656 litres) and the other—LXXV (75)—similarly but as that *dolium* having contained 75 amphorae worth of wine (or 1,972 litres). The ship was also transporting a cargo of Italian Dressel 2-4 wine amphorae. There was a minimum of 141 Dressel 2-4 amphorae from the Naples area, along with a minimum of 26 Dressel 2-4 amphorae from the Adriatic.²⁶⁵ The cargo amphorae are estimated to have originally numbered above 200.²⁶⁶

La Giraglia (c. AD 20)

The *La Giraglia* wreck was discovered in 1993 off the northernmost point of Corsica near the island of La Giraglia.²⁶⁷ The ship contained 10 *dolia* and probably 5 or 6 *doliola*. One *dolium* bore the stamp (. . . ITESIPIRA(m).CER(donis)S(ervus).F(ecit)), connecting the *dolium* directly with the Piranus family of Minturnae.²⁶⁸ In addition to the *dolia* and *doliola* there was a cargo of Dressel 2-4 amphorae from Tarraconensis, namely from Can Pedrerol and Can Tintorer.²⁶⁹ 55 amphorae toes were recovered from the site,²⁷⁰ and it is estimated that there were approximately 200 amphorae originally on board.²⁷¹

Of particular interest to this discussion of trading patterns are the two groups of amphorae cargoes, those from Tarraconensis and those from Italy. While an additional cargo in the form of Italian amphorae that could have been loaded at Minturnae is not at all surprising, the presence of entire cargoes of Tarraconensian amphorae is more unexpected.

Upon examining this group of wrecks, however, a very clear rationale behind the choice of cargo becomes apparent. The *dolia* were permanently built into the mid-section of the ship and could not be re-arranged; this created a restricted space in the fore and aft sections of

²⁶⁵ *Ibid.*, 60.

²⁶⁶ The initial publication (Hesnard *et al.* 1988) gives a final estimate of between 208 and 267 amphorae. The recent review by Marlier (Marlier 2008) however gives an estimate of 441-515 amphorae.

²⁶⁷ Marlier and Sibella 2002, 161.

²⁶⁸ Sciallano and Marlier 2008, 122.

²⁶⁹ *Ibid.*, 124.

²⁷⁰ *Ibid.*

²⁷¹ Marlier and Sibella 2002, 161.

this ships, allowing considerably less flexibility in terms of the remaining cargo than would otherwise be the case. When these ships were being built, the primary wine amphorae being manufactured in the Minturnae region were Dressel 2-4 amphorae. It appears that these ships were therefore constructed with the intent of carrying cargoes of Dressel 2-4 wine



Figure 27. Map of *Dolia* Wrecks with Amphorae Cargoes. Blue: Tarraconensian Dressel 2-4; Yellow: Italian Dressel 2-4 (author).

amphorae at the fore and aft sections of the ship. This would balance the weight of the *dolia* and allow for a more diversified cargo with lower quality wine shipped in the *dolia* and a higher quality vintage in the amphorae.²⁷² Perhaps more importantly, by consistently carrying Dressel 2-4 amphorae, the *navicularius* would know exactly how many amphorae would fit in the hold regardless of whether the ship was being loaded with a Spanish cargo or an Italian cargo which allowed for easy expansion into the Spanish wine market.

The dating of the wrecks in comparison to the different cargoes of amphorae is also revealing. In 1985, Corsi-Scialliano and Liou proposed a chronology for three generations of

²⁷² Heslin 2011, 163.

the Piranus family. The first generation is that of Sotericus. The second generation is that of Felix and Cerdo²⁷³ while Primus and Philomusus are part of the third generation.²⁷⁴ The earliest dated wrecks—the *Grand Ribaud D* and *Ladispoli*, whose cargoes place them in the late first century BC during the first generation of Pirani involved in the production of *dolia*—contain cargoes of Italian Dressel 2-4 amphorae. Based on the evidence known at present, those ships with cargoes of Tarraconensian Dressel 2-4 amphorae begin with the second generation of Pirani. Of these ships, the earliest dated is the *Giraglia* wreck (AD 20) which was connected with Cerdo. Ships with cargoes of Italian Dressel 2-4 amphorae certainly continued as evidenced by the *La Garoupe* wreck which contained *dolia* stamps of Sotericus but also of Felix and Cerdo, Pirani of the second generation.

It is therefore possible to imagine a pattern whereby a family or firm began their business with ships filled with Italian wine in *dolia* and additional cargoes of Italian Dressel 2-4 amphorae. However certainly by the second generation, the business expanded and connections were cultivated with Tarraconensis where imitation Dressel 2-4 amphorae were being manufactured that would still permit the stowage arrangements designed to accommodate the Italian Dressel 2-4 but would allow for a diversification of goods and perhaps ensure that such ships did not have to make a return journey without any cargo. The restrictions on additional and return cargo were inherent in the design of the *dolia* ships. This limitation was minimized however when they began carrying Tarraconensian amphorae and presumably also Tarraconensian wine in the *dolia*.

While these ships did not merely sail a linear route between Minturnae and Tarraconensis, one can see a very direct relationship where a ship loaded in Minturnae with Italian Dressel 2-4 amphorae and *dolia* filled with Italian wine would sail to Tarraconensis and empty the *dolia* and refill them with Tarraconensian wine and exchange the Italian Dressel 2-4 for Tarraconensian Dressel 2-4. The land-based evidence for the Tarraconensian coast certainly complements this suggested pattern. The Tarraconensian coast began to produce wine, known as Layetanian wine, around the second century BC, largely connected with the new

²⁷³ It has been debated whether Cerdo belongs to the first or second generation (Marlier 2008, 151) however, based on the dating of *La Giraglia* and *La Garoupe*, I believe that Cerdo must represent a second generation.

²⁷⁴ Corsi-Sciallano and Liou 1985, 173-174.

Roman presence. The first amphorae produced were imitation Greco-Italic and Dressel 1B amphorae followed by the Layetanian 1 and Pascual 1 amphorae and then the Dressel 2-4 imitations. All of these amphorae contained Layetanian wine and based on the evidence of kilns and vineyard sites, this production peaks in the early first century AD, coinciding with the *dolia* wrecks.²⁷⁵ The production sites of these amphorae are predominantly coastal and concentrated around the cities of Barcino, Baetulo and Illuro. During the first century BC, 'industrial centers' for the production of wine appear such as the site of Sant Pol del Mar, dated to the first and second centuries AD.²⁷⁶

These ships appear to have a relationship with Gaul as well, as the *Grand Ribaud D*, *Petit Congloué*, *La Garoupe* and *Meloria B* wrecks are all located along the southern coast of France and some of the wrecks contain various Gallic products such as the small number of Gallic amphorae aboard the *Petit Congloué*. There were certainly ports such as Marseille and Lattara that contained *dolia* warehouses and given the location of the wrecks (Figure 27) the most probable explanation would be that the wine in the *dolia* was being exchanged in southern Gaul but that the amphorae were intended either for Italy or Spain.²⁷⁷ It has also been suggested that the *dolia* ships were towed up the Rhône to Lyon.²⁷⁸ It is not possible given the limited state of information about the construction methods of the *dolia* ships to say for certain whether or not this was the case. It does seem, however, from the available evidence, particularly from the *Ladispoli* wreck, that the ships had a relatively flat bottom and keel and a draft which would have been suitably low for towage up the Rhône (under 1.5 m), at least during particular seasons.²⁷⁹

The connection between Tarraconensis and Gaul is also apparent in the shipwreck evidence. There are 37 wrecks in Parker's catalogue containing cargo of specifically identifiable types of Dressel 2-4 amphorae.²⁸⁰ Of these wrecks, 23 contained Spanish Dressel 2-4 amphorae, 15 (or 65%) of which were wrecked off the coast of France. Ceramic assemblages from the

²⁷⁵ Personal Communication, Oriol Olesti Vila.

²⁷⁶ Gurri 2004.

²⁷⁷ Three of the wrecks with Tarraconensian amphorae appear to have sailed past the French coast.

²⁷⁸ Sciallano and Marlier 2008, 164-170.

²⁷⁹ *Ibid.*

²⁸⁰ Parker 1992.

area around Narbonne show a very clear change in the pattern of imports over the course of the late first century BC and the early first century AD switching from the predominant import of Italian amphorae to that of Spanish amphorae, such as can be seen in Figure 28 showing the amphorae assemblages over the course of the first century BC—note the very drastic change in the pattern beginning around 30 BC.²⁸¹

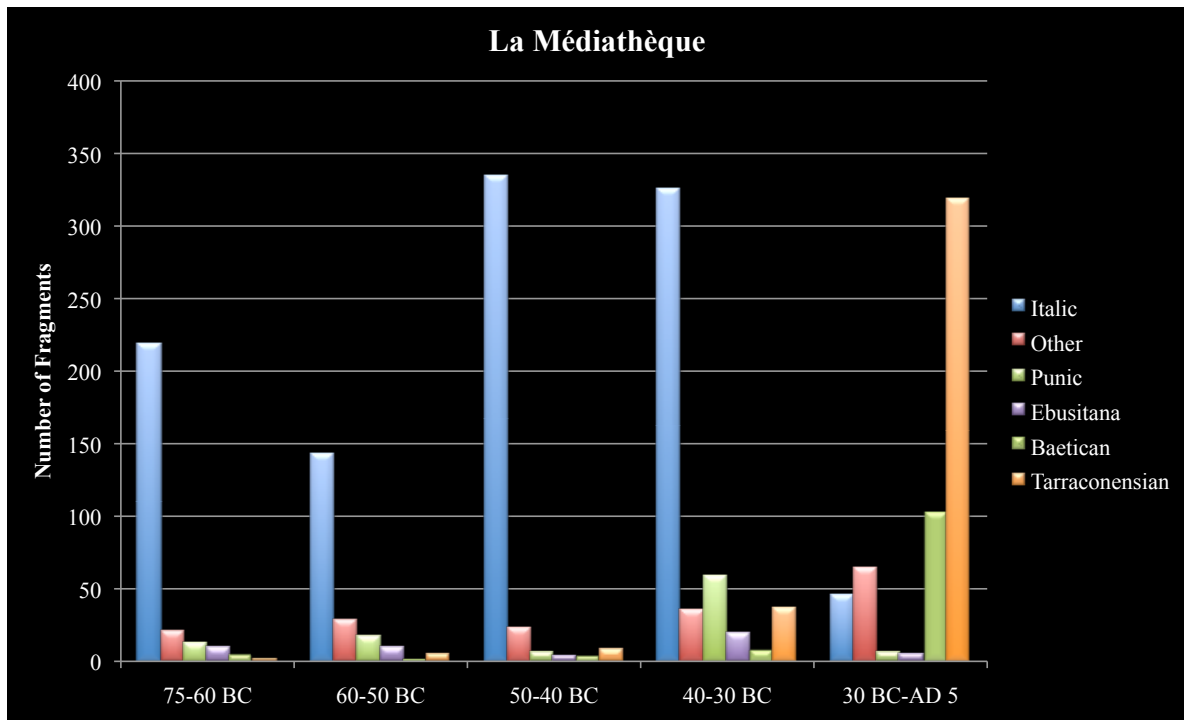


Figure 28. Graph of amphorae from the site of La Médiathèque, Narbonne (author's graph, data taken from Sanchez 2009, 122-153).

The *dolia* wrecks reveal a very particular niche of trade during the early Roman period. They provide an interesting look at trade in bulk (i.e., bulk containers)—trade which certainly occurs in the later periods in barrels but is rarely visible in the archaeological record. These ships must have had a very specific intended market (i.e., ports at which they could unload the contents of the *dolia*) which implies good communication between various ports and a knowledge of the facilities available at such ports. The direct connection with Tarraconensis visible through the amphorae again shows careful planning and forethought.

²⁸¹ Sanchez 2009, 122-153.

Multi-Regional Cargoes

Finally, this chapter examines wrecks which contained cargoes from multiple regions. Wrecks with heterogeneous cargoes are the most prevalent in the archaeological record, and the most complex to reconstruct.²⁸² The mixed nature of these cargoes often leads to the assumption that they must have been engaged in coastal tramping.²⁸³ Careful examination of the evidence of several wrecks with highly heterogeneous cargoes, however, presents a different picture.

Saintes-Maries-de-la-Mer (late first century BC-early first century AD)

The *Saintes-Maries-de-la-Mer* wreck was discovered off the coast of the Camargue in southern France. The primary cargo consisted of two groups of lead ingots (Figure 29): 91 ingots with a parabolic transverse section and 8 ingots with a trapezoidal transverse section.²⁸⁴ Typologically, the first group is consistent with Spanish ingots of the first century BC, and the second group have a shape which is common from the first century AD onwards in the majority of lead producing provinces.²⁸⁵

Figure has been removed due to copyright restrictions

Figure 29. Ingots from the *Saintes-Maries-de-la-Mer* wreck (Musée départemental Arles antique, author's photo).

²⁸² Parker 1992, 20-21.

²⁸³ Rickman, 1980: 125; Horden and Purcell, 2000: 142; Bang, 2008: 141.

²⁸⁴ Long and Domergue 1995, 806.

²⁸⁵ Trincherini *et al.* 2001, 395.

Lying on top of the ingots were slightly more than 100 amphorae sherds.²⁸⁶ These sherds are primarily of Dressel 20 amphorae, though at least one may have been a Haltern 70. The Baetican amphorae coupled with the shape of the ingots led the excavators to assume initially that the ingots were also Baetican, not an unlikely assertion based on the prolific output of the Spanish mines during this period. Recent isotopic analysis has shown, however, that these ingots were not from Spain. Instead, they seem to be from the mines of southern France such as those in the Cévennes.²⁸⁷

It is, of course, difficult to tell how large a cargo of amphorae was originally on board this ship, but what would seem certain is that the amphorae were not loaded in Spain. The ingots would have been placed on the ship first and then the amphorae would have been loaded on top of these. The *Sud-Lavezzi B* wreck provides a good example of this where the preservation was such that one could see that the amphorae were slotted in amongst the ingots.²⁸⁸ As Arnaud has observed, lead ingots are often combined with other cargoes (such as amphorae) in order to render a ship more stable under difficult wind conditions.²⁸⁹ The weight and value of metal ingots made them ideal saleable ballast.

As it would be highly impractical for a ship bearing French ingots to travel south to Baetica to pick up a load of amphorae and then sail back up the French coast again, it would appear that these Baetican amphorae must have arrived as a different cargo and were loaded with the ingots at an emporium in France such as Narbonne.

Comacchio (c. 25-1 BC)

The *Comacchio* wreck was discovered in the territory of Valle Ponti, north of Ravenna in 1980 and subsequently excavated.²⁹⁰ The ship was 21 meters long and is calculated to have had a 130-tonne capacity (Figure 30).²⁹¹ Owing to the lack of a proper keel, the ship seems

²⁸⁶ Long and Domergue 1995, 805.

²⁸⁷ Trinchèrini *et al.* 2001.

²⁸⁸ Liou and Domergue 1990.

²⁸⁹ Arnaud 2011b, 156-158.

²⁹⁰ Bondesan *et al.* 1990, 13.

²⁹¹ Bonino 1990, 39.

to be best suited to coastal and fluvial navigation.²⁹² The wreck is dated to the last quarter of the first century BC. The cargo was well preserved and included various amphorae as well as lead ingots. Also on board were six lead models of temples, several wooden boxes, assorted pieces of north Italian terra sigillata and common wares.²⁹³

The lead ingots, 102 of which were recovered from the wreck in 1981, have been studied extensively.²⁹⁴ They have been divided into 5 basic types. Most recently, 20 of these ingots, taken from each of the 5 types, were tested using isotopic analysis.²⁹⁵ The results of the isotopic analysis show that the ingots were probably from the mines of Sierra Almegrera or Carthago Nova in Spain.²⁹⁶ By comparing the epigraphic evidence of these regions with the stamps and the counter-stamps on the ingots, it is most likely that the ingots were produced at Carthago Nova. A small group of them (Type 5), however, seem to have been mined at Mazarrón.²⁹⁷

Figure has been removed due to copyright restrictions

Figure 30. Reconstruction of the *Comacchio* ship (Bonino 1990, 38).



²⁹² *Ibid.*

²⁹³ Berti 1990, 65.

²⁹⁴ Domergue 1987; Domergue *et al.* 2006a; Dušanić 2008.

²⁹⁵ Domergue *et al.* 2006a.

²⁹⁶ *Ibid.*

²⁹⁷ *Ibid.*, 19.

A wide variety of cargo amphorae were also on board: Koan, Chian, Cnidian and Dressel 6A (Figure 31).²⁹⁸ While the Dressel 6 were manufactured most commonly along the Adriatic coast, around the region in which the wreck was found, the other amphorae are from the Aegean.



Figure 31. Amphorae from the *Comacchio* Wreck (Museo del carico della Nave Romana di Comacchio, author's photo).

This ship thus contained cargo from Spain (ingots), the Aegean (amphorae) and Northern Italy (amphorae and finewares). A lack of keel indicates that the *Comacchio* would have been suited primarily for fluvial and coastal navigation, it is unlikely that the ingots or the Aegean amphorae would have been loaded directly. Rather the ship was probably loaded at an Adriatic port where the cargo was assembled from a collection of previously unloaded cargoes. It is possible that this wreck represents a return cargo acquired from an emporium such as Aquileia.

²⁹⁸ Bondesan *et al.* 1990, 70.

Cap Béar C (50-25 BC)

The *Cap Béar C* wreck was discovered at a depth of 40 meters in the region between Port-Vendres and Cap Béar. The ship is estimated to have been approximately 20 meters long,²⁹⁹ and the cargo consisted of three types of amphorae originating from three very different locations. Extant were 162 Dressel 1B amphorae, 16 Dressel 12 amphorae and 32 Pascual 1/Layetanian 1 (a form which appears to be the predecessor to the Pascual 1).³⁰⁰ *Cap Béar C* therefore contains cargo from central Italy (Dressel 1B), Baetica (Dressel 12) and Tarraconensis, specifically the area of Badalona (Pascual 1).

Reconstructing the loading of this ship is rather more complex than the ships discussed previously. It has been suggested that this ship is a classic example of a tramping cargo.³⁰¹ The ship was loaded with Dressel 1B's in Italy and then sailed to Spain where it picked up additional cargo in the form of the Baetican and Tarraconesian amphorae. Yet this model is problematic for a number of reasons, principally the stability of the ship.³⁰² For example, if the Baetican and Tarraconesian amphorae were simply added on top of the pre-existing cargo it would have drastically changed the balance of the ship. Even if some of the Dressel 1Bs had been exchanged for the Spanish amphorae the ship would have had to have been carefully reloaded. Furthermore the unloading of part of the cargo in port would have presumably incurred harbour fees and customs duties,³⁰³ thus making the relatively small amount of Spanish amphorae taken on not worth the cost.

Recent investigations into the Dressel 1B amphorae from the wreck have, however, shown that a significant portion of these were not actually from Italy, as formerly believed, but were actually produced in Tarraconensis.³⁰⁴ These are very close in form to the Italian Dressel 1B amphorae and are primarily distinguishable on the basis of the clay. It is proposed that they

²⁹⁹ Liou and Pomey 1985, 548.

³⁰⁰ Colls 1986, 203.

³⁰¹ *Ibid.*, 204; Parker 1992, 98.

³⁰² The organization of the cargo directly affects the stability of the ship, and if the cargo is not adequately balanced, the ship will sink (McGrail 1989).

³⁰³ State customs dues typically would have been enacted when crossing between provinces. In this case, import duties would have been exacted on the cargo from Italy and then export duties would have been applied to the entire outgoing cargo. Customs duties are discussed in detail on pages 106-109.

³⁰⁴ Etienne and Mayet 2000, 123-125.

were made by Italian potters who had re-located to Tarraconensis using the same techniques and with the Italian variety on hand to imitate.³⁰⁵

Given that these Tarraconensian amphorae were mixed in with the Italian originals, I would propose that the most likely scenario is that the entire ship was loaded at one time, perhaps near Badalona. The Italian Dressel 1Bs could have arrived as an entirely separate cargo and then have been purchased in port to add to the local cargo. The Dressel 12 amphorae were surely added to the original cargo, whether as a specific consignment or as a means of diversifying goods for better potential sale at the ship's destination. As there were only 16 on board it is unlikely that the ship actually stopped at a Baetican port. If these amphorae were indeed all loaded at a Tarraconensian port, this ship is very similar to those ships with regional cargoes discussed earlier.

Skerki Wreck D (c. 80-50 BC)

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Figure 32. Photomosaic of Wreck D illustrating the void implying missing cargo (McCann *et al.* 2004, 40, Figure 4.1).

Skerki Wreck D, one of eight wrecks discovered in a series of deep-water surveys off the Skerki Bank (about 80 kilometres NW of Sicily), was located at a depth of 850m.³⁰⁶ The bulk of artefacts were primarily concentrated in two large heaps with only a few scattered artefacts in the near vicinity. The investigators of the survey propose that the two heaps of

³⁰⁵ *Ibid.*, 125.

³⁰⁶ McCann *et al.* 2004, 41.

cargo lie as they would have been in the ship itself and that the absence of artefacts in the middle of the area can be explained by an organic cargo or the jettisoning of the easily accessible cargo located in the midship section of the hold (Figure 32).³⁰⁷

Excavation was not carried out on *Skerki Wreck D*, although the seabed was carefully surveyed by an ROV and a sampling of artefacts was retrieved. While the cargo seems incomplete, there are several artefacts of interest. From the two heaps combined, approximately seventy amphorae are visible on the seabed of at least twelve different types originating from a variety of locations including Italy, North Africa, Greece and probably Gaul.³⁰⁸ The presumed contents of the amphorae include wine, oil, and either pickled fish or fruit. Also on board were a number of finewares which were probably part of the cargo, a large deposit of lamps (noticed after the survey and not fully investigated), and various artefacts which were part of the crew's belongings (cooking pots, a quern, etc).

The majority of amphorae (27) visible on board are Dressel 1B. There are also four Dressel 1A wine amphorae (the earliest dated amphorae), one Dressel 1C, associated with *garum* and a Dressel 12, also identified with *garum*. Other types include eleven Lamboglia 2 wine amphorae, six Greek Koan wine amphorae, three Dressel 26 Tripolitanian oil amphorae and one Neo-Punic van der Werff 1 amphora of unknown contents.³⁰⁹

The artefact assemblage of the *Skerki Wreck D* is thus quite diverse. The initial problem with interpretation is, of course, the fact that the wreck is evidently missing a significant portion of its original cargo. However the amphorae are still quite informative. Petrological analysis of the Dressel 1B amphorae indicates that those noted on *Wreck D* originated in Albinia near Cosa.³¹⁰ A number of the cooking vessels believed to be part of the crew's kit appear to be from Cosa or Viterbo, leading to the proposition that the ship either originated in Cosa or at least stopped there along its journey.³¹¹

³⁰⁷ *Ibid.*, 53.

³⁰⁸ *Ibid.*

³⁰⁹ *Ibid.*, 53-4.

³¹⁰ *Ibid.*, 54.

³¹¹ *Ibid.*, 55.

If the primary cargo was wine from western Italy, how does one explain the presence of the Lamboglia 2, Koan and Tripolitanian amphorae? Lamboglia 2 amphorae are thought to have originated along the northern or eastern shores of the Adriatic and spread to production centres all along the eastern coast of Italy. Their contents are usually assumed to be olive oil; some, however, have been proven to contain wine.³¹² The Koan amphorae were wine amphorae typically from Kos, though they were also manufactured on Cnidus and Rhodes from the third century BC through to the Imperial Period.³¹³ The Dressel 26 Tripolitanian amphorae originated in North Africa and are believed to have typically carried oil.

Thus, a ship which seemingly began its journey in northwestern Italy also has cargo from the eastern coast of Italy, Greece and North Africa. None of these three amphorae seems to be represented in a low enough number simply to be attributed to the crew's provisions (which is probably the case for the Neo-Punic amphora, the Dressel 1C and the Dressel 12). Of course, the origin of the missing cargo cannot be determined, but it could have provided yet another represented location.

While the investigators have suggested that this is perhaps an example of tramping,³¹⁴ the notion is illogical. The *Skerki Wreck D* contained cargo from northwestern Italy, eastern Italy, Greece and North Africa. Furthermore, based on the location of the wreck, it has been proposed that its destination was North Africa. This is highly unlikely; a journey with such a relatively small cargo over such great distances makes very little economic sense. A much more feasible explanation is that the entire cargo was loaded at Cosa, a proposal which is strengthened by the fact that many of the crew's items, such as their cooking pots, seem to have originated near Cosa.³¹⁵

³¹² *Ibid.*, 63.

³¹³ *Ibid.*, 65.

³¹⁴ *Ibid.*

³¹⁵ McCann *et al.* 2004, 55.

Cabrera III (c. AD 257)

The *Cabrera III* wreck, excavated over two seasons in 1985 and 1986, is one of six wrecks discovered around the island of Cabrera, a Balearic Island located south of Mallorca.³¹⁶ The wreck was not completely excavated, though the majority of the site has been examined.

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Figure 33. Amphorae from the *Cabrera III* wreck: 1. Dressel 20; 2. Dressel 23; 3. Almagro 50; 4. Beltrán 72; 5. Africana II Grande 6. Almagro 51 c; 7. Beltrán 68 (Mayet, 1999, Figure 4).

The cargo of the *Cabrera III* wreck consisted primarily of a large group of coins and amphorae. During the 1985 season, 950 *sestertii*, originally contained inside an amphora, were recovered. In 1986, a further 15 *sestertii* and two *antoniniani* were discovered.³¹⁷ Of the 967 coins recovered, 803 could be securely identified, ranging in date from AD 82 (*sestertius* of Domitian) to AD 257 (*sestertius* of Valerian dated to 256/257), giving the wreck a *terminus post quem* of AD 257.³¹⁸ Substantial coin finds such as this are rare on ships; Parker's catalogue contains only three other wrecks which contained a large enough number of coins to be sufficient for use during trade and these all date to the fourth century AD.³¹⁹ The excavators of the *Cabrera III* assert that group of coins was not a hoard, but part of the typical circulation of small bronze coins in the mid third century and evidence of the prosperity of Spain.³²⁰

³¹⁶ Bost *et al.* 1992, 11.

³¹⁷ *Ibid.*, 37.

³¹⁸ *Ibid.*, 35-98.

³¹⁹ The three wrecks are the *Grand Bassin D* (c. AD 313) which contained 4,000 coins, the *Scole A* wreck (AD 365-380) which contained approximately 500 coins and the *Vignale* wreck (AD 307-310) which contained over 1,000 coins (Parker, 1992).

³²⁰ Bost *et al.* 1992, 115-116.

The primary cargo aboard the *Cabrera III* was olive oil and fish products transported in amphorae, nine types of which were discovered: Dressel 20 and 23, Almagro 50 and 51, Africana Grande, Beltrán 68 and 72 and two unidentified types (Figure 33).³²¹ Considering only complete examples and necks, there were 131 amphorae retrieved.³²² Amphorae from Baetica are the best represented with 50 in total—34 Dressel 20 oil amphorae and 16 Dressel 23 oil amphorae. 42 amphorae came from Lusitania including 19 Almagro 50 (thought to have contained fish sauce), seven Beltrán 72 amphorae (thought to have contained *garum* or *liquamen*) and 16 Almagro 51c amphorae (also possibly holding *garum*). Also present were 32 Africana II Grande amphorae of types B, C and D from Africa Proconsularis, in modern Tunisia.³²³ With the exception of two of these amphorae which contained whole olives, the Africana II amphorae were pitched and contained fish products. The Beltrán 68, of which three were recovered, and the two unidentified types, of which seven in total were recovered, were probably not part of the main cargo.

The *Cabrera III* wreck therefore contained a highly heterogeneous cargo from three provinces, Baetica, Lusitania and Africa Proconsularis, and the majority of it consisted of olive oil from Baetica. The second largest part of the cargo appears to be fish products from Byzacena. While only 30 Africana II amphorae for fish products were recovered, as compared to the 42 amphorae containing three types of fish products from Lusitania, the capacity of the Africana amphorae is greater than the types from Lusitania.³²⁴ There is considerable diversity within even these 42 amphorae as several different cities are represented on the basis of stamps (Leptiminus, Sullethum and possibly Thaenae) and type (Africana II C amphorae are thus far known only from Neapolis).

Based on the arrangement of the amphorae, the excavators conclude that the ship was loaded in its entirety at a single location.³²⁵ They propose, based on the types of amphorae and the

³²¹ *Ibid.*, 117.

³²² *Ibid.*, 118.

³²³ *Ibid.*, 143. The contents of Africana II A appear to have been *salsamenta* and possibly wine, II B is still unknown, II C is *salsamenta* and II D was *salsamenta* and possibly wine (Bonifay 2007, 23).

³²⁴ The average capacity of Africana II C is 55-60 litres and that of the II D is 45-50 litres whereas the average capacity of the Almagro 51C amphorae is 25-30 litres (Roman Amphorae: a digital resource, <http://ads.ahds.ac.uk/catalogue/resources.html?amphora2005>, last accessed July 20, 2012).

³²⁵ Bost *et al.* 1992, 200-201.

wreck location, that the ship was originally loaded in Gades (Cádiz) and was on its way to Italy, most likely to Ostia.³²⁶ It also seems likely that it could have been loaded at an entrepôt in the Balearics. A single loading is the only plausible way to explain such a diverse cargo, particularly as it represents no less than four different North African cities amongst only 32 amphorae. While Ostia certainly could have been the final destination intended for this ship, one could also imagine that the ship was intended for any of the other ports along the central Italian coast such as Terracina, Anzio or Civitavecchia. The excavators of the *Cabrera III* wreck compiled a list of twenty wrecks with cargoes that they deemed similar to that of the *Cabrera III*. Several other wrecks also display similar assemblages. While some of these simply contain one of the types of amphorae found on board the *Cabrera III*, six of them are relevant as their cargoes combine North African and Spanish amphorae suggesting that this combination was relatively common.³²⁷

Conclusions

Throughout this chapter, I have sought to answer questions about the organization of Mediterranean trade in the Roman period using the evidence of shipwreck cargoes. Horden and Purcell say that wrecks with heterogeneous cargoes such as *Skerki Wreck D* and *Cap Béar C*, ‘reflect admirably the haphazard conditions of trade’,³²⁸ yet the evidence presented here does not support this. Rather, it indicates a high level of organization. With all of these wrecks, and perhaps particularly with the *dolia* wrecks discussed, it is apparent that there was considerable planning involved with regard to cargoes and their destinations. The level of previous knowledge and the degree of communication amongst producers and merchants was necessarily high. It also seems to be the case, especially from the evidence of the warehouses at Baetulo and the *Cap del Vol* wreck, that the decision of what specific cargo to carry was in the hands of the *navicularius*.

³²⁶ *Ibid.*, 201-202.

³²⁷ Wrecks with both Spanish and North African amphorae include: *Cabrera I* (third century AD), *Cap Blanc* (late third to early fourth centuries AD), *Gisement des Catalans* (mid third to fourth centuries AD), *Planier VII* (mid third to fourth centuries AD), *Pampelonne* (first half of the fourth century AD), *Punta Ala* (second half of the third century AD), *Femmina Morta* (late third to early fourth centuries AD) (Bost *et al.* 1992, 203).

³²⁸ Horden and Purcell 2000, 368.

At the outset, it was noted that shipwreck evidence should be approached with caution. In particular, no wrecks from the eastern Mediterranean have been examined in detail in this chapter as there are few from this period which are well documented and published. The wrecks considered in this chapter, while of various sizes and cargo arrangements, were selected because they are rather typical examples of Roman period wrecks (at least in the western Mediterranean); none of these wrecks, even those with highly heterogeneous cargoes, is unusual and there are numerous others which exhibit the same basic characteristics. Several consistent patterns emerged from the wrecks discussed which bear examination for their wider applicability to the organization of Roman maritime trade. Certainly there are caveats with shipwreck data, but this detailed examination provides a nuanced view of how cargoes were assembled and the processes which drove the prolific exchange of goods during this period.

While I argue that coastal tramping was not the primary way in which goods were traded in the Mediterranean in the Roman period, the statement that most trade was conducted between emporia can be further developed and clarified. In particular, the shipwreck evidence from this chapter and the ceramic evidence from Chapter I can be combined with what is known about the social institutions of trade to produce a holistic picture of the maritime trade processes. This will be addressed in the next chapter.

CHAPTER III. MODELLING ROMAN MARITIME TRADE

Chapter I demonstrated significant and sustained maritime trade amongst coastal cities in the Mediterranean and Chapter II highlighted the strong degree of organization and economic rationale which characterized maritime commerce. Explaining the mechanisms by which maritime trade was conducted and the social networks and physical infrastructure which made it possible are the topics to which I turn in this next chapter.

To begin, I wish to attempt to move through the processes of maritime trade in a largely theoretical way. The purpose of this is not to identify every possible way in which a product might have moved from its point of production to its point of consumption, but rather to think through the process of trade in its entirety and highlight the major mechanisms involved. There is unfortunately little direct archaeological or textual evidence for the ways in which Roman producers, merchants, shippers and buyers coordinated their transactions. We must occasionally rely on hypothetical attempts to outline the various stages involved in maritime trade. How did the various products destined for maritime transport make it from the farm or bottling site to the foreign market, or rather, what were the processes through which wine went from the vine to the table? How many people were involved and what types of decisions were made? Most scholarship focuses on only one specific type of commerce (*e.g.* the wine trade or trade in amphora-borne commodities) and this thesis has hitherto done the same, but this neglects the larger picture. We may forget that every producer needed a buyer and a shipper, or that every shipowner needed a cargo, and that every consumer needed a producer. It thus becomes very easy to exclude the human element. By looking at the process from beginning to end, the people come to the forefront. What were the various steps involved in trade from the point of production to consumption?

This discussion is framed from the point of view of the merchants because they played a major role in the decision-making process for reasons which will be explained in the following discussion. Furthermore, as this thesis is concerned with ports and maritime trade, I will focus on seaborne transportation. Finally, this discussion focuses on market exchange (see Introduction). Redistribution is not dismissed as a method for the movement of goods

throughout the Roman world; indeed, redistribution and market exchange were not in any way mutually exclusive, but rather co-existed and were often reciprocally beneficial.³²⁹

The Trading Process

Acquisition, transport and sale: these are usually identified as the three major stages in trade. While the acquisition and transport of a product would be done sequentially, selling the product could either be done before or after the acquisition of the product.

Product Acquisition

A merchant might obtain his goods in one of two main ways, directly from the producer or through a middle man. Literary sources give some indications of the ways in which merchants acquired their products directly from the producers, particularly with regard to wine and oil. Cato specifies terms for the purchase of olives, grapes, oil and wine which can give some idea of the stages of the process, at least as concerns Italy in the second century BC.³³⁰ Both olives and grapes could be purchased before harvest, i.e. still on the tree or vine.³³¹ In both cases, however, it is not the olives or the grapes that are transported, but rather the eventual olive oil or wine. The buyer is, however, liable for the production costs entailed in the process of making oil or wine, such as the leases for the harvesters. In this case, the buyer is speculating that the product will be of sufficient volume and quality. Payment was due within 10 months. After purchase, the wine could be stored with the producer until the first of October, if the buyer failed to claim the wine by this point, it reverted back to the property of the producer.

Wine could also be purchased from the *dolia*, which must be done by January, and as with oil, the wine could be stored with the producer until October. Importantly, there was a stipulation that following the purchase of the wine, the buyer could test the wine and was not

³²⁹ C.f. Harris 2011, 293-297.

³³⁰ *On Agriculture* 144-148.

³³¹ See Erdkamp 2005, 120-134 for a thorough discussion of the advance sale of agricultural products.

required to go ahead with the purchase of wine that had moulded or gone musty.³³² The tasting insurance is also mentioned repeatedly in the *Digest* and therefore suggests a continuity in practice for the purchasing of bulk wine.³³³ It is important to note that a buyer cannot turn down the wine simply because they do not like the taste, but only if the wine has spoilt and turned to vinegar.³³⁴

The passages from Cato and the *Digest* reveal several aspects about the production of wine and oil for sale. First of all there are two different ways to purchase the product—on the vine or tree, or by the finished product—but in either case, the final product was produced on the estate. Secondly, contractual terms were established between the producer and the buyers—if the buyer failed to claim the wine in time for the producer to begin the next year's vintage, the producer was able to repossess the wine, and if the producer ruined the wine after the sale and customary tasting, he was liable for the loss. These factors indicate a fairly complex market structure; estates commonly did not handle the market sale of their own produce, but rather arranged the process through professionals within a legal system that regulated the sale of wine and olive oil in a way that protected both the producer and the buyer from fraud.

Once a merchant had purchased the desired product from the producer, he could proceed either by selling the product on a larger market himself, or he could sell the product to another merchant who specialized in long-distance trade. The amphorae warehouses from Baetulo discussed in Chapter II provide a good example of the ways in which merchants might have purchased their products from middle men. A similar warehouse from Olbia in southern France which contained wine bottled in amphorae from at least four different regional production sites will be discussed in detail in Chapter V.³³⁵ The warehouses at Baetulo and Olbia served as collection points for the wine from various villas in the nearby area. The fact that the amphorae were collected from sites in the interior and brought to a port city suggests that they were intended for maritime transport.

³³² *On Agriculture* 148. 3-4; *Digest* 18.6.1; 18.6.6; 18.6.15.

³³³ See Frier 1983.

³³⁴ *Digest* 18.1.9.2; 18.6.1.

³³⁵ Bats 2006, 140.

These warehouses illustrate a situation in which a local merchant bought wine from a variety of local producers and then either sold the wine abroad himself or acted as a middle man, selling the wine to a merchant who specialized in maritime transport. Buying through a middle man would perhaps have created a simplified system of communication and exchange where the locally or regionally-based merchant coordinated transactions through fostered local contacts, while the merchant specializing in long-distance trade established and maintained a different set of contacts.

Transporting the Product

Maritime shipment is one of several processes in the movement of a product from the point of production to that of consumption. While there are necessary steps which must occur prior to a commodity being exported from its original production site, this first export makes a logical starting point for understanding maritime trade. Only in rare cases does the initial export of a product involve major maritime movement. Rather, the initial stage of export typically involves short transport, either overland or by river or sea, or by a combination thereof; for those products destined for maritime export, this is simply an intermediary stage necessary to get the products to a port where they can be assembled for actual export. There are occasions when this first step would not have been necessary. For example, stone, particularly marble, from coastal sites seems to have been exported directly from purpose-built harbours at the quarries,³³⁶ but even products produced on the coast most often would have been collected and moved to the harbour of the city for export.

The Ports

Maritime transport begins and ends in ports. Ports varied in their facilities as well as the size of their harbours and associated infrastructure; this variation intrinsically linked them with the types of ships they could support and therefore the types of trade which they handled. The idea that ports existed within a hierarchal network is not new; Strabo lists 47 emporia in

³³⁶ Russell 2011.

his *Geography* and distinguishes them by size.³³⁷ The majority of these are maritime ports, though a few major riverine cities are also referred to as emporia.³³⁸ Strabo frequently refers to the relative size of the emporia: Alexandria, for example, is referred to as “the greatest emporium in the inhabited world”³³⁹ and Ephesus as “the largest emporium in Asia this side of the Taurus”;³⁴⁰ Arelate was “no small emporium”.³⁴¹

More recent scholarship has also considered the hierarchical nature of Roman ports. Roug  spends several pages on the categorization of ports, though he divides them primarily into the large and the small and spends the majority of his time on the large well-known ports.³⁴² Houston examines the types and sizes of Roman ports, considering in particular when ships required specialized harbour facilities and the relationship between ship and harbour size.³⁴³ Importantly he points out that focusing only on the largest ports “risks distorting our view of the overall level and nature of trade in the Roman Empire”.³⁴⁴

But how does one go about establishing hierarchies for the smaller ports about which we often know very little? Pascal Arnaud has developed a hierarchical model for the coast of Narbonensis based on the evidence of customs stations and official status.³⁴⁵ Another recent approach has based a hierarchical development of the Italian coast on the physical size of the harbour basin and available docking space.³⁴⁶ This is a very interesting approach and works well along the central Tyrrhenian coastline where the majority of harbours were artificially constructed.

Both of these approaches were developed for specific regions and are not easily transferrable to others. Arnaud’s model based on customs points works for Narbonensis as there were only three official ports of clearance. In the province of Asia, however, essentially every port is

³³⁷ See  tienne 1993 for a complete list of the emporia mentioned in Strabo’s *Geography*.

³³⁸ For example, Lugdunum and Hispalis.

³³⁹ *Geography* 17.13.

³⁴⁰ *Geography* 14.1.24.

³⁴¹ *Geography* 1.4.6.

³⁴² Roug  1996, 149-150 (small ports), 150-156 (large ports).

³⁴³ Houston 1998.

³⁴⁴ *Ibid.*, 560.

³⁴⁵ Arnaud 2010.

³⁴⁶ Sch rle 2011; Wilson *et al.* forthcoming.

recorded as having a customs station. The harbour-based approach, while ideal for artificially constructed harbours, cannot usefully be applied to regions where the majority of harbours are natural and their size dependent upon their setting. While a small, natural harbour would inhibit the types of traffic which it could handle, a large natural harbour is not inherently more important. A new approach must be sought which allows for both natural and artificial harbours and which is not wholly dependent on well-preserved archaeological remains.

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Figure 34. Stopford's modern port development (Stopford 2009, Figure 2.9).

The question of port hierarchies as they relate to the organization of the shipping market has been addressed for the modern period by maritime economist Martin Stopford:

Ports have several important functions which are crucial to the efficiency of the ships which trade between them. Their main purpose is to provide a secure location where ships can berth. However, this is just the beginning. Improved cargo handling requires investment in shore-based facilities. If bigger ships are to be used, ports must be able to handle different cargoes - bulk, containers, wheeled vehicles, general cargo and passengers all require

different facilities. There is also the matter of providing storage facilities for inbound and outbound cargoes. Finally, land transport systems must be efficiently integrated into the port operation.³⁴⁷

He has also postulated four levels of port development (Figure 34): small local port, large local port, large regional port and regional distribution centres. As is seen in the diagram in Figure 36, these classifications are based on requirements for modern shipping. What is useful, however, is the fact that in order for ports to develop, they must increase their infrastructure. Small ports have only minimal infrastructure, while the large redistribution centres have extensive facilities.

Modern Terms	Ancient Infrastructure	Ancient Activities
Small local port	None, Beach, Breakwater, Quays	Villas, Small ports- very small scale export, mixed imports Not dealing with re-distribution
Large local port	Breakwater, Quays, Small warehouses	Moderate export on regional scale, perhaps some direct imports, but probably imports collected from the two higher port levels
Large regional port / Emporium	Breakwater, Quays, Enclosed Harbour with depth of 2-3m, Warehouses for both imports and exports, Lighthouse, Possible Crane, Fresh water source	Substantial import/export. Involved in re-distribution on a regional level.
Large redistribution port / Emporium	Breakwater, Quays, Large Enclosed Harbour with depth above 3m, Extensive warehouses for both imports and exports, Lighthouse, Cranes, Fresh water source	Large scale imports / export and re-distribution in Mediterranean and beyond.

Table 2. Ancient Port Development (author).

This model can provide a useful way of thinking about the interactions between ancient ports. One difficulty with regard to ancient ports is that we rarely have anywhere near a complete picture of the harbour infrastructure. Other types of evidence can, however, be used when they are available - such as the extent and scale of imports and exports and the

³⁴⁷ Stopford 2009, 81.

degree to which products are re-distributed - to come to an understanding of a port's role within a wider network of trade. Table 2 represents my attempts at this process.

Each individual port operated within a wider network, both within their local landscape and within the wider Mediterranean. The modeling of ancient ports and the development of a hierarchical port network thus begins at the local level by examining each coastal settlement and port in terms of landscape, geology, infrastructure, immediate hinterland, river and road connections, productive capabilities and imports and exports. Each port must then be placed within its regional context—how did the various ports along these particular stretches of coastline develop alongside each other? To what extent did they interact horizontally and vertically?

The creation of a model is a useful exercise through which we can begin to think about the function of individual ports within a wider system and the basic organization of the shipping market. I return to this model in greater detail in Chapters IV and V where I apply it to the ports of southern Turkey and southern France, but it is useful to introduce the concept here as the various categories of ports are an integral part of the organization of the shipping market.

Import and Export Duties

When a ship arrived in harbour, its cargo had to be officially registered.³⁴⁸ Two separate taxes were levied on ships coming into a harbour:³⁴⁹ harbour dues (municipal fees that were exacted for the use of harbours and their facilities) and customs fees (state taxes that would have been calculated *ad valorem*). While there are no extant figures for municipal harbour dues during the period in question, these certainly existed.³⁵⁰ It is probable that the rate of such dues varied by harbour and depended upon the available facilities. Charges also could

³⁴⁸ It is not certain whether or not every port had a customs station. The Customs Law of Asia seems to indicate that every port along the coast of Asia had a station, but it appears that there were only three among the ports of Narbonensis (France and Hesnard 1995). Arnaud suggests that it is unlikely that every port had a customs station (2011a, 66). This is certainly true, though it would seem probable that all ports of moderate size would have had the capacity to exact customs lest tax evasion become far too simple.

³⁴⁹ *Cf.* Arnaud 2011a.

³⁵⁰ Scheidel 2011a, 28.

have been levied on specific activities which took place within a harbour, such as ferry services.³⁵¹

We are better informed about customs dues, or *portoria*, though our knowledge remains uneven and there is still a considerable amount of uncertainty concerning the taxation process.³⁵² The *portorium* was applied both to products being imported and exported over provincial boundaries. Customs rates varied by province; along the external frontiers the rates were as high as 25%, though within the Empire the rate was most commonly 2.5%.³ Sicily and Illyricum, however, seem to have had a 5% rate,³⁵⁴ and it is possible that the ports of Italy were free from customs duties.³⁵⁵ Specific rates were often applied to particular products, particularly those of high value such as slaves or purple-dye.³⁵⁶

For incoming ships, it is probable that the entire cargo would have been unloaded at the point of customs clearance.³⁵⁷ The Customs Law of Asia states that the merchant (upon importing or exporting) had to announce verbally and declare in writing the value of the cargo and where necessary the quantity of goods and their weight.³⁵⁸ The basis of the declared value of the goods is not known. In some cases, the products would have been a commission and the selling price would have been decided in advance, but in others the selling price must have been negotiated after the cargo arrived in harbour. Occasionally, the percentage based fees seem to have been adapted to flat rate tolls to simplify the clearance process.³⁵⁹ While an immediate declaration of value on the cargo could be interpreted as a hindrance on normal market bartering procedures,³⁶⁰ it would not necessarily have been the case. Unfortunately, we lack explicit evidence for how commodities were valued in

³⁵¹ Ferry services are attested from Smyrna (*IK* 24.1, 712), Myra / Limyra (see pages 147-148). There were five corporations of ferrymen at Ostia (*CIL* 14.409; 4144).

³⁵² For recent discussions of Roman customs dues see Duncan-Jones 2006 and Cottier *et al.* 2008.

³⁵³ Duncan-Jones 2006, 4.

³⁵⁴ *Ibid.*

³⁵⁵ Rathbone 2008, 275-276.

³⁵⁶ For example in the Customs Law of Asia, slaves, slave children, ore and murex shells were subject to specific rates (Cottier *et al.* 2008).

³⁵⁷ Bresson 2008, 101-105; Arnaud 2011a, 67.

³⁵⁸ Cottier *et al.* 2008, 106-107.

³⁵⁹ Duncan-Jones 2006, 6.

³⁶⁰ Arnaud 2011a, 67.

antiquity. According to the World Trade Organization, there are three common methods for valuing imports:

1. the price at which goods comparable with the exported goods are sold in the internal markets of the exporting country (“current domestic value”);
2. the price at which the imported goods are sold from the exporting country to the importing country (“transaction value”);
3. the price at which goods comparable with the imported goods are sold in the markets of the importing country (“import market value”).³⁶¹

Of these, valuation based on “transaction value” (number 2) is preferred for its simplicity and practical advantages.³⁶² It is possible that the valuation in antiquity would also have been based on the so-called “transaction value”. Commodities being imported would already have been subjected to export duties and the price would have been fixed at this stage; the valuation of the cargo for the purposes of taxation would therefore have been based on the products’ original sale price. In this case, the final sale of the product on the market would not have influenced the amount of the *portorium*. This scenario would have somewhat reduced state revenues, but would have conversely provided a straightforward way to calculate the duty without requiring merchants to speculate on their selling prices.

As the *portorium* was only levied once within each province, it would be necessary to document that the required customs had been paid before products were moved beyond the initial customs point. Numerous customs receipts on *ostraka* or papyri from Egypt illustrate the process.³⁶³ In addition, a small number of lead seals were discovered near the river harbour at Lyon which were stamped with the mark of the customs *statio* at Arelate and presumably served to mark portions of cargo, or to seal the record of the cargo that had already passed through a customs point.³⁶⁴

³⁶¹ Rosenow and O’Shea 2010, 8.

³⁶² *Ibid*, 22.

³⁶³ Sijpesteijn 1987.

³⁶⁴ See further discussion on page 225.

While it is not possible to calculate the aggregate income which the Roman state would have gained from customs duties, it is certain that the amount was considerable. The revenues from trade across the frontiers would have been particularly high; the Muziris papyrus records the cargo valuation of a ship from Muziris in India at nearly 7 million HS after tax, implying that the revenue from the customs would have amounted to approximately 2.2 to 2.3 million HS.³⁶⁵ Indeed, Cicero refers to the importance of revenues gained from customs duties on multiple occasions,³⁶⁶ and their importance is also mentioned by Strabo.³⁶⁷ Perhaps the best evidence for the potential income from customs duties comes from Polybius' account of a complaint lodged by the Rhodians on account of loss of harbour revenues following the establishment of Delos as a free port.³⁶⁸ The Rhodians claimed that the yields from their harbour dues fell from one million *drachmae* to 150,000 *drachmae*. That being said, from a historical perspective, the interprovincial rates of Roman customs duties were actually quite low; they compare more closely to the rates from modern industrial countries, which are typically under 5%, than to rates from the Medieval and Early-Modern modern periods which could range from 10 to 30%.³⁶⁹ In other words, while the revenue was an important source of income for the Roman state, the costs were far from prohibitive to those involved in trade.³⁷⁰

Shipping Patterns

Shipwreck cargoes, such as those discussed in Chapter II, provide the most direct evidence for understanding the various way in which products were transported.³⁷¹ This in turn, sheds light on how commodities were bought and sold. In many wrecks, one product forms the majority of the cargo—for example, the Latium wine from San Anastasia on the *Madrague de Giens*. In these cases, it can be argued that the production zone of the majority of the cargo represents the location where the ship was loaded. Clearly there were exceptions to

³⁶⁵ Rathbone 2003, 220-221.

³⁶⁶ *On the Agrarian Law* 2.80; *On the Manilian Law* 6.15

³⁶⁷ *Geography* 4.5.3.

³⁶⁸ *The Histories* 30.31.

³⁶⁹ Scheidel 2011a, 28.

³⁷⁰ *C.f.* Scheidel 2011a.

³⁷¹ An examination of shipping patterns has been attempted without archaeology, for example Rougé 1966, 415-435.

this, but it provides a general guideline. In other instances, the initial starting point of the ship is less clear, and it is possible that cargo was assembled at an emporium without a geographic connection to the production site. The *Cabrera III* would be an example of this as the cargo is split between North African, Baetican and Lusitanian amphorae. Broadly speaking, one can identify four basic shipping/trading patterns.

Direct Export: This is the initial stage of maritime export which occurs as a direct shipment between two ports. This could be a pre-arranged shipment or a consignment, or be speculative on a known market; the owner of the goods could be a merchant who bought the product directly from the producer, or a merchant that purchased the cargo from an intermediary merchant. The cargoes are fairly homogenous and from a localized production zone. The *Cap del Vol* and *Plemmirio B* wrecks discussed above are examples of this pattern of trade. Products intended for the state also followed this general organization (e.g., grain and oil for Rome, marble for Imperial building). As mentioned earlier, stone also seems to be directly exported. The *P. Bingen 77* papyrus also reflects this pattern as it records various small ports exporting local products directly to Alexandria.³⁷² The *dolia* wrecks belong largely to this category.³⁷³ As seen with the *Petit Congloué* and its small number of Gallic wine amphorae,³⁷⁴ a ship could also pick up a complementary cargo at an intermediate point along its journey as long as it was relatively small or lightweight, and presumably also when such an action would not necessitate additional customs payments.

Trade Between Emporia: The two largest categories of ports outlined in the hierarchical port model can be regarded as emporia. Emporia acted as both regional and inter-regional collection points of products. As such, products traded between emporia could be on any stage of export. In some cases goods departing from an emporium might be on their initial stage of transport, or they might be on a secondary stage of export or beyond. A cargo might include a mix of products from various stages of export. There are two basic scenarios involved. One scenario would involve a merchant who specialized in trade between major

³⁷² This papyrus is discussed in detail in Chapter IV.

³⁷³ The amphorae in the *Grand Ribaud D* are from around Naples and also from the Adriatic whereas those in the *Giraglia* wreck are from a more localized production zone. As stated earlier, the contents of the *dolia* are unknown.

³⁷⁴ See page 80.

emporium, making his living by assembling cargoes which were not necessarily local at emporium A and then selling them at emporium B or C. The *Cabrera III* and *Punta Scifo A* are potential examples of this model. The second scenario would involve a cargo of largely local material supplemented with products (not necessarily local) gathered from the emporium market. The *Madrague de Giens* ship with its primary load of Latium amphorae and its smaller cargo of Campanian fineware, and the *Chiessi* wreck with its main cargo of Beltrán 2B amphorae and additional Dressel 20s and Haltern 70s are good examples of this pattern, as is the *Sainte-Marie-de-la-Mer* and perhaps the *Cap Béar C*.

Return Cargoes: Return cargoes are closely related to trade between emporia. After a merchant moves a specific cargo composed of one or two main products from emporium A, he might return from emporium B with a more heterogeneous cargo. The scenario of heterogeneous return cargoes may explain a number of the shipwrecks which have fairly mixed contents. The difference is in the focus on export versus import—whereas the first two patterns begin with export, the intent of a return cargo is to import products which are locally needed at the home port. Return cargoes are surely largely responsible for the widespread distribution of many low-value products across the Roman world:³⁷⁵ Italian bricks were used in the construction of bath complexes and cisterns in numerous North African port sites,³⁷⁶ and Cilician roof tiles were used in Syria and Phoenicia.³⁷⁷ As seen from the example of Leptiminus, iron ore apparently made a desirable return cargo. As has already been argued for the spread of ARS around the Mediterranean, the consumer sites were not necessarily trading directly with the production sites, but could have purchased the goods at intermediary locations. The *Comacchio* and the *Skerki Wreck D* are probable return cargoes. Economically speaking, return cargoes are important because both ends of a journey were potentially profitable. Given the choice between sailing with only ballast or sailing with a cargo, one would surely have chosen to take on a cargo.

³⁷⁵ Cf. Tchernia 2011, 124, 344-345.

³⁷⁶ Wilson 2001a; Wilson *et al.* forthcoming.

³⁷⁷ Mills 2005.

Tramping: Tramping,³⁷⁸ or cabotage, is typically portrayed as a haphazard trading activity in antiquity. Peter Bang paints a rather nonchalant picture of trampers: “Those markets [by which he is referring to all cities under 10,000 people, therefore the majority of cities in the Mediterranean] were normally served by a system often referred to as cabotage: small merchant ships would more or less casually tramp along the coast from harbour to harbour in search of a good bargain”.³⁷⁹ Horden and Purcell discuss the role of cabotage in *The Corrupting Sea*, stating that ‘commerce of this kind has an accidental, casual flavour about it; destinations, cargoes, the speed of the voyage, what was available and what was wanted in each locality all change, season to season’.³⁸⁰

Heterogenous cargoes are often explained on the basis of tramping, yet none of the ships discussed in this thesis can be labelled as coastal trampers, as most heterogenous cargoes were loaded at emporia. While there was certainly some degree of coastal tramping in the Roman period, it was not responsible for major movements of goods such as those documented in Chapter I. When tramping did occur it probably did so primarily within the bounds of a single province as otherwise the cargo would have been subject to both import and export duties. One exception seems to be the province of Asia, where a cargo was subject to import and export dues only once within a year. If a merchant were to import a cargo, he would be liable for import dues on the cargo; if he only sold a portion of the cargo, they he must pay export dues on the unsold portion of the cargo; if, however, he were to re-import the same cargo into Asia later within the same year, the merchant would not have to pay either import or export duties again.³⁸¹ If moving goods in and out of Asia, this would have reduced transaction costs for one side of the trading process. A similar situation existed

³⁷⁸ Tramping is a term which is used in post-Industrial shipping, but with a completely different meaning from that which is used for the ancient world. From the early 1800s until the rise of modern shipping in 1950 (notably container shipping and air transport), the shipping system is customarily divided into two categories, liner and tramp. Liner shipping, including both passenger service and cargo service, was characterized by regularly scheduled service often between specific ports, and with published prices (Stopford 2009, 29). The cargoes were typically diverse and the ships had complex storage facilities. Tramp shipping, on the other hand, transported primarily bulk cargoes such as grain, coal and timber, commissioning their cargo per voyage with their destination contingent on the cargo they acquired and the market demand (*ibid.*, 32-34).

³⁷⁹ Bang 2008, 141.

³⁸⁰ Horden and Purcell 2000, 142.

³⁸¹ *Lex Portorii Asiae*, line 18. See commentary in Cottier *et al.* 2008, 108.

at Caunus, where a merchant could re-export unsold merchandise without being subjected to export duties for a period of 20 days as long as one-third of the cargo had been sold.³⁸²

In general, travelling outside of a single customs zone, however, would cause one to be subject to import and export duties upon every border crossing. This surely made inter-provincial tramping unlikely, as the costs of doing so would be so high that it would surely outweigh the benefits of haphazard trade.

Importantly, the small-scale local movement of goods does not need to be regarded as haphazard. It was undoubtedly often aimed at local markets and fairs and was therefore part of a regular system of sale.³⁸³ This was not a primitive or unsophisticated mode of exchange, but a smaller-scale system of supply of the type which still serves major cities today and which is compatible with a market economy. Tramping was certainly important locally, especially between very small harbours, but the evidence suggests that this was not the mode of transport responsible for the majority of trade in the Roman Mediterranean.³⁸⁴

Selling the Product

The sale of the product could occur either before or after its acquisition. Commissions, for example, would have been arranged prior to the physical acquisition of the product, occurring on the free market or through imperial redistribution. Often, though, even imperially requisitioned commodities were transported by private merchants,³⁸⁵ sometimes with the addition of non-imperial goods. The best example of this is the grain trade. Literary sources make it clear that the owners of the grain ships were private merchants,³⁸⁶ and as discussed in Chapter I, the spread of ARS is best explained by it travelling alongside grain. This implies that a merchant might stock his ship both with imperially-owned grain and with additional goods which he could sell on the private market.

³⁸² Marek 2006, 198-199.

³⁸³ See De Ligt 1993 on markets and fairs.

³⁸⁴ *C.f.* Arnaud 2011a; Wilson 2011a.

³⁸⁵ Sirks 1990, nos. 21 and 22.

³⁸⁶ Suetonius, *Claudius* 18-19; Tacitus, *Annals* 13.51.

While the transport of imperially-owned grain might earn the shipowner or merchant certain benefits such as tax breaks or even citizenship, it seems clear that not only did the majority of trade take place on the market, but that market trade was more profitable than imperially-contracted trade.³⁸⁷ Free market commissions could occur in a variety of circumstances. We might imagine that a wealthy citizen would commission a shipment of a specific marble with which he wanted to adorn his floor, or that the proprietor of a large wine shop might establish regular shipments of wine to maintain a constant supply, or that a town or magistrate might commission wild animals for their games.

A merchant who specialized in long-distance trade might also regularly sell their products to a local merchant, perhaps more precisely termed a distributor, in a given city, the counterpart to the merchant middleman on the production end. As with the merchant middleman on the production end, this would allow a simplified communication network. A merchant could also sell the products on the market himself, setting up shop in the forum, *macellum* or *agora*, or a more transient fair.³⁸⁸

The Merchants

For the sake of simplicity, the previous discussion used the term ‘merchant’ to describe a broad category of people involved in maritime trade, yet the group may be split into several specific types of goods purveyors. There is the general merchant—he buys directly from the source, ships the goods himself and markets them abroad. This could be done on a large or small scale. On the other hand, there are specialist merchants: those who purchase; those who ship; and those who distribute.

The primary Latin terms for those involved in maritime trade are *negotiator*, *mercator*, *navicularius*, and occasionally *nauta*. In Greek, the terms are ἔμπορος, ναύκληρος, and ναῦτης. The distinction between the terms *negotiator* and *mercator* is not entirely apparent; in general, it would seem that the term *negotiator* signifies trade on a larger scale while

³⁸⁷ For example, Suetonius records that *annona* merchants would not be liable for cargo losses and that if a Roman citizen, an *annona* shipowner was exempt from the lex Papia Poppaea (*Claudius*, 18-19). Tacitus states that Nero exempted *annona* ships from being included in one’s property for tax purposes (*Annals*, 13.51).

³⁸⁸ See de Ligt 1993.

mercator is often used to describe someone working on a fairly small scale.³⁸⁹ One indication of this is that *mercator* frequently appears in inscriptions without any indication of further specialization while the application of the term *negotiator* is frequently further clarified by some sort of specialization.

A detailed look at the Latin inscriptions related to *negotiatores* is revealing. I have collected a total of 311 inscriptions from the Epigraphik-Datenbank Clauss-Slaby³⁹⁰ which refer to *negotiatores* or those that negotiate and have analysed them according to whether or not the inscriptions indicate specialisation (Figure 35). These inscriptions are included in Appendix I. As can be seen in Figure 35, 78% of the inscriptions (242) provide some degree of clarification to the title *negotiator*. There are several different ways to indicate a specialization, and as such I have subdivided the inscriptions by the indicator of specialisation.

The most common indicator of specialization is the trade in which the *negotiator* was engaged, and there are 124 such inscriptions (40% of all specialized inscriptions). Unsurprisingly, *negotiatores vinarii*, or wine traders, are the most common with 29 attestations. Geographically, most of these inscriptions come from Rome (11), and 11 more are from Italy in general (three at Ostia), but there are also several in Gaul (three in Narbonensis and five in Lugdunensis), as well as Germany and Dalmatia. Numerous other trades are also recorded including *negotiatores artis cretariae* (pottery dealers), *negotiatores frumentarii* (grain merchants), *negotiatores ferrarii* (iron merchants), *negotiatores eborarii* (ivory merchants), and several cloth and clothes merchants (*negotiatores lanarii*, *sagarii*, *vestiarii*).

³⁸⁹ Verboven 2007.

³⁹⁰ Epigraphik-Datenbank Clauss-Slaby, <http://www.manfredclauss.de/>, last accessed April 2012.

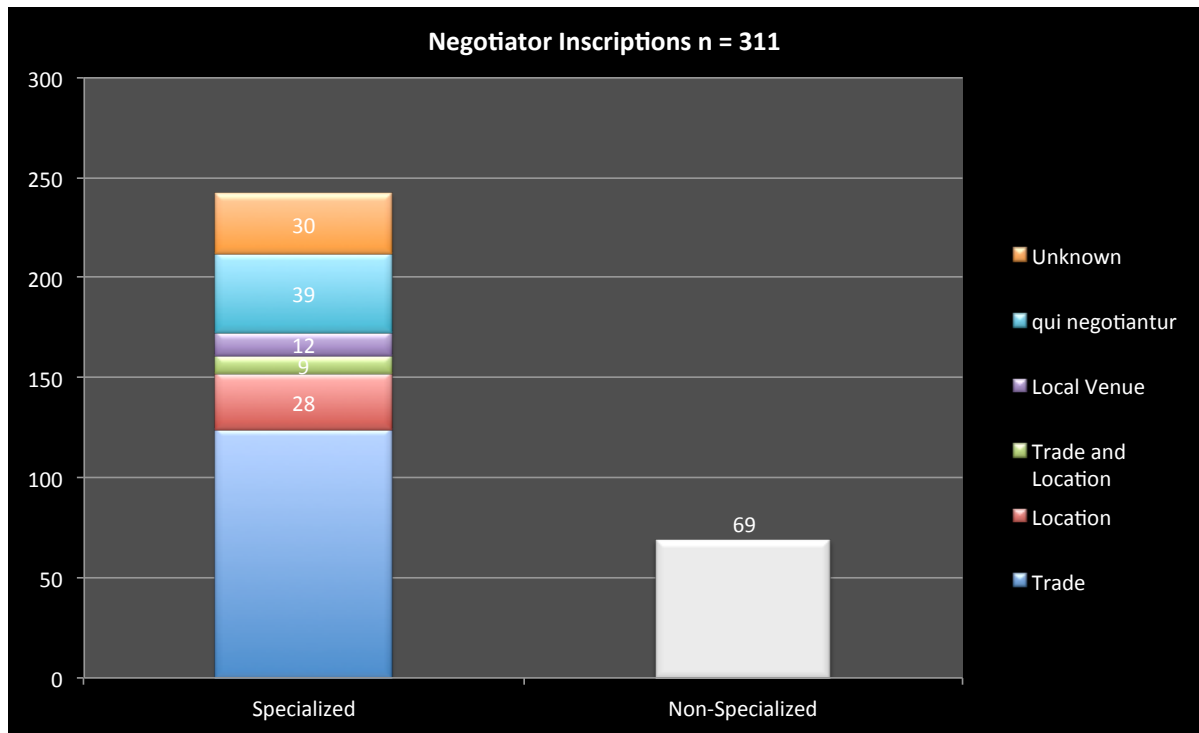


Figure 35. *Negotiatores* Inscriptions by Specialty (author's graph).

The epigraphy also records those *negotiatores* who specialized in trade with a certain region rather than a certain commodity—for example the *negotiatores Cisalpini et Transalpini*. These inscriptions account for 9% of all inscriptions. A further group of inscriptions which deal with location are the very specific ‘qui negotiantur’ inscriptions. These account for 12% of the inscriptions and are discussed in more detail below. An additional 3% of inscriptions record *negotiatores* who specialized in a specific product from a specific region. At Rome, for example, an inscription records a certain Tiberius Claudius Docimus who traded in wine and *salsamenta* from Mauretania.³⁹¹ Twelve of the inscriptions (4%) refer to *negotiatores* who sold products in a specific part of their own city—for example, the *negotiatores ex area Saturni* from Ostia.³⁹²

Of course, the terminology was not consistent. Olive oil dealers, for example, only rarely referred to themselves as *negotiatores olearii*, but more commonly identify themselves as simply *olearii*; there are 29 Latin inscriptions mentioning *olearii*, only four of which refer to

³⁹¹ CIL 6.9676.

³⁹² CIL 14.397.

negotiatores olearii. Rome has the highest concentration (nine), but as expected there are several from Spain (five from Baetica and two from Hispania Citerior), and four of those from Rome are traders in Baetican oil. There are also three inscriptions from North Africa and others from Gaul and Dalmatia.

The specialisation of merchants, or *negotiatores*, is an important indicator with regard to the developed nature of the Roman maritime economy. Specialization comes with higher risk and is typically unsustainable in underdeveloped economies.³⁹³ Yet it appears that specialized traders were fairly common in the Roman period. The fact that they chose to identify themselves as such indicates that they were successful in their chosen ventures.

Trading Diasporas

Specialization does, however, bring a complication: the coordination of various stages of the trading process. Preindustrial maritime trade was limited by a number of factors, the two most important being a dependence on wind for sailing and a lack of communication. These factors were not wholly prohibitive; the Romans, the Venetians, the Portuguese, and the Dutch all had successful maritime trading empires. While none of these empires overcame the dependence on the sail, they all found ways around the issue of communication, an issue whose resolution did not really begin until the invention of deep-sea cables in the 1860s.³⁹⁴

The primary way in which the Romans dealt with communication issues in the context of trade was the establishment of diaspora communities in major trading centres across the Roman world. The term ‘trading diasporas’ was coined in 1971 by anthropologist Abner Cohen to describe “dispersed, but highly interrelated communities.” A trading diaspora is established to “co-ordinate the co-operation of its members in the common cause and establish channels of communication and mutual support with members from communities of the same ethnic group in neighboring localities who are engaged in the trading network”.³⁹⁵ Cohen’s diaspora community was a subset of the west African Hausa ethnic

³⁹³ C.f. Doerflinger 1983.

³⁹⁴ Stopford 2009, 27.

³⁹⁵ Cohen 1971, 267.

group that established residency in Yorubaland (part of Nigeria occupied by the Yoruba group) to facilitate trade communication.³⁹⁶ Geographically closer to the Roman world, historical diaspora communities include the Hanseatic League, the Venetian colonists in Constantinople,³⁹⁷ and the Dutch in Venice.³⁹⁸ Excellent evidence for the workings of Medieval merchant communities comes from the documents of the Cairo Geniza.³⁹⁹

There is a very specific category of inscriptions referring to *negotiatores* which are characterized by the fact that they refer to specific ethnic groups of people that trade in specific locations. The Latin construction is typically very formulaic: ethnic group-*qui* location-*negotiantur*. Furthermore, they are the earliest inscriptions referring to such ethnic trading groups.⁴⁰⁰ They are also, in contrast with the other inscriptions of *negotiatores*, largely concentrated in the eastern Mediterranean and are occasionally bilingual inscriptions in both Latin and Greek. I have collected 39 such inscriptions in total from the Epigraphik-Datenbank Clauss-Slaby (numbers 174-212 in Appendix I).⁴⁰¹ 73% of which are from the eastern Mediterranean (27 inscriptions). They are primarily from the provinces of Asia and Achaia. Some of the earliest inscriptions come from Delos where there are four inscriptions dating to the first century BC which refer to the Italians and Greeks who trade at Delos. For example,

A.Terentium A. f. Varro[nem legatum]
Italicei et Graecei quei Delei negoti[antur]

[Α]ὔλον Τερέντιον Αὔλου υἱὸν Οὐ[άρονα πρεσβευτὴν]
[Ῥ]ωμαίων, Ἰταλικοὶ καὶ Ἑλλήνες οἱ κατ[οικοῦντες ἐν Δήλῳ]⁴⁰²

Those from the western Mediterranean are not concentrated in any particular location but appear singly in Germania Superior, Noricum, Rome, Raetia and Africa Proconsularis; there are also two from both Hispania Citerior and Latium.

³⁹⁶ *Ibid.*

³⁹⁷ Dursteler 2008.

³⁹⁸ Van Gelder 2007.

³⁹⁹ Goitein 1999.

⁴⁰⁰ Verboven 2011a, 338.

⁴⁰¹ Epigraphik-Datenbank Clauss-Slaby, <http://www.manfredclauss.de/>, last accessed April 2012.

⁴⁰² *CIL* 3.7240.

Many of the inscriptions are of the *cives Romani* who trade with various locations across the Mediterranean.⁴⁰³ At Ephesos, numerous inscriptions show the presence of associations of Italian traders. Around 60 BC, the *Italicei qui Ephesi negotiantur* dedicated a statue of a certain L. Agrius Publeianus⁴⁰⁴ and in 37 BC they dedicated an honorary inscription placed in the western hall of the agora to the consul M. Cocceius Nerva. In 36 BC, the *conventus civum Romanorum qui Ephesi negotiantur* dedicate another inscription to M. Cocceius Nerva.⁴⁰⁵ In the AD 40s, the *conventus civum Romanorum qui in Asia negotiantur* made two dedications to Claudius, one of which was an equestrian statue.⁴⁰⁶

The *cives Romani* also appear on Crete. Several inscriptions attest groups of Roman traders at Gortyn—the *cives Romani qui Gortynae negotiantur*.⁴⁰⁷ In the first century BC, the *cives Romani qui Gortynae negotiantur* set up an honorific inscription to Doia L Procilla, probably a member of a *duumviral* family from Knossos.⁴⁰⁸ In the second century AD, the *cives Romani*—who instead of being identified as *negotiatores* are now attested as those who settled in Gortyn (*qui consistunt*)—along with two priests of the imperial cult, dedicate an honorary inscription to Septimius Severus.⁴⁰⁹

Aside from the above inscriptions, some of our best examples of trading diasporas come from Italy at Puteoli and Ostia, though such groups are attested elsewhere across the Empire. *Stationes* are attested in several harbour cities and were probably present in many others. *Stationes* seem to have been trading offices where merchants and shippers could organize trading ventures. The best attested *stationes* are those in the *Piazzale delle Corporazioni* at Ostia. The *Piazzale* consists of 61 individual *stationes*, many of which preserve mosaics revealing various economic activities. Surviving inscriptions attest *navicularii* and

⁴⁰³ There are thirteen overall that refer to the *cives Romani* from Ephesos (3), Kos (1), Mytilene (1), Prymnessus (1), Gortyn (1), Limnia (2), Bracara (1), Terracina (1), Thinissut, Africa Proconsularis (1).

⁴⁰⁴ *IvE* 6.2058.

⁴⁰⁵ *IvE* 3.658.

⁴⁰⁶ *IvE* 2.409; *IvE* 7.1.3019.

⁴⁰⁷ *I.Cret.* 4.291.

⁴⁰⁸ *I.Cret.* 4.290; Baldwin Bowsky 1999, 310.

⁴⁰⁹ *I.Cret.* 4.278, *CIL* 3.4.

negotiatores from 14 different cities, 10 of which are in North Africa,⁴¹⁰ two of which are in Gaul,⁴¹¹ and two in Sardinia.⁴¹² Offices are also indicated for traders of flax and rope, leather traders and wood traders. The individual offices in the *Piazzale* are relatively small; they were certainly not for the storage of any goods and were most likely offices where one could coordinate trading agreements with members of various represented areas of the Empire. The *Piazzale* facilitated commercial transactions at Ostia by creating a centrally defined location where one could readily find representatives from key emporia such as Carthage and Narbo Martius.

A well-known inscription from Puteoli dated to AD 174 records the request of an association of Tyrians resident in Puteoli for assistance from Tyre in paying the annual rent for their *statio*.⁴¹³ Other foreign groups were also active at Puteoli, though none is attested as explicitly as the Tyrians.⁴¹⁴ The presence of residents from Berytus is indicated by an inscription set up by the Berytian worshippers of Jupiter Heliopolitanus dedicated to Trajan.⁴¹⁵ Another inscription referencing Jupiter Heliopolitanus was setup by a *corpus* of worshippers from Berytus or Heliopolis which apparently owned a seven-*iugera* necropolis with a cistern and tabernae.⁴¹⁶ Groups of merchants (probably Italian) doing business in Alexandria, Asia and Syria are also identified in an inscription dedicated to L. Calpurnius Capitolinus: *Calpurnio L(uci) f(ilio) / Capitolino // C(aio) Calpurnio L(uci) f(ilio) / [[6]] // mercatores qui Alexandr[ia]i Asiai Syriai negotiantu[r]*.⁴¹⁷

A community of Nabateans at Puteoli is probable on the basis of several cultic inscriptions to their principal god, Dusares.⁴¹⁸ It is believed that there was a temple to this deity in Puteoli, located in the *vicus Lartidianus*, an area of the city believed to have been inhabited largely

⁴¹⁰ Misua (*CIL* 14.4549.10), Musluvium (*CIL* 14.4549.11), Hippo Diarrytus (*CIL* 14.4549.12), Sabratha (*CIL* 14.4549.14), Gummi (*CIL* 14.4549.17), Carthage (*CIL* 14.4549.18), Sullecthum (*CIL* 14.4549.23), Colonia Iulia Curubis (Kurma, Tunisia) (*CIL* 14.4549.34), Alexandria (*CIL* 14.4549.40), and Mauretania Caesariensis (*CIL* 14.4549.48).

⁴¹¹ Arelate (Statio 27), Narbo Martius (*CIL* 14.4549.32).

⁴¹² Turrus Libisonis (Porto Torres) (*CIL* 14.4549.19) and Carales (Cagliari) (*CIL* 14.4549.21).

⁴¹³ Editions: Mommsen 1843, 57-62; *CIG* 3.5853; *IG* 14.830. Discussed by D'Arms 1974, 105; Duncan-Jones 1974, 210, 236; Sosin 1999.

⁴¹⁴ On foreign communities in Puteoli, see particularly D'Arms 1970; 1974 and Terpstra 2011.

⁴¹⁵ *CIL* 10.1634.

⁴¹⁶ *CIL* 10.1579.

⁴¹⁷ *CIL* 10.1797.

⁴¹⁸ *AE* 1971.86; *AE* 1994.422; *AE* 1994.423; *AE* 2001.843; *CIL* 10.1556.

by foreigners on the basis of an inscription dedicated to Hadrian by the *inquilini* of the *vicus Lartidianus*.⁴¹⁹ The numerous references to this cult, the probable location of the temple in an area associated with foreign groups coupled with the general scarcity of the worship of Dusares in Italy certainly points to a resident community of Nabateans in Puteoli.

The existence of foreign cults in harbour cities can be a useful marker of groups of foreign residents. Harbour cities were, without a doubt, cosmopolitan, and as such, one expects a high degree of foreign cults.⁴²⁰ One should not simply equate a foreign cult with a resident diaspora community without evidence beyond the simple existence of the cult. There are, however, several situations in which foreign cults can probably be linked with resident communities. Here, let us briefly examine two cases from North Africa in connection with the cult of Sarapis.

While nothing explicitly states that a group of Greek-speaking worshippers of Sarapis at Carthage were resident merchants, this seems to be the most likely explanation. This cult at Carthage appears to have comprised a distinct group of people, seemingly of Alexandrian origin; the known dedicators all had Greek cognomina and the dedicatory inscriptions are either in Greek or are bilingual.⁴²¹ Furthermore, there are several dedications which show clear Alexandrian connections, perhaps most importantly there was a bust of the Egyptian priest Manetho, the priest that Plutarch records as having assisted with the foundation of the cult in Alexandria.⁴²² The presence of a group of Alexandrians at a major emporium such as Carthage is certainly plausible and perhaps even to be expected.

It is possible that a similar situation existed at Lepcis Magna. While yet unpublished, a group of 30 Greek inscriptions dedicated to Sarapis were found inside the temple to Sarapis. These are apparently similar to five inscriptions from the same temple published in *IRT* (310, 310a, 311, 312, 313), three of which bear the names of men with the Latin *nomen* of Aurelios with Greek cognomina. Out of the group of thirty unpublished inscriptions, 12 apparently have

⁴¹⁹ *AE* 1977.200.

⁴²⁰ The site of Naukratis provides an interesting example of this phenomenon from the Greek period, discussed most recently in Malkin 2012, 87-93.

⁴²¹ Rives 1995, 212-214.

⁴²² Plutarch, *Isis and Osiris* 28.

the *nomen* of Aurelios. Thirteen different dedicators are mentioned in total, but all are reported as having Greek cognomina.⁴²³

While monuments to Sarapis are fairly common in North Africa, there are only four cities which have verifiable temples or sanctuaries: Carthage, Sabratha, Lepcis and Lambaesis.⁴²⁴ As discussed, the sanctuaries at Carthage and Lepcis contained Greek dedications whereas the dedications at Lambaesis, the base of the Third Legion in inland Algeria, are primarily in Latin. Indeed, the presence of Greek inscriptions in North Africa west of Cyrenaica is extremely rare; two cities which have the greatest concentration of Greek inscriptions are Lepcis Magna and Carthage; other cities that contain more than a few are Oea, Sousse and Cherchel, all major port cities.

The importance of this material relates not to the general constituency of the cult of Sarapis as a widespread phenomenon but to the use of Greek in a predominantly Latin-speaking province. The majority of dedications in the western Empire are in Latin. Here, the use of Greek by dedicators with Greek cognomina, and in particular the strong Alexandrian connection of the dedications at Carthage, point to a resident foreign community engaging in cultic practice by means of their own traditions.

The presence of sustained diaspora communities and particularly of resident foreign merchants links directly with a sophisticated and organized model of trade; that is, the idea of premeditated harbour-to-harbour trade linked with trade through emporia. It was the recurring trade amongst specific parties that made the existence of diaspora communities of merchants necessary. The money devoted to maintaining such communities, whether for the maintenance of a *statio*, or the installation of a new cult suggests regular and sustained contact between regions.

⁴²³ Brouquier-Redde 1992, 103.

⁴²⁴ Kater-Sibbes 1973, 136.

Commerce and Social Standing

Finally, it is worth briefly considering the social situation of the people discussed above. The social status of merchants and traders, and indeed businessmen in general, has generated much debate amongst scholars. This is unsurprising given not only the general debate over the nature of the Roman economy, but also because it seems to have been a somewhat controversial topic amongst authors of the Roman period. In the trading scenarios outlined above, it is quite possible for the elites to avoid the actual marketing processes altogether—at least visibly. The elites often owned the estates on which agricultural products were grown, yet as seen in the passages from Cato and the *Digest*, they did not market the products personally, but sold them to merchants. Tchernia and D’Arms argue that the separation of the producers from the traders allowed a way for the landed elites to maintain at least a symbolic separation from trade.⁴²⁵ There were, of course, exceptions. The senatorial Sestius family at Cosa, well known for the production and trade of wine during the latter half of the 2nd century through the 1st century BC, is a prime example. They owned vineyards, produced amphorae,⁴²⁶ owned ships⁴²⁷ and seemingly expanded into the fish-salting industry.⁴²⁸

Elites were also, of course, responsible for providing the demand for expensive products from luxury goods from India to large quantities of building materials. The obvious way in which they could maintain a discreet role in the world of commerce was through the agency of freedmen. There are numerous ways in which freedmen, or even slaves, could have been involved in commercial partnerships with their patron, from selling the products of their patron (as already discussed) to handling specific stages of transactions or coordinating supply.⁴²⁹ This idea has been most prominently put forward by Frier and Kehoe in the *Cambridge Economic History of the Greco-Roman World*. They situate the idea of agency within the framework of New Institutional Economics. They conclude as follows:

⁴²⁵ D’Arms 1981; Tchernia 2011.

⁴²⁶ Numerous amphora sherds discovered around Cosa stamped with Sestii family stamps indicate the production of amphorae which were exported on a significant scale with distribution extending primarily to Gaul and Spain, but also to Athens and Delos (Manacorda 1978; McCann 2002).

⁴²⁷ Cicero refers to the *navigia luculenta* that Sestii contributed to Brutus (*Letters to Atticus* 16.4.4.).

⁴²⁸ McCann 2002.

⁴²⁹ Broekaert 2012; forthcoming. Broekaert gives six basic levels of agency (Broekaert forthcoming).

This method of managing businesses through friends or social dependants had significant implications for the organization of the Roman economy. For one, it tended to reinforce the strict social hierarchy that helped to preserve the economic and social privileges of the landowning elite: there was little capacity for developing a class of artisans let alone entrepreneurs who were fully independent of elite patronage or control. Successful freedmen who gained wealth as artisans or business managers were ultimately dependent on a master or patron for an initial investment in skills and capital, and they often remained socially bound at least to some degree to their patron.⁴³⁰

Frier and Kehoe do, however, argue that slaves ‘could operate with a great deal of independence’ despite being socially bound to their patrons.⁴³¹

The ideas presented by Frier and Kehoe are largely correct—it is clear that freedmen and even slaves often acted as agents for their elite owner or former owner’s business. Wim Broekaert, who analyses the issue much more closely in a forthcoming article, concludes that tracing the relationship between patron and freedmen is extremely difficult with the evidence at hand, and he agrees with Frier and Kehoe, largely because of the significant advantages that a freedmen with startup capital from a patron would have over an independent freedmen.⁴³² But is this really to say that behind every freedman *negotiator* there was an elite patron calling the shots and handling the connections?

I would posit that both arguments underestimate the independence of freedmen businessmen, particularly within certain environments. This is not to say that they did not get their beginnings in trade through their patrons, or that many of them did not continue to work with the same families following manumission. What must be kept in mind, however, are the environments in which merchants and traders were working. Within a busy port where merchants, traders and shippers interacted amongst each other, it cannot always have been the familial connections which dictated social and economic interactions. If it were, one would expect frequent references to patrons in the epigraphy, but this does not often occur. An exception to this would be a situation where members of the same family or freedmen of the same patron are situated in complementary locations, i.e. an agent in Gaul and an agent

⁴³⁰ Frier and Kehoe 2007, 133-134.

⁴³¹ *Ibid.*, 134.

⁴³² Broekaert forthcoming.

in Italy. Even in the financial sphere, where one would presume the elite presence was the most necessary, continual ties with a patron are not always detectable. People surely banked with the Sulpicii bankers of Puteoli because of the reputation that they themselves (Faustus, Cinnamus and Onirus) built, not because of the family which originally owned Faustus.⁴³³

Kehoe, in his chapter on production in the *Cambridge Economic History of the Greco-Roman World* states the following:

But for the most part, the involvement of the Roman elite was limited to supplying raw materials, and it was left in the hands of artisans and workers recruited from more humble levels of society to undertake the actual production of manufactured goods. So it does not seem that the Roman empire experienced the development of a class of entrepreneurs engaged in manufacturing on a sufficient scale to rival the political and social ascendancy of the landowning elite.⁴³⁴

While this is a perfectly true statement, it misses the point. We would not expect entrepreneurs to reach a level sufficient to rival the landowning elite. That does not, however, mean that they did not rise above the poorest class. Verboven has argued in several articles that there was in fact a ‘business class’.⁴³⁵ In particular, he makes a very strong argument for the emergence of a business class of merchants, producers and traders in the northwest provinces. He argues that the strong military presence in these provinces provided a large emerging market unlike anything previously in the region and that this created an environment for a business class to prosper.⁴³⁶ While the disproportionately large amount of epigraphy related to merchants and traders in Gaul and Germany must depend on factors other than the military (otherwise the same situation would occur in every militarized frontier zone), the point that regions with large markets create extended opportunities for businessmen is valid. I would argue that port cities create a similar type of environment;

⁴³³ There were three main bankers mentioned in the archive, Gaius Sulpicius Faustus, Gaius Sulpicius Cinnamus and Gaius Sulpicius Onirus. Faustus, a freedman, was the earliest banker and Cinnamus was the former slave of Faustus. The exact relationship of Onirus to the others is not known, though it has been suggested that he was the brother or former slave of Faustus (Jones 2006, 54-55).

⁴³⁴ Kehoe 2007, 569.

⁴³⁵ Verboven 2007; 2009; 2011a; 2011b. See also Broekaert 2012.

⁴³⁶ Verboven 2007.

commerce was the *raison d'être* of port cities, and the people involved in this commerce formed the largest and in some respects most important social class present within them.⁴³⁷ It is to be expected therefore that what may justifiably be called a 'business class' developed.

Conclusions

It has been suggested by Whittaker that the widespread distribution of wine amphorae around the Mediterranean was due not to market trade, but to elites transporting their own products amongst their familial estates.⁴³⁸ While not to deny that this practice occurred, the evidence presented in the previous three chapters illustrates a scale and sophistication across all aspects of the trading process which would not have been necessary outside of a market system.

Facilitated by both physical infrastructural and social networks, Roman maritime trade involved advanced commercial processes which operated within a market economy. This synthesized discussion of ports, shipwrecks, merchants, traders and producers has outlined the broad mechanisms of maritime trade. By thinking of trade as a composite process in which production, transport and marketing processes are intrinsically linked, the level of organization and development which were required to succeed in commerce becomes readily apparent. Each category evidences a specific part of the processes of maritime trade and when considered together they produce a detailed picture of how maritime trade was carried out during the Roman period.

The evidence from the ports and from the shipwrecks reveal the different levels and patterns of maritime trade from the very small scale to the major emporia such as Portus and Alexandria. It shows on the one hand that there was a dense and integrated network of ports which functioned as a system, but it also reveals that specific ports would have been best suited to specific functions. For example, not all ports could have adequately functioned as unloading points for the *dolia* ships or unloaded colossal columns. This begs the question of how the various ports developed and how they were integrated into the larger system. The

⁴³⁷ C.f. Mouritsen 2001; Heinzelmänn 2010, 7.

⁴³⁸ Whittaker 1985; 1989.

model developed above will be tested against regional evidence and explored in detail in the subsequent two chapters.

The evidence of the people involved in maritime trade further brings to light the complexity of managing successful trading ventures. The trading diasporas reveal a level of sophistication in dealing with problems of communication inherent in pre-Industrial trade. The obvious level of specialization amongst merchants and traders further speaks to the advanced structure and scale of maritime trade and also indicates that trade could make a profitable career. It is in this respect that the approaches outlined by new institutional economists appear the most successful, though the question still remains of whether institutions enabled trade to expand or simply arose out of the necessity of trade expanding; this will be fully addressed in the Conclusion. In many ways, however, the role of the state in the pacification and unification of the Mediterranean was crucial to the success of maritime trade; this should not be underestimated, though it can be nuanced.

Thus far, this thesis has focused on the macro scale, examining the mechanics of maritime trade from a panoptic level. But as said above, its success required both the social infrastructure just discussed and the physical infrastructure. Ports, as cities, contain both these requirements, and therefore it is now necessary to turn in detail to the ports themselves to examine how the broad characteristics of maritime trade sketched in the first half of this thesis were made possible on the ground.

CHAPTER IV: LYCIA, PAMPHYLIA AND ROUGH CILICIA

The second half of this thesis endeavors to examine in greater detail the broad categories of evidence discussed in the first half through the use of two case studies. This chapter focuses on the southern coast of Turkey, while Chapter V focuses on the southern coast of France. These regions have been chosen so as to encompass both the western and eastern portions of the Mediterranean, areas which are rarely compared, particularly in economic terms. The geographical extent covered by this chapter is approximately 600 km of the coastline of southern Turkey, between modern day Fethiye and Ayaş. This encompasses the Roman province of Lycia and Pamphylia and the western portion of Cilicia, Cilicia Tracheia/Aspera, or Rough Cilicia. With the exception of the small area of Pamphylia, the landscapes of these provinces are rugged and necessitated a dense network of harbours. This region is, therefore, an ideal place to study a maritime environment.

The definition of the coastal zones of southern Turkey as a region requires justification. Defining a region is not straightforward; it can be done based on physical factors such as geography and landscape, or human factors such as ancient or modern political boundaries. In the broad sense of the word, we can consider the coastal zone of southern Turkey to be a region of the Mediterranean. More specifically, I consider the coastal areas of Lycia, Pamphylia and Rough Cilicia to be regions in their own right. The justification lies in their landscapes. The mountainous zones between the coast of Lycia and Rough Cilicia and inland Anatolia created a natural barrier between the coastal and inland settlements. Due to practicalities of transport, the coastal settlements were far more integrated with each other than with the inland cities of the provinces. Communication between cities and towns along this coast has occurred largely by sea until relatively recently; the vast majority of the region was only connected by road in 1979. Pamphylia had a larger plains area, which allowed for more integration between the coast and hinterland and is reflected by the presence of two major river harbours. Given the natural separation between the interior and coastal zones for much of the area under discussion, the consideration of the coastal zones as specific regions is warranted.

History of economic research in southern Turkey

With a few notable exceptions,⁴³⁹ the majority of the ports along this coastline have been subject to varying degrees of archaeological research and publication. The earliest systematic examination of the area was done by Captain Beaufort in his study of the southern coast of Turkey for the British Royal Navy in 1811-1812 and published as *Karamania*.⁴⁴⁰ The ports of central Lycia have been treated cohesively in several articles and a book chapter by Martin Zimmermann.⁴⁴¹ Relatively little has been written with regard to regional assessments of the economy of Asia Minor during the Roman period. In general, ancient economic studies in the eastern Mediterranean are far behind those of the western Mediterranean. Asia is the subject of part of volume IV of *An Economic Survey of Ancient Rome*.⁴⁴² While very little archaeological material is incorporated into this survey, it probably remains the most comprehensive epigraphic collection of economic material for this region to date. More recently, Barbara Levick has drawn on historical and epigraphic sources to produce a brief account of Roman trade and the economy of Asia Minor.⁴⁴³ Stephen Mitchell and Constantina Katsari have edited an important volume entitled *Patterns in the Economy of Roman Asia Minor*, which collects papers focusing on the archaeological, historical, epigraphic and numismatic evidence and highlights both the infancy and the potential of economic studies in Asia Minor.⁴⁴⁴

However, archaeological projects specifically targeting economic questions are rare. Quantified ceramic reports, for example, are strikingly absent. Of the 32 harbour sites mentioned in this chapter, only one has a fully quantified ceramic report. Survey work can be particularly informative in terms of documenting infrastructure relating to ancient economic activities. Since 1996, the Rough Cilicia Archaeological Survey Project, directed by Nicholas Rauh, has substantially contributed to our understanding of the economy of

⁴³⁹ Phoinix, Olbia.

⁴⁴⁰ Beaufort 1817.

⁴⁴¹ Zimmermann 1992a; 1992b; 2003.

⁴⁴² Frank *et al.* 1938.

⁴⁴³ Levick 2004.

⁴⁴⁴ Mitchell and Katsari 2005.

Rough Cilicia during the Hellenistic and Roman periods.⁴⁴⁵ Frank Kolb directed a large survey project in central Lycia between 1989 and 2001.⁴⁴⁶ The survey has produced significant amounts of material, but the results have not been well disseminated and as such have not been incorporated into wider studies of the Roman economy.

While these studies have contributed to the overall state of research regarding the Roman economy in southern Turkey, they are generally isolated; archaeological excavations focus on one site and rarely look to nearby sites in comparison, and there have been few attempts to situate the economy of southern Turkey within the wider Roman world. Much remains to be done in terms of data collecting, synthesis and interpretation, and it is hoped that this chapter will begin to address the gaps in our knowledge of the economy of coastal southern Turkey. Moving from east to west, I will discuss each harbour and harbour city and where possible include a brief survey of the urban amenities and the evidence for economic activity both within the cities and in their hinterlands. I will do this for each of the three provinces and then proceed to a more integrated discussion.

The Ports: Lycia

Lycia was described by Strabo as rugged and hard to travel through,⁴⁴⁷ but exceedingly well supplied with harbours (Figure 36). The region has very little arable land today. Figure 37, taken from a recent GIS study on soil depth analysis, illustrates the scarcity of sufficient soil for agriculture.⁴⁴⁸ 54% of the region has essentially no soil.⁴⁴⁹ The next most common soil depth is 20 cm and below, and this accounts for 24% of the land. 20-50 cm of soil, the range for olive cultivation, only appears in 11% of the region. These are, of course, modern data and as such cannot be unquestionably applied to antiquity. However, even if we assume that

⁴⁴⁵ The Rough Cilicia Archaeological Survey Project, <https://engineering.purdue.edu/~cilicia/>, last accessed July 20, 2012.

⁴⁴⁶ The Lycia Project, <http://www.uni-tuebingen.de/en/faculties/philosophische-fakultaet/fachbereiche/geschichtswissenschaft/abteilungeninstitute/ancient-history/staff/prof-dr-f-kolb/lycia-project.html>, last accessed July 20, 2012.

⁴⁴⁷ *Geography* 14.3.2.

⁴⁴⁸ Aydin 2006.

⁴⁴⁹ Really need upwards of 75 cm of soil for vines, minimum of 45 for olive trees.



Figure 36. Map of Lycian Sites Discussed (author).

there was greater soil depth in antiquity, it is extremely unlikely that region was ever highly fertile.

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Rivers

The areas with substantial soil depth are primarily limited to the river valleys. The Dalaman Çayı forms the border between Lycia and Caria; at 160 km long, it is the longest river in the region.⁴⁵⁰ Within Lycia, there are four major

Figure 37. Soil depth map of Lycia (Aydin 2006, Fig. 4.6, 135).

⁴⁵⁰ Hellenkemper and Hild 2004, 88.

rivers—the Eşen or Koca Çayı (ancient Xanthos), Demre Çayı (ancient Myros), Arykandos and Alakir Çayı. The Eşen Çayı, at 120 km, is the second longest river in Lycia, draining the western Taurus mountains and creating a highly fertile area in which many Lycian cities were located and are farmed intensively using greenhouses today. After the Eşen, the next river is not for another 80 km. The Demre Çayı reached the Mediterranean near Andriake and Myra, the Arakyandos at Phoinix. The Alakir Çayı, the most important river in eastern Lycia, began 60 km north of the coast in the Bey mountains and ran, along with a Roman road (see Figure 40), through several cities including Akalissos and Rodiapolis and emptied 4 km east of Limyra. This can perhaps be identified with the ancient Gages river (see Gagai). A branch also ran east towards Olbia.⁴⁵¹ The smaller rivers will be mentioned where appropriate.

Roads

While this chapter is primarily focused on coastal trade, one cannot ignore the roads for their role in transport. Despite the ruggedness of Lycia, it was not without roads, though they were arguably less integrated than in some provinces, and the fact that they only very occasionally survive today is indicative of their lesser importance. The most important source for Roman roads in Lycia is the Claudian *stadiasmos* from Patara, found after a fire on site in 1992 when some 60 blocks which had been built into a Byzantine wall were subsequently cleaned and reassembled. The monument was a square column of slightly over 5 m in height and appears to have been the base for a statue, presumably of Claudius.⁴⁵² There are two Greek inscriptions on the monument, one of which is a dedication to Claudius by the Lycian people, and the other is a list of roads, along with their lengths, which were built by Claudius.

⁴⁵¹ *Ibid.*, 90.

⁴⁵² Jones 2001, 161.

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Figure 38. Roads in Lycia reconstructed from the *Stadiasmos* (Grasshoff and Mittenhuber 2009, 156, Abb. VI.5).

According to the monument (Figure 38), beginning in the east, a road stretched from Kaunos and Kalynda in Caria to Telmessos. From Telmessos, one section of the road branched north through the inland cities of Kadyanda and Araxa to Oinoanda. The other section continued through a valley in a coastwards direction to Pinara and Xanthos and down to Patara. Xanthos was the intersection of five roads: a road which led to Kaunos, a road which ran south to Patara, a road north through Tlos, Oinanda, Balbura to Kibyra, a small westerly road to Kalabantia, and an easterly road through Neisa to Choma. From Patara, the occasionally coastal road continued to Phellos, Kyaneai, Myra, Limyra, Korydalla, Gagai, Korykos, Phaselis, then inland to Kosara. At Kosara, it intersects with a road which runs inland from Arneai to Attaleia. Not attested in the *Stadiasmos*, but suggested through physical remains and milestones, small roads intersected with the coastal road and led to the ports of Antiphellos, Aperlae and Teimioussa.⁴⁵³

⁴⁵³ Grasshoff and Mittenhuber 2009, 82, Abb. III.4.

Maritime Routes

The coast of southern Turkey was not only an important route for regional traffic in the northeastern Mediterranean, but was located along the coastal sailing route between Alexandria and Rome.⁴⁵⁴ This route was most frequently used as an off-season route due to its length; a much quicker route from Alexandria was eastwards to the Gulf of Sirte and then northwards directly across the Mediterranean, but this route was probably only in use during the spring and early summer.⁴⁵⁵ The coast of southern Turkey between Caunus and Elaiussa-

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Sebaste is described in the *Stadiasmus Maris Magni*, a probable Late Antique text which describes selected segments of the Mediterranean coastline.⁴

Figure 39. Wind Patterns for the Turkish Coastline (Heikell 2006, 30).

Unfortunately, the section related to southern Turkey is terse and particularly

uninformative. As Arnaud has effectively illustrated, the work was surely not intended to function as a sailing guide.⁴⁵⁷

When sailing the southern Turkish coast, it is crucial to factor in regional wind patterns. In general, the winds blow eastwards over Africa, northwards along Israel, Lebanon and Syria, and then westwards along the southern coast of Turkey. This is interrupted by the southerly

⁴⁵⁴ The coast was followed between Alexandria and Rhodes (Arnaud 2005, 212-216).

⁴⁵⁵ Arnaud 2007, 333.

⁴⁵⁶ See Arnaud 2009 for a description of the text and its controversial dating.

⁴⁵⁷ *Ibid.*

meltemi winds which blow heavily in the afternoons from mid-May to mid-September and creates strong waves and swells, particularly in Lycia (Figure 39).

Telmessos

Telmessos (modern Fethiye), was the largest and most ideal harbour site in Lycia,⁴⁵⁸ due to



Figure 40. Press bed in Fethiye museum (author's photo).

its natural setting and the protection that its bay offered. The natural bay around the ancient settlement enclosed an area of some 127 hectares. Of the ancient Lycian harbours, this is the only site which now functions as a major harbour. As the majority of the ancient city is now covered with modern construction, very little is actually known archaeologically. In Late

Antiquity, a small harbour was located to the east of Telmessos on Gemiler Island.



Figure 41. Grinding stones in Fethiye museum (author's photo).

In terms of documenting economic activities taking place in the area around the city, the museum at Fethiye contains several elements relating to oil and / or wine pressing. While none of the objects have a find location, their presence in the museum indicates that they

⁴⁵⁸ Foss 1994, 4.

were discovered relatively nearby. There are two press beds, one of which is rather large, two grinding stone elements, and one socketed stone that is perhaps part of a press element or olive mill (Figures 40 and 41). Pliny mentions that the wine of Telmessos was held in some esteem.⁴⁵⁹ Epigraphic material attests craftsmen,⁴⁶⁰ shoemakers⁴⁶¹ and stone-cutters.⁴⁶²

Kalabantia

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Figure 42. Google Earth imagery of terracing between Sidyma and Kalabantia.

Very little is known about the harbour at Kalabantia or its nearest city, Sidyma.⁴⁶³ The Stadiasmus records a road from Xanthos and ancient remains are visible along the coastline and at Sidyma, but the area has not been surveyed or excavated. Google Earth coverage of the area was updated in 2009 and reveals substantial terracing between Sidyma and Kalabantia (Figure 42). From the aerial view, the terracing is extremely similar to Roman-period terracing documented in the region around Kyaneai and Teimioussa (discussed below). In the region of Kyaneai and Teimioussa, the terraces were constructed largely for the purposes of growing olives and vines and it seems probable that this would have been the

⁴⁵⁹ Pliny, *Natural History* 14.9.74.

⁴⁶⁰ *TAM* 3.4 and *TAM* 3.62.

⁴⁶¹ *TAM* 3.114, *IGRR* 3.442.

⁴⁶² *TAM* 3.AIX S.265.

⁴⁶³ A brief survey of Sidyma has been published in Dardaine and Frézouls 1985.

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case for the hinterland of Kalabantia as well. Indeed, a tourist photo from the site of Sidyma shows an olive mill (Figure 43).

Patara

Patara was one of the principal cities of Lycia and the capital of the Roman

Figure 43. Photo of an olive mill at Sidyma. (Lycian Turkey, http://www.lycianturkey.com/lycian_sites/sidyma-photos-1.htm, last accessed July 20, 2012).

province of Lycia and Pamphylia. It was the most important port in Lycia, largely due to its location at the entrance to the Xanthos river valley. Despite its early Lycian foundation, the remains are largely Roman and late Roman.

The city was enclosed by walls in the Hellenistic period, though it expanded somewhat beyond these during the Roman period. Despite the fact that it was originally the port of Xanthos, a mere 56 *stadia* (approximately 10 km) north, Patara became a large and fully monumental city in its right. Extant Roman remains include a large theatre, a *bouleterion/odeon*, a *stoa*, four bath complexes, a fountain, an aqueduct, an agora and adjacent colonnaded street, and a monumental gateway. The primary monumental zone is located to the east of the harbour. An inscription on a lintel found behind the theatre welcomes travelers to the city in both Greek and Latin.⁴⁶⁴

⁴⁶⁴ *CIL* 3.14183.

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Figure 44. Plan of Patara with key to relevant buildings: 7. Olive oil workshop, 25. Main street, 26. Hadrian's arch, 28. Harbour basilica, 30. Harbour bath, 32. Stadiasmus Patarensis, 42. Agora, 47. Lighthouse, 48. *Horrea*, 51. Commercial buildings (Isik, 2000).

The harbour is large (Figure 44); approximate measurements from Google Earth indicate that it enclosed an area of some 40 hectares. Today the area is a swamp and excavations in the harbour basin have not occurred. To the west of Patara beach, there is a series of capes which today are particularly notorious. Stretching for 7 miles between Kötü Burun and Zeytin Burun, the Yedi Burunlar, or Seven Capes, are particularly difficult as the wind gusts from different directions creating high waves, particularly with the *meltemi*. This is also the case where the Eşen Çay (the ancient Xanthos river) meets the ocean, near the entrance to

the Patara harbour. The water is shallower in this area, and it is recommended that one sails at least 2 or 3 miles off the coast.⁴⁶⁵

Recent excavations have, however, uncovered the lighthouse of Patara (Figure 45). Constructed during the reign of Nero, this is one of the few examples of a surviving Roman lighthouse. The inscription, which records its construction by Nero in AD 64/65, uses the expression ἀντοκράτορ γῆς καὶ θαλάσσης—ruler of the earth and the sea—which as formal *titulature* is very rare. In fact, as such, the phrase only occurs in Lycia, appearing elsewhere at Andriake and once at Teimioussa.⁴⁶⁶

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Figure 45. Lighthouse at Patara
(author's photo).

Figure 46. Hadrianic *Horrea* at
Patara (author's photo).

The area to the west of the harbour seems to have been the commercial zone. The most obvious monument of a commercial nature is the large warehouse⁴⁶⁷ constructed by Hadrian (Figures 46 and 47).⁴⁶⁸ From personal observation, the warehouse seems to be built right up to a harbour wall. The building is a rectangular structure measuring 70 m x 27 m with an exterior façade constructed in high-quality ashlar masonry and an interior constructed in polygonal masonry. The warehouse is divided into eight equally-sized rooms which were covered by barrel vaults at a height of 10 m.⁴⁶⁹ Pilasters on division walls at the mid-point of each room held supporting arches. Centrally placed doors of 2 m width opened into each of

⁴⁶⁵ Heikell 2006, 174.

⁴⁶⁶ Jones 2008, 154.

⁴⁶⁷ The warehouse is a single structure, but explicitly referred to in the plural as *horrea* in the building inscription.

⁴⁶⁸ The *horrea* are tentatively dated to around AD 130 based on comparison with the *horrea* at Andriake which is dated to AD 129-130 for reasons explained below on pages 163-166.

⁴⁶⁹ Rickman 1971, 138.

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the rooms on the harbour-facing side of the building. Windows located above each doorway give the impression that the

Figure 47. Plan of the *horrea* at Patara (Rickman 1971, Figure 30).

horrea had two storeys, but from the interior,

this does not appear to be the case.⁴⁷⁰ There were also smaller doors, measuring 1.13 m, located just inside the front doors which connected the rooms internally.⁴⁷¹ The building inscription is located on the front of the *horrea* just above the doors:

Horrea Imp(eratoris) Caesaris divi Traiani Parthici f(ili) [Nervae nepotis Traiani Hadriani Augusti]⁴⁷²

The other buildings in this area have not been thoroughly investigated but are believed to have been related to the commercial life of the city.

A settlement close to Patara contained two olive oil workshops, one of which seems to have been enclosed and one which was open-air. The enclosed structure had two *trapeta*, a fulcrum and support bases. The open air workshop contained a mill, press bed, collection bowl, a weight stone, a mill stone and *orbes*.⁴⁷³ Remains of another olive press were discovered during road construction in the nearby modern village of Gelemiş.⁴⁷⁴ These are approximately dated to the Late Antique period. A Late Antique kiln complex with numerous small kilns has also been discovered near the inland entrance to the site which seem to have been producing common pottery and lamps.

⁴⁷⁰ *Ibid.*

⁴⁷¹ *Ibid.*

⁴⁷² *CIL* 3.12129 = *TAM* 2, 397 = *AE* 2007, 1491.

⁴⁷³ Işık 2000, 39-40.

⁴⁷⁴ *Ibid.* 2000, 55.

There are no quantified ceramic reports from Patara, but preliminary quantification studies have been carried out on the Roman amphorae from the nearby Letoon sanctuary. From the Imperial period, 2,816 amphorae sherds have been excavated with a total of 440 rims, bases and handles.⁴⁷⁵ There are approximately 30 different amphora types present from Asia Minor, the Levantine coast and the western Mediterranean. Approximately 80% are wine amphorae, the vast majority of which are from the Aegean, namely Rhodes and Chios.⁴⁷⁶ The Agora F65/66, a wine amphora from the region of Ephesos and the Agora G199, a Cilician wine amphora, were also found in considerable quantities. From the western Mediterranean, there were less than twenty wine amphorae from Italy and a small number of fish-sauce amphorae were also recovered from Baetica, the only western amphorae present in any noticeable quantity.⁴⁷⁷ No oil amphorae were found, the significance of which will be considered in the concluding discussion to the chapter.

Antiphellos

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Antiphellos, modern Kaş, at first appears a curious site for a town as the site has no fresh water and essentially no arable land. The landscape, in particular the bay which provides natural shelter is however, an obvious place for a harbour (Figure 48). The water around the Kaş harbour is quite deep: the opening of the modern harbour is at a depth of around 9 m and the harbour gets progressively shallower towards the shore where the depth is about 2 m.⁴⁷⁸ The modern

Figure 48. Google Earth image of the maritime topography of Antiphellos.

⁴⁷⁵ Lemaître 2006, 389-391.

⁴⁷⁶ *Ibid.*

⁴⁷⁷ *Ibid.*, Fig. 10.

⁴⁷⁸ Heikell 2006, 178.

harbour is not, however, located at the most sheltered point in the bay, and it sees considerable swells with the *meltemi*. To the east of the bay, in front of the theatre, there is more shelter, but the water is 12-15 m deep in some areas, 8-10 in others.⁴⁷⁹ There was an ancient harbour wall in this area which was recognized by Bean but has not been recorded on the most recent plan by Zimmermann (Figure 51).⁴⁸⁰ To the southeast there is another bay at a depth of 8-15 m which also provides particularly good shelter.⁴⁸¹ The most substantial remaining architectural structure is a theatre which overlooks the sea. Brief survey work has identified only scattered remains as this is one of the rare Lycian sites which is currently the location of a modern town (Figure 49).⁴⁸²

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Figure 49. Plan of Antiphellos (Zimmermann 2005, Abb. 29).

According to Pliny, the best sea sponges came from Antiphellos.⁴⁸³ Probable tanks for fish-salting have also been observed here, though are not yet published.⁴⁸⁴ A recent ongoing maritime survey between Kaş and Aperlae has highlighted the complexity of the maritime

⁴⁷⁹ *Ibid.*, 179.

⁴⁸⁰ Bean 1978.

⁴⁸¹ Heikell 2006, 179.

⁴⁸² Zimmermann 2005.

⁴⁸³ Pliny, *Natural History* 31.131

⁴⁸⁴ Personal Communication with Martin Zimmermann.

environment. At least five sites, Kovanlı, Körmen-Çılpacık, Kalkan-Heybeli, Gürmenli Islands and İnceburun, and the Çapabanko Inlets, have been identified as probable ancient mooring sites.⁴⁸⁵ These sites have been identified on the basis of anchor and amphora concentrations over a wide chronological period. Also within the survey zone, five possible shipwreck sites have been identified, including two which appear to be undisturbed.⁴⁸⁶

Aperlae

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Figure 50. Plan of Aperlae (Hohlfelder and Vann 1998, 132, Figure 8).

The city of Aperlae was founded during the Hellenistic Period and occupied until the late seventh century (Figure 50).⁴⁸⁷ It lies at the head of the inlet known as Asar Bay. The present anchorage is at 5-10m and the inlet is unsafe during swells from the *meltemi*. A quay existed from the Hellenistic period, but the majority of the coastal installations date to the Roman and late Roman periods. The quay was extended with a jetty approximately 22 m long and 6

⁴⁸⁵ Varinlioğlu 2011, 184.

⁴⁸⁶ *Ibid.*, 185.

⁴⁸⁷ Hohlfelder 2011.

⁴⁸⁸ Aslan 2010, 181; 2011.

m wide.⁴⁸⁸ Much of the city is submerged as a result of earthquakes both in antiquity (AD 141 and 240) and more recent periods.⁴⁸⁹

A Diocletianic porphyry milestone indicates the presence of a road.⁴⁹⁰ The only Roman road discovered thus far in this area runs between the east gate of Aperlae and Kekova. From the time of Diocletian, the city seems to have become particularly prosperous during the Late Antique period. Indeed, the town, which is estimated to have had a maximum population of 1000 people, has four basilica churches, most likely constructed from the fourth to sixth centuries. During Late Antiquity the city walls were extended from their original Hellenistic enclosure which included only the upper portion of the city down to the shore. Numerous other public buildings and domestic structures are clearly dated to this period.

The prosperity of the city was certainly due to its involvement in the purple dyeing industry. Survey work at Aperlae by Hohlfelder and Vann revealed the remains of extensive purple dye production. The primary evidence for this is three *murex* debris scatters which cover a total area of 1644 m².⁴⁹¹ The mortar of Roman and Late Antique structures also contains shell fragments. In addition, the survey documented three basins with hydraulic mortar which were probably connected with the purple dyeing. While these structures do not appear to be for the actual processing of the purple dye, the surveyors suggest that they were perhaps *vivaria*, tanks for the storage of live snails.⁴⁹²

The survey team suggest that the city did not have sufficient access to fresh water to have actually dyed textiles on site, confining the industry to the production of the dye itself, which then would have been shipped to other locations where the dyeing would have taken place.⁴⁹³ This is problematic however as experimental archaeology has shown that the dye must be used almost immediately while it remains in liquid form.⁴⁹⁴ It was possible to

⁴⁸⁹ *Ibid.*, 182.

⁴⁹⁰ Leadbetter 2003.

⁴⁹¹ Hohlfelder and Vann 1998, 30.

⁴⁹² *Ibid.*, 34.

⁴⁹³ Hohlfelder and Vann 1998, 30.

⁴⁹⁴ Macheboeuf 2005.

preserve the glands of the *murex* in either salt or honey⁴⁹⁵ so that they could be shipped, but the extraction of the gland in this manner is very characteristic as it leaves behind a relatively intact shell with a carefully placed hole for the extraction of the gland.⁴⁹⁶ The other way in which to obtain the gland involved the complete crushing of the shell. This method was faster but meant that the gland was not preserved and had to be used immediately. As the excavations at Aperlae uncovered fully crushed shells this implies that cloth or yarn must have been dyed on site.

The importance of animal husbandry in relation to the economy of this coastal region is undeniable but unfortunately undocumented. The Lycian landscape is ideally suited for grazing animals such as sheep and goats; sheep and goats can be grazed in olive orchards, resulting not only in diversified output but also advantages for the olive crop in terms of soil vitality as a result of reduced underbrush and more fertile soil.⁴⁹⁷

Animal husbandry remains today one of the dominant uses of the land and records from the Food and Agriculture Organization of the United Nations (FAO) clearly show the dominance of sheep and goats within the agricultural sector of the modern Turkish economy.⁴⁹⁸ Sheep and goats are used for a variety of purposes today, as in antiquity, including meat, milk, skins and hair. Textile production remains important in modern Turkey,⁴⁹⁹ with much wool now being used for Turkish carpets instead of purple-dyed cloth.

While there are as of yet no faunal reports for Lycian sites, three sites in Anatolia have produced detailed faunal reports for the Roman period: Troy,⁵⁰⁰ Pergamon⁵⁰¹ and Sagalassos.⁵⁰² Of these, Sagalassos is the closest geographically. At Sagalassos, ovicaprine

⁴⁹⁵ Vitruvius, *On Architecture* 7.13.3.

⁴⁹⁶ Tébar Megias and Wilson 2008.

⁴⁹⁷ Wilson and Hardesty 2006, 101.

⁴⁹⁸ According to the FAO, sheep and goat were the only livestock in which Turkey maintained a positive net trade (exports outweigh imports) in live animals until 2002. The production of sheep and goat in terms of both live animals and food products far outweighs that of cattle, buffalo, pig and poultry in all records (FAO 2005).

⁴⁹⁹ According to statistics from the World Trade Organization, Turkey ranked 7th in textile producing countries in the world in 2009 (International Trade Statistics 2010, Table II.65, http://www.wto.org/english/res_e/statistics_e/its2010_e/its10_merch_trade_product_e.htm, last accessed October 17, 2011).

⁵⁰⁰ Uerpmann *et al.* 1992.

⁵⁰¹ Boessneck and Von den Driesch 1985.

⁵⁰² De Cupere 2001.

(domestic sheep and goat) are the most common with 25,535 faunal remains studied as of publication in 2001.⁵⁰³ The second most common remains were those of cattle at 22,380,⁵⁰⁴ followed by pig at 14,060.⁵⁰⁵ What is particularly interesting is the slaughter age of the sheep and goats; the remains indicate that over 50% were slaughtered after the age of four,⁵⁰⁶ which indicates that the sheep and goat were not kept primarily for meat, but rather for other uses such as milk and wool.⁵⁰⁷

Teimioussa

Teimioussa (modern Uçagiz) was a small site in antiquity and is not attested in the ancient sources (Figure 51). It lies in an area of the coast which Strabo describes as having many islets and harbours (*νησία πολλὰ καὶ λιμένες*).⁵⁰⁸ The cities of Teimioussa and nearby Simena

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Figure 51. Plan of Teimioussa (Zimmermann 2003).

⁵⁰³ *Ibid.*, 83.

⁵⁰⁴ *Ibid.*, 91.

⁵⁰⁵ *Ibid.*, 74.

⁵⁰⁶ *Ibid.*, 87.

⁵⁰⁷ *Ibid.*, 144. Animals kept primarily for meat would have been slaughtered at a younger age.

⁵⁰⁸ *Geography* 14.3.7.

are protected by the Kekova Adasi, a four-mile-long island. The Uçagiz Liman bay provides consistently calm waters, though there are several underwater rocks which must be avoided. The nearby anchorage at Kale Köy is generally only suitable in the morning.⁵⁰⁹

Although the site has never been excavated, it has been identified on the basis of its tombs and buildings amongst which the modern village of Uçagiz is located and is known from an inscription.⁵¹⁰ The site has been surveyed in the past decade, yielding good evidence for production for export in the form of salted fish production sites (Figure 52).⁵¹¹ At the time of their publication in 2003, these were the first fish-salting workshops identified in Asia Minor. Constructed in the third century AD, there are four separate fish-salting workshops in Teimioussa—labeled in Figure 55 as A, B, C and D. Workshop A consisted of 22 vats of an average size of 3.33 m³ which is about 73 m³ total vat capacity in the workshop.⁵¹² Unfortunately the excavation reports only give the dimensions of workshop A, but by comparing the planned versions, it would seem that workshop D had about 20 vats and workshop C had 8 vats. B has rather irregular vats, but at the very least it seems safe to say that the output of workshop A could be doubled. Zimmermann estimates that the annual output of all workshops would have been around 500 tons of salted fish.⁵¹³

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Figure 52. Fish-Salting Vats at Teimioussa, cropped to scale (based on Zimmermann 2003).

⁵⁰⁹ Heikell 2006.

⁵¹⁰ The Princeton Encyclopedia of Classical Sites.

⁵¹¹ Zimmermann 2003.

⁵¹² *Ibid.*, 290.

⁵¹³ *Ibid.*, 292.

Survey work led by Kolb in the last two decades around the area of Teimioussa and Kyaneai⁵¹⁴ (Figure 53) has been particularly informative regarding oil and wine production. In an area of approximately 106 km², survey work has identified 700 agricultural terraces (400 of which consist of three or more walls) and 400 rock-cut press installations including 80 weights and 80 grinding stones.⁵¹⁵ Given the nature of the survey these are widely dated as beginning in the late Hellenistic period and continuing through Late Antiquity. Survey to the west of Teimioussa also identified a further eight pressing installations.⁵¹⁶ While we cannot say how many were functioning at any one time, they are fairly durable features. It seems unlikely that one would have invested the time and effort necessary to construct a new pressing installation if there were nearby ones no longer in use. This suggests very intensive

Figure has been removed due to copyright restrictions use of the land, perhaps beyond the needs of the local population.

As yet, no amphora kilns have been identified which is striking as amphorae would presumably have been needed to export the oil, wine and fish products. One reason for this could be that the coastline has not been surveyed in detail and amphora kilns are commonly

Figure 53. Plan of Survey Area (Kolb 2008).

located near the coast. The survey by Kolb, which was focused primarily inland, maps several kilns, but there is not yet a final publication and thus far the report simply says that most of them are lime kilns.

⁵¹⁴ Kolb 1995; 2003; 2006; 2008.

⁵¹⁵ Kolb 2008, 197.

⁵¹⁶ Konecny 1998; 1999.

Phoinix

Nothing is known archaeologically regarding the site of Phoinix, the port of Limyra. Strabo mentions the site of Limyra and the outlet of the Limyrus river, but not the harbour.⁵¹⁷ An inscription from Myra dating to the second or third century AD concerns a regular ferry service between Myra and the neighboring city of Limyra,⁵¹⁸ the distance between which is between 25 and 30 km, depending on how closely a vessel hugged the coastline. According to the inscription, carved on a Doric column which still stands in Myra, an edict was passed by the city and council of Myra because the city was losing revenues on account of people sailing between Myra and Limyra without using and paying for the official ferry transportation which was contracted out by the city of Myra.

It is interesting that this inscription refers to the harbours by the name of their cities, Myra and Limyra as opposed to the names of the harbour settlements, Andriake and Phoinix. As will be seen below, Andriake became a relatively large settlement in its own right, but as there are no remains at Phoinix, it is impossible to comment on the size of the harbour settlement.

Survey work directed by Thomas Marksteiner in the Bonda-Tepesi region in the hinterland of Phoinix has produced significant evidence for olive oil production. In an area of approximately 20 km², 36 pressing installations have been discovered, some of which had multiple presses.⁵¹⁹ They have been identified as olive presses due to the presence of *orbes* at some sites, as well as the fact that the limestone used for the construction of the presses is very porous and would not have been well-suited to pressing grapes.⁵²⁰ The small settlement of Karakuyu,⁵²¹ located approximately 3.5 km from Phoinix, and its nearby surroundings contain 14 oil presses, with a combined production capacity⁵²² of a minimum of 14,000 litres per season. Approximately 2 km to the north of Karakuyu, at a distance of roughly 4 km

⁵¹⁷ *Geography* 14.3.7.

⁵¹⁸ *OGIS* 572.

⁵¹⁹ Konecny 1998; 1999.

⁵²⁰ Konecny 1998, 134.

⁵²¹ Marksteiner 2004, 276.

⁵²² The production capacity of the presses has been estimated between 1,000-3,000 litres per season (Konecny 1998, 143).

from Phoinix another small settlement, Dinek Tepesi, contains 10 pressing installations and 12 orbes. The estimated production capacity of this site is between 9,000 and 12,000 litres per year. If we take the minimum capacity of the presses, the 20 km² zone would have had an aggregate production of 36,000 litres of oil per season.

Andriake

Andriake (Figure 54) was founded during the third century BC and appears in the literary record for the first time in relation to its capture by Antiochus III in 197 BC. It was the port of Myra and is often simply referred to as part of Myra. The city of Myra itself is not well known archaeologically; it is buried under some 4 to 6 m of alluvial silt though recent study

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Figure 54. Plan of Andriake (Forstenpointner *et al.* 2007, Figure 1).

suggest that the site was approximately 4 km across.⁵²³ Visible remains include Roman baths, numerous Lycian rock-cut tombs and a large theatre, estimated to seat some 11,500 people.⁵²⁴

⁵²³ Çevik 2010, 55.

⁵²⁴ *Ibid.*, 55.

In 2005, a Neronian inscription relating to the *lex portorii* of Lycia was discovered at Andriake which sheds significant light on the fiscal organization of the province, though to date, only a summary of the inscription has been published.⁵²⁵ The inscription confirms what has been suspected on the basis of a customs inscription from Myra—namely, that the province of Lycia was an independent customs zone. Each year, Lycia owed the sum of 100,000 *denarii* to the Roman state to be collected from the cities within the province. Myra, for example, contributed 7,000 *denarii* per year. As long as this sum was paid, Lycia was free to administrate the collection of customs duties in its own manner. With the correct organization and vital trading communities, this *lex* allowed the Lycians to receive greater profit from customs dues than was typically the case under the Empire. The *lex* also includes a list of specific commodities which were important to the region in terms of tax revenue.



Figure 55. Hadrianic *Horrea* at Andriake (author's photo).

These include slaves, murex, dry pitch, olive oil, saffron, figs and fish.⁵²⁶ More will be discussed on these products in the concluding section on Lycia.

At Andriake, there was significant building during the Roman period, with the most obvious construction occurring during the reign of Hadrian.

The most striking and well-known structure at Andriake is the Hadrianic *horrea* (Figure 55-56). Built in AD 129-130⁵²⁷ by the emperor, the *horrea* still stands to roof level today. The *horrea* are constructed on a predominantly rectangular plan, though with some variation, and cover an area of 2,307 m².⁵²⁸ As at Patara, the exterior façade was constructed in high quality ashlar

⁵²⁵ Takmer 2007.

⁵²⁶ *Ibid.*, inscription lines 4-22.

⁵²⁷ Wörrle dates the *horrea* to AD 129-130 on the basis of the Hadrianic titulatur in the building inscription and Hadrian's AD 129 visit to Lycia (in Borchardt 1975, 67-68).

⁵²⁸ Çevik 2010, 57.

masonry, while the interior is constructed in polygonal masonry. It measures 64.24 m across and is divided into eight rooms of equal width. The internal room depths vary, however, with the six easternmost rooms having a depth of 32 m and the two westernmost rooms having a depth of only 27 m.⁵²⁹ Doors opening into each of the rooms were centrally placed in the middle six rooms, but the doors of the two exterior rooms were situated towards the interior, rather than in the centre, to accommodate two inward facing rooms with arched entrances in the façade. The function of these two rooms is not entirely clear, though it has been suggested that they were rooms for custodians.⁵³⁰ Above each door were two small windows divided by ornamental pilasters, but again, the building was only a single storey. As at Patara, the building inscription was located above the doors and extended across the façade of the building.

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Figure 56. Plan of the *horrea* at Andriake (Rickman 1971, Figure 31).

Horrea Imp(eratoris) Caesaris divi Traiani Parthici f(ili) divi Nervae
nepotis Traiani [H]adriani Augusti co(n)s(ulis) III.⁵³¹

It is worth noting that the building inscriptions on both the *horrea* at Andriake and the *horrea* at Patara are in Latin, an unusual occurrence in an area dominated by Greek inscriptions. At Andriake, there are also two other later Greek inscriptions on the *horrea*, as well as two figural reliefs.⁵³² At the top of the fourth doorway from the left were busts of Hadrian and Sabina. To the left of the fourth doorway is an inscription from AD 388-392 which records weight standards.⁵³³ Towards the right side of the building is a relief of Isis

⁵²⁹ Çevik 2010, 57; Wörrle in Borchhardt 1975, 66; Rickman 1971, 139.

⁵³⁰ *Ibid.*, 139.

⁵³¹ *CIL* 3.232 = *CIL* 3.6738 = *AE* 2007, 1491.

⁵³² Wörrle in Borchhardt 1975, 68.

⁵³³ Grégoire 1922, no. 290.

⁵³⁴ *Ibid.*, 69.

and Serapis.⁵³⁴ Under the relief is its dedicatory inscription by Herakleon, the overseer of the *horrea*.⁵³⁵

Other Roman period construction included harbour improvements, numerous structures to the south of the harbour, a commercial agora, and possibly an aqueduct. Under the agora is a large cistern consisting of two rows of eight arches, measuring 23.62 x 12.09 m in area and over 7 m deep.⁵³⁶



Figure 57. Harbour Buildings (author's photo).

The harbour itself is oriented towards the northeast in the natural river basin at the mouth of the Andriakos river. Measurements taken from Google Earth indicate that the basin itself was approximately 23 hectares. Nothing is known as of yet about the docking facilities and quays, though the level of siltation could have created good conditions for preservation.

Alongside the southern edge of the harbour are rows of buildings covering an area of 50 x 30 m, including four independent shops (Figure 57) and three storerooms.⁵³⁷ The shops were two-storied and lead weights and scales were

recovered from some of them.⁵³⁸ Three connected rooms extended from the shops and have

⁵³⁵ CIG 3.4331.

⁵³⁶ Çevik 2010, 58.

⁵³⁷ *Ibid.*, 55; Çevik and Bulut 2011.

⁵³⁸ Çevik and Bulut 2011.

been interpreted as storerooms. The easternmost storeroom was located above a vaulted cistern which collected rainwater from the roof through a series of pipes.⁵³⁹

Also discovered in this area were *podia* and a collection of inscriptions with the names of Agrippa, Germanicus and Gaius, and it is argued that the area that they were found in was a harbour square adorned with statuary.⁵⁴⁰ Stairs at various intervals lead from the harbour, up to these buildings and then up to the *horrea*.

The site did not reach its peak until the Late Antique period, a period which saw the construction of many of the extant buildings including five churches. Excavations in 2009 produced 543 coins, the majority of which dated to the fourth and fifth centuries AD. Constantius II and Arcadius are particularly well represented. A 10 square-meter ceramic survey produced 1,481 sherds, 97.5% of which were amphorae dated between the fifth and eighth centuries AD.⁵⁴¹



Figure 58. *Murex* deposits at Andriake. Left: *Murex* debris *in situ*, Right: *Murex* debris removed by excavation (Photos: T. Franconi).

⁵³⁹ Çevik 2010, 55.

⁵⁴⁰ *Ibid.*, 58.

⁵⁴¹ Marksteiner 2006, 73-74.

One of the most striking features of the site today is that it is blanketed in crushed *murex* shells, the remains of what must have been an extensive purple dyeing industry (Figure 58). The surface scatter is concentrated around three sides of the agora and comprises an estimated area of 300 m³.⁵⁴² This particular deposit is dated to the sixth century based on the pottery levels below the scatter. The extent of the scatter would seem to suggest that by this time the agora was partially out of use, though the other facilities such as the *horrea* must have still been functioning. The reasoning for the placement would presumably have been the large cistern directly underneath the agora due to the large amounts of water required for dyeing. Excavations in 2011 revealed substantial *murex* debris underneath the sixth-century pottery levels. While these are clearly pre-sixth century, further dating information is currently unavailable as the excavations have not yet been published. Papyrological evidence indicates that Lycian purple was a source of income at least as early as the Ptolemaic period.⁵⁴³

While the harbour structures themselves have not been investigated, the clear dependence of the city upon its harbour is illustrated by the *horrea*, harbour-side buildings and the purple dyeing industry.

Gagai

Very little remains today of Gagai and were it not for literary and papyrological sources, one might conclude that it was an insignificant settlement. In 2007 the site was ‘rediscovered’ by a survey team. Four areas were identified: the upper acropolis, lower acropolis, a flat urban zone at the foot of the slope and a necropolis (Figure 59).⁵⁴⁴ Two towers in the upper acropolis built during the Hellenistic Period monitored and controlled the maritime traffic.⁵⁴⁵ Also on the upper acropolis are scattered houses and numerous cisterns, along with a fifth-century AD basilica church and fortification walls. The lower acropolis has a number of what are referred to as ‘hybrid buildings’, partially rock-cut structures of unknown use.

⁵⁴² Forstenpointner *et al.* 2007.

⁵⁴³ Bagnall 1976, 108.

⁵⁴⁴ Çevik 2008, 67.

⁵⁴⁵ *Ibid.*, 67-68.

There are also interesting deep caves which from the remains of ceramics seem to have functioned as storage zones, particularly cold storage as the caves are cool.⁵⁴⁶ The flat zone at the base of the slope was the main urban area of the city; amongst modern orchards and greenhouses, remains of a Roman aqueduct, small theatre, bath and nymphaeum, basilica and agora have been identified.⁵⁴⁷ An inscription reveals that the bath was built by Opramoas for 18,000 *denarii* during the second century AD.⁵⁴⁸ The aqueduct is associated with the bath and the nymphaeum, and it is suggested that they were built at the same time.

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Figure 59. Plan of Gagai (Çevik 2008, Figure 4).

Gagai is mentioned by Pliny for its jet, probably bitumen.⁵⁴⁹ The city is also mentioned in the papyrus *P. Bingen* 77, as the origin of a small ship carrying wine and figs (see concluding discussion for more detail). The customs inscription from Andriake mentions figs, and while

⁵⁴⁶ *Ibid.*, 69.

⁵⁴⁷ *Ibid.*, 70.

⁵⁴⁸ *Ibid.*, 70.

⁵⁴⁹ *Natural History* 36.34.

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Figure 60. Plan of Olympos (Parman *et al.* 2006).

there is very little in the process of growing and trading figs that can be attested archaeologically, this is supporting evidence for their importance to Lycia as a trade item.

Olympos

Olympos was situated in the Akçay river valley where the river empties into the Mediterranean. The city is bounded on two sides by the slopes of the Tauros mountains. Olympos was a Lycian city, probably founded around the fourth century BC and was inhabited until the late eighth century with scattered re-occupation in the fifteenth century.



Figure 61. Harbour wall at Olympos (author's photo).

The Akçay divided the site in two; a bridge connected the northern and southern parts of the city. Remains of a pier which re-uses Roman material survives today (Figure 60).⁵⁵⁰

The site is heavily overgrown with brush and trees.

Consequently, relatively little is known about the site beyond the major standing monuments. Mapping projects are ongoing, but excavations are lacking. As with many of the Lycian cities, the Roman remains are largely second-century AD, following rebuilding in the aftermath of the AD 141 earthquake. Remains include four necropoleis, a large, perhaps Antonine, temple, a harbour basilica, a theatre, a gymnasium/palaestra, Vespasianic bath complex, small baths, three houses and riverside harbour buildings.

Very little remains of any harbour structures such as quays. The harbour is a natural bay still used by relatively large ships carrying tourists to the beach and ruins. Near the mouth of the river, a poorly preserved wall serves today to keep beach-goers' belongings out of the sand (Figure

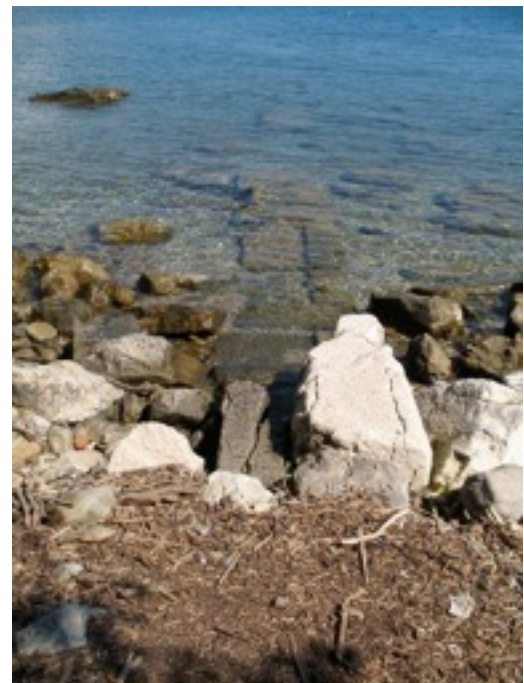


Figure 62. Submerged structure at Olympos (author's photo).

⁵⁵⁰ Olcay Uçkan 2009, 59.

61). In the southern part of the bay there are submerged structures, possibly the remains of a quay, but it is difficult to date; the presence of a Genoese fortress on the shore means that it could be of late date (Figure 62).

The harbour buildings line the southern side of the river beginning at the mouth of the harbour and stretching up to the theatre. The foundations are Hellenistic, but the standing remains are Roman and later.⁵⁵¹ It is proposed that the ships actually unloaded at these buildings, but the bridge near the mouth of the river would presumably have prevented any sailed ship of substantial size from crossing underneath. There are stairs down to what must have been the ancient water level—it is possible that perhaps the ships docked in the bay, and the cargoes were transhipped into river boats to go up to the buildings.



Figure 63. Tomb of Captain Eudemos (author's photo).

The harbour at Olympos was relatively small compared to others along this coast, and due to the poor state of excavation, very little is known about the types of economic activities that took place in the town. Given the presence of pine and cedar forests, it seems likely that Olympos exported timber; indeed, the modern name of Mount Olympos means wooded or

⁵⁵¹ Parman *et al.* 2006, 98-99.

Figure has been removed due to copyright restrictions

Figure 64. Plan of Phaselis (Blackman in Schaefer *et al.* 1981).

timber mountain. The site is mentioned by Pliny in connection with saffron where he says that the of Cilicia is of the highest quality, followed by that of Mount Olympus in Lycia.⁵⁵² While this trade would not be identifiable archaeologically, saffron would have been a high-value commodity.⁵⁵³ Saffron is also specifically mentioned in the Neronian customs inscription from Andriake.⁵⁵⁴ A sarcophagus (Figure 63) of a *ναύκληρος* named Eudemos stood at the entrance of the harbour at Olympus as a testament to the importance of maritime traffic to the city.

⁵⁵² *Natural History* 21.17.

⁵⁵³ The Price Edict of AD 301 gives the maximum price for saffron from Arabia as 2,000 *denarii* per Roman pound, and Arabia Felix (?) at 1,000 *denarii* per Roman pound (32. 46-37).

⁵⁵⁴ Takmer 2007.

Phaselis

Founded from Rhodes in 690 BC and involved in trade from its inception, this site had three harbours: the North Harbour, the Central Harbor (also known as the Stadthafen) and the South Harbour. The harbour remains of Phaselis are the most thoroughly documented of this coastline thanks to the extensive work of David Blackman (Figure 64).⁵⁵⁵

Phaselis is situated on a peninsula which extends approximately 600 m into the sea. The South Harbour is located in the eastern part of a large bay on the southwest side of the peninsula, and it contained an extensive breakwater and ashlar masonry pier, both of which are now submerged.⁵⁵⁶

The Central Harbour, or Stadthafen, is the smallest of the harbours and is located in a small bay north of the acropolis. Naturally protected on three sides, the harbour opens to the east, and its entrance is restricted by two moles. The city walls were situated atop the moles, and at the end of each mole, the wall ended in a small bastion, allowing the harbour to be enclosed if desired.⁵⁵⁷ The harbour was only 2.9 m deep in 1973, and today it is not even a meter deep in places (personal observation), but it is estimated to have been about 4 m deep in antiquity.⁵⁵⁸ The quay was located on the southwestern side of the harbour, close to the main street, and had unique horizontal bollards at intervals of between 3 and 6 m.⁵⁵⁹

The North Harbour is situated to the northeast of the Central Harbour. A natural rock barrier followed by a reef 300 m offshore existed to the northeast of the harbour, and between these a breakwater, 235 m long by 4 m wide, was constructed. This harbour was not inside the city walls and was the least built up of the three harbours.

In contrast to the detailed study of the harbours, the site itself has not been thoroughly excavated apart from a small theatre, bath complex, harbour street and various agoras. There

⁵⁵⁵ Blackman 1973; Blackman in Schaefer *et al.* 1981.

⁵⁵⁶ *Ibid.*, 358.

⁵⁵⁷ *Ibid.*, 360.

⁵⁵⁸ *Ibid.*

⁵⁵⁹ *Ibid.*



Figure 65. The outcrop between the north bay and the Stadthafen (author's photo).

are no known houses, workshops, etc. Significant building projects occurred in the second century AD, including an aqueduct and a new main street. The epigraphic evidence related to Trajan, Hadrian and Antoninus Pius is particularly

prominent.⁵⁶⁰ A visit to the city by Hadrian seems to have spurred public building. The prosperity of the city was certainly linked to its harbours but due to the lack of excavation, very little is known about its economy. Pliny notes that Phaselis was known for its lilies and rose oil.⁵⁶¹ The hinterland has very little arable land, but is rich in timber, and while not specifically attested by ancient sources, it seems highly likely that this would have been exported in antiquity.

When I visited the site in September 2010, I noticed on the outcrop between the north bay and the Stadthafen (Figure 65) a significant scatter of crushed *murex* shells (Figure 66). This scatter is certainly not as extensive nor as dense as the one at Andriake, though here it seems to be only visible due to weathering. There is no publication mentioning the scatter. The scatter extends over the



Figure 66. *Murex* debris (author's photo).

⁵⁶⁰ Schaefer *et al.* 1981.

⁵⁶¹ Pliny, *Natural History*, 13.2; 21.11.



Figure 67. Sea walls in the Stadthafen (author's photo).

outcrop in an irregular fashion and measures 17 x 22 m at its smallest extent. To the south of the outcrop, inside the Stadthafen, the remains of sea walls can be seen which form a structure resembling the *vivariae* at Aperlae (Figure 67).

Given the presence of purple-dye manufacture at Aperlae and Andriake, it is actually not at all surprising to find evidence for the industry at Phaselis. The date and the extent of the production cannot be known without excavation, but it is worth further study.

Discussion: Lycia

Before turning to Pamphylia, it is worth considering the overall implications of some of the evidence discussed above.

Olive Oil

The evidence for olive oil production in Lycia is extensive; as the evidence comes from the only two regions that have been thoroughly surveyed, it is to be expected that these are only a portion of what existed and many still remain to be found. If we consider that half of the 400 pressing installations documented in Kolb's central Lycian survey region in the vicinity of Teimioussa and Kyaneai were for olive oil production, along with the 44 pressing installations from the Bonda-Tepesi and Istlada surveys, and assign a minimum production capacity to each pressing installation of 1,000 litres per year, we arrive at a minimum output of 244,000 litres per year, assuming that each press was operating simultaneously. If we consider per capita consumption of olive oil to be 20 litres per year,⁵⁶² these two relatively small regions (approximately 126 km²) were potentially producing olive oil for some 12,200

⁵⁶² Mattingly 1988a, 34; Hitchner 1993, 500.

people. It is impossible to know how many presses were operating simultaneously, but as they are rock-cut and would have required considerable time investment to construct, it seems improbable that new ones would have been built if abandoned ones were available. Even if we consider that only half the total number were in use simultaneously, the output is still considerable. While the presses are typically smaller than those found in North Africa,⁵⁶³ the site density in Lycia is far higher. In the surveyed area around Kyaneai and Teimioussa, the average density of presses is four per squared kilometer compared with only one press every two kilometers squared in Tripolitania.⁵⁶⁴

It is certain that oil was being produced on a scale intended for supra-local export, even using minimal output calculations. Whether or not the oil was being exported beyond Lycia is a more difficult question. Kolb estimates that the population of his survey region was around 6,200 inhabitants,⁵⁶⁵ and Marksteiner estimates that the population of the Bonda-Tepesi region was around 800-1000 inhabitants.⁵⁶⁶ What these figures do not include, however, is the population of the coastal cities, many of which would have sustained fairly large populations. It is, of course, highly improbable that these were the only regions under intensive olive cultivation. If the aerial photography from the region around Sidyma is evidence of oil production, as seems probable, the total output of Lycia could increase dramatically.

The fact that no amphora production sites have been identified in Lycia is a considerable hindrance in interpreting export-oriented production. The mode of olive oil production in Lycia is probably similar to that of North Africa where the cultivation of olives and the production of oil occurred in the hinterland, but much of the bottling of the oil into amphora took place at coastal amphora production sites. While there are occasional examples of amphora kilns near the oil production sites in North Africa, many were located on the coast.⁵⁶⁷ In these instances, the oil was shipped to the coast in skins where it was bottled in

⁵⁶³ Mattingly 1988a.

⁵⁶⁴ Mattingly 1988a; 1988b.

⁵⁶⁵ Kolb and Thomsen 2004, 41.

⁵⁶⁶ Marksteiner 2004, 285.

⁵⁶⁷ Bonifay 2004.

amphorae that had been produced in and around the coastal cities.⁵⁶⁸ We should expect the same basic pattern in Lycia; amphorae are designed for maritime transport and would not have been ideal for moving oil across the mountainous hinterland of Lycia. Systematic survey through major river valleys and along the coast is therefore essential for the identification of kilns. It is highly probable that olive oil was produced for export across Lycia; the combined aggregate production would have created an economy of scale which would have justified the investment in purpose-built infrastructure. Tracing the export of Lycian oil will, however, remain impossible until the amphorae in which it was traded are identified.

The Horrea

The *horrea* at Andriake and Patara are the subject of some debate as they are significant for understanding the economy of Lycia. As was clear from the earlier descriptions, the *horrea* were similarly conceived: they were located in the two largest ports of Lycia, both bore Latin inscriptions designating them as *horrea* and recording their construction by Hadrian, and they have similar ground plans and construction techniques.

Historically, these *horrea* have been regarded as granaries; certainly as early as Sir Francis Beaufort's *Karamania*, the term granary has been used without question⁵⁶⁹ and remains the principal way in which the buildings are described.⁵⁷⁰ While the term *horreum* did originally refer to a building to store grain, by the Imperial period, *horrea* had come to describe a storehouse for any number of products,⁵⁷¹ even works of art.⁵⁷² Indeed, excavations at the *Horrea Galbana* in Rome revealed rooms with amphorae, lentils, ivory and crystalline sand.⁵⁷³ Despite this, the idea that the *horrea* at Patara and Andriake were specifically granaries has been perpetuated and even taken a step further by linking them with the

⁵⁶⁸ On the production of olive oil in North Africa see particularly Mattingly 1988a; 1988b; 1988c; 1994; Mattingly and Hitchner 1993; Hitchner 1998; 1989; 1990.

⁵⁶⁹ Beaufort 1817, 27.

⁵⁷⁰ For example, Çevik 2010, 57.

⁵⁷¹ See Smith *et al.* 1890, 975-976 for a discussion of the term. *Horrea* are also referred to in the Murecine archives as storing multiple goods.

⁵⁷² Pliny, *Letters* 8.18.

⁵⁷³ NSc 1885, 224.

annona, the suggestion being that facilities were in place for the storage of *annona* grain if the ships en route from Alexandria to Rome needed to stop along the Lycian coast.⁵⁷⁴

The arguments for their relation to the *annona* predominantly stem from the interpretation of *horrea* as granaries and the fact that their inscriptions state in Latin that they were built by Hadrian, the assumption being that if the emperor were to build such pragmatic structures as *horrea* that they must have been intended for the benefit of Rome. There are also other factors; the late Roman weight standard inscription on the *horrea* at Andriake is often connected with *annona* measures and the relief of Isis and Serapis provides an iconographic connection with Egypt.⁵⁷⁵

There are, however, objections to each of these arguments, and Cavalier has recently insisted that there is no firm evidence to tie the *horrea* exclusively to grain.⁵⁷⁶ I would agree. The fourth-century inscription is simply concerned with market weights and does not need to be related to the *annona*. Iconographic depictions of Isis and Serapis were rather common across the Roman world by this period, though the spread of the religion has been linked with traders.⁵⁷⁷ One argument made against the *horrea* holding grain is that such structures were typically designed for added protection against moisture and insects. This was most obviously accomplished by raising the floor of the structure, a technique which is not seen at either Patara or Andriake. It is otherwise suggested that floors and walls be lined with *opus signinum* or a layer of lime or marble chips.⁵⁷⁸ It is not possible to see the floors of the *horreum* at Patara, but the floors are visible at Andriake and are simply covered in tiles and occasionally mortar composed of murex shells.⁵⁷⁹

Patara and Andriake were not only strategically located along a busy and important sailing route along the Lycian coast but were also situated at the mouths of densely settled river valleys; the *horrea* served, therefore, as regional import and export centres for Lycia and

⁵⁷⁴ Rickman 1971, 140.

⁵⁷⁵ *Ibid.*, 69.

⁵⁷⁶ Cavalier 2007.

⁵⁷⁷ See Chapter III.

⁵⁷⁸ *Ibid.*, 297.

⁵⁷⁹ Cavalier 2007, 60.

could have stored any number of products for regional import and extra-regional export. The *horrea* could have also provided space to house offloaded cargoes during the winter period if sailing became too dangerous. While this was surely not an ideal situation, it does seem to have occurred.

A strong parallel for this in both form, and, I would argue, function, can be seen in the Roman/late Roman *horrea* of Marsa on the eastern side of the island of Malta (Figure 68). Several warehouses were found near the port in 1768.⁵⁸⁰ Their plans bear a striking resemblance to those at Andriake and Patara, whose plan is otherwise only vaguely matched by a storehouse in Djemila, Algeria.⁵⁸¹ The *horrea* of Marsa have not been examined since their initial discovery in 1768, but the reports and drawings indicate that one of the excavated chambers contained 260 amphorae. These amphorae have not been identified, though they look from the drawings to be LR1 and *spatheia*.⁵⁸²

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The question of whether these *horrea* were designed specifically for grain, or were all-purpose warehouses, is not entirely answerable, but there is no apparent

Figure 68. The *horrea* at Marsa (Barbaro 1794, Tavola 1).

reason to suggest that their usage was restricted to grain and, without such evidence, the idea that they were all-purpose warehouses seems much more probable. What does seem clear is that there was an imperial connection, and this is surely significant. The fact that there are two such similar structures built at the same time at the two leading ports in Lycia cannot be without importance.

⁵⁸⁰ Barbaro 1794, Tavola 1.

⁵⁸¹ Rickman 1971, 140-141.

⁵⁸² Barbaro 1794, Tavola 3-5.

I would argue that the significance of the *horrea* can be connected with the fact that Lycia was an independent customs zone. As mentioned earlier, the combination of skillful application and administration of the *portorium* coupled with high levels of trade would have created additional income for Lycia. Updated harbour facilities, such as adequate storage space in the form of *horrea* would have encouraged merchants to trade in these cities. Therefore, by giving *horrea* to Patara and Andriake, Hadrian was facilitating a major source of income for these cities and indeed for Lycia as a whole.

Lex Portorii Provinciae Lyciae

While the full significance of the *lex portorii* cannot be fully understood until the full publication of the inscription, the preliminary information on the commodities singled out in the inscription is particularly informative for the purposes of this chapter. These commodities—slaves, *murex*, dry pitch, saffron, olive oil, figs and fish—were surely those which were significant in terms of customs revenues for the overall province and were probably commonly traded products. Where possible, these products have been talked about in the context of the ports in which they produced or traded (e.g., *murex*, saffron, olive oil). Presumably fish was important in every port. Ephesos, for example, had a fishing toll.⁵⁸³ It is unknown whether any of the ports in Lycia were particularly known for slaving, though it is to be expected that this was an important activity in the larger ports. The slave trade will be discussed in somewhat more detail in the sections on Pamphylia and Rough Cilicia, but pitch and *murex* warrant further discussion here.

The *lex* specifies a tax on the *murex* itself as opposed to the purple dye produced from the molluscs. The published part of the line reads, κ[ο]νχυλίων τῶν ἰσαγο[μέ]νη, which refers to the imports of the *murex*-fisher. A parallel to this can be seen in the customs law of Asia⁵⁸⁴ which specifies in line 20, §7, ὁ ἰχθύι κογχυλίῳ θαλασσίῳ νεαρῷ χρώμενος τὸ εἰκοστὸν μέρος τέλους διδότη—‘The worker of fresh purple fish from the sea is to pay the twentieth part as *telos*’.⁵⁸⁵ In some instances, this allows a double tax on this luxury item as

⁵⁸³ *IvE* Ia.20.

⁵⁸⁴ Cottier *et al.* 2008.

⁵⁸⁵ Translation from Cottier *et al.* 2008, 35.

this particular clause taxes the raw product which will subsequently be turned into purple dye and then dyed cloth, which will be taxed again on export. Given the usage of the Greek for murex-fisher in the Andriake inscription, it seems probable that the situation would be the same as in Asia. The extensive murex debris at Andriake and Aperlae, and perhaps also Phaselis, suggests that this tax would have been a large source of income for the province.

Pitch is also of particular interest.⁵⁸⁶ The mention of pitch⁵⁸⁷ in the customs inscription of Andriake is intriguing as it is included with other products which are known to have been high value (saffron, *murex*) or traded in considerable quantities (olive oil). As stated earlier, these are products which were important in terms of taxable income. This becomes more significant when one considers that pitch was one of three commodities (the others being slaves and salt) mentioned in the tariff of nearby Caunus which was subject to specific customs dues.⁵⁸⁸ An interesting parallel for the taxation of pitch is that of Bruttian pitch, produced in the Sila forest of Calabria, Italy. Here, Cicero records a corporation of contractors who were leasing the production of pine resin from the censors.⁵⁸⁹ Dionysus of Halicarnassus wrote of the income from the pitch: ‘But the largest and most resinous part of the timber is made into pitch, furnishing the most fragrant and sweetest pitch known to us, the kind called Bruttian, from the farming out of which the Roman people receive large revenues every year’.⁵⁹⁰ It is perhaps significant in this respect that a Lycian forest, referred to as Silva Serra, or the Serra forest, is singled out as a noteworthy location in a treaty between Rome and Lycia in 46 BC detailing the extent of Lycian territory prior to its incorporation into the Roman Empire.⁵⁹¹

Meiggs refers to pine resin as ‘one of the most commonest items of trade’,⁵⁹² but the economic impact of the production and trade of pitch, both plant-derived resin and petroleum-derived bitumen, has not been the subject of much archaeological enquiry. It is

⁵⁸⁶ The most extensive discussion is that by Russell Meiggs in Appendix 7 of his *Trees and Timber in the Ancient World* (Meiggs 1982). Forbes discusses bitumen extensively (Forbes 1964), but spends very little time on resin (Forbes 1966, 23-25).

⁵⁸⁷ The published summary of the inscription mentions only dry pitch. The distinction between solid and liquid was common, the Greek πίσσα was frequently used to mean resin.

⁵⁸⁸ See Bean 1953; Marek 2006. The tariff concerns the tax situation following a donation of 66,000 *denarii* by two citizens for the remission of general customs duties in the city of Caunus.

⁵⁸⁹ Cicero, *Brutus* 85.

⁵⁹⁰ *The Roman Antiquities* 20.15.

⁵⁹¹ Mitchell 2005, 212-215.

⁵⁹² Meiggs 1982, 471.

worth considering here given its epigraphic prominence. Pitch had a plethora of applications in antiquity; amongst other things, it was used to flavor wines, treat medical ailments, waterproof boats and ships, and coat the interior of wine and fish sauce amphorae.⁵⁹³

Two genera of trees were typically used for resin: *pinus* and *pistacia*. Both genera are abundant in Turkey, including the wild species *Pistacia atlantica* and *Pistacia terebinthus*, sources of terebinth resin⁵⁹⁴ and *Pinus brutia*. *Pinus brutia*, commonly known as the Calabrian pine, is the entire source of Turkey's modern resin production.⁵⁹⁵

Resin was primarily extracted by tapping a tree and collecting the resin that flowed from the punctured area; Pliny describes a process very similar to that in use today.⁵⁹⁶ Resin could also be distilled from twigs through burning, a process described below in Chapter V. Yields vary considerably. Recent work on a sample of 2,483 Aleppo pines in ten separate plots (a species very similar to the Calabrian pine) in Euboea, Greece, has shown yields between 0.50 kg and 13.5 kg per year, with 85.2% yielding under 5.4 kg per year.⁵⁹⁷ This study, however, includes the use of a stimulant paste to increase yield. While it is not known whether or not this was a practice used in antiquity, it is best to assume that the yields would have been on the lower end of the scale. In the above study, output of above 2.7 kg per year is considered economically profitable.⁵⁹⁸

Diocletian's Price Edict distinguishes between pitch (*pix* / *πίσσα*) and resins (33.7-10, Aezani); Colophonian or Phrygian resin was the cheapest, at six *denarii* per pound, solid pitch was priced at eight *denarii* per pound; terebinth resin was by far the most expensive at 40 *denarii* per pound.⁵⁹⁹ Let us play with numbers hypothetically—the mean yield of 85.2% of the Aleppo pines recorded from Euboea is 2.95. To allow for a lower output in antiquity, let us consider 2 kg per year as an approximate mean yield for pine species in the Roman period. This weight is equal to approximately 6.2 Roman pounds, so considering the cheapest Edict price of six *denarii*, a resin-producing pine tree would produce a maximum

⁵⁹³ Pliny, for example, lists a wide range of uses (*Natural History* 14.25; 16.22; 18.74; 20.23, 40, 50, 51). See also Columella, *On Agriculture* 12.22-24.

⁵⁹⁴ Kafkas and Perl-Treves 2001, 908.

⁵⁹⁵ Gezer 1986, 55.

⁵⁹⁶ *Natural History* 16.23.

⁵⁹⁷ Spanos *et al.* 2010, Table 4. The yield is based on tapping every 10-15 days between April and October.

⁵⁹⁸ *Ibid.*, 40.

⁵⁹⁹ Crawford and Reynolds 1979, 200.

average of 37.2 *denarii* worth of resin. A pottery lease from Oxyrhynchus records the purchase of 26 talents of pitch, or 707 kg, for the purpose of lining 10,000 amphorae. According to Columella, one needs 25 pounds of hard pitch to line a *dolium* containing a *culeus* and a half (30 amphorae).⁶⁰⁰ This equates to approximately 270 grams per amphorae, but 30 individual amphorae would have considerably more surface area than a single *dolium* and thus would have required more resin for the lining. Experimental archaeology would be useful in this situation to clarify the amount of resin needed per amphora. At minimum, it would seem that 1 kg of resin would line 14 amphorae (based on the Oxyrhynchus lease, it would obviously vary based on the size of the amphora). Based on Columella, 1 kg would line less than four amphorae. The consumption of resin by those bottling wine and fish products in amphorae was therefore substantial and costly.

Trade in resin is directly evidenced not only in the two customs inscriptions, but also through shipwrecks carrying either blocks of pitch or pitch in amphorae,⁶⁰¹ and papyri from Egypt which record the purchase of pitch from abroad for lining wine amphorae.⁶⁰² Indirectly, we may infer that, like Egypt, other regions lacking in timber resources would have needed to import pitch. The two major products requiring pitch were amphorae and ships. Constructing ships in a region lacking in timber would have already required significant imports from timber rich areas and pitch could seemingly have been imported along with this. Pitch, most commonly resin, for amphorae production might be viewed as a separate and more widespread phenomenon.

One of the major importers of resin for amphorae lining must have been North Africa, in particular modern Libya and Tunisia.⁶⁰³ Amphorae were commonly lined with resin from both the *pinus* and *pistacia* genus.⁶⁰⁴ While both tree species are found in small quantities in

⁶⁰⁰ *On Agriculture* 12.18.

⁶⁰¹ The earliest cargo of resin is the *Ulu Burun* wreck which contained 130 Canaanite amphorae with terebinth resin, a total amount of approximately one metric tonne (Pulak 1998, 201). The *Dramont D* wreck, dating to the late fourth or early fifth century contained a very small cargo of some 120 amphorae filled with resin (Parker 1992, 169). Other wrecks containing pitch are Parker nos. 308, 373, 451, 577, 578, 725, 830.

⁶⁰² Mayerson 2004. One papyrus *P. Oxy. 3596.19* specifically mentions Troad resin.

⁶⁰³ Forest cover in North Africa is amongst the lowest in the world with only around 1% of land surface being occupied with forests (FAO 2000, <http://www.fao.org/DOCREP/004/Y1997E/y1997e0i.htm>, last accessed July 20, 2012).

⁶⁰⁴ Mills and White 1989; Stern *et al.* 2008.

North Africa⁶⁰⁵ the amount of resin needed to pitch the amphorae for wine and salted-fish products⁶⁰⁶ surely exceeded the amount that could be produced within the region.

Sourcing resin from amphorae has been unsuccessful thus far, with only vague locations such as the Levant, Anatolia and the Aegean being suggested,⁶⁰⁷ this is a worthwhile area for further enquiry. Given the epigraphic evidence and the known presence of a timber industry, it seems highly probable that Lycia would have been a major exporter of resin. There are certainly known trading links with Egypt, and North Africa was a large potential buyer.

The Ports: Pamphylia

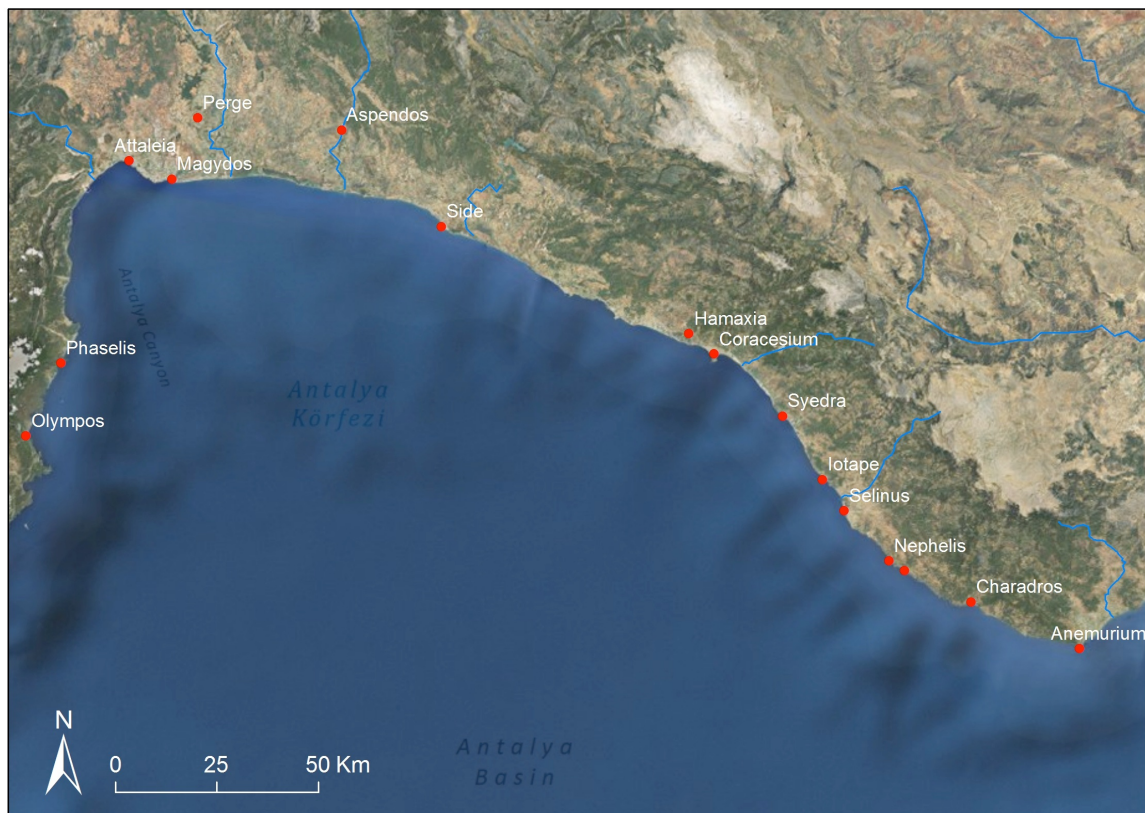


Figure 69. Map of Pamphylian Sites Discussed (author).

Moving away from rugged Lycia, Pamphylia was a very small region encompassing roughly 75 miles of coastline at a breadth of about 30 miles (Figure 69).

⁶⁰⁵ The *pistacia* genus is present in modern Tunisia, where conservation attempts are ongoing. Wild species, such as those used to make resin including the *Pistacia terebinthus* is particularly rare (Padulosi and Hajd-Hassan 2001, 70.)

⁶⁰⁶ See Bonifay 2007 for pitched North African amphorae.

⁶⁰⁷ Vogt *et al.* 2002.

Rivers

Pamphylia is an extremely fertile alluvial plain of the Kestros (modern Aksu Çayı), Eurymedon (modern Köprüçay Çayı) and Melas (modern Manavgat Çayı) rivers. The Aksu Çayı is over 100 km long; it begins in Pisidia and flows through the Taurus mountains emptying south of Perge. It was navigable at least between its mouth and Perge, a distance which Strabo records as 60 stadia (11 km).⁶⁰⁸ The Köprüçay Çayı is the longest river in Pamphylia at 156 km.⁶⁰⁹ It was bridged by a multiple-arched bridge near Aspendos. The Manavgat Çayı has the highest water volume; beginning near the border with Pisidia, the river flowed south; there was a waterfall 8 km upriver from Side, and the river emptied three km east of Side.

Roads

Lacking a monument such as the *stadiasmos* of Patara, the roads of Pamphylia are somewhat less well understood. Several milestones have been found in Pamphylia at Antalya, Silyum, Alanya and Syedra.⁶¹⁰ Side was the terminus of a major road which began at Pergamum, built by the first governor of Asia, M. Aquilius between 129 and 126 BC.⁶¹¹

Sites

The two major maritime ports were Attaleia (modern Antalya, Figure 70) and Side. Other harbour cities were Magydos and Kynosarion.



Figure 70. Portion of the Hadrianic archway at Antalya (author's photo).

⁶⁰⁸ Hellenkemper and Hild 2004, 91.

⁶⁰⁹ *Ibid.*

⁶¹⁰ There are three from the vicinity of Antalya, two from near Silyum, one from Alanya and one from Syedra (French 1981).

⁶¹¹ French 1991; Talbert 2000, map 65.

Also extremely important in this region are the fluvial harbours of Perge and Aspendos, both of which have been located by geophysical work in the past decade. Attaleia became the primary port of the region, though relatively little is known about the city and its harbour structures as the site has been inhabited since antiquity.

Just to the east of Attaleia, in what is now the suburb of Lara beach, was the site of Magydos. Again, nothing remains of the site due to modern occupation. In the *Karamania*, Beaufort mistakes the site for Attaleia, but he records the presence of an aqueduct, ancient artificial harbour structures and scattered columns and sculpture.⁶¹² He wrote that the harbour piers ‘embraced a more considerable space than was usual in a harbour of those times’ and that it still contained deep water.⁶¹³

Side

Side was one of the major ports of antiquity, and while it appears to have lost some importance to Attaleia during the Roman period and later, the state of preservation at Side allows for more productive discussion. The monumentality of the city in antiquity is still largely visible today. The harbour-side temples of Apollo and Athena (Figure 71), situated



Figure 71. Temples of Apollo and Athena at Side (author's photo).

⁶¹² Beaufort 1817, 132-35.

⁶¹³ *Ibid.*, 133.

directly to the south of the harbour, are amongst the most striking remains in the city today and in antiquity, must have served as landmarks through which to recognize the city from the sea. Other extant remains include a large theatre, three bath complexes including the great baths, the harbour baths and the agora baths (which currently house the city museum), a nymphaeum, additional temples, an agora, colonnaded street, domestic houses, an aqueduct, a triumphal arch and a monumental city gate under which one still must drive to reach the city.

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Figure 72. Plan of the harbour at Side (Knoblauch 1977, Abb. 3).

Side possessed a harbour from at least the sixth century BC, including a constructed seawall and entrance on the southern side of the harbour. The majority of construction seems to date to around AD 200 (Figure 72) when the harbour enclosed approximately 7.8 ha. However, around AD 500, an extension to the harbour was constructed to the northwest.⁶¹⁴

Following decline associated with mid-third century incursions by Goths and Isaurians, Side shows signs of renewal by the time of Diocletian, visible in the epigraphic record, such as repairs to damaged monuments and new construction. Side is mentioned in the *Expositio totius mundi et gentium* as one of the two splendid cities of Pamphylia, the other being Perge.⁶¹⁵ From the third century, Side was responsible for the *annona militaris* to Syria.

The city shows ample signs of both rebuilding and new construction during Late Antiquity, though much of the construction is simply dated between the fourth to sixth centuries on stylistic grounds. The continued upkeep of the harbour, and particularly its extension in the fifth century AD are indicative of its importance to the city. Relatively little, however, is known in detail about the kinds of goods which were imported and exported. The *Expositio totius mundi et gentium* lists Pamphylia as a producer of olive oil for export.⁶¹⁶ Side, along with Perge and Attaleia would have been integral in this exportation. Survey work in the village of Lryboton Kome, approximately 12 km north of Antalya, provides a good example of the prolific production. Eleven houses contained press installations, dating from the Roman through Byzantine period, and there were several purpose-built oil production structures.⁶¹⁷

The sale of slaves seems to have been an important factor in the economy of Side. Strabo records that the Cilicians had a place for building ships in Side, as well as the fact that the Cilicians auctioned slaves from the docks.⁶¹⁸ Slaving continued past the days of piracy, well into the Imperial period; two Greek papyri, originating in Side, record the sale of slave girls. Papyrus *P. Turner* 22, dated to AD 142, is a contract for the sale of a ten-year-old girl for 280

⁶¹⁴ Knoblauch 1977, 38, Abb.5.

⁶¹⁵ *Expositio*, 45.

⁶¹⁶ *Ibid.*

⁶¹⁷ Çevik 1996, 86.

⁶¹⁸ *Geography* 14.3.

denarii and papyrus BGU.III.887, dated to AD 151, is a contract for the sale of a twelve-year-old girl for 350 *denarii*.

Perge

Perge is located 11 km north of the Mediterranean and is connected to the sea via the Kestros river (modern Aksu Çayı) which runs 4 km to the east of the site.⁶¹⁹ The city was founded long before the Roman period, but little remains prior to the Hellenistic period. Hellenistic wall remains are a prominent feature of the city,



Figure 73. Macellum at Perge (author's photo).

particularly the famous monumental gateway in the south of the city with two circular towers and an oval courtyard. Walls of Hellenistic date are also preserved leading to the harbour on the Kestros.⁶²⁰ The monumentality of the city is striking, even today. From the towered gateway, a colonnaded street ran northwards. The colonnade was constructed during the Tiberian period, though a Hadrianic monumental triple arch at the beginning of the street and a Hadrianic nymphaeum-gateway at the end indicate ongoing construction.⁶²¹ A large macellum was located to the east of the monumental triple arch and its façade is aligned with the colonnaded street. The macellum (Figure 73) has a large *tholos* at its centre. The city had two large bath complexes. Extensive building in the city also occurred under the Severans. Outside the city walls were a large Neronian theatre and stadium. The statuary from the theatre, now located in the museum in Antalya, is a testament to the wealth of the city. The

⁶¹⁹ Abbasoğlu 2001, 173.

⁶²⁰ *Ibid.*, 177.

⁶²¹ *Ibid.*, 179.

river harbour has recently been identified near the modern village of Solak, 4 km to the east (Figure 74).⁶²²

Aspendos

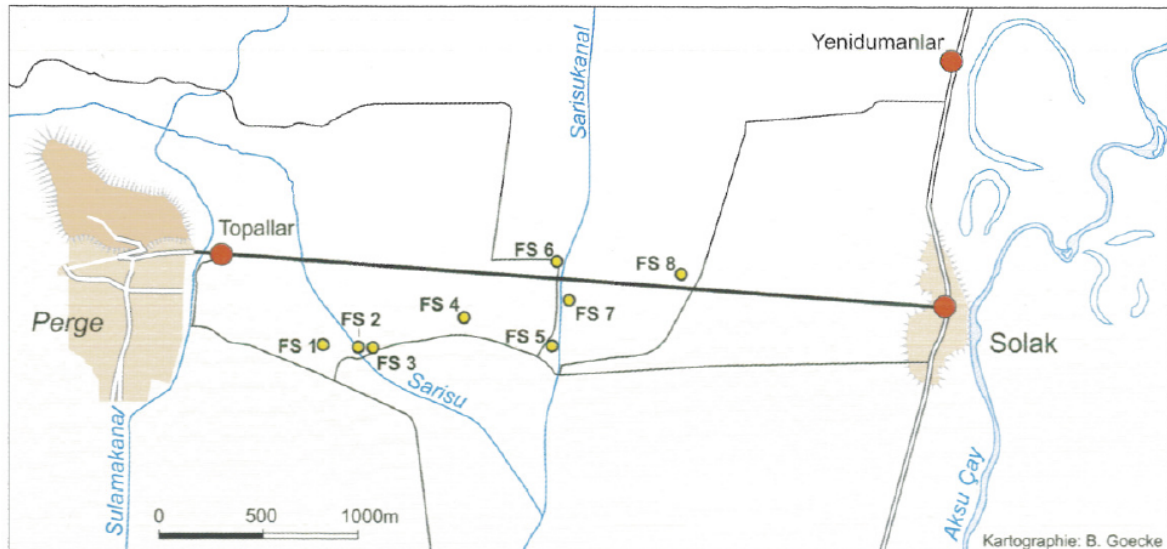


Figure 74. Location of the river harbour at Perge (Martini *et al.* 2008, 170, Abb. 4).

Despite its impressive standing remains, Aspendos has been less thoroughly investigated than Perge or Side. A new project begun in 2008 under the direction of Dr. Veli Köse⁶²³ should considerably expand our knowledge of this city and its place in the Pamphylian economy. The river harbour at Aspendos was a major factor in the city's prosperity; Strabo records that the Eurymedon river

Figure has been removed due to copyright restrictions

Figure 75. Probable location of the Aspendos river harbour (Google earth).

⁶²² Martini *et al.* 2008.

⁶²³ Aspendos Project, <http://www.aspendosproject.com/>, last accessed July 20, 2012.

was navigable up to the flourishing city of Aspendos, a distance of 60 stadia.⁶²⁴ The harbour has been tentatively identified in the northwest of the city (Figure 75).⁶²⁵ The navigability of the river is further attested by the high clearance of the Eurymedon bridge which would allow fairly large ships to sail unhindered.⁶²⁶ The city was known for its oil and its salt in antiquity, the latter of which came from the nearby Capria lake.⁶²⁷

Discussion: Pamphylia

Amphora Production

Amphora production surely occurred in Pamphylia, though no kiln sites have yet been discovered. Some degree of production is suggested by the ‘Pamphylian’ amphora type which is attributed to the region on the basis of Pamphylian names on amphorae stamps.⁶²⁸ Some of the amphorae stamps can be tied to Aspendos, but further identification of actual production sites has proved elusive. The stamped amphorae seem to be restricted to a fifty-year span in the middle of the first century BC. The production seems to have continued, however, and Grace proposed that development of the type continued through the third century AD.⁶²⁹ The largest collection of Pamphylian amphorae, identified securely by stamps, is found in the Benaki collection of the Musée Gréco-Romain in Alexandria with 547 stamped pieces.⁶³⁰ The contents of the amphorae are unknown.

Lex Portorii Asiae

Briefly referred to in comparison to the customs inscription from Andriake, the Customs Law of Asia is a record of the regulations concerning customs dues in the Roman province of Asia, a *lex portorii*. The extant version is a Greek inscription on marble measuring 2.82 m

⁶²⁴ *Geography* 14.4.2.

⁶²⁵ Köse 2011, 144.

⁶²⁶ Grewe 1999.

⁶²⁷ Pliny, *Natural History* 31.39.

⁶²⁸ Grace 1973.

⁶²⁹ *Ibid.*, 194-200.

⁶³⁰ *Ibid.*, 185.

in height by 1.44 in width with a thickness of 0.305 m.⁶³¹ This version was a translation of an original Latin version dated 9 July AD 62, the date when the Latin copy was received in the record office of the *curatores* of the public revenues (1-7).⁶³² The *lex* was translated into Greek after it arrived in Ephesos.⁶³³ This text is extremely important as it is one of the most detailed description of customs dues for a province in the Roman world. Prior to becoming a distinct province, the region of Pamphylia was included in the province of Asia and administered as such; the Pamphylian ports⁶³⁴ are therefore included in the earliest drafting of this *lex*.⁶³⁵ While it is not known whether the regulations in the *lex* continued to apply in Pamphylia, it is similar in scope to the customs law for Lycia and therefore can provide a general guide to the way in which customs were administered in the province.

A customs station was built at every port, and it was unlawful to unload a ship in a place where one might evade paying the tax (15, §5). There was, however, an exception for goods which were re-imported into the province within the same year (16-20, §6); i.e. if a merchant were to import a cargo, he was liable for import dues on the cargo, and if he only sold a portion of the cargo, he then must pay export dues on the unsold portion of the cargo, however, if he were to re-import the cargo into Asia later within the same year, the merchant would not have to pay either import or export duties again.⁶³⁶

The majority of products was taxed at a rate of 2.5% of their value, based on weight and the number of individual items. Slaves, slave children, ore and *murex* shells were subject to specific rates. Slaves (imported and exported) were initially taxed at a maximum rate of 5 *denarii*; child slaves, both male and female, were exemptions, but the tax on these is not specified. In 15 BC the *telos* on slaves was reduced to 2.5 *denarii* for import and one *denarii* for export. Ore - specifically ore exported from Asia to Rome - was taxed at a rate of 4 asses per hundred pounds (including the container in which it was transported). Murex was

⁶³¹ The inscription was discovered in 1976 in the Church of St John in Selçuk where it was being re-used as a pavement stone in front of the narthex (Cottier *et al.* 2008, 16).

⁶³² This version dates to AD 62, but it is based on a significantly earlier law(s) (Cottier *et al.* 2008, 4-5).

⁶³³ Cottier *et al.* 2008, 89.

⁶³⁴ Perge, Magydus and Side are certain, Attaleia and Aspendos have been restored. Phaselis is also included in the list (22-26, §9).

⁶³⁵ See Mitchell 2008, 188-192 for a full discussion of this issue.

⁶³⁶ *Lex Portorii Asiae*, line 18. See commentary in Cottier *et al.* 2008, 108. *C.f.* Arnaud 2011a, 66-68.

initially taxed at 5% (20, §7); the rate was changed in AD 5 (122-3, §53), probably increased, but the amount to which the tax was changed does not survive. Murex dye production has not yet been identified in Pamphylia, though there is no particular reason why it would not have occurred. Slaves, however, were certainly a major part of the Pamphylian economy.

The Ports: Rough Cilicia



Figure 76. Map of Rough Cilician Sites Discussed (author).

Moving to Rough Cilicia (Figure 76), we are, as the name implies, once again in a very rugged landscape. In western Rough Cilicia, there are three major rivers: the Bıçkıcı, the Hacımusa, and the Kaledran. The Tauros mountains and the 800 m deep Calycadnus (modern Göksu) river gorge form a natural barrier between the coastal regions and the hinterland.⁶³⁷ The primary ports are Coracesium (modern Alanya), Iotape, Selinus, Nephelis, Antioch ad Cragum, Anemurium, Kelenderis, Corycus and Elaiussa Sebaste. Lesser-known harbour sites, which will not be discussed here due to their lack of archaeological remains, include Nagidos, Aphrodisias and Charadros.

⁶³⁷ Rauh *et al.* 2009, 298.

Coracesium and Hamaxia

Coracesium, modern Alanya, lies on the border between Pamphylia and Rough Cilicia, but very little is known about the ancient site. Nearby Hamaxia is better documented due to survey work by an Austrian team under the direction of Gerhard Huber.⁶³⁸ Hamaxia was located on a hill to the east of Coracesium and possessed a small harbour on the coast (perhaps to be associated with the Aunesis of the *Stadiasmus Maris Magni*). Strabo records the importance of the settlement for shipbuilding:

After Coracesium, one comes to Arsinoe [Syedra], a city; then to Hamaxia, a settlement on a hill, with a harbor, where ship-building timber is brought down. Most of this timber is cedar; and it appears that this region beyond others abounds in cedar-wood for ships; and it was on this account that Antony assigned this region to Cleopatra, since it was suited to the building of her fleets.⁶³⁹

In doing so, he indicates the importance of cedar wood for the region of Cilicia. As confirmed by several ancient sources, the renown of Cilician cedar was widespread in antiquity.⁶⁴⁰ Current investigations into the landscape of Rough Cilicia are examining the possibility that the region was deforested during the Roman period. While this is a complex process, at present the oldest cedar trees in the region around modern Gazipaşa (ancient Selinus) are approximately 300 years old.⁶⁴¹ This is extremely young for cedars and implies that at some point in the past the region was stripped of its trees. While it seems probable that this occurred during the Roman to late Roman period, proof will require further investigation.

Iotape

This site (Figures 77 and 78) was founded by Antiochus IV of Commagene on a rocky cliff overlooking the Mediterranean. The city has a harbour street and near the current highway is a large *mortarium*, presumably for oil production. Brief underwater survey in 2004 revealed

⁶³⁸ Huber 2005.

⁶³⁹ *Geography* 14.5.3.

⁶⁴⁰ Theophrastus, *On the Causes of Plants* 3.2.6; 4.5.5; Appian, *Mithradatic Wars* 92.96.

⁶⁴¹ Personal Communication with Nicholas Rauh.



Figure 77. Views of Iotape. Right: Acropolis, Left: Public Area. (author's photos).

a 65 m long submerged foundation which perhaps is part of the ancient harbour.⁶⁴² Numerous anchors have been recovered as well, but the site remains to be thoroughly investigated.

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Figure 78. Satellite Image of Iotape with highlighted areas (Rauh et al. 2009, 287, Figure 14).

⁶⁴² Ward 2005, 130.

Between Iotape and Selinus, at Biçkici, Rauh's survey team has identified a kiln site. The kiln site at Biçkici is one of the largest known in southern Turkey thus far and produced at least three major amphorae types between the first century and the fourth century including the Koan-style (first century BC to first century AD), Pamphylian (second to fourth century AD), and the Agora G199 (first to fourth century AD).⁶⁴³ Nearby at Kale Tepe, a pressing installation with at least five separate presses has been identified.⁶⁴⁴

Selinus

Selinus, modern Gazipasha, is in an extremely poor state of preservation and upkeep (Figure 79). The harbour opened out of the mouth of a small river which ran through the town (Figure 80). Some remains can be seen along the river today, though they are difficult to interpret. The city must have been relatively important in antiquity; Trajan died here and there are certainly hints of substantial monuments, though they are buried amongst modern dwellings.

Today, Selinus is at the centre of an extensive survey project, the Rough Cilicia Survey Project (hereafter RCSP) directed by Nicholas Rauh. Beginning in 1996 and continuing through 2011, this project focused on some 60 km of coastline from the border with Pamphylia through western Rough Cilicia.⁶⁴⁵ This survey area contained at least eight, though probably nine, cities, here defined as sites which are historically attested as *poleis*.⁶⁴⁶ These include five coastal cities (Iotape, Selinus, Nephelion, Antioch ad Cragum and Charadros) and three or four inland cities (Kestors, Lamos, Asar Tepe and possibly Sivaste).⁶⁴⁷ The survey has identified a further 7 'urban sites' and 149 '*loci*' meaning 'smaller settlements ranging from large fortified villages to isolated fortifications, industrial complexes (kiln sites, amphora depots, wine and oil press complexes), isolated settlements

⁶⁴³ Rauh and Slane 2000.

⁶⁴⁴ Rauh *et al.* 2006, 65.

⁶⁴⁵ Rauh *et al.* 2009, 255.

⁶⁴⁶ *Ibid.*, 288.

⁶⁴⁷ *Ibid.*, 255.

(farms), isolated (unidentifiable) structures, tombs, road fragments and dense sherd scatters'.⁶⁴⁸

Some 8,350 sherds of pottery have been collected over the course of the survey, the largest percentage of which date to the early Roman period, here classed as first to third centuries AD. Based on an earlier assessment of 7,313 sherds, 2,038 sherds dated to the early Roman period, 391 are pre-Roman, 920 are Late Roman (fourth to seventh centuries) and 75 are Byzantine (ninth to twelfth).⁶⁴⁹

Breaking them down by vessel category, the majority are coarse wares, followed by cooking wares and then

amphorae. While a breakdown by vessel type has not yet been published, the majority of the



Figure 79. The current state of the agora at Selinus (author's photo).



Figure 80. The modern harbour at Gazipaşa, built to the east of the river and ancient harbour (author's photo).

⁶⁴⁸ *Ibid.*, 257.

⁶⁴⁹ Rauh *et al.* 2009, 261-262.

amphorae are relatively local in that they were produced in Cilicia.⁶⁵⁰ The settlements and ceramics from the survey indicate that the population density of this region was higher during the Roman period (first to third centuries AD) than in any subsequent period (including today).⁶⁵¹

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The RCSP has brought to light numerous oil and wine pressing installations and several amphorae kilns. They have documented 28

Figure 81. Modern Grapevine Signature in Rough Cilicia (Rough Cilicia Archaeological Survey Project, https://engineering.purdue.edu/~cilicia/rc2004/anime/allsites_04a.gif, last accessed July 20, 2012).

pressing installations, including 12 counterweights, 18 *mortaria* and 18 *orbes*, suggesting oil production. An interesting new method of investigation—remote sensing of the spectral reflectance of grapevines—has shown the prevalence of grapevines (largely uncultivated) in the landscape today (Figure 81), illustrating the potential of the region for wine production.⁶⁵²

Nephelis

The site of Nephelis was discovered in 1991 during the construction of terraces for banana cultivation around the modern village of Muzkent (literally, Banana-town).⁶⁵³ The site has not been properly surveyed and measured, due to a lack of permits, but an approximate plan

⁶⁵⁰ Personal Communication with Nicholas Rauh.

⁶⁵¹ Rauh *et al.* 2009, 261.

⁶⁵² *Ibid.*, 267.

⁶⁵³ Karamut and Russell 1999, 355.

has been produced by James Russell and Ismail Karamut (then director of the Alanya Museum). Clear structures include a walled acropolis, a prostyle temple, a theatre or bouleuterion, a vaulted water tunnel to control water run-off from the slopes and a wadi, a necropolis, a limestone quarry and various unidentified buildings.⁶⁵⁴ The rear and southwestern side wall of the temple, identified by an inscription as a Tychaion constructed c. AD 150 by Antoninus Pius, are still standing to the height of the pediment.⁶⁵⁵ An olive crushing basin has also been identified in the scree south of the acropolis.⁶⁵⁶

Figure has been removed due to copyright restrictions

Figure 82. Google Earth imagery of Iotape Harbour (left) and Nephelis harbour (right) to scale.

There are no easily identifiable harbour remains aside from a small natural bay. A rectangular two-storey building overlooking the coast is seemingly associated with the harbour, perhaps in a defensive capacity, but its function is not fully understood.⁶⁵⁷ While the bay would not have provided significant protection for a large vessel, it would have been suitable for small vessels and is akin to other small bays such as that at Iotape (Figure 82).⁶ As the site is mentioned as an anchorage in *Stadiasmus Maris Magni*, it apparently functioned as a harbour to some extent.

⁶⁵⁴ *Ibid.*, 357 - 363.

⁶⁵⁵ *Ibid.*, 359.

⁶⁵⁶ *Ibid.*, 357.

⁶⁵⁷ *Ibid.*, 362.

⁶⁵⁸ *Ibid.*, 363.

Antioch ad Cragum



Figure 83. Antioch ad Cragum. Left: Cove. Right: Acropolis. (author's photos).

This city sits some 300 m above sea level and is a striking reminder of how piracy⁶⁵⁹ could have thrived in this region (Figure 83). The harbour lies to the northwest of the castle structure, and the natural bay encompassed a significant area (Figure 84). A large colonnaded

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Figure 84. Plan of Antioch ad Cragum (Rauh *et al*, 2009, 289, Figure 15).

⁶⁵⁹ For discussion of piracy in the regions see De Souza 1999; 2008, Raul *et al*. 2000 and Rauh 2003.

street was constructed using imported granite columns and the city was equipped with at least one bath complex, a probable agora and a temple. Recent survey has identified the harbour as measuring 1.2 x 0.6 kilometers.⁶⁶⁰ This encompasses a large natural bay which was all potential harbour space, though it was probably not all artificially enhanced. More than 30 stone weights and nearly 20 iron anchors were recovered during the survey. The iron anchors date mainly from the fourth century AD to the tenth century AD.

Anemurium

Anemurium, meaning the windy cape, is the southernmost point of Asia Minor, only 64 miles from Cyprus. The city had a separate citadel and lower town. The city did not have a natural harbour (Figure 85)



Figure 85. The coastline at Anemurium (author's photo).

and must have had substantial artificial harbour structures, though little remains visible and they have not been investigated. The remains of the city are striking today in their



Figure 86. Bath Complex, Anemurium (author's photo).

preservation (Figure 86) and the majority of standing remains are Late Antique. Following a period of decline in the third and early fourth centuries, a new city wall was constructed around AD 382 and from this point the city seems to have flourished. Several of the larger monuments in the city have been thoroughly investigated and published, but no work has been done on the

⁶⁶⁰ Ward 2005, 127.

harbour. Several kilns have been identified in the city and the city was producing Agora G199 wine amphorae in the Roman period and Late Roman 1 amphorae during Late Antiquity.⁶⁶¹ These seem to have been produced for export, particularly during Late Antiquity, and the city would have needed the infrastructure to support this.

Kelenderis

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Figure 87. Kelenderis Harbour Mosaic (Pomey 2006, 326, Figure 1).

Kelenderis is located in the modern city of Aydıncık (former Gilindire) in the Mersin province. The city and its harbour were mentioned by Pausanias and Strabo.⁶⁶² Excavations which began in 1987 continue at the site and have focused largely on the Late Antique and Byzantine levels.⁶⁶³ One of the most prominent finds of the excavations thus far is the discovery of a fifth-century mosaic depicting the harbour and its associated buildings (Figure

⁶⁶¹ Williams 1989, 90-99.

⁶⁶² *Description of Greece* 2.32.9; *Geography* 14.5.3.

⁶⁶³ Zoroğlu 2003 - 2011.

⁶⁶⁴ The ship depicted on the mosaic has spurred considerable discussion as scholars disagree on whether or not the ship has a lateen sail (Friedman and Zoroğlu 2006; Pomey 2006; Friedman 2007).

87).⁶⁶⁴ If the mosaic is read literally, it suggests that Kelenderis had an elaborate dockside area with a colonnade and various related buildings, some of which are perhaps warehouses.

In 2002, underwater survey began at the site of Yılanlı Ada, an island located approximately 1 mile offshore from Kelenderis and revealed a high concentration of anchors dating from the Bronze Age (36 stone anchors, 1 stone anchor stock, 11 metal anchors, 1 lead anchor stock, 1 bracket for a lead anchor stock) indicating the probable usage of the island as a short-term anchorage.⁶⁶⁵ A wreck, the *Erkut Arcak*, with a cargo of Late Roman 1 amphorae was also discovered in this area.⁶⁶⁶

In 2006, underwater survey and excavation began in the ancient harbour. A foundation wall constructed from rectangular-cut limestone blocks and measuring 26 m long and 4.8 m across was identified and is probably a pier.⁶⁶⁷

Corycus / Korykos

13	Sail makers	1	Sailor
1	Fisherman	3	Shipwrights
1	Murex fisher	17	Wine traders
4	Murex workers	4	Olive Oil dealers
5	Net workers	26	Potters
4	Shipmasters	19	Tavern Keepers

Table 3. Selected professions attested at Corycus, based on Trombley 1987.

⁶⁶⁵ Zoroğlu 2004, 31.

⁶⁶⁶ 50-60 amphorae were identified on the surface (Zoroğlu 2005, 40).

⁶⁶⁷ Zoroğlu 2007, 21; 2008, 34.

The site of Corycus has not been excavated but is worth mentioning purely on the basis of its epigraphic material. While this material dates to the fifth and sixth centuries AD and is therefore rather outside the chronological scope of this thesis, it is a uniquely large corpus of funerary inscriptions related to the professions of the city's inhabitants (Table 3). These inscriptions make clear that the harbour was essential to the city's livelihood in Late Antiquity. Relevant professions attested in the funerary epigraphy are shown in the chart below.⁶⁶⁸

While the extent of epigraphy such as this is thus far unattested elsewhere, I do not believe that the scale of activities represented is unique, but rather that this gives us a particular insight into the people and activities of a busy port. The level of specialization is striking and as discussed in Chapter III, points to a developed economic system.

Elaiussa Sebaste

Elaiussa Sebaste was founded around the end of the first/beginning of the second century BC on a rocky promontory at the eastern limit of Rough Cilicia (Figure 88). The city was originally simply Elaiussa, but its name was changed to Sebaste by Archelaos I of Cappadocia around 20 BC to honor Augustus. Elaiussa is referred to by Strabo as an island, but geophysical research has shown that it was simply a promontory connected by a small strip of land.⁶⁶⁹ The site sits above two sheltered bays, one facing north and one facing southeast, in which the city's two harbours were constructed.

The city was particularly prosperous in the second and third centuries AD and witnessed extensive building of the city towards the harbours. The urban landscape was that of a wealthy Roman city and as this is one of the few cities in the region under discussion which is currently being excavated, relatively more is known about its urban development. The earliest Roman monumental structures are a Corinthian order temple to an unknown deity,⁶⁷⁰ built during the first half of the first century AD, and an aqueduct. The aqueduct was

⁶⁶⁸ Figures are taken from Trombley 1987.

⁶⁶⁹ Equini Schneider 1999, 17-22.

⁶⁷⁰ Equini Schneider 2008, 128.

Figure has been removed due to copyright restrictions

Figure 88. Plan of Elaiussa Sebaste (Equini Schneider 2008).

built during the first century AD bringing water from the Lamas river where it was channeled through a gorge to service both Elaiussa Sebaste and Corycus.⁶⁷¹

The theatre was constructed in the second century AD as part of a new monumental public quarter near the harbour. The plan is a blend of Greek and Roman design, and the stage building used imported columns of Troad granite and Proconnesian marble capitals. To the southwest of the theatre was the Roman Agora, a large (31.6 x 32 m) quadrangular structure with a *tholos* at its centre.⁶⁷² Also in this monumental quarter was a large bath complex.

⁶⁷¹ *Ibid.*, 64.

⁶⁷² Equini Schneider 2008, 46.

There were, in fact, at least five baths in Elaiussa Sebaste including the Harbour Baths, located just off the North Harbour, and the ‘Bath in *opus mixtum*’. The *opus mixtum* baths are interesting because they make use of a building technique which is rarely used outside of Italy and probably represents the work of Italian craftsmen.⁶⁷³ The harbour baths were also partially constructed in *opus reticulatum*, a characteristically Italian technique. Could this be evidence of Italian residents in Elaiussa Sebaste, or of a particular connection between Italy and Elaiussa?

In 2005, excavations began near the southern harbour at what is called the domestic and handicraft quarter. While most of what remains is Byzantine, the area was first occupied in the Hellenistic period, and it was during this period that the area was terraced extensively to allow for occupation on the cliffs.⁶⁷⁴ Extensive walls remain from the Roman period, but most structures were so altered by Byzantine occupation that it is difficult to interpret the Roman levels. Excavations have revealed a LR1 amphora kiln as well as a cistern which contained some 750 examples of LR1 amphorae, many of which were intact. A total of three kilns for Late Roman 1 amphorae have been discovered thus far.

The northern harbour is the larger of the two as well as the earlier. The natural basin was sheltered by the promontory and the site was presumably used as the city’s harbour since its foundation. The second harbour seems to have been added after the mid first century AD. Measurements indicate that the northern harbour was roughly 6.4 hectares. The southern harbour as measured according to the current site plan is only about 1.6 hectares, though the entire natural harbour could surely have been used to some extent, creating an available area of about 5 hectares.

Elaiussa Sebaste is the sole site discussed in this chapter from which I have found a quantified ceramic assemblage from an excavation. These assemblages have already been discussed in Chapter I, but I have included the graphs here as well for the sake of context. Figure 89 shows the amphorae from the first three phases of the site.⁶⁷⁵ As can be seen, the

⁶⁷³ *Ibid.*

⁶⁷⁴ *Ibid.*, 117.

⁶⁷⁵ Equini Schneider and Morselli 2010, 11-18.

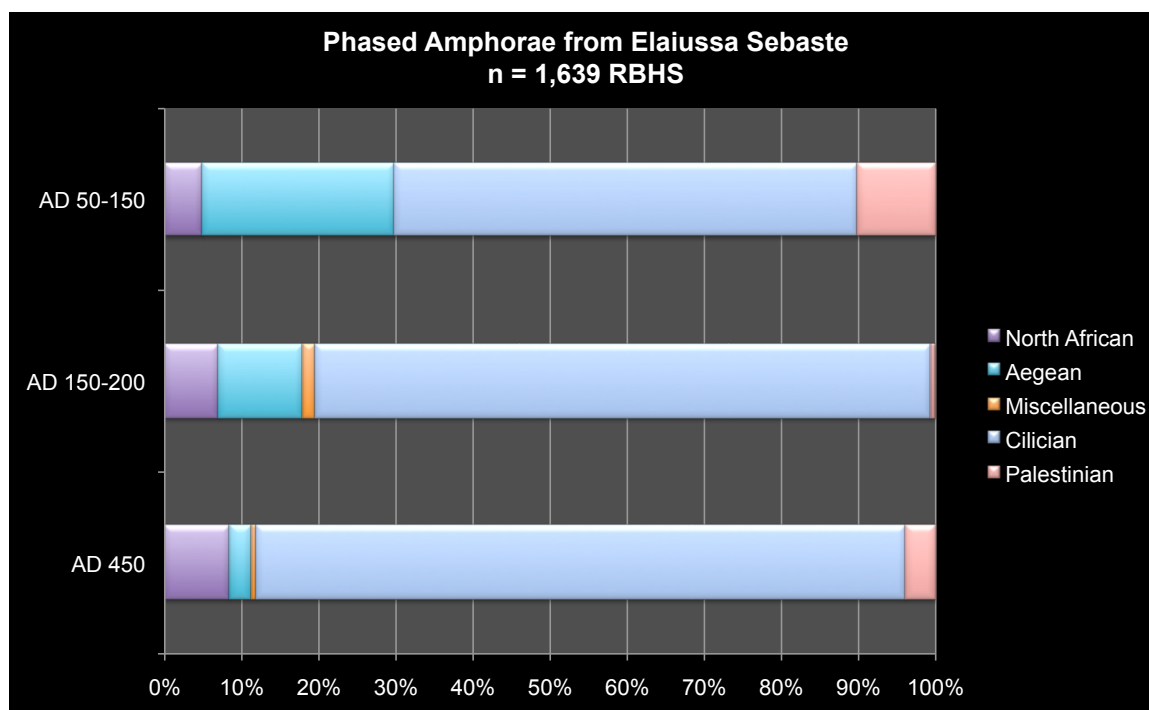


Figure 89. Amphorae from Elaiussa Sebaste (author's graph, data from Equini Schneider and Morselli 2010).

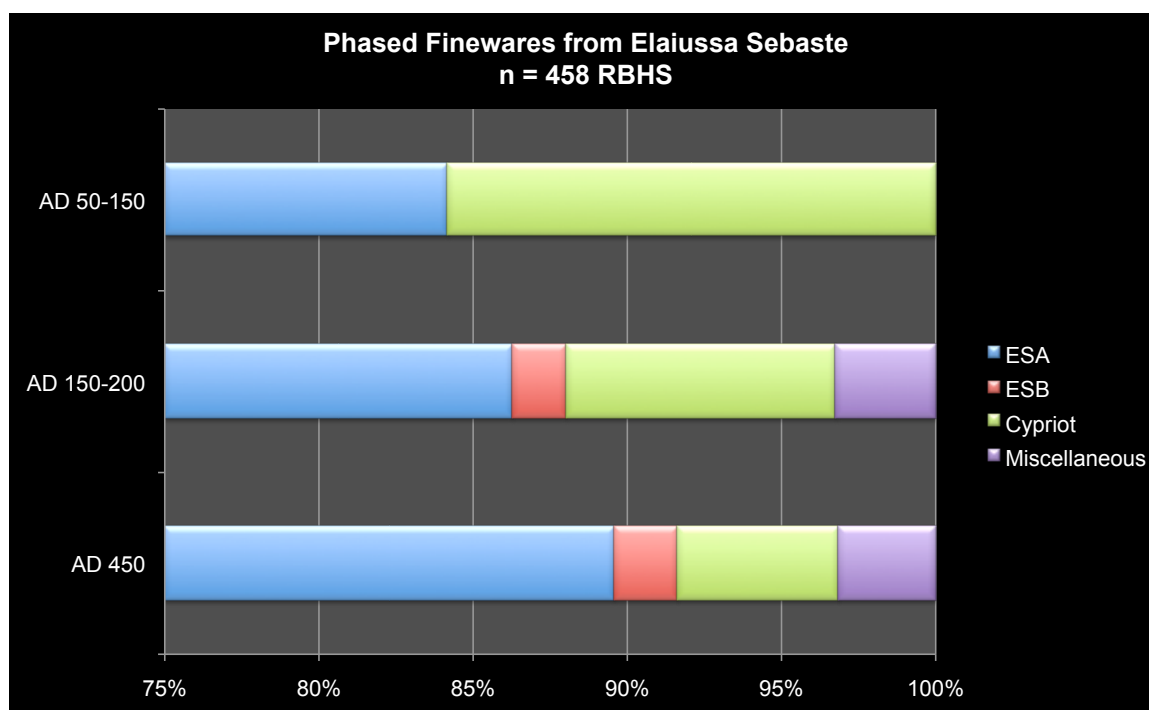


Figure 90. Phased finewares from Elaiussa Sebaste (author's graph, data from data from Equini Schneider and Morselli 2010, 186-224).

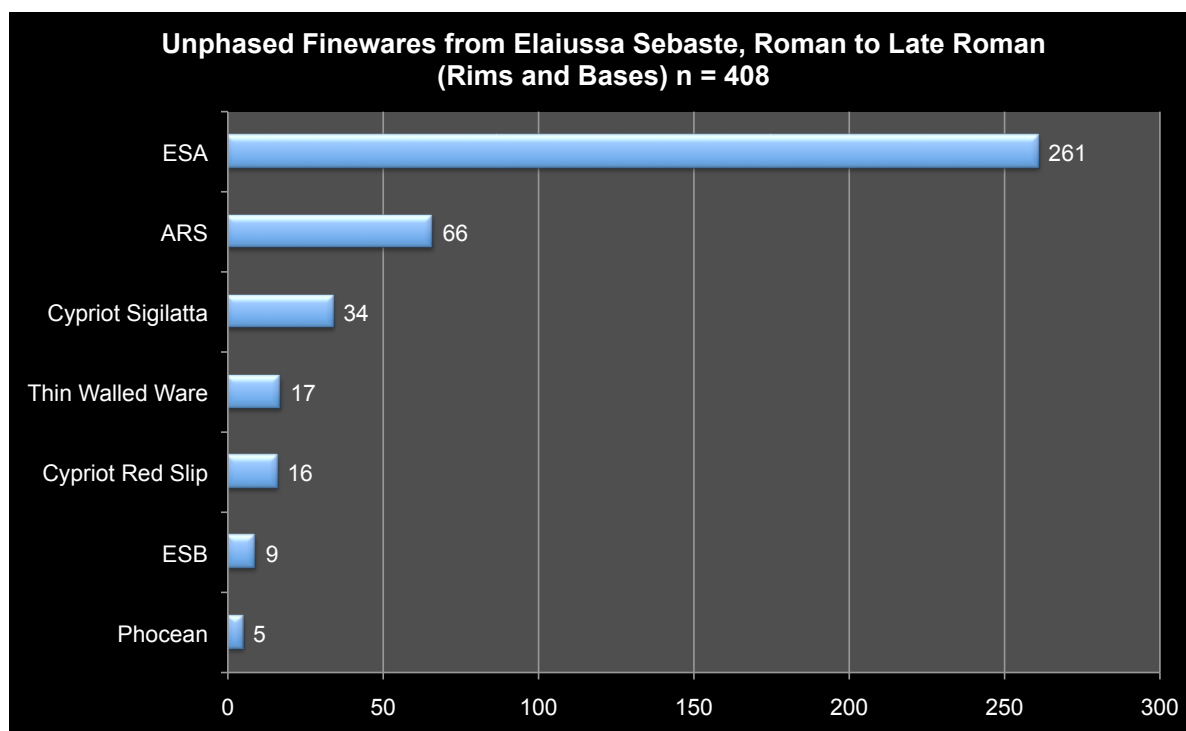


Figure 91. Unphased finewares from Elaiussa Sebaste (author's graph, data from Equini Schneider Schneider 2003, 649-661).

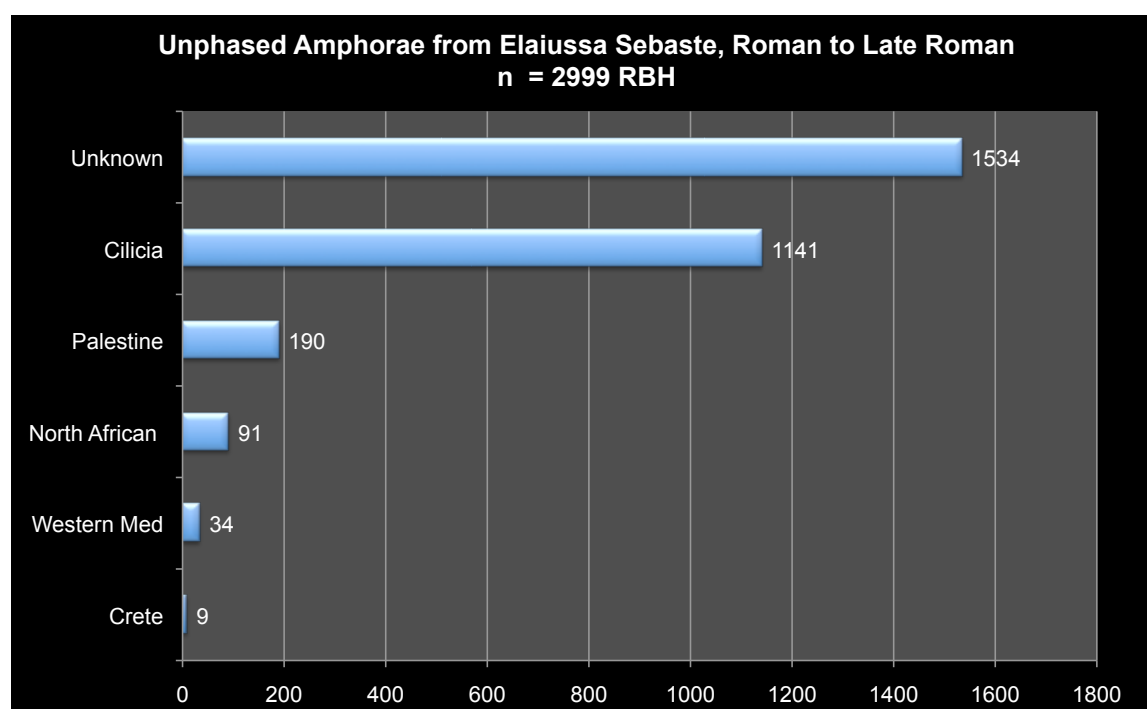


Figure 92. Unphased amphorae from Elaiussa Sebaste (author's graph, data taken from Schneider 2003, 682-687).

amphorae of the phased assemblages are dominated by Cilician types, though Aegean amphorae are also common. The dominance of Eastern material is also demonstrated by the finewares. Eastern Sigillata A (ESA) is the primary fineware type found in Phases 1-3 (Figure 90).⁶⁷⁶ The second most common type of fineware is Cypriot Sigillata.

The unphased assemblage shows similar trends to that of the phased assemblages. The finewares are primarily Eastern Mediterranean in origin, though ARS and even thin-walled ware are present in significant quantities making the percentage of western fine wares about 20% (Figure 91).

The amphorae are even more dominated by eastern forms (Figure 92). Unfortunately there are a large number of amphorae of unknown origin—this category includes both amphorae which could not be identified and amphorae which have been typed but for which the production site is unknown. Of the identifiable amphorae, 78% are Cilician and 13% are Palestinian with North African amphorae comprising only 6% of the assemblage. In general, this is an expected trend that is visible across the Mediterranean—finewares and amphorae were traded by different means. Finewares were much more widely distributed while amphorae tended to circulate in a much more regional context (Chapter 1). There are two other matters which should be kept in mind, however. First, most of the amphorae are Late Antique, and eastern amphorae types are extremely common. Second, nearly half of the Cilician amphorae are LR1s, which are being produced on site (this count does not include those amphorae found in the kilns).

Conclusions

Exports

The evidence for exported products in the three regions is at the same time both extensive and elusive. Relatively little systematic work has been done to document production, but what there is has produced very rich results. This is a likely indicator that what is known is

⁶⁷⁶ Phase 4 contained only six pieces of fineware.

just a small percentage of what exists. What can be seen from the evidence, however, is a diversification and specialization of production.

From Lycia, major exports certainly include purple-dyed wool, cloth and perhaps finished products, oil, salted-fish products (at least from the third century onwards), timber and pitch. The Neronian customs inscription from Andriake mentions a few specific products including murex, olive oil (interestingly not wine), saffron, pitch, figs and fish. The export of slaves is also mentioned. While notoriously difficult to trace, the slave trade was an important facet of the Roman economy⁶⁷⁷ and seems to have been particularly active along this coastline.

From Pamphylia, olive oil is frequently mentioned in the sources and appears in the archaeology. Timber and slaves were also major exports from Pamphylia. Pamphylia probably produced enough grain to support the local population, but it is unlikely that there would have been surplus grain for export.

From Rough Cilicia, wine is the most obvious export. Timber was also an extremely valuable asset, and in all likelihood, the Romans deforested the region. There is as of yet no direct evidence for the export of fish products or purple-dyed products. Here again, the export of slaves must be kept in mind.

Archaeological invisibles aside, perhaps the largest gap in our knowledge concerning the exports is the fact that, as yet, there has been no identification of a Lycian amphora type and no identification of Pamphylian kiln sites. It is interesting to consider the differences between the provinces discussed, in particular Lycia and Rough Cilicia. As the evidence stands today it would seem that Lycia focused on the exploitation of marine and forest resources for export while Rough Cilicia concentrated on the export of wine and oil. Yet while Cilicia has the evidence of production for exports in the form of amphorae kilns and a relatively widespread distribution of amphorae, at present, Lycia has a substantially larger number of oil and wine production facilities. In Rough Cilicia, there are some 30 press

⁶⁷⁷ For discussion on the difficulties of tracing the slave trade see, Harris 1980, Scheidel 1997, Harris 1999, Scheidel 2011b and Fentress 2011. See also various papers in JRA 2005 (volume 18).

facilities documented in an area of 300 km² and in Lycia there are hundreds in an area of approximately 200 km². This begs the question of the destination of the Lycian oil or wine. Was the produce being transported overland and by river to the cities of inland Lycia in skins or barrels, or was it aimed at maritime export, and we are simply missing the amphorae at this point?



Figure 93. A small bronze figure of an animal skin from the Antalya museum, date unknown (author's photo).

The use of skins,⁶⁷⁸ particularly for the localized transport of olive oil, is something that should be seriously considered for this region. This is not simply because there seems to be a lack of oil amphorae, but because of the strong pastoral focus of the region. The production of skins would have been a complementary aspect to animal husbandry practised for a more primary purpose such as wool production and food.

Initial assessment of amphorae at the Letoon sanctuary near Xanthos has not identified any oil amphorae from the Imperial period, as compared with numerous wine and fish-sauce amphorae.⁶⁷⁹ This is, as Lemaître points out, unexpected in a sanctuary context where one would envisage the usage of oil for a number of purposes. A small figurine (Figure 93) in the Antalya museum illustrates the usage of animal skins.

Imports

While there is ample evidence of export, there is relatively little information at present about the imports of southern Turkey. This is certainly due in part to the lack of published evidence with regard to classic import goods such as finewares, amphora-borne food products and marble types. In all probability, most of this region needed to import grain. Metal resources

⁶⁷⁸ See Marlière 2002, 22 for a brief discussion of oil in skins.

⁶⁷⁹ Lemaître 2006, 390.

are also lacking. Many of the cities minted bronze coins during some stages of their occupation⁶⁸⁰ and would have needed metals for this as well as for other everyday uses such as tools, pipes, vessels and so forth. Given the demonstrable wealth of the region as shown in the civic architecture, there was surely also a high demand for luxury goods.

The ceramic assemblages from Elaiussa-Sebaste are dominated by both local and regional types of amphorae and finewares. Finewares, as expected, are imported from further afield. Eastern Sigillata A, the dominant fineware in all Roman periods at Elaiussa, is imported from Syria. Western finewares do not appear in any significant quantity before ARS and even this is found in much smaller quantities than the eastern sigillatas. While there are no other ceramic assemblages from excavations published to this level, the ceramics from the Rough Cilicia Survey Project support the idea that relatively little was imported in the way of amphora-borne goods.

Production, Supply and the Economics of Absolute and Comparative Advantage

Let us contextualize what we have discussed for southern Turkey in terms of the principles of absolute and comparative advantage. On a large scale, I would argue that there are few products for which this region can be said to have an absolute advantage. The one obvious product for which this could be argued is timber, particularly in Lycia and Rough Cilicia. Otherwise, we should consider the principle of comparative advantage to be the driving force behind the surplus production of oil, wine, purple dye and perhaps pitch. The cultivation of olives and vines is possible in the majority of the Mediterranean climatic zone, which includes most of the Mediterranean coastline. Similarly, *murex*-based purple dye and salted fish products are necessarily produced on the coast, but this can be done around the entire Mediterranean. Most coastal zones, therefore, had the potential to be self-sufficient in these products.

⁶⁸⁰ Lycia did not mint bronze coins between the reign of Claudius and that of Gordian III, but rather imported bronze coinage from Rome (Katsari 2003).

While trade in items a region did not possess, or could not easily produce, had long before become common, as had trade in luxury goods, specialization in more common trade goods is one of the defining features of Roman trade. The degree of integration into the Mediterranean trade network allowed for a focus on those products which the region could produce more efficiently whilst importing those that would have required a greater degree of effort to produce in line with the principles of comparative advantage. In real terms, excepting fertile Pamphylia, the region under discussion would have struggled to produce cereal crops. While some degree of cereal cultivation was possible, widespread importation was necessary to support the population during the Roman period. The archaeological evidence shows a clear focus on the production of specific, and more efficient, products for export. Grain, finewares and, to some extent, cookwares, were imported.

Interestingly, this is an economic strategy that was not adopted by modern Turkey until 1980. The country profile of Turkey from the European Environment Agency states:

A Comprehensive Stability Program with the objective of introducing substantial economic reforms was prepared and applied on January 24, 1980. Thus, Turkey abandoned the industrialization model based on substitution of imports and adopted another model concentrating on and giving priority to exports. The reform policies implemented also adopted a change in the economy by gradually concentrating more on the market mechanisms instead of central administration. Export-led growth policies in Turkey have yielded a significant transformation in industrial relations and production since the 1980s.⁶⁸¹

The fact that the development of a production and trade system based on the principles of comparative advantage existed in the Roman period speaks to an awareness of economic prosperity and a substantial degree of economic rationale. This is not to say that the Romans thought in terms of economic policy, but simply that they realized they were operating in an environment which allowed for economic development and they seized the opportunity.

⁶⁸¹ European Environmental Agency, http://www.eea.europa.eu/soer/countries/tr/soertopic_view?topic=country%20introduction, last accessed July 20, 2012.

Port Development

In most cases, the primary factor behind the development of the large regional ports appears to be their placement for ease of access to the hinterland, i.e. their access to communication routes (Figure 94).⁶⁸² For the most part, these are not ideal harbour settings. Patara and Andriake were located at the mouths of major rivers. This meant that siltation was a continual problem, but the river valleys provided a route through the rugged landscape. The ports of Pamphylia were large and prosperous, taking advantage of major rivers and the only large swathe of fertile land along the coastline. The location clearly outweighed the cost of continual upkeep in terms of dredging and repair. Anemurium was located at the point of the shortest crossing to Cyprus and on the western edge of the basin of the Anamur Çayı. Elaiussa Sebaste and Corycus were both located less than 25 km from the 260 km long Göksu river (ancient Calycadnus). This type of placement also typically holds true for the large local ports.

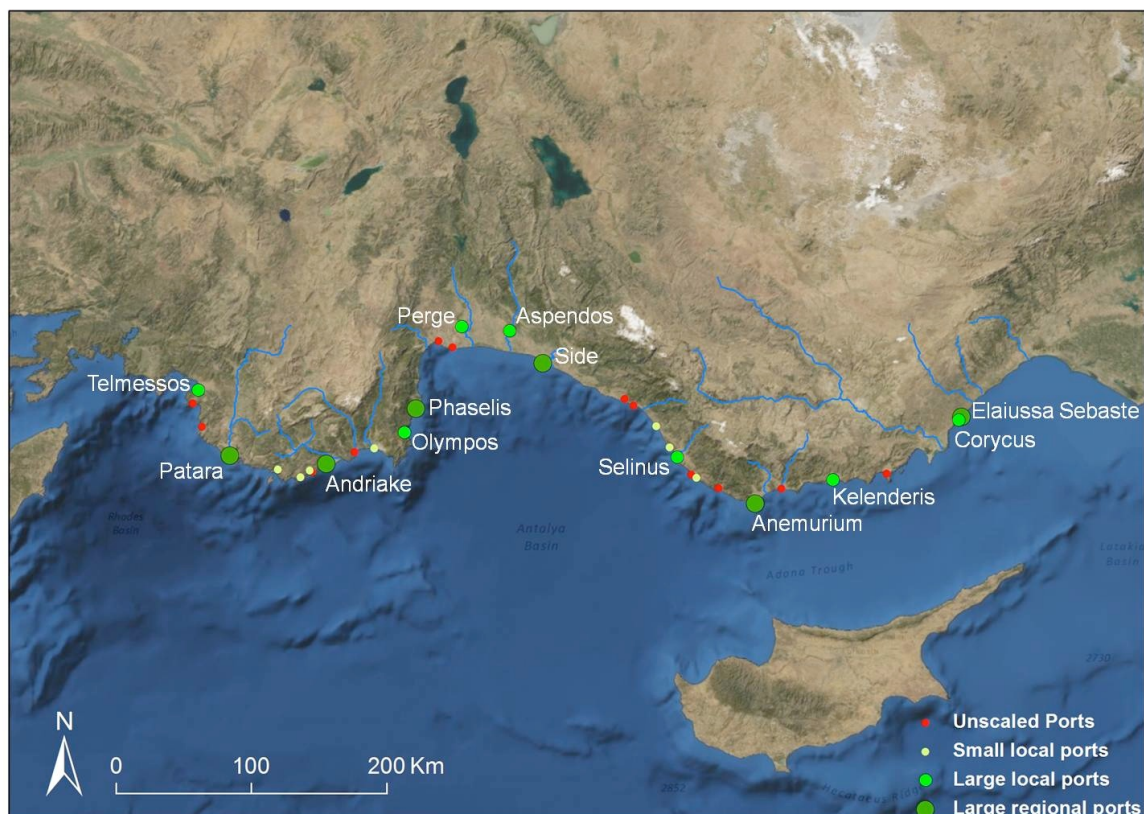


Figure 94. Map of suggested ancient port development (author).

⁶⁸² *C.f.* Vann 1997.

The small local ports, on the other hand, are often situated in a naturally ideal harbour setting; for example, Antiphellos, Aperlae, Teimioussa, Iotape and Antioch ad Cragum are all located in natural bays. These ports communicate primarily by sea and are less well-connected with the interior.

While I have charted a sequential progression of port development, moving from the simple to the complex, the small to the large (Table 4), the relationships between these ports are far from linear. In other words, trade does not simply happen upwards in this hierarchy. For example, all levels of ports might be engaged in some type of bulk export. We might also think of the larger local ports as assembly points for the products from the small local ports. It is primarily the upper two levels of ports that would have received bulk shipments as it is unlikely that the small local ports needed such shipments, nor would they necessarily have had the infrastructure to receive large ships or unload their cargo. The import demand of a

Modern Terms	Ancient Infrastructure	Ancient Activities	Possible Ports
Small local port	None, Beach, Breakwater, Quays	Villas, Small ports- very small scale export, mixed imports Not dealing with re-distribution	Antiphellos, Aperlae, Teimioussa, Gagai, Iotape, Antioch ad Cragum, Syedra
Large local port	Breakwater, Quays, Small warehouses	Moderate export on regional scale, perhaps some direct imports, but probably imports collected from the two higher port levels	Telmessos, Olympos, Phoinix (?), Perge, Aspendos, Selinus, Kelenderis
Large regional port / Emporium	Breakwater, Quays, Enclosed Harbour with depth of 2-3m, Warehouses for both imports and exports, Lighthouse, Possible Crane, Fresh water source	Substantial import/export. Involved in re-distribution on a regional level.	Patara, Andriake, Phaselis, Side, Anemurium Elaiussa Sebaste, Corycus
Large redistribution port / Emporium	Breakwater, Quays, Large Enclosed Harbour with depth above 3m, Extensive warehouses for both imports and exports, Lighthouse, Cranes, Fresh water source	Large scale imports / export and re-distribution in Mediterranean and beyond.	Portus, Alexandria, Ephesos

Table 4. Ancient Port Development (author).

city such as Patara would have been higher than that of Antiphellos, and we should therefore expect a different mode of supply.

Examples of the first three categories of ports can be found along the coast of Lycia, Pamphylia and Cilicia. The nearest large redistribution ports were Ephesos and Alexandria. The large regional ports of Lycia and Pamphylia are located under a day's sailing distance apart (i.e. Patara is less than a day's sail from Andriake and Andriake is less than a day's sail from Phaselis). Between Pamphylia and Rough Cilicia, however, the distance between the large regional ports is closer to a two-day sail, perhaps implying that the ports of Selinus and Kelenderis were well-equipped and could accommodate large ships if the need arose.

The papyrus *P. Bingen 77* provides supporting evidence for this model. The papyrus dates to the second century AD and is a register of ships coming into the port of Alexandria (Table 5). It gives the origin of the ship, the *naukleros*, the owner of the cargo, the tonnage and the type of cargo. All of the ships have a single origin, and most of the ships have either one or two types of cargo. Three of the ports of origin are from the areas under discussion: Gagai, Side and Anemurium. From Gagai is listed a rather small ship of only 45 tons containing wine and figs (a third category of cargo was perhaps present, but not preserved on the papyrus); from Side, a ship of some 210 tons with a cargo of pine trunks and oil; and a cargo of wine from Anemurium of unknown tonnage. Previously discussed in Chapter II,⁶⁸³ this register clearly indicates that ports of varying sizes were importing directly into Alexandria. They would have most certainly departed from Alexandria with a return cargo, often comprised of a heterogeneous combination of products based on the wide-range of products available at an emporium on the scale of Alexandria.

If we return to the shipping models discussed in Chapter III, the relationship between the ports can be examined in terms of wider trading patterns. It appears that the majority of ports along this coastline exported products for surplus sale, whether to larger ports within the nearby vicinity or farther afield such as Alexandria. Few of the cities would have been self-

⁶⁸³ In Chapter II, four basic trading patterns were identified on the basis of shipwreck evidence: direct export, trade between emporia, return cargoes and tramping. The ships in this papyrus belong to the first two patterns, direct export and trade between emporia.

Origin	Cargo	Tonnage	Naukleros	Owner of Cargo
Attalion, Crete	A. Oil B. 41 demi-jars of olive oil	—	—, son of Sozomenos	A. — B. Serenos
Aigeai, Syria	700 jars of red wine	60	Diodoros, son of Athenodoros	Diodoros, son of Athenodoros
Aigeai, Syria	Red wine	—	Demetrios, son of —	Demetrios, son of —
Ostia	Empty?	375 / 675	Lucius Pompeius Metrodoros	—
Lib—	Empty?	60	Publius Aelius Ann—	—
Diôru (near Alexanria by canal)	Olive oil	30	Basilon, son of Libus	Lord Caesar
Paltos, Syria	500 amphorae of wine	75	Zenon, son of Protos	Heliodoros
Laodiceia, Syria	Wine	60	A. Kassianos, son of Kyros B. Dominios, son of Agathokles	A. — B. Dominios, son of Agathokles
Gagai, Lycia	300 amphorae of Sidean Wine, Figs, —	45	Neon, son of Varos	Claudius Crispinus
Side, Pamphylia	A. 32— of pine B. 216 demi-jars of Aspendian olive oil	210	Gaius Ulpius Iason	A. Lord Caesar B. Numerios alias Kallistratos
Anemurium, Rough Cilicia	2,500 amphorae of Sidean wine	—	Ninos, son of Tounis	Ninos, son of Tounis

Table 5. The ships in *P. Bingen 77* (author).

sufficient and would have depended upon imports; for the lower two categories of ports, these were likely obtained through return cargoes, or trips to the large regional ports. The large regional ports would also have supplied themselves via return cargoes, but would also have been engaged in more purpose-driven exchange with other emporia. The degree of interdependence amongst these ports allowed for increased economic development as the ports facilitated the trade necessary to allow the regions to specialize in the production of goods for which they had a comparative advantage instead of simply striving for self-sufficiency.

Lycia, Pamphylia and Rough Cilicia experienced increased economic success during the Roman period: the pirates were pacified, resulting in a safer Mediterranean, and unification allowed for the creation of an extensive trading network.⁶⁸⁴ This success continued, and at times even increased during Late Antiquity as the movement of the capital to Constantinople provided increased demand for the products of southern Turkey.⁶⁸⁵ The prosperity so clearly visible in the remains today was due largely to their engagement in both the local and Mediterranean maritime economy and the subsequent adoption of sophisticated economic practices.

⁶⁸⁴ *Cf.* Scheidel 2011a and Wilson 2011b.

⁶⁸⁵ Kingsley and Decker 2001; Karagiorgou 2001; Mitchell and Katsari 2005.

CHAPTER V: SOUTHERN FRANCE

In the cultivation of the soil, the manners and civilization of the inhabitants, and the extent of its wealth, it is surpassed by none of the provinces, and, in short, might be more truthfully described as a part of Italy than as a province.⁶⁸⁶



Figure 95. Map of Roman ports of southern France (author).

This chapter provides a western counterpart for the previous discussion of Southern Turkey. It is primarily concerned with the ports and coastal regions of the Roman provinces of Gallia Narbonensis and Alpes Maritimae, coinciding with the modern regions of Languedoc and Provence-Alpes-Côte d'Azur (Figure 95).⁶⁸⁷ The coastline measures some 400 km and is bounded on the west by the Pyrénées and on the east by the Maritime Alps. The coastal region of southern France is geologically complex and includes numerous landscapes, ranging from the marshy lagoons of Languedoc, to the large alluvial plain of the Camargue

⁶⁸⁶ Pliny, *Natural History* 5.4.

⁶⁸⁷ The ports of Carsicis, Citharista, Tauroentum, Heraclea Caccabaria, Lero and Nicaea will not be discussed in detail owing to a lack of data.

delta at the mouth of the Rhône River, to the mountainous stretches of Provence Alpes-Cote d'Azur, where the western extent of the Alps meet the sea. The coastal plain of Languedoc is situated between the sea and the Montagne Noire and Cévennes mountain ranges of the Massif Central to the north, allowing for substantial arable development. The Rhône River, one of the most important rivers of the western Empire, bisects the study region with the marshy Camargue delta, an alluvial plain of approximately 1,450 km². This river facilitates crucial inland connections, linking the coastal cities of Narbonensis with those of the rest of Gaul. East of the Rhône the landscape changes as the low plains give way to more mountainous ranges where the Alps meet the sea, creating a dramatic coastline reminiscent of Lycia or Cilicia Trachea. This varied landscape allowed for different sorts of coastal communities to develop, as well different sorts of regional connectivity and development.

Prior to the Roman conquest, there was no single urban network along the French coast. Unlike southern Turkey, where substantial Hellenistic and earlier kingdoms were in existence by the time that Lycia, Pamphylia and Rough Cilicia were annexed into the Roman Empire, the French coast was a mixture of Greek colonies and Gallic tribes. While the Greeks established an early urban culture in Gaul, it did not often extend much outside their own walls. Gallic oppida, such as that at Lattes, can perhaps better be termed as “proto-urban” rather than urban.⁶⁸⁸ The Roman conquest, therefore, established the first cohesive urban system that the region had seen, creating an environment which was on the surface more Romanized than that of the eastern Empire.

Yet this urban situation is now reversed; unlike southern Turkey, southern France has maintained a high level of urbanism and population throughout more modern history, and many of the Roman sites are currently located beneath major cities. With the exception of various isolated monuments such as theatres, amphitheatres, aqueducts and occasional temples, the monumentality of the Roman Empire is no longer visible; a stark contrast with southern Turkey. The difference in archaeological preservation has led to vastly different archaeological traditions, in which ceramic assemblages are favored over architectural elevations, and where larger questions are generally asked of less overtly impressive

⁶⁸⁸ Fichtl 2005.

material. The types of evidence presented here in this chapter sometimes vary greatly from those seen in Turkey, but this helps to highlight both the difficulties and intricacies of cross-regional comparison within the Roman world. There is, therefore, much to be learned from this comparison.

There are several questions which I seek to address for this region. Perhaps the most important is that of chronology. Regional economies fluctuate through time, and identifying these changes in the archaeological record can be difficult. Southern France offers a rather different chronological view from southern Turkey, coming under Roman influence in the second century BC with the establishment of the Roman colony of Narbo Martius in 118 BC. The subsequent development from Roman frontier to an important and successful Roman province that could be likened to Italy by Pliny deserves close examination, as does its transformation in Late Antiquity which brought a number of further changes.

Other questions include the identification of the primary trading partners of the region and the degree to which these changed over time. This chapter also looks to examine the production of goods for export. Wine is, of course, the most easily documentable export for the region, but what other goods played a significant role in the coastal economy of southern Gaul? What were the major imports and from which regions did they come? Were imports limited to necessities or based on easy availability or economic strategy? Who were the people involved within the commercial sphere of the economy; what were their connections locally and externally?

Both production and consumption lead to important questions regarding regional connectivity and integration. Southern France occupied a crucial place in trade in the western Mediterranean, linking with the Mediterranean shores of Spain and Italy as well as northern Europe via the Rhône. Identifying patterns in this connectivity across space and time allows us to understand how southern Gaul functioned not only internally, but also as part of the wider western Mediterranean.

Before addressing individual sites, however, it is useful to make a point regarding rural settlement. The frequency of villa sites should be kept in mind throughout this chapter; they warrant discussion not only because they are a substantial factor in the settlement pattern of Roman Gaul, but also because they are largely absent from southern Turkey and it is interesting to explore the effects of the presence or absence of villas. As can be seen from Figure 96, the density of villas near the southern coast is substantial.⁶⁸⁹

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Many of the villas were involved in wine and oil production, as well as the production of amphorae and building materials; maritime villas also

occasionally had fish-tanks for raising live fish.⁶⁹⁰ While there are far too

Figure 96. Villa density in France (Villa, villae en Gaule romaine, http://www.villa.culture.fr/mediatheque/communs/images/grandFormat/1/80_2.jpg, last accessed July 20, 2012).

many villas to explore them

in detail in this chapter, several are considered below in order to present an idea of the rural settlement and its economic impact on the major coastal sites which acted as collection points for the agricultural material produced in the hinterland.

Pre-Conquest Trade

Large-scale trade between Italy and Gaul predates the Roman conquest of Gaul. From the end of the third century BC, Gaul was a major consumer of Italian wine. Greco-Italic and

⁶⁸⁹ The small coastal region completing lacking in villas on this map is the Camargue delta which has seen significant progradation since the Roman period.

⁶⁹⁰ Unusually, there are also isolated examples of fish tanks which do not appear to be directly related to villas (Lafon 2010).

Dressel 1 amphorae have been found in the hundreds of thousands. While the scale of the trade is undeniable, the nature of the trade is less evident. Until recently, it was believed that the wine trade was restricted to the Mediterranean regions of Gaul prior to the conquest of Narbonensis,⁶⁹¹ but new research has shown that this was not entirely the case. In particular, a landmark study by Matthieu Poux has excellently illustrated the chronological and geographical extent of the early Italian wine trade in Gaul, showing without doubt that the trade began well in advance of Roman conquest and reached the interior of Gaul from the end of the third century BC.⁶⁹²

Questions regarding the Gallic consumers of the Italian wine and the goods for which the wine was being traded remain controversial. Tchernia and Poux postulate that the trade was linked with Gallic elites.⁶⁹³ Poux regards the distribution of amphorae as representative of potlatches and associates numerous amphorae deposits with ceremonial sites where amphorae were “sacrificed” at feasts,⁶⁹⁴ a view with which Tchernia agrees.⁶⁹⁵ In terms of the items of exchange, Tchernia has convincingly argued that the wine was being traded primarily for slaves.⁶⁹⁶ Several historical sources reference the Gallic slave trade, most famously Diodorus Siculus who records that the Gauls would exchange one slave for an amphora of wine.⁶⁹⁷ Elizabeth Fentress has recently hypothesized that the potlatches were linked with the slave trade and that the ritual practice of “sacrificing” the wine amphorae with their blood red contents was directly related to slave raiding. The more slaves that a tribe could acquire and sell, the more wine could be consumed at the potlatch.⁶⁹⁸

While reservations have been expressed with regard to the views of Tchernia and Poux on the nature of the Italian-Gallic wine trade,⁶⁹⁹ their explanations are highly plausible. The most convincing aspect of Tchernia’s argument regarding the connection between the wine and slave trade is the chronology of the trade’s decline. The quantities of Italian wine

⁶⁹¹ Tchernia 1983, Loughton 2003, 186-187.

⁶⁹² Poux 2004. See also Poux 1999; Loughton 2003; 2009.

⁶⁹³ Tchernia 1983; Poux 2004; Tchernia 2011, 163.

⁶⁹⁴ Poux 2004, 529.

⁶⁹⁵ Brun *et al.* 2004.

⁶⁹⁶ Tchernia 1983, 95-99.

⁶⁹⁷ Diodorus Siculus 5.26.3; Cicero, *In Defense of Publius Quinctius* 6.2.

⁶⁹⁸ Fentress 2011, 65.

⁶⁹⁹ See, in particular, Loughton 2003; 2009.

amphorae in Gaul drastically decline around the middle of the first century BC and nearly ceased by 30 BC. It has been suggested that this decline is associated with the collapse of Italian viticulture, or the change from amphorae to barrels,⁷⁰⁰ but the link between the wine trade and slaving provides a much more credible reason for the cessation of the trade. As pointed out by Tchernia, Caesar's conquest of Gaul would have destroyed the source of slaves,⁷⁰¹ as slaving within the bounds of Roman territory was unacceptable.⁷⁰² The continued importation of Italian wine into pre-conquest Britain suggests that the trade simply moved north until the Claudian conquest.⁷⁰³ The Italian wine amphorae in Gaul provide evidence of what was a very specific class of trade during the Republican period. As will be seen throughout this chapter, the trade that follows surely builds upon this earlier trade, but as it occurs within the bounds of the Roman Empire, it has a distinctly different nature.

The Ports

Colonia Narbo Martius

Narbo Martius, modern day Narbonne, was founded in 118 BC; it was the first of the Roman colonies in Gaul and was settled with a civilian rather than a military population. After 45 BC, however, Caesar re-founded the city as a colony for the tenth legion with the name of *Colonia Julia Paterna Decumanorum*. Strabo records that by the Augustan period, Narbo was the greatest emporium of the region.⁷⁰⁴ The foundation of the colony coincided with the construction of the Via Domitia, built in 118 BC by the proconsul Domitius Ahenobarbus. This road, a portion of which is still visible in the centre of Narbonne, was the primary road through southern Gaul and connected Italy to Spain. Narbo was also the terminus of a road from Tolosa (modern Toulouse). The city suffered extensive damage during a fire in AD 145, sustaining significant enough damage for Antoninus Pius to step in and assist with the rebuilding.⁷⁰⁵

⁷⁰⁰ See Tchernia 1983, 104; 1986 and 2011, 351-375 against the decline of Italian viticulture and Poux 2004, 202-205 for a rebuttal of barrel hypothesis.

⁷⁰¹ Tchernia 2011, 164, 359.

⁷⁰² C.f. Fentress 2011, 66.

⁷⁰³ Carver 2001; Morris 2010, 32-37.

⁷⁰⁴ *Geography* 4.1.6.

⁷⁰⁵ *CIL* 12.4342.

Located beneath the modern city of Narbonne, little remains of Roman Narbo Martius (Figure 97). The most striking remains are the first-century BC *horreum*, located in the centre of the modern city. The remaining sections of the *horreum* include the subterranean northern and southern wings of the structure, and the beginning walls of the southern wing. The wings contain a series of small individual rooms which open off a central hallway and

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Figure 97. Plan of Narbo Martius (Sanchez 2004, Figure 6).

measure between 4 and 5 m² each with doorways of an average of 0.6 m wide and 1.8 m high.⁷⁰⁶ At the northwest corner is an additional series of six rooms and a staircase which would have led to the upper stories of the *horreum*.

Outside the main urban centre, excavations have taken place at the Clos de la Lombarde, an area of approximately 1 hectare which contains a number of elite Roman houses.⁷⁰⁷ The combined amphora report from three of the excavated houses (IV, VI and VII) provides an interesting look at domestic consumption from the first century BC through the fourth

⁷⁰⁶ L'Horreum, <http://www.amisdesmusees-narbonne.org/musees/horreum.html>, last accessed July 20, 2012.

⁷⁰⁷ Sanchez 2004.

century (Figure 98). The pattern is initially very typical with the majority of the first-century BC assemblages being almost entirely dominated by imports of Italian amphorae. By 30 BC, the switch from Italian to Spanish imports occurs; the assemblages are then dominated by Tarraconensian amphorae though Baetican amphorae are also common. The first century AD is also characterized largely by Spanish amphorae. What is interesting is actually the extreme lack of Gallic amphorae when compared with other contemporary sites. While the

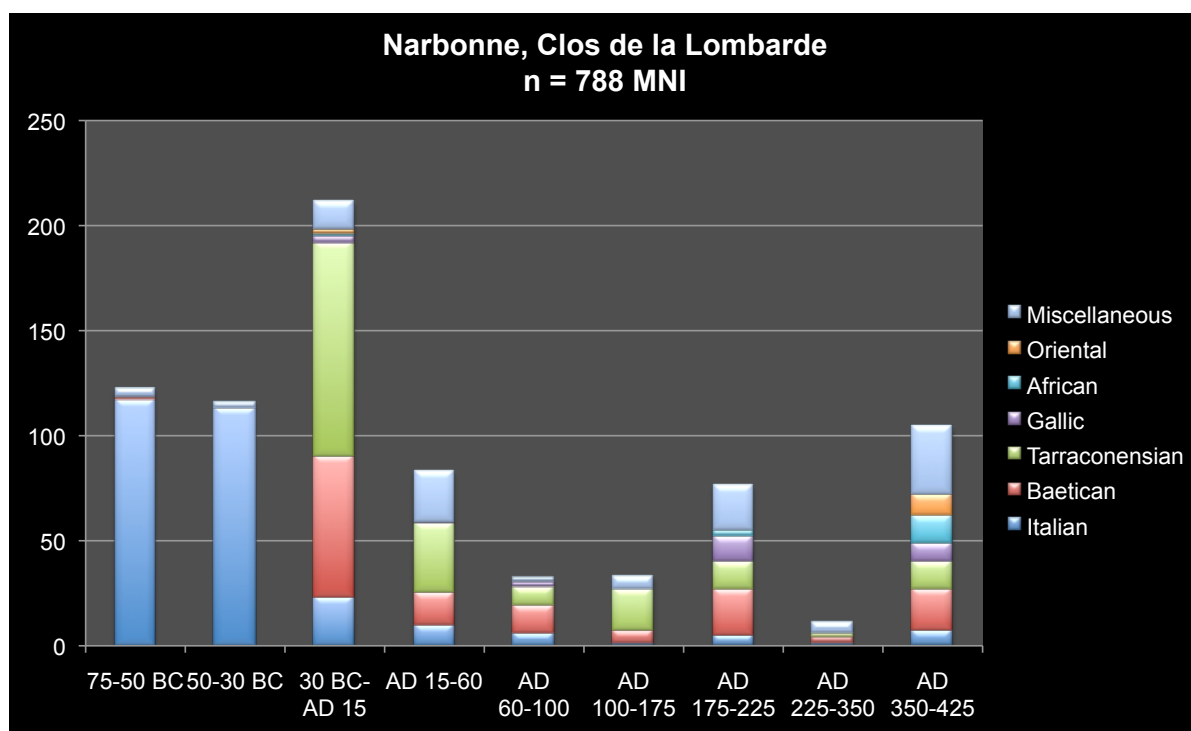


Figure 98. Graph of amphorae from the houses of the Clos de la Lombarde, Narbonne (author's graph, data from Sanchez 2004).

late first century through the second century saw an overall decline in the number of amphorae, one would still expect to see Gallic amphorae during this period in far greater numbers. The reasons for their absence is unknown.

To date, the amphorae from the port areas of Narbo Martius are only published up the end of the first century BC. As discussed in Chapter II, these show a similar pattern to that evidenced in the domestic assemblages; around 30 BC the imported amphorae change drastically from being dominated by Italian wine to being dominated by Tarraconensian wine. This trend was previously illustrated in Chapter II.

Narbo Martius was served by a number of harbour lagoons between the city itself and the Mediterranean. Excavations within the lagoons (Figure 99) are ongoing and revealing particularly interesting facets of the ancient harbour structures. Full reports have not yet been published, but excavations at the site of Port-la-Nautique in 2010 revealed warehouses with *dolia* in conjunction with a 60 m long canal.⁷⁰⁸ A kiln has also been discovered, along with a massive deposit of oyster shells. Two wooden piers, maintained between the second and fifth centuries AD, have also been uncovered at the site of Castelou.⁷⁰⁹ At Port-la-Nautique, aerial

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Figure 99. Narbo Martius and the Port Sites (Sanchez 2004, Figure 8).

⁷⁰⁸ Communication du CNRS, <http://www2.cnrs.fr/presse/communique/2023.htm>, last accessed July 20, 2012.

⁷⁰⁹ CNRS, Institut des sciences humaines et sociales, http://www.cnrs.fr/inshs/recherche/fouilles_narbonne.htm, last accessed July 20, 2012.

⁷¹⁰ *Ibid.*

photography has highlighted a circular basin of some 80 m in diameter, called the Lac de Capelle, where excavations began in 2011.⁷¹⁰ This is currently reconstructed to resemble the circular harbour at Carthage (Figure 100).

The epigraphic record of Narbo Martius is particularly rich with regard to those involved in trade. There was also a *stat* Figure has been removed due to copyright restrictions
io of the shippers of Narbo
in the *Piazzale delle*
Corporazioni at Ostia
(Figure 101) depicting a
seamark and a ship.⁷¹

There are seven epigraphic
a t t e s t a t i o n s o f
navicularii.⁷¹² There are
five attested *mercatores*,
four of whom are simply
listed as a *mercator*⁷¹³ and
one as a *mercator*
panucularius,⁷¹⁴ and one
negotiator.⁷¹⁵ The exact

Figure 100. Reconstruction of new excavations at Port-la-Nautique (CNRS, Institut des sciences humaines et sociales, <http://www.cnrs.fr/inshs/recherche/docs-actualites/narbonne-Capelle.jpg>, last accessed July 20, 2012).

meaning of *panucularius* is not known, but it is suggested that it is a diminutive of *panus* and perhaps means thread.⁷¹⁶ Indeed, there are several inscriptions related to the textile industry: three inscriptions relate to clothes dealers (*vestiarii*),⁷¹⁷ a *linarius*,⁷¹⁸ and a *lintiarius*⁷¹⁹ (both linen merchants), two *lanarii* (wool workers),⁷²⁰ a *sagarius*,⁷²¹ and a

⁷¹¹ *CIL* 14.4549.32.

⁷¹² *CIL* 12.4398; 4406; 4493; 4494; 4495; 5972 and *AE* 1905.8.

⁷¹³ *CIL* 12.4492; 5971; *AE* 1908.185; *AE* 1916.41.

⁷¹⁴ *CIL* 12.5973.

⁷¹⁵ *CIL* 12.4496.

⁷¹⁶ Bonsangue 2002, 211.

⁷¹⁷ *CIL* 12.4420; 4520; 4521.

⁷¹⁸ *CIL* 12.5969.

⁷¹⁹ *CIL* 12.4484.

⁷²⁰ *CIL* 12.4480; 4481.

⁷²¹ *CIL* 12.4509.

purpurarius.⁷²² Around AD 400, there was a *procurator bafii Narbonensis* (procurator of dye-works); while it is not known for certain whether dye workshops existed at Narbo during the earlier Roman Empire, it would seem probable.⁷²³

Metallurgical trades are also well-represented in the epigraphic record. Three *aurifices* (goldsmiths) are attested,⁷²⁴ along with one *faber argentarius* (silversmith),⁷²⁵ and a *faber aerarius* (bronze maker),⁷²⁶ as well as three locksmiths (*limarii*),⁷²⁷ a *ferrarius* (iron merchant),⁷²⁸ a *conductor ferrariarum* (a lease holder for the iron mines),⁷²⁹ a ring-maker (*annularius*),⁷³⁰ and a *vascularius* (maker of metal vessels).⁷³¹

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There is also a *salinator* (either a salt merchant or producer),⁷³² and an *olearius* (oil merchant).⁷³³ There are numerous bankers including five *argentarii*,⁷³⁴ a *coactor argentarius*,⁷³⁵ a *mensularius* (money changer)⁷³⁶ and a *nummularius* (probably related to changing foreign currency).⁷³⁷

Figure 101. Sketch of the mosaic in the *statio* of Narbo Martius at Ostia (NSc 1916, p. 327).

There is a particularly large amount of epigraphy related to those in the service industry, which must have been very

⁷²² CIL 12.4507, 4508.

⁷²³ Notitia Dignitatum 11.73.

⁷²⁴ CIL 12.4391; 4464; 4465.

⁷²⁵ CIL 12.4474.

⁷²⁶ CIL 12.4473.

⁷²⁷ CIL 12.4476; 4523; 4733.

⁷²⁸ CIL 12.4532.

⁷²⁹ CIL 12.4398.

⁷³⁰ CIL 12.4456.

⁷³¹ CIL 12.4519.

⁷³² CIL 12.5360.

⁷³³ CIL 12.4499.

⁷³⁴ AE 2002, 936; CAG-11-01, p 454; CIL 12.4457, 4458, 4459.

⁷³⁵ CIL 12.4461.

⁷³⁶ CIL 12.4491.

⁷³⁷ CIL 12.4497.

active in a busy port such as Narbo Martius. These include doctors, cooks, butchers, bakers, bath attendants, construction workers, sandal makers and no less than six barbers.⁷³⁸ Yet again, there is ample evidence of specialization within the realm of commerce and industry.

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Agatha

Agatha (modern Agde) is believed to have been a Massaliote colony founded in the fifth or fourth century BC. The city was located at the estuary of the Hérault river. Despite the excellent museum which houses substantial underwater finds from the area, very little is understood about the ancient city and port. One of the major exports of the city was basalt extracted from the quarries at Embonne near Cap d'Agde and used primarily for millstones (Figure 102) which were widely distributed.⁷³⁹ A wreck was discovered off the île de Brescou which contained a cargo of partially finished querns believed to be from Embonne, but it was unfortunately looted before it was thoroughly investigated.⁷⁴⁰

Figure 102. Graphic reconstructions of millstones from Embonne / Cap d'Agde found at the site of Nages (Reille 2002, Figure 6).

In general, shipwrecks around Agde are very numerous; there are nineteen referenced by Parker along with the suggestion of an additional nine for the Roman period.⁷⁴¹ Finds from the underwater excavations presented in the museum include a very wide range of amphorae, finewares, *dolia*, ingots, millstones, agricultural tools and statuary, indicating an active settlement in antiquity.

⁷³⁸ These have been collected and summarized in Bonsangue 2002, 227-228.

⁷³⁹ Millstones from Embonne make up the majority of millstones at sites like Ambrussum and Nages (Reille 2000; 2002). Examples have also been identified in Ampurias (Williams-Thorpe 1988).

⁷⁴⁰ Gallet de Santerre 1962, 622; Parker no. 114.

⁷⁴¹ Parker 1992, 42-47.

Lattara

Lattara (modern Lattes) was an indigenous Celtic site inhabited since c. 525 BC. In antiquity the site was situated on the shores of a lagoon at the mouth of the Lez river. From its inception, the site's importance stemmed from its trading connections; Etruscan artefacts are very common during the early period of occupation, and the site was perhaps home to an Etruscan trading post. Trade with Massaliote Greeks and then Italians is also well documented.⁷⁴² The importance of the port is interestingly revealed by the fact that it continued to be used for trade after the town itself ceased to be inhabited.⁷⁴³

The lagoon provided an ideal location for the harbour; while siltation has today far removed the port site from the lagoon, it seems to have been kept to a minimum during antiquity due to the regular currents of the Lez.⁷⁴⁴ Excavations between 1996 and 2001 covered an area of

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Figure 103. Phases 1-4 of the port at Lattara (Garcia 2008, Figure 95).

⁷⁴² Luley 2011.

⁷⁴³ Garcia 2008.

⁷⁴⁴ *Ibid.*, 133.

2,500 m², extensively documenting the ancient port.⁷⁴⁵ Despite the activities documented as early as the sixth century BC, the earliest port structures date to the second century BC. Five phases of construction have been identified (Figure 103): Phase 1: 175-125 BC; Phase 2: 125-25 BC; Phase 3: 25 BC -AD 75; Phase 4: AD 75-225; Phase 5: AD 225-300.

The largest number of improvements to the port facilities were made during Phase 3. During this time, two warehouses with sunken *dolia* were installed (Building 26/3-6 and Building 26/9 on Figure 104).⁷⁴⁶ In the first building (26/3-6), the pitched *dolia* are estimated to have held an average of perhaps 1,000 litres each. With the nine *dolia* actually remaining, this would total some 9,000 litres of wine. It is estimated, however, that the building would have originally held some 35 to 40 *dolia*, with a potential maximum storage capacity of 40,000 litres.⁷⁴⁷ The *dolia* in the second building (26/9), of which three survived, were probably not for the storage of wine as they were not pitched, but rather for other miscellaneous products. There would not have been direct access to the ships in the port from this warehouse.⁷⁴⁸

The other major structure built during this phase was a square building measuring 80 m² (Building 34/20 on Figure 104).⁷⁴⁹ In the centre of the building are the bases of four symmetrically-placed columns. Archaeological remains suggest that the building was not covered in the centre, and this has led the excavators to suggest that this building could function as a type of lighthouse, though its construction method is not akin to that of a traditional lighthouse.⁷⁵⁰

At the end of the first century AD, the *dolia* in Building 26/3-6 were filled in, and the organization of the room was changed. It is proposed by the excavators that the building was still used to store trade goods, but in amphorae and barrels as opposed to *dolia*.⁷⁵¹ The port continued to be used until the end of the third century AD, and the storage room was certainly still functioning. This is particularly interesting as the city of Lattara itself was no

⁷⁴⁵ *Ibid.*, 134.

⁷⁴⁶ *Ibid.*, 138.

⁷⁴⁷ *Ibid.*, 139.

⁷⁴⁸ *Ibid.*

⁷⁴⁹ *Ibid.*, 140.

⁷⁵⁰ *Ibid.*

⁷⁵¹ *Ibid.*, 144-145.

longer inhabited to any visible extent at this stage.⁷⁵² It appears that the port continued to be used as a point of transshipment following the cessation of habitation in the city itself. This was perhaps due to the fact that Lattara was situated at the half way point between the ports of Narbo Martius and Fossae Marianae. Without Lattara, the distance between ports on this

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Figure 104. Phase 3 of the port at Lattara (Garcia 2008, Figure 99).

stretch of coastline was greater than a day's journey and therefore not ideal were a problem to arise at sea.

Coinciding with the period of expansion of the port, a *schola* was built in Lattara in the first century AD. As an inscription shows, the *schola* was the meeting place of the collegium of *fabri* and *utricularii* of Lattara.⁷⁵³ *Utricularii* were overland merchants that transported wine or oil in skins.⁷⁵⁴ Interestingly, of the thirty inscriptions mentioning *utricularii*, twenty-seven are from Gaul.⁷⁵⁵

⁷⁵² *Ibid.*, 146.

⁷⁵³ *AE* 1965.164.

⁷⁵⁴ Kneissel 1981; Deman 2002.

⁷⁵⁵ Of the three not in Gaul, one is from Latium and two are from Dacia. Within Gaul, one is from Alpes-Maritmae, seventeen are from Gallia Narbonensis and nine are from Lugudunensis.

During the latter half of the first century AD, a kiln complex with multiple workshops was installed near the port. The site was producing Gauloise 1 and 4 amphorae, as well as common wares, bricks and tiles.⁷⁵⁶ The scale of production was large, as indicated by a large deposit of kiln debris with a surface area of 100 m²; the deposit contained the remains of a minimum number of 1,507 vessels (55,000 sherds), 44% of which were Gauloise amphorae (40% Gauloise 1, 4% Gauloise 4).⁷⁵⁷ The production of amphorae is perhaps associated with the expansion of viticulture in the area around Lattara during this period.

Probable evidence of fish sauce production has also recently been discovered at Lattara. While vats have not been discovered, excavation of a well fill has revealed thousands of fish bones, the majority of which are sardines. It has been suggested that this is the refuse from *garum* production.⁷⁵⁸

Colonia Arelate

Colonia Julia Paterna Arelate Sexterum (modern Arles) was founded in 46 BC on a low hill on the left bank of the Rhône for the settlement of the sixth legion after the civil wars. The colony was situated near to an earlier Gallo-Greek city which had its beginnings as a Phocæan settlement. The earliest major Roman influence in the area significantly predates the colonial establishment; in 102 BC Marius constructed canals linking Arelate to the sea. In 49 BC, Caesar used the shipyards at Arelate to construct ships for the siege against Massalia during the Civil Wars. The city of Arelate was developed under Augustus, during which time the theatre was probably built. Ramparts were also built, but were rapidly outgrown as evidenced by the fact that the Flavian amphitheatre was constructed atop them. Arelate was the most southerly bridging point over the Rhône; a pontoon bridge connected Arelate to the suburb of Trinquetaille, a substantial peripheral settlement with a port, elite houses and a forum-like area.⁷⁵⁹

⁷⁵⁶ Piqués and Martinez 2008, 181-182.

⁷⁵⁷ Atelier d'amphores gauloises, http://www.lattara.culture.fr/index.php?id_periode=7&id_fiche=3&fichier=07_03.xml&ver=acc, last accessed July 20, 2012.

⁷⁵⁸ Piqués and Martinez 2008, 182-183.

⁷⁵⁹ Sintès and Heijmans 1994, 149.

Over the past twenty years, several underwater excavation projects have been carried out along the right bank of the Rhône at Arles (Figure 105). Amongst these, the area of the so-called 'Gisement A' has produced a particularly large ceramic assemblage consisting of approximately 2,000 ceramics, about 1,000 of which are amphorae. The excavators have suggested that the amphorae represent a dump where recently emptied amphorae were discarded. Some of the amphorae have been slashed at their necks and toes, seemingly to facilitate the emptying.⁷⁶⁰ Exactly what type of vessels the liquids were emptied into is unknown; perhaps the contents were transferred into smaller vessels, such as glass bottles, for individual sale.

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Figure 105. Arelate with location of underwater excavations (Long et al 2006, Figure 1).

During the first century BC, Italian wine amphorae dominate the assemblages from the Rhône. By the first century AD, Italian amphorae disappear and are replaced by Spanish amphorae holding various goods; the majority of the amphorae are Dressel 7-11 fish sauce amphorae along with Beltrán II B, but Haltern 70 and Dressel 20 amphorae are also present in significant numbers. Gallic amphorae come in during the end of the first century AD and dominate the second- and third-century assemblages. In addition to the Gallic amphorae,

⁷⁶⁰ Long *et al.* 2006, 584.

there are similar numbers of Spanish and African amphorae during the third century (22 and 19 respectively). By the fourth century, there are far fewer amphorae and during the fifth century only African and eastern types are present.⁷⁶¹

As at Narbo Martius, merchants and traders are common in the epigraphic corpus. There are six epigraphic attestations of *navicularii*, and these are typically related to groups of *navicularii*. Two inscriptions from Arelate relate to the *navicularii marini Arelatenses*.⁷⁶² The *navicularii marini Arelatenses* are also the recipients of a letter from the prefect of the *annona* which was inscribed on a reused bronze plate found in Beirut.⁷⁶³ A sarcophagus from Arelate also bears the epitaph of M. Atinius Saturninus, *apparitor* of the *statio* of the *navicularii*.⁷⁶⁴ Two altars also bear epitaphs of individual *navicularii*.⁷⁶⁵ Another sarcophagus bears the epitaph of Q. Navicularius Victorinus, possibly a freedman who probably worked as a *navicularius*.⁷⁶⁶

There are also three inscriptions mentioning the *nautae Druenticii*, *nautae* of the Durance river. Two are from Arelate; one refers to an individual *nauta* and one to the group of *nautae*.⁷⁶⁷ The third is from nearby Ernaginum and is the epitaph of a member of the *navicularii marini Arelatenses* (already mentioned above) and a patron of the *nautae Druenticii*.⁷⁶⁸ Interestingly, however, there are no inscriptions relating to *nautae* of the Rhône, despite the fact that they are relatively common in Lyon. Two of the *nautae Druenticii* were also members of the corporation of *utricularii*, a corporation which is attested four times in the epigraphy of Arelate,⁷⁶⁹ and once in the above-mentioned inscription from Ernaginum.

⁷⁶¹ Long *et al.* 2006.

⁷⁶² *CIL* 12.672; 692.

⁷⁶³ *CIL* 3.14165.8.

⁷⁶⁴ *CIL* 12.718.

⁷⁶⁵ *CIL* 12.704; 982 (actually from Ernaginum).

⁷⁶⁶ *CIL* 12.853.

⁷⁶⁷ *CIL* 12.721; 731.

⁷⁶⁸ *CIL* 12.982.

⁷⁶⁹ *CIL* 12.700; 729; 732; 733.

There are several inscriptions relating to the *fabri navales*,⁷⁷⁰ as well as an *architectus navalis*.⁷⁷¹ A recently discovered altar also has a relief of a boat along with various building tools including a plumb line and an adze.⁷⁷² As attested by Caesar, Arelate had a shipyard since at least the first century BC.⁷⁷³

Two inscriptions regarding corporations of *lenuncularii* (those who sail small vessels) were

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found in 2007 and published in 2009. These are particularly interesting as *lenuncularii* were previously only known from Ostia where several groups are attested epigraphically.⁷⁷⁴ Various other corporations in Arelate include the *fabri tignuarii* (builders) which are attested six times.⁷⁷⁵

Figure 106. Drawing of the mosaic in *statio* 27 at Ostia (NSc 1914, p. 286).

It seems probable that Arelate had a *statio* in the *Piazzale delle Corporazione* at Ostia. *Statio* 27 at Ostia contains a mosaic of a river with a pontoon bridge at the top and three mouths at its bottom. It has been suggested that this is the

Tiber or the Nile,⁷⁷⁶ but I would argue, as did Meiggs, that it is actually the Rhône (Figure 106)⁷⁷⁷ as Arelate was known for its pontoon bridge and Pliny records that the Rhône had three mouths.⁷⁷⁸

⁷⁷⁰ CIL 12.700; 730; 5811.

⁷⁷¹ CIL 12.723.

⁷⁷² AE 2003, 1079.

⁷⁷³ *The Civil Wars* 1.36.

⁷⁷⁴ Christol and Fruyt 2009; Christol and Tran forthcoming.

⁷⁷⁵ CIL 12.719; 722; 726; 728; 736; 738.

⁷⁷⁶ Becatti 1961, 64-85.

⁷⁷⁷ As did Meiggs (1973).

⁷⁷⁸ *Natural History* 5.4. The ancient authors differ on the number of mouths of the Rhône, though the majority recorded that there were three mouths (Strabo, *Geography* 1.4.8).

At Arelate, Caius Junius Priscus repaired a portion of the amphitheatre and was in turn granted a section of reserved seats by the town council which were inscribed for the *severi Augustales* and *navicularii* or *nautae*.⁷⁷⁹ Similarly at Nemausus, 65 seats were reserved for *nautae* of the Rhône, Saône, Ardèche, and Ouvèze rivers. These were groups of people who were not native to Nemausus, but were nevertheless important to its civic life.⁷⁸⁰

Arelate was one of the coastal (or relatively coastal) customs points for the *Quadragesima Galliarum*, the 2.5% customs duty levied on incoming and outgoing goods in the Gallic provinces. It was probably initiated under Augustus and there were numerous customs points throughout the wider Gallic provinces. Two inscriptions from Arelate refer to the *Quadragesima Galliarum*.⁷⁸¹ More importantly, the existence of a *statio* at Arelate for the collection of the customs dues is explicitly known from several lead seals found in Lyon and stamped ST(ationis) AREL(atensis) INP(in p...).⁷⁸² There are five such seals, which were found in the river bed near the ancient

harbour at Lyon (Figure 107). They are now part of the Récamier Collection (nos. 64-68; 731, 732).⁷⁸³ The seals are oval and measure between 18-22 mm by 15 mm and are decorated with either the figure of a genius or of a woman holding a patera and a horn of plenty. These seals apparently served to mark portions of cargo, or to seal the record of the cargo that had already

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passed through a customs point. As has been discussed elsewhere in this thesis, customs were only exacted once within a single province, so it would have been important to prove to the customs officials at Lyon, the site of another *statio* for the *Quadragesima Galliarum*, that the required customs had already been paid.

Figure 107. Lead seals of the customs *statio* at Arelate (Grenier 1934, Figure 228).

⁷⁷⁹ *CIL* 12.697.

⁷⁸⁰ *CIL* 12.3316.

⁷⁸¹ *CIL* 12.717; 724.

⁷⁸² Grenier 1934, 654.

⁷⁸³ Dissard 1905.

Like most of the ports discussed, Arelate had a concentrated urban population employed in non-agricultural trades. This implies that much of the population would have needed to purchase grain or flour. In the case of Arelate, we are fortunate enough to have some indication of how the urban population was supplied with flour. At Barbegal, 7 km to the east of Arelate, a large hydraulic grain mill was constructed in the first part of the second century AD (Figure 108).⁷⁸⁴ The

mill was constructed of two parallel rows of eight overshot water wheels and powered by an aqueduct which ran above the mill itself. Calculations suggest that the mill could produce a maximum of nine tonnes of milled flour per day, with a probable average of 4.5 tonnes a day which would equate to supply approximately 12,500 people with 350 g of flour per day.⁷⁸⁵

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Figure 108. Aerial view of the Barbegal Mill (Leveau *et al.* 2000, Figure 2).

The city of Arelate suffered general decline in the third century before relative revival beginning in the fourth century. Arelate became the seat of the Praetorian Prefect in 395, and its economic vitality was extolled in the literary sources.⁷⁸⁶ The reality was, of course, slightly different, but I will return to this in the concluding discussion.

Fossae Marianae

In 102 BC, Marius ordered the construction of a canal linking the Mediterranean and Arelate in order to circumvent the difficulties of navigating the mouth of the Rhône. Strabo records

⁷⁸⁴ Leveau *et al.* 2000.

⁷⁸⁵ Sellin 1983, 101.

⁷⁸⁶ See Loseby 1996 for a thorough discussion on Arelate in Late Antiquity.

that the canal was presented to the Massaliots to administer and that they gained significant revenue from the exacting of tolls from those sailing up or down the canal.⁷⁸⁷ While the site of Fossae Marianaе, the harbour at the mouth of the canal, has been positively confirmed at modern Fos-sur-Mer, the location of the canal remains unknown.⁷⁸⁸

The amphorae from Fos have been published in a somewhat unusual manner as they have been gathered from various collections, including the museum of Istres, and the collection of underwater diving clubs.⁷⁸⁹ As a result, the amphorae are unstratified, and as they are not from controlled contexts, interpretations drawn from them must be limited. That being said, the collection includes 1,357 amphorae (1,303 of which are Roman in date) and as such provides a look at the types of amphorae circulating in the area during the Roman period (Figure 109).

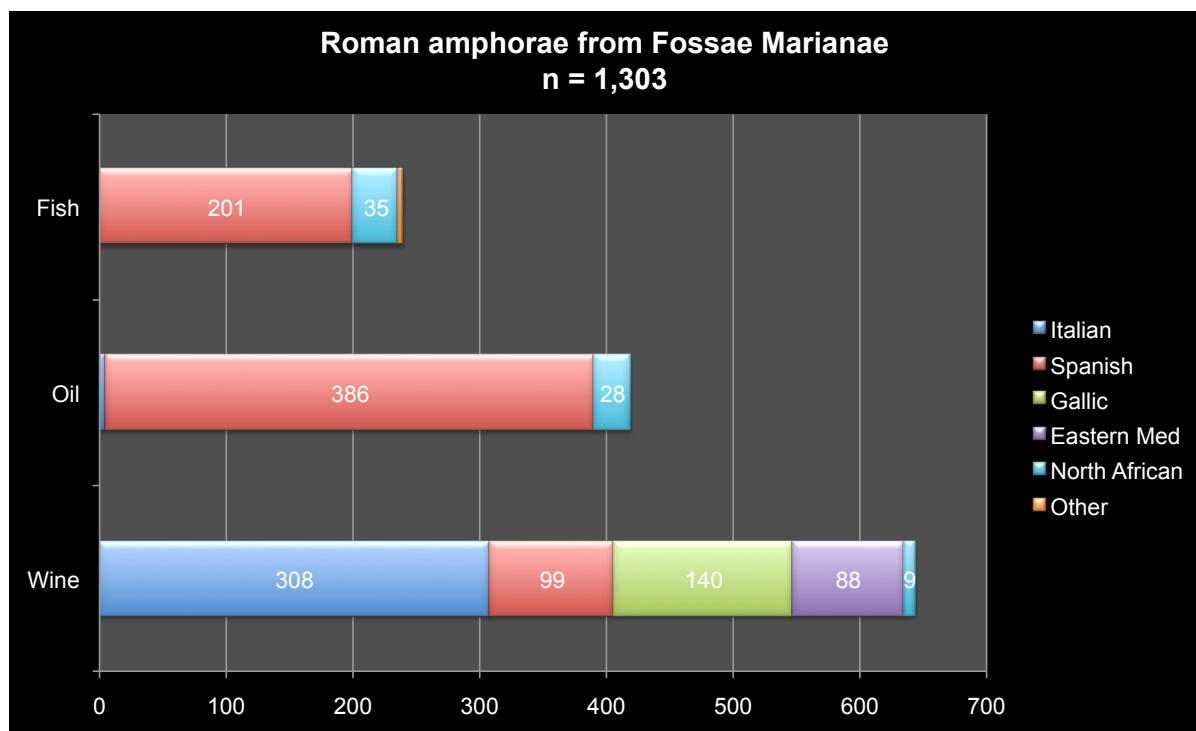


Figure 109. Roman amphorae from Fossae Marianaе (author's graph, data from Liou and Sciallano 1989).

⁷⁸⁷ *Geography* 4.1.8.

⁷⁸⁸ Provansal *et al.* 1999, 131.

⁷⁸⁹ Liou and Sciallano 1989.

For the Roman period, wine amphorae account for 49% of the amphorae. Olive oil amphorae account for 31% and the remaining 19% of the amphorae are attributed to salted-fish products. The majority of the wine amphorae are Italian (primarily Dressel 1 amphorae) while the vast majority of the oil amphorae are Baetican Dressel 20s. There are only 28 North African olive oil amphorae. The amphorae attributed to salted-fish products are more diverse, though they also come primarily from Spain. From the end of the first century BC and the early first century AD, the most common amphora type is the Dressel 7-11, supplanted by the Beltrán II B over the course of the first and second centuries AD. Third-century amphorae are less common, but the Almagro 50 and 51 types (16 total) are present. One immediate difference in this collection of amphorae versus the excavated collections is the percentages of the three major categories of amphora-borne goods. In the majority of excavated contexts, wine amphorae are by far the most common and oil amphorae often make up only a small percentage. While Dressel 20s are certainly found at consumption sites in southern France, the largest consumers can be argued to be those north of the French olive producing zone, i.e. northern Gaul and also Germany. The relatively high percentage of oil amphorae compared with other assemblages might be explained on the basis that Fossae Marianae functioned as the entry point for products to be shipped up the Rhône.

Approximately 12 km to the north of Fos, surface survey has verified the existence of an amphora production site at Istres, north of the Étang de l'Olivier.⁷⁹⁰ The survey indicated an occupation zone of approximately two hectares dating from the first and second centuries AD. Excavation has confirmed at least one kiln attached to a villa and in use during the second half of the first century producing Gauloise 4 and 5 amphorae along with common wares and construction materials.⁷⁹¹ These amphorae were probably exported to the Mediterranean through the port at Fossae Marianae. If intended for northern export, they would have probably gone to Arelate.

⁷⁹⁰ Marty 2003; Laubenheimer and Schmitt 2009, 79.

⁷⁹¹ Laubenheimer and Schmitt 2009, 79

Saintes-Maries-de-la-Mer

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Figure 110. Iron bars from wrecks at Saintes-Maries-de-la-Mer (Pagès 2011, Figure 2).

Saintes-Maries-de-la-Mer, while not a harbour site, is worth mentioning due to the exceptional amount of wrecks which have been discovered off its shore at the former mouth of the Rhône—over 30 of which have been discovered thus far.⁷⁹² One of these wrecks was discussed in Chapter II. Of particular interest is the fact that eleven of these wrecks dated between the last quarter of the first century BC and the end of the first century AD and contained cargoes of iron bars (Figure 110); the total combined weight of the iron bars recovered thus far is over 500 tons.⁷⁹³ Given their placement at the mouth of the Rhône, it is not known whether they were headed north on the Rhône or out into the Mediterranean, but they are clearly connected with trade along the Rhône corridor. A total of 21 different stamps (probably manufacturer's marks) have been documented on the bars⁷⁹⁴ and a typology has

⁷⁹² Coustures *et al.* 2006, 244.

⁷⁹³ Pagès 2011, 1234-1235.

⁷⁹⁴ *Ibid.*, 246.

been developed which includes eight forms (divided by length and form, as seen in Figure 110), though only six are present in significant numbers.⁷⁹⁵

Five bars (specifically the slag in the bars) from three different wrecks—*SM2* (first quarter of the first century AD), *SM9* (Augustan to Claudian) and *SM10* (first century AD)—have been subjected to detailed chemical analysis using Laser Ablation Inductively Coupled Plasma Mass Spectrometry (LA-ICP-MS).⁷⁹⁶ The results were compared in the first instance against known chemical signatures from Roman iron mines in the Montagne Noire, particularly the region of Les Martys. Two, perhaps three, of the bars analysed align well with the chemical signature of the the Montagne Noire and seem to have originated from the Roman mines in this location. The two remaining bars were certainly not from the Montagne Noire, nor were they from the same source, but their origin was not able to be determined.

It is also worth noting that there is little consistency amongst the wrecks analysed. It is probable that all three of the wrecks specifically examined contained iron from the Montagne Noire. These bars however vary based on shape and stamping practice. Furthermore, the composition of the iron cargoes was mixed. Wreck *SM9* contained iron bars of three different origins perhaps including the Montagne Noire. Wreck *SM2* also contained two bars from two different sources.⁷⁹⁷

Given the prominence of iron from the Montagne Noire, Narbonne is the most likely location for the loading of these ships.⁷⁹⁸ Narbonne would also have been a logical location for the acquisition of iron bars from other regions, as indicated by the heterogenous nature of the wreck cargoes. In this case, it would seem that the ships wrecked attempting to navigate into the Rhône.

A more extensive analysis of 48 iron bars was published in 2011 which has wider reaching implications for the Roman iron industry in general.⁷⁹⁹ Major element analyses indicate that

⁷⁹⁵ Pagès 2011, 1236.

⁷⁹⁶ Coustures *et al.* 2006, 252.

⁷⁹⁷ *Ibid.*, 258.

⁷⁹⁸ *Ibid.*, 259.

⁷⁹⁹ Pagès 2011.

amongst the 48 bars, at least six different reducing systems were used, indicating multiple reduction workshops.⁸⁰⁰ This coupled with the fact that some of the bars contain more than one primary metal source suggests that the bars were not formed at the mining site, but were rather located at some distance from mining sites and formed bars using ore of multiple origins which had been smelted according to different techniques.⁸⁰¹ The only significant standardization seems to have occurred in the choice between ferritic iron, steel or phosphoric iron.⁸⁰² Importantly, the physical separation between mining site and processing sites suggests the specialization of the various steps of the iron production process.

Massalia

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Figure 111. Plan of the Massalia harbour area (Mellinand *et al.* 2010, Figure 1).

⁸⁰⁰ *Ibid.*, 1247.

⁸⁰¹ *Ibid.*

⁸⁰² *Ibid.*, 1250.

Strabo describes Massalia as reliant upon the sea for sustenance:

They possess a country which, although planted with olive-trees and vines, is, on account of its ruggedness, too poor for grain; so that, trusting the sea rather than the land, they preferred their natural fitness for a seafaring life.⁸⁰³

The settlement of Massalia was first established by Phocian colonists around 600 BC on the northern side of the Lacydon calanque.⁸⁰⁴ The Lacydon calanque made for an ideal harbour setting, though it was prone to siltation. Massalia was a major city in the Greek world and many of the cities along the southern French and the Spanish coast first were established as Massaliot colonies. The city was captured, but not sacked, by Caesar in 49 BC.

While some evidence seems to suggest decline during the Roman period,⁸⁰⁵ two major excavations at areas around the port have been crucial in demonstrating Massalia's continuing importance. These excavations are those at Place Jules-Verne and La Bourse, and they will be discussed in turn (Figure 111).

Place Jules-Verne

Little is known about the earlier first-century BC port structures as an Augustan period reorganization of the port obliterated the previous remains.⁸⁰⁶ The major changes were generalized redevelopment, the construction of docks and warehouses and the dredging of the harbour basin.⁸⁰⁷

In the first century AD, a substantial quay or jetty (number 11 on Figure 112),⁸⁰⁸ measuring 1.3 m in width and 3.5 m in depth with 30 m of length remaining, was built with the aid of a

⁸⁰³ *Geography* 4.1.5.

⁸⁰⁴ Morhange *et al.* 1996.

⁸⁰⁵ For example, Massalia stops exporting amphorae on a large scale. There are also relatively few remains apart from the port excavations as much of the city has just been continually built up since antiquity.

⁸⁰⁶ Hesnard 1994, 207.

⁸⁰⁷ *Ibid.*

⁸⁰⁸ The structure appears to run parallel to the coast, but it is cut by subsequent construction and therefore it is not known if the structure could have functioned as a jetty.

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Figure 112. Port structures at Place Jules-Verne (Hesnard 1994, Figure 7).

cofferdam on the eastern side of the basin.⁸⁰⁹ West of this structure was a well-preserved quay constructed using two parallel rows of wooden stakes measuring approximately 25 cm in diameter and 4-5 m in height. The stakes were reinforced with sheet piling made of reused ship timbers.⁸¹⁰ The barnacle line on the stakes suggests that the water depth was some 1.5 m at this area.⁸¹¹ To the west of this, a pier was constructed from large trunks of wood which jutted out approximately 30 m into the water and allowed ships to dock on both sides of the platform. As the end of the pier was so far out into the sea, it could accommodate very large ships with significant drafts.⁸¹² During the second century, a hull of a ship was used to extend the pier.⁸¹³ An additional, but smaller, pier was constructed to the west of the main pier in the third century. By the fourth century, the port had silted considerably and was no longer being dredged and the piers went out of use.⁸¹⁴

⁸⁰⁹ Hesnard 1994, 207.

⁸¹⁰ *Ibid.*, 209.

⁸¹¹ *Ibid.*

⁸¹² *Ibid.*, 210.

⁸¹³ *Ibid.*

⁸¹⁴ *Ibid.*

Excavations also revealed nine shipwrecks dating between from the Greek and Roman periods, five of which belong to the first four centuries AD.⁸¹⁵ Three of the wrecks dating to the first and second centuries AD, the Jules-Verne 3, 4, and 5, were dredging ships. Such ships, characterized by a rectangular opening in the central portion of the ship in which the dredging wheel would have been placed, were not attested archaeologically prior to this discovery, though they are known to have existed. The Jules-Verne 3 is the best preserved (Figure 113). It is preserved to a length of 12 m and a width of 4 m and is estimated to have originally been 16 m in length and 5 m in width.⁸¹⁶ The ship shows numerous signs of repair before it was sunk in the harbour.⁸¹⁷ The presence of the three dredging ships correlates well with the evidence from coring which indicates numerous Roman dredging phases.⁸¹⁸

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Figure 113. Jules Verne 3 dredging boat (Morhange and Marriner 2010, Figure 8).

The port area was also enhanced with various warehouses during the Roman period. Located to the east of the inlet, were two warehouses with sunken *dolia* (number 1 on Figure 112).

⁸¹⁵ Pomey 1995.

⁸¹⁶ *Ibid.*, 463.

⁸¹⁷ *Ibid.*, 464.

⁸¹⁸ Morhange and Marriner 2010, 25-26.

The warehouses were oriented north-south, and their southern wall was bounded by the large quay or jetty mentioned above (number 11). A portico surrounded its western and southern side. The western-most warehouse is the best preserved; it contained three rows of ten *dolia* each, though the northern portion of building which could have contained additional *dolia* has been destroyed. Each *dolium* had a capacity of over 1,000 litres.⁸¹⁹ As they were pitched, it is probable that they held wine. The *dolia* were abandoned during the course of the second century AD and the warehouses converted to more all-purpose structures,⁸²⁰ similar to those already discussed at Lattara. It is probable that the abandonment of the *dolia* reflects a large-scale movement to barrels for bulk storage.

During the third century AD, following the abandonment of the *dolia*, the warehouse was enlarged, and the porticoes went out of use. The warehouse burned during the fourth century and was never used again. In the refuse were found the remains of African amphorae as well as decorative material such as mosaics and painted plaster.⁸²¹

An important discovery made in the sediment near the pier further attests the importance of the port of Massalia during the Roman period. Along with accumulated material dating to the third century, such as ceramics, excavators uncovered a minimum of fifty wooden writing tablets.⁸²² Unfortunately, there is no writing on the interior faces of the tablets. On the exterior of one of the tablets, however, is text in the style of an inscription which reads:

XL (quadragesima) Gall(iarum) St (atio) Mass(iliae).

This is the first attestation of a *statio* for the collection of Roman customs dues in Massalia. This tablet was presumably for the recording of cargoes either embarking or disembarking from Massalia so that the customs duties might be calculated. Ample iconographic evidence

⁸¹⁹ Hesnard 1994, 211.

⁸²⁰ *Ibid.*

⁸²¹ *Ibid.*

⁸²² France and Hesnard 1995, 78. A similar tablet also exists from Toulon (French 1999).

⁸²³ See France and Hesnard 1995 for a collection of the iconographic material.

records this process,⁸²³ as do documents such as the papyrus *P. Bingen 77* and the fourth-century *ostraca* from Carthage which seem to record oil shipments.⁸²⁴

La Bourse

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Excavations at La Bourse began in 1967 and continued to some degree until 1994.⁸²⁵ Harbour structures existed at La Bourse since the archaic period,⁸²⁶ but as at place Jules-Verne, significant reorganization occurred during the Roman period. The first and most significant

Figure 114. Excavations at La Bourse (Guery 1992, Figure 3).

renovation was the cutting of an internal basin (1 on Figure 114), which was done with the assistance of a cofferdam, the negative of which has been discovered (2 on Figure 114).⁸ The basin was edged with a stone wall of more than 4 m in height and enclosed an area of some 2,000 m².⁸²⁸ Coins of Vespasian date the completion of this construction to AD

⁸²⁴ Peña 1998.

⁸²⁵ Treziny 1996.

⁸²⁶ Guery 1992, 111.

⁸²⁷ *Ibid.*, 113.

⁸²⁸ *Ibid.*; Euzennat 1969, 426.

⁸²⁹ Euzennat 1980, 136.

75-80.⁸²⁹ By the fourth century, siltation had reduced the depth of the basin to less than 2 m.⁸³⁰

Two other major structures were added in the first half of the second century AD, a large decantation basin and warehouses. In the beginning of second century, a large basin measuring 17.5 by 15 m was constructed to the east of the internal terminus of the harbour basin (8 on Figure 114).⁸³¹ The walls of the basin were composed of five courses of limestone blocks, creating a basin depth of approximately 2.6 m, and it was paved with stone slabs.⁸³² The walls and bottom were lined with pitch and it was fed with freshwater from a stream of the Lacydon. The basin seems to have had a dual purpose; it served as a source of fresh water for ships and other harbour needs and for this purpose it was equipped with a water-lifting wheel. As a decantation basin, it also served to settle some of the silt from the stream before it entered the harbour basin.⁸³³ The basin ceased to function as designed by the end of the second or beginning of the third century because it silted up.⁸³⁴

Warehouses were also added to the port facilities at la Bourse during the first half of the second century AD. Now preserved *in situ* in the Musée des docks Romains, one warehouse contained thirty-four sunken dolia lined with pitch.

The excavations of the port clearly illustrate that Massalia was a vibrant economic centre during the Roman period. While Massalia was no longer exporting amphorae on the same scale as it did before the Roman period, the city continued to produce some amphorae during the Roman period, as evidenced by the discovery of a kiln at Butte des Carmes which operated from the second century BC through the first century AD producing a variety of forms including the Pascual 1, Dressel 2-4 and Gauloise forms 2, 3, 4 and 7.⁸³⁵ An inscription also attests a group of *dendrophoroi*,⁸³⁶ probably indicating the importance of

⁸³⁰ Euzennat 1969, 426.

⁸³¹ Guery 1992, 119.

⁸³² *Ibid.*

⁸³³ *Ibid.*; Euzennat and Salciat 1968, 155.

⁸³⁴ Euzennat and Salciat 1968, 155.

⁸³⁵ Laubenheimer 2001.

⁸³⁶ *CIL* 12.411.

timber to the city. There was also a corporation of *centonarii*.⁸³⁷ The existence of a customs *statio* at Massalia is to be expected, as the city would have served a very different role from that of Arelate given that it is a properly maritime harbour and was less oriented towards northern riverine trade.

Telo Martius

Excavations between 1986 and 1988 revealed substantial archaeological remains at Toulon (ancient Telo Martius) indicating a much larger ancient city than was previously known.⁸³⁸ Excavations covered more than 3,000 m² and exposed part of the Roman harbour as well as shops and habitation zones (Figure 115).⁸³⁹

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Figure 115. Excavations of the harbour of Telo Martius (Préfecture de la région Provence-Alpes-Côte d'Azur, http://www.paca.culture.gouv.fr/banqueImages/cd/ARR93_0511011_E/pla/ARR93_05832147ZA_P.jpg, last accessed July 20, 2012).

⁸³⁷ *CIL* 12.410.

⁸³⁸ Brun 1992, 123.

⁸³⁹ *Ibid.*

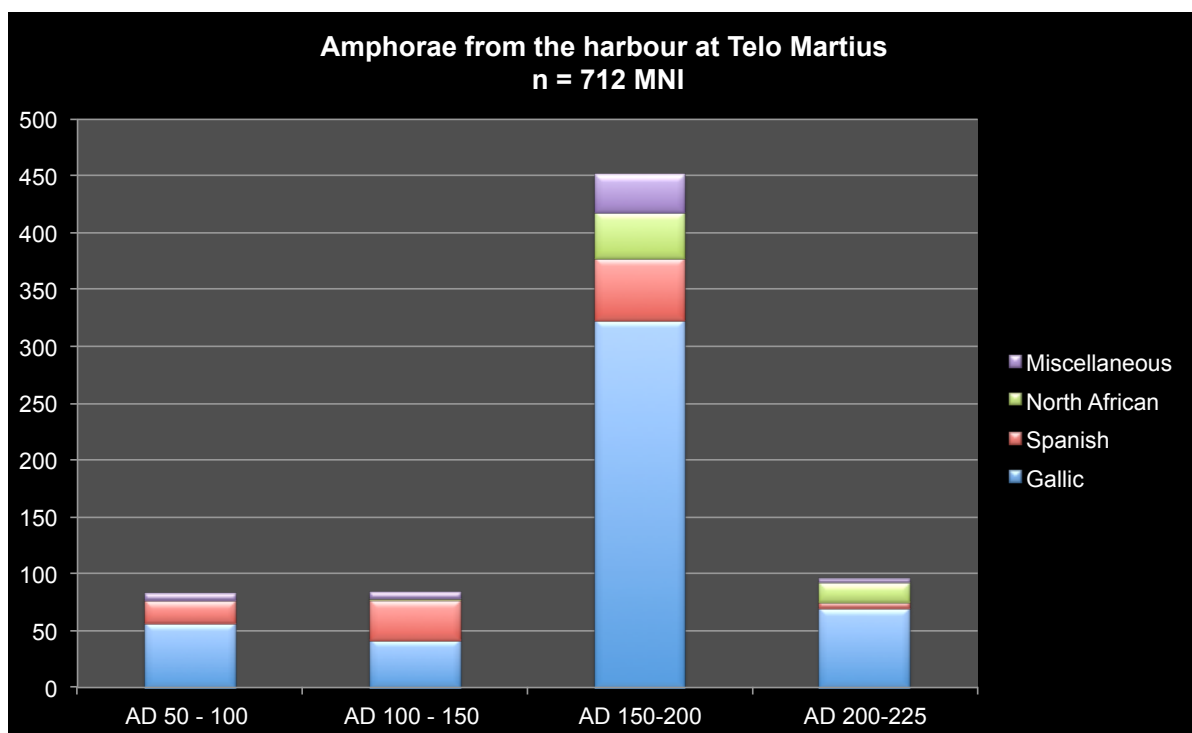


Figure 116. Amphorae from the harbour at Telo Martius (author's graph, data from Brun 1992).

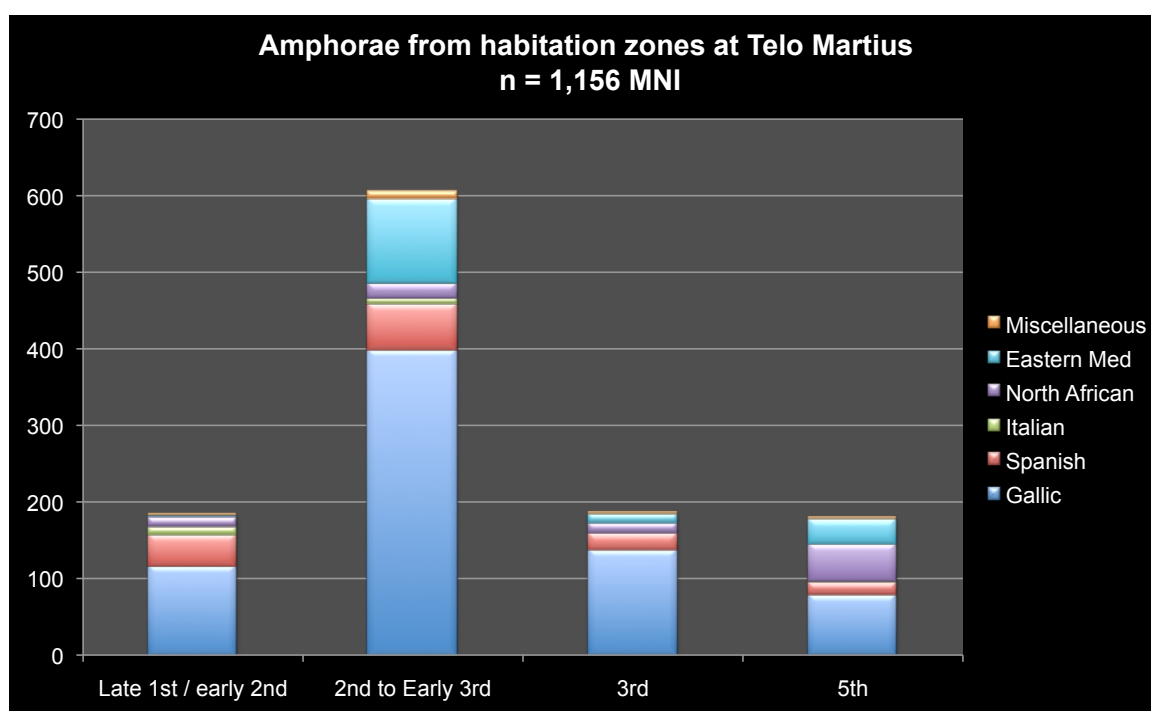


Figure 117. Amphorae from habitation zones at Telo Martius (author's graph, data from Brun 1992).

At the very end of the first century BC, a quay and landing stage were built. The quay was constructed of oak trunks and perpendicular to this, two small boats were filled with stones and sunk to support the landing stages. Remnants of various artisanal crafts were also discovered at the port site including wood chips, pieces of leather and discarded pieces of worked bone.⁸⁴⁰ Excavations have also produced the only known evidence of murex production along the French coast in the form of murex debris from the îlot Magnaque.⁸⁴¹ At the beginning of the fifth century AD, Telo Martius was home to a *procurator bafii*.⁸⁴²

The amphorae assemblages from both the harbour area and habitation zones at Telo Martius have been discussed in Chapter I, but I have included the images again in their context. Figure 116 contains the amphorae from the harbour area and Figure 117 from the habitation zones.

As stated in Chapter I, the harbour assemblage shows a relatively limited range of amphorae dominated by the major western types, the amphorae from the habitation zones, while still dominated by Gallic amphorae, are generally more diverse (Figure 116). An unusually high percentage of Gauloise 4 amphorae as compared with other amphora types has led to the proposal that Telo Martius was producing these amphorae.⁸⁴³ Alternatively, the site could have served as the major maritime export point for the amphorae produced inland. The presence of a stamp, CDO, which appears in very high quantities at Telo Martius, and a similar fabric composition supports the idea that there was a local kiln site.⁸⁴⁴

Porquerolles

Excavations on the small island of Porquerolles have provided a very small number of amphorae from stratified Roman deposits (Figure 118).⁸⁴⁵ Between the Augustan period and the mid-third century there are only 196 amphorae in total (MNI), and they suggest a rather

⁸⁴⁰ *Ibid.*

⁸⁴¹ Personal Communication with J.-P. Brun.

⁸⁴² *Notitia Dignitatum* 11.72.

⁸⁴³ Brun 1992, Laubenheimer and Schmitt 2009, 98.

⁸⁴⁴ Laubenheimer and Schmitt 2009, 98-99.

⁸⁴⁵ Pellegrino 2010.

similar pattern of imports when compared to the other Gallic sites. The Augustan and Tiberian periods are dominated by Baetican and Massaliote amphorae. There is a minimum number of 23 amphorae from the Flavian period, but they are fairly diverse with eight Gallic, five Massaliote, four Baetican, three Italian and two African amphorae. The late second century sees the first dominance of Gallic amphorae at 44% of the total assemblage (68 MNI). Baetican amphorae make up a further 16% of the assemblage, Tarraconensian 15%, African 10% and Massaliote only at 9%. By the end of the third century, Gallic amphorae account for 69% of the amphorae with Baetican being the second most common type at 14%, followed by African amphorae at 9%.

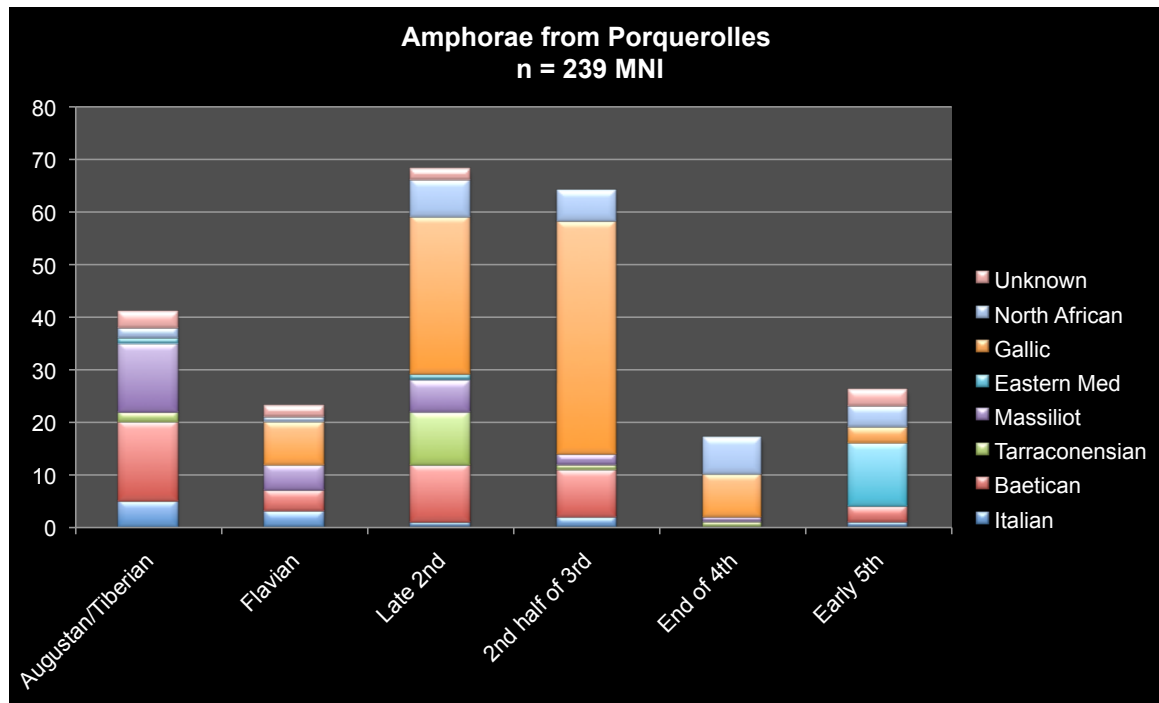


Figure 118. Amphorae from Porquerolles (author's graph, data from Pellegrino 2010).

Olbia

The remains of Olbia are located near modern Hyères. The settlement was founded in the late fourth century BC as a fortified maritime colony from Massalia.⁸⁴⁶ The setting is unusual for a port as it is located on an extremely exposed coastline. There does not seem to

⁸⁴⁶ Bats 2006, 11.

have been a formally built harbour of any sort during the Greek period, though it appears that during antiquity there was a double tombolo just offshore which probably created a lagoon environment.⁸⁴⁷ The harbour was enhanced during the Roman period by the construction of a mole to shelter the harbour from the Mistral winds and the associated western swells (Figure 119).

The mole ran NE-SW for approximately 20 m; the alignment then changed and the mole continued with a WSW orientation for an additional 50 m until it terminated at a large square platform for loading and unloading cargoes measuring 40 x 30 m. The final section of the mole as it approached the platform was characterized by two parallel walls.⁸⁴⁸

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Detailed excavations have been carried out in city block VI, located in the southwest of the city near the gates (Figure 119).

Figure 119. Plan of Roman Olbia (Bats 2006, Figure 2).

Phased amphorae quantifications are particularly informative with regard to trading partners (Figure 120). The first phase, 40/30 BC to AD 10, is dominated by Italian wine amphorae, which constitute 41% of the assemblage.⁸⁴⁹ Massaliote amphorae are the next most frequent type at 21%, followed by Tripolitanian amphorae at 9% and Baetican at 7.5%.⁸⁵⁰ By AD

⁸⁴⁷ Pasqualini 2000, 36.

⁸⁴⁸ Bats 2006, 22.

⁸⁴⁹ In descending order of frequency: Dressel 1A, 1C, 1B, 2-4, and Lamboglia 2.

⁸⁵⁰ Bats 2006, 209.

10-30, Italian amphorae are no longer as prominent, only comprising 9% of the assemblage. The bulk of the amphorae (46%) are from Marseille, followed by Gallic amphorae (particularly from Narbonensis) at 10%. Massaliote amphorae also dominate the assemblage of AD 30-60 at 32%. Baetican amphorae are well-represented at 17%, and Italian and Gallic amphorae⁸⁵¹ are both present at 13%. Furthermore, a warehouse with amphorae dating from AD 30-50 was located in city block VI.⁸⁵² The warehouse had a shop front facing the main

road and living quarters at its back. The excellent state of preservation is due to the fact that the warehouse was destroyed by fire.⁸⁵³ Thousands of amphorae sherds relating to a minimum of 485 amphorae were discovered in the warehouse (Figure 121). Wine amphorae from Narbonensis make up 87.5% of the assemblage. The majority of these are Dressel 2-4 (241 amphorae, 51%) which based on the clay are from at least four different production sites.⁸⁵⁴ The second most common amphora is the Gauloise 2 with 115 amphorae of Type 1 and 25 of Type 2.⁸⁵⁵ After the Gallic amphorae, the next most common amphora type is the Italian Dressel 2-4, of which there were only 26 amphorae. During AD 60-80, Gallic amphorae become the most prominent amphorae (23%), a trend which continues through Late Antiquity. Otherwise, amphorae from the regions of Baetica (19%), Marseille (18%), Tarraconensis (14%) and Italy (14%) occur in relatively even numbers. The period between AD 80 and 275 is overwhelmingly dominated by Gallic amphorae (67%), though there are still small numbers of Baetican (7%) and Italian (7%) amphorae, as well as African (6%). Unfortunately this period is poorly dated and therefore includes a much larger time span than the earlier periods.

A more closely dated complementary amphora assemblage has been published from Olbia dating to the end of the second/beginning of the third century AD (Figure 122). The assemblage contains 215 amphorae (MNI), of which 39 are residual (18.5%).⁸⁵⁶ Again, amphorae from Narbonensis are the most recurrent; not considering the residual material,

⁸⁵¹ This includes the Gauloise 1, 3, 5, 7 and the Dressel 2-4. The Gauloise 4 has not yet appeared.

⁸⁵² *Ibid.*, 137-139.

⁸⁵³ *Ibid.*, 139.

⁸⁵⁴ *Ibid.*, 140.

⁸⁵⁵ *Ibid.*

⁸⁵⁶ Italian Greco-Italic, Dressel 1A, 1B, 2-4; Spanish Dressel 12; Gallic Dressel 2-4, Gauloise 5 and Gauloise 7.

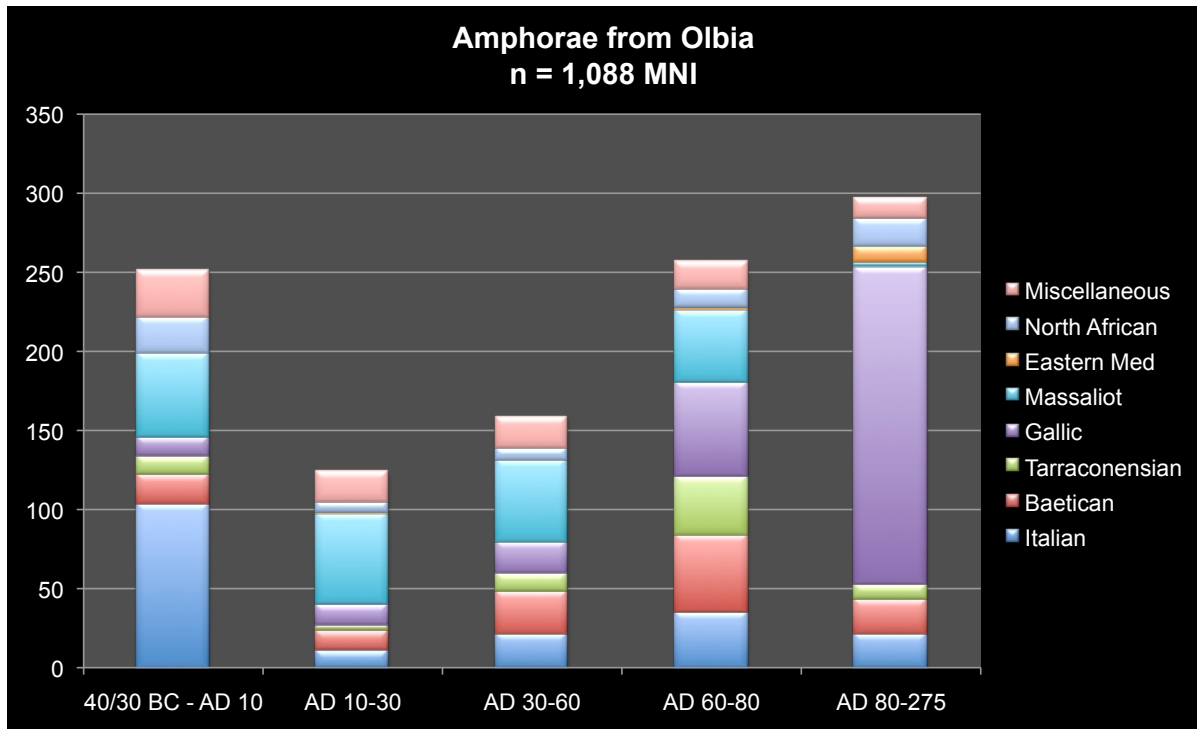


Figure 120. Amphorae from Olbia (author's graph, data from Bats 2006).

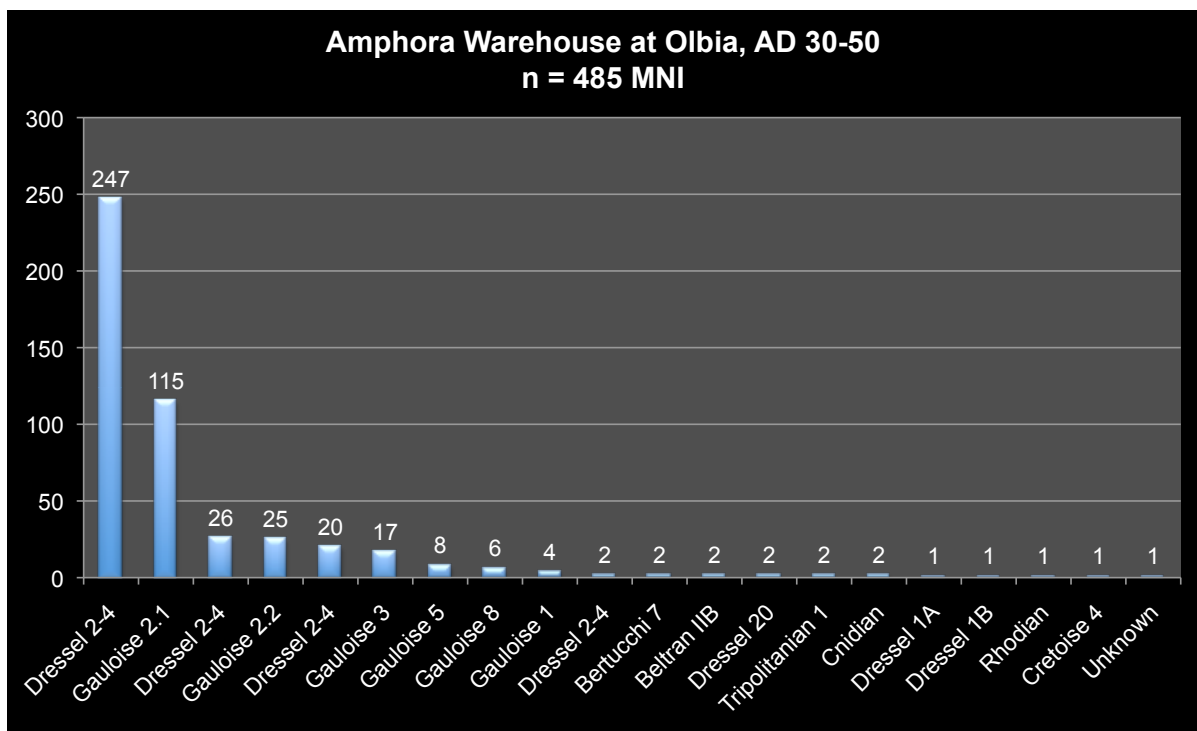


Figure 121. Amphora warehouse at Olbia (author's graph, data from Bats 2006).

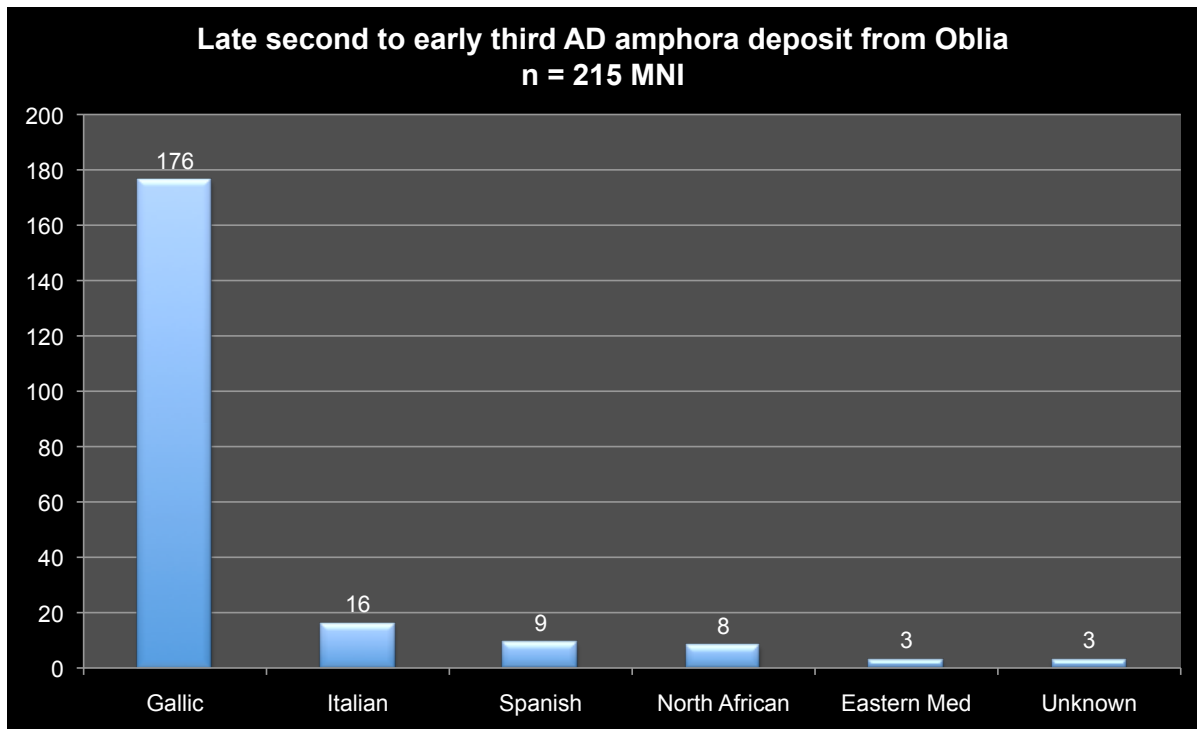


Figure 122. Amphora deposit dating to the late second / early third century AD, Olbia (author's graph, data from Bats 2006).

Gauloise 4 wine amphorae dominate the assemblage thoroughly at 87% (153). The next most common amphorae are the Dressel 20, of which there are six examples and the Africana I, of which there are eight examples.⁸⁵⁷

Colonia Forum Julii

Forum Julii, modern Fréjus, is thought to have been founded as a colony by Julius Caesar around 49 BC (Figure 123). It was situated to the northeast of the Argens River, between the Maures and Estérel mountain ranges.⁸⁵⁸ Forum Julii was the site of one of the three most important naval bases in the western Roman Empire from the Augustan period through to the end of the second century AD.⁸⁵⁹

The harbour was located approximately 15 m below the city itself; the basin was dug in a proto-lagoon which allowed for a sheltered basin in direct contact with the

⁸⁵⁷ Bats 2006, 53.

⁸⁵⁸ Gébara and Morhange 2010, 12.

⁸⁵⁹ *Ibid.*, 16.

Mediterranean.⁸⁶⁰ The basin measured at least 10-11 ha.⁸⁶¹ The last mention of the port occurs in the Antonine Itineraries; the harbour was probably severely silted by the sixth and seventh centuries and was no longer connected to the sea but was simply a freshwater pond. By the beginning of the nineteenth century the area was entirely silted and is now located 1.5 km from the shoreline.⁸⁶²

The so-called 'Lanterne d'Auguste', still a landmark in modern Fréjus, was not actually a lighthouse, but a seamark. The seamark was built on top of an exedra at the terminus of the south quay. The base of the building is hexagonal with sides measuring between 1.72 to 2 m wide; it is topped with a hexagonal spire and the building is faced with ashlar masonry. In total, the 'Lanterne' stands 11 m above the foundation of the exedra.⁸⁶³ The seamark, parallels for which exist at Lepcis Magna and Caesarea Maritima, as well as on the previously mentioned *statio* mosaic of Narbo Martius, allowed the entrance of the harbour to be visible from the sea.⁸⁶⁴

North of the seamark on an extension of the southern quay is an eroded square structure of approximately 6.2 by 6.75 m in *opus caementicium*. It was initially proposed that this was the base of a small building such as a temple, but recent research suggests that this may have been a lighthouse.⁸⁶⁵ The lighthouse (probably Augustan) pre-dates the 'Lanterne' and was seemingly out of use by the time that the seamark was constructed in the first century AD.⁸⁶⁶

Five separate amphora production sites have been located in the vicinity of Fréjus: Pauvadou, Saint-Lambert, Saint-Croix, Porte d'Oree and Valescure. At Pauvadou, a complex with at least four kilns was discovered which produced Gauloise 5 amphorae, along with common wares, during the second half of the first century AD. The three largest kilns were in operation at the same time and the fourth, a very small kiln, was a later addition.⁸⁶⁷

⁸⁶⁰ *Ibid.*, 30.

⁸⁶¹ *Ibid.*, 114.

⁸⁶² *Ibid.*, 32, 36.

⁸⁶³ *Ibid.*, 58-62.

⁸⁶⁴ *C.f.* Arelate *statio* mosaic, also Lepcis Magna and Caesarea.

⁸⁶⁵ *Ibid.*, 65.

⁸⁶⁶ *Ibid.*, 76-77.

⁸⁶⁷ Laubenheimer 1985, 196-199; Laubenheimer and Schmitt 2009, 101.

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Figure 123. Plan of Forum Julii (Gébara and Morhange 2010, Figure 65).

250 m from the Pauvadou site, at Sainte-Croix, was another amphora production site. The site is poorly preserved, but identifiable on the basis of kiln remains and wasters. This site was producing Gauloise 4 amphorae between the end of the first century and the beginning of the second century AD.⁸⁶⁸ Gauloise 4 and 5 amphorae were also produced at the site of Valescure where a furnace and various associated buildings and structures have been identified. The kilns were also used for common wares and tiles.⁸⁶⁹

⁸⁶⁸ Laubenheimer and Schmitt 2009, 102.

⁸⁶⁹ *Ibid.*

At Porte d'Orée, near the ancient harbour basin, a *vide sanitaire* (drainage ditch) was constructed of primarily complete Dressel 2-4 amphorae, many stamped with MARI, which are thought to have been locally produced.⁸⁷⁰ Another production site was located at Saint-Lambert where one kiln was producing Dressel 2-4 amphorae along with Gauloise 8 and 9, common wares and Campanian plates from the end of the first century BC to the beginning of the first century AD.⁸⁷¹ The contents of the Gauloise 8 and 9 are not certain but are thought to have been wine. This kiln was also producing a fish-sauce amphora, the Dressel 14.

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Forum Julii also had a supra-local tile industry. Two wrecks, the *Roches d'Aurelle* and the *Dramont G*, have been discovered with loads of tiles manufactured in Forum Julii.⁸⁷² Tiles with

Figure 124. Distribution map of tiles of L. Herrinus (Rico 1995, Figure 4).

the stamps of potters from Forum Julii are also well-known from the southern coast of France and Tarraconensis. The stamps of one potter in particular, L. Herrinus, are particularly widely distributed and are noted at Alicante, Bocairent, Valencia, Sagunto, Tarragona, San Ginès de Vilasar, Barcelona, Badalona and Mataró, as well as on Majorca (Figure 124).⁸⁷³ Interestingly, the trade seems to skip the area of Languedoc, implying a

⁸⁷⁰ *Ibid.*, 103.

⁸⁷¹ Laubenheimer 1985, 199; Laubenheimer and Schmitt 2009, 102.

⁸⁷² Rico 1995, 771.

⁸⁷³ *Ibid.*, 775.

direct connection between Forum Julii and Tarraconensis. The evidence from both the shipwrecks and the stamps places this trade in tiles almost exclusively within the first two centuries AD.⁸⁷⁴ The tiles were perhaps return cargoes, though it is not known what Forum Julii was importing from Tarraconensis, particularly in the second century AD when Tarraconensian wine production had slowed. One wreck, *Les Roches d'Aurelle*, was carrying both Gauloise 5 amphorae and tiles, perhaps implying that the tiles acted as a complementary cargo to the wine.⁸⁷⁵ It is difficult to imagine that tiles would have had sufficient value to export on their own account, though one cannot entirely rule out the possibility.

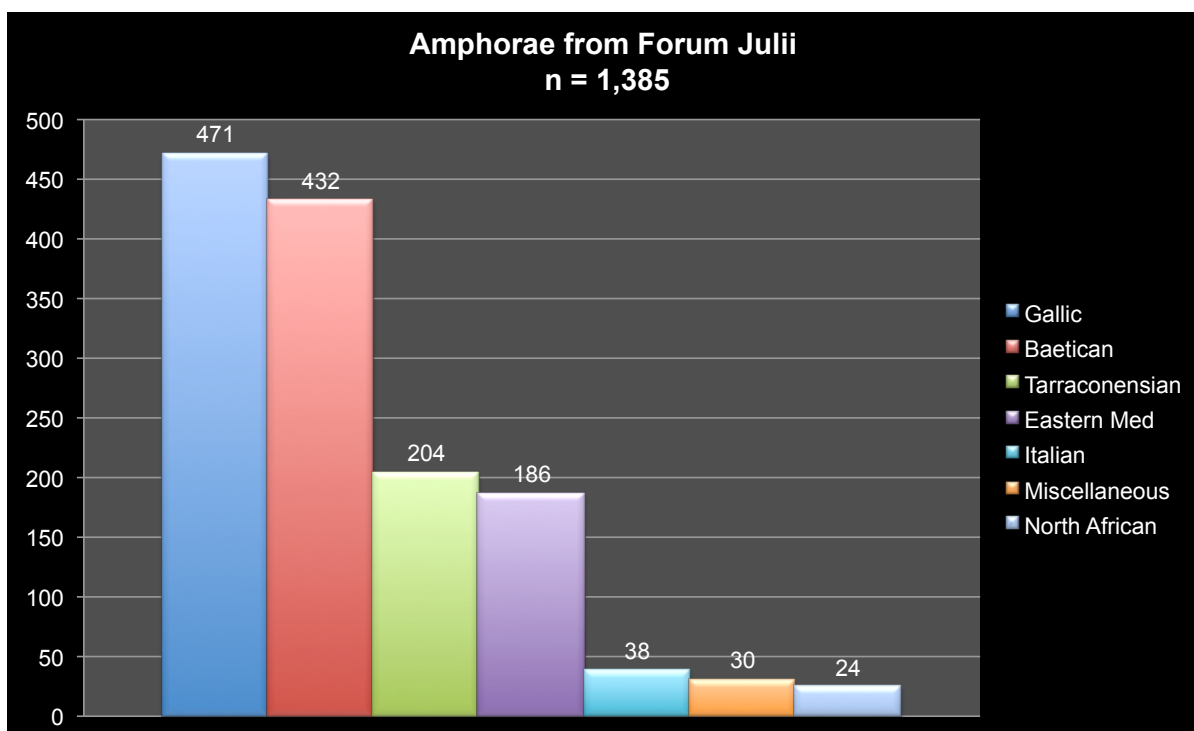


Figure 125. Amphorae from Forum Julii (author's graph, data from Brentchaloff 2009).

The connection between Forum Julii and Spain is also attested through the amphorae. Amphora assemblages from the naval base⁸⁷⁶ (Figure 125) show a predominance of products from Narbonensis; the predominant amphorae are wine amphorae from Massalia (MNI = 363). Fish-sauce amphorae from Fréjus are also very common (103).⁸⁷⁷ There are a variety

⁸⁷⁴ *Ibid.*, 778.

⁸⁷⁵ *Ibid.*, 771.

⁸⁷⁶ These amphorae are from the excavations at the site of Villeneuve, both from the site of Argentièrre (1975) and Aiguères (1979-1981) (Goudineau and Brentchaloff 2009).

⁸⁷⁷ Brentchaloff 2009, 536.

of Baetican imports including 164 Haltern 70s, 124 Dressel 20s and 144 Dressel 7-11, representing *defrutum*, olive oil and fish sauce respectively. Wine from Tarraconensis is also common, represented by 131 Dressel 2-4 and 73 Pascual 1 amphorae. Aegean wine is nearly as common as Tarraconensian wine with 186 amphorae from Kos, Rhodes and Crete. Imports from Italy and North Africa are present only in small quantities.

Antipolis

Antipolis, modern Antibes, was originally established as a Greek settlement from Massalia during the sixth century BC. From 154 BC, it was under the protection of Rome following incursions by the Ligurians. The town and the port were expanded during the Roman period; remains of a theatre and perhaps also an amphitheatre have been discovered, as well as baths and an aqueduct. Other than the speculation regarding the town and port's expansion based on scattered finds little is known about Antipolis in the Roman period. Epigraphy reveals that there was a collegium of *utricularii*.⁸⁷⁸ A second inscription clearly refers to a collegium though its poor state of preservation prevents further interpretation.⁸⁷⁹

Pliny records that Antipolis produced a well-regarded *muria*.⁸⁸⁰ Martial also refers to *muria* made from tuna at Antipolis.⁸⁸¹ As *muria* was a by-product of fish-salting, this suggests that Antipolis was also producing *liquamen* and indeed, an almost complete Dressel 16 amphora from London filled with the bones of mackerel reads: *LIQUAM/ANTIPOL/EXC/L TETTI AFRI/CANI*.⁸⁸² Kilns producing the Dressel 16 are known from Cannes.⁸⁸³ It is probable that Antipolis was also producing the Dressel 16, though they could presumably have been purchased from either Cannes or Forum Julii. Several basins have been identified at Antipolis which might have been for the production of fish-sauces, but they could also have been for live fish or salt.⁸⁸⁴

⁸⁷⁸ *CIL* 12.187.

⁸⁷⁹ *CIL* 12.189.

⁸⁸⁰ *Natural History* 31.43.

⁸⁸¹ *Epigram* 4.88.

⁸⁸² Museum of London, <http://www.museumoflondon.org.uk/Collections-Research/Research/Your-Research/Londinium/Lite/classifieds/sauce.htm>, last accessed July 20, 2012.

⁸⁸³ Laubenheimer 1985, 95; Laubenheimer and Schmitt 2009, 105.

⁸⁸⁴ Basins have been found at the etang de Lauvert (CAG 06, 163-164), Anse Saint-Roch (CAG 06, 164-164, 167), near Fort Carré (CAG 06, 168) and at Anse de la Salis (CAG 06, 195)

Discussion

Now that the various economic facets of each port city have been discussed in turn, it is worth considering several specific classes of evidence for their influence on the economy of southern Gaul as a whole.

Wine Production

While viticulture had been practised in southern Gaul for centuries before the Roman period,⁸⁸⁵ it expanded significantly following Roman colonization of the region. Pre-Roman production had largely centered around Massalia, and this continued to be an area of production throughout the early Roman period. One of the earliest known vineyards has been uncovered near Nîmes, dating from the second century BC. It is only identifiable based on planting pits, however, as there is no pressing or fermenting infrastructure.⁸⁸⁶ The oldest datable remains relating to wine pressing come from near Arelate, at Île des Sables; these consist of an oak vat filled with crushed grape seeds, and are dated to the first century BC.⁸⁸⁷ What distinguishes the Roman period in particular is the presence of stone-built infrastructure.

Viticulture increased steadily in Provence and became increasingly larger in scale, sometimes at the expense of smaller farms which did not survive or were absorbed into larger production units.⁸⁸⁸ During the Flavian period and the early second century, a number of large wineries were constructed as at Pardigon 3, Mesclans and Telo Martius.⁸⁸⁹ Construction and production peaks in Provence during the mid second century AD; at this point even small farms were characterized by purpose-built infrastructure and were producing oil and wine.⁸⁹⁰ Towards the end of the second century, there seems to be a

⁸⁸⁵ Brun 2001, 71-72.

⁸⁸⁶ Buffat *et al.* 2001, 104.

⁸⁸⁷ *Ibid.*

⁸⁸⁸ *Ibid.*, 87.

⁸⁸⁹ *Ibid.*, 87.

⁸⁹⁰ *Ibid.*, 87.

general consolidation of production centres, but not a decrease in overall production until the mid third century.⁸⁹¹

The situation in Languedoc is similar. Wine production coincides with the production of Gallic amphorae beginning in the mid first century AD and peaking in the second.⁸⁹² Approximately 80 wineries have been documented in Languedoc-Roussillon in varying stages of preservation; the majority of these date to the early Empire. The preponderance of these sites are in the departments of Aude and Hérault (30 in each instance) centred around the major cities of Narbonne and Béziers.⁸⁹³ At the end of the second century and beginning of the third, wineries began to be abandoned. While production did seem to continue to some degree, it was on a much smaller scale with no *dolia* fermenting structures and no pressing elements.⁸⁹⁴

An excellent example of wine production facilities can be seen in the Prés-Bas Villa at Loupian. The villa was located on the shores of the Etang du Thau in Languedoc. The villa had its beginnings as a small rural settlement from the first century BC but had developed into a recognizable villa with an elite residential zone and large production area by the first century AD (Figure 126).⁸⁹⁵ The villa had an extensive winery measuring approximately 315 m² with an estimated 90 *dolia*.⁸⁹⁶ The capacity of the winery is estimated at 1500 ± 250 hl.⁸⁹⁷

The villa was also producing Gauloise 4 amphorae and given that some 100 amphorae found around the Etang du Thau bear the stamp MAF it is probable that this was the stamp of the Loupian villa production and perhaps even the initials of the villa owner. It is estimated that approximately 4,000 Gauloise 4 amphorae would have been required to bottle the contents of the winery each year.⁸⁹⁸ The workshop and winery continued through the second century AD, but were then reduced. The number of *dolia* in use was reduced, and the space was

⁸⁹¹ *Ibid.*, 88.

⁸⁹² Buffat *et al.* 2001, 105.

⁸⁹³ *Ibid.*, 105-106.

⁸⁹⁴ *Ibid.*, 110-111.

⁸⁹⁵ Buffat *et al.* 2001, 97. See Chapter III for a discussion of the purpose of the *Piazzale delle Corporazioni*.

⁸⁹⁶ *Ibid.*

⁸⁹⁷ *Ibid.*, 98.

⁸⁹⁸ *Ibid.*

converted for more varied storage and perhaps barrels. Grain also appears to have been stored in the former winery at this time.⁸⁹⁹

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In the fourth century, a new winery was installed on a similar plan; it measures approximately 267 m² but also contained pressing elements thus greatly reducing the production capacity of the space (Figure 127); the amount of storage space was approximately 200 m², and it is thought that barrels were used to store

Figure 126. Imperial era Prés-Bas villa at Loupian (Villa, villae en Gaule romaine, http://www.villa.culture.fr/mediatheque/communs/images/grandFormat/1/212_2.jpg, last accessed July 20, 2012).

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Figure 127. Fourth-century layout of the Prés-Bas villa at Loupian (Villa, villae en Gaule romaine, http://www.villa.culture.fr/mediatheque/communs/images/grandFormat/1/255_2.jpg, last accessed July 20, 2012).

the wine. Four roughly circular pits were found dug in the storage zone, but their function is not understood.⁹⁰⁰

⁸⁹⁹ *Ibid.*

⁹⁰⁰ *Ibid.*

The movement from *dolia* to barrels certainly impedes our understanding of the changes in viticulture in the late second and third centuries. It should be stated, however, that while barrels are known archaeologically from southern Gaul, none of them dates past the second century AD.⁹⁰¹ The latest known example is from Toulon and is the lid of a barrel which was found discarded in an early third-century well. Furthermore, as seen from the warehouses at Lattara and Massalia, the switch from *dolia* to barrels as the preferred container for bulk storage occurred significantly before the switch from amphorae to barrels; at Lattara, the *dolia* were replaced during the end of the first century AD and at Massalia over the course of the second century AD. Amphorae continued to be produced on a large scale throughout the second century AD. The cessation of amphora production, coupled with the fact that the pressing infrastructure also largely went out of use by the third century, strongly suggests that there was a significant decline in the volume of production at this time. In many cases, it seems clear that the infrastructure went out of use despite the fact that the villas were still inhabited. Brun has proposed that the system of land management changes at this time to a system dominated by sharecropping; this would explain why villas continued to be inhabited while their productive facilities went out of use.⁹⁰² As he admits, this is difficult to verify archaeologically.

Amphorae Production

The most obvious indicators of the wine industry are the Gauloise amphorae. As has already been discussed in this chapter, the several varieties of the Gauloise amphorae almost exclusively held wine.⁹⁰³ At present, 64 kiln sites are known from the Rhône valley, Provence-Côte d'Azur and Languedoc (Figure 128). They have been published and classified largely due to the work of Laubenheimer.⁹⁰⁴ The earliest productions beginning in the Augustan period are imitation Pascual 1, Dressel 1 and Dressel 2-4 amphorae. Production increases drastically in scale with the Gauloise amphorae in the first century AD. The most common form is the Gauloise 4, followed by the Gauloise 1 and the Gauloise 5 (Figure 129). The majority of kilns date to the first and second centuries AD.

⁹⁰¹ Marlière 2001, 183.

⁹⁰² Brun 2001, 89.

⁹⁰³ The exceptions are the Gauloise 14 and 16 from Forum Julii and Cannes.

⁹⁰⁴ Laubenheimer 1985; Laubenheimer and Schmitt 2009.

Outside southern Gaul, the largest market for Gallic wine was the northern provinces and Gallic amphorae make up a very large percentage of wine amphorae at northern sites from the mid-first century AD. In Germania,⁹⁰⁵ imported wine initially came from a variety of sources including Italy, Spain and the eastern Mediterranean. After the mid-first century AD, however, Gallic amphorae, particularly the Gauloise 4, dominate the wine imports almost entirely. Unfortunately, most of the amphorae assemblages from Germany are very poorly phased, making the overall switch difficult to graph, but the usage of two rather extreme examples illustrates the rise of Gallic wine very clearly. Figure 130 graphs the wine amphorae from two sites—Dangstetten, a fort dated from 15 BC to 8 BC and Nida—Hedderheim, a Vespasianic fort and Trajanic civitas capital inhabited until AD 260. The examples are not entirely ideal given that one is a fort and one is an urban centre and that the early first century AD is not represented, but they illustrate a trend which is clearly observable in other German sites. As can be clearly seen, essentially all imported wine at Nida-Hedderheim comes from Gaul.

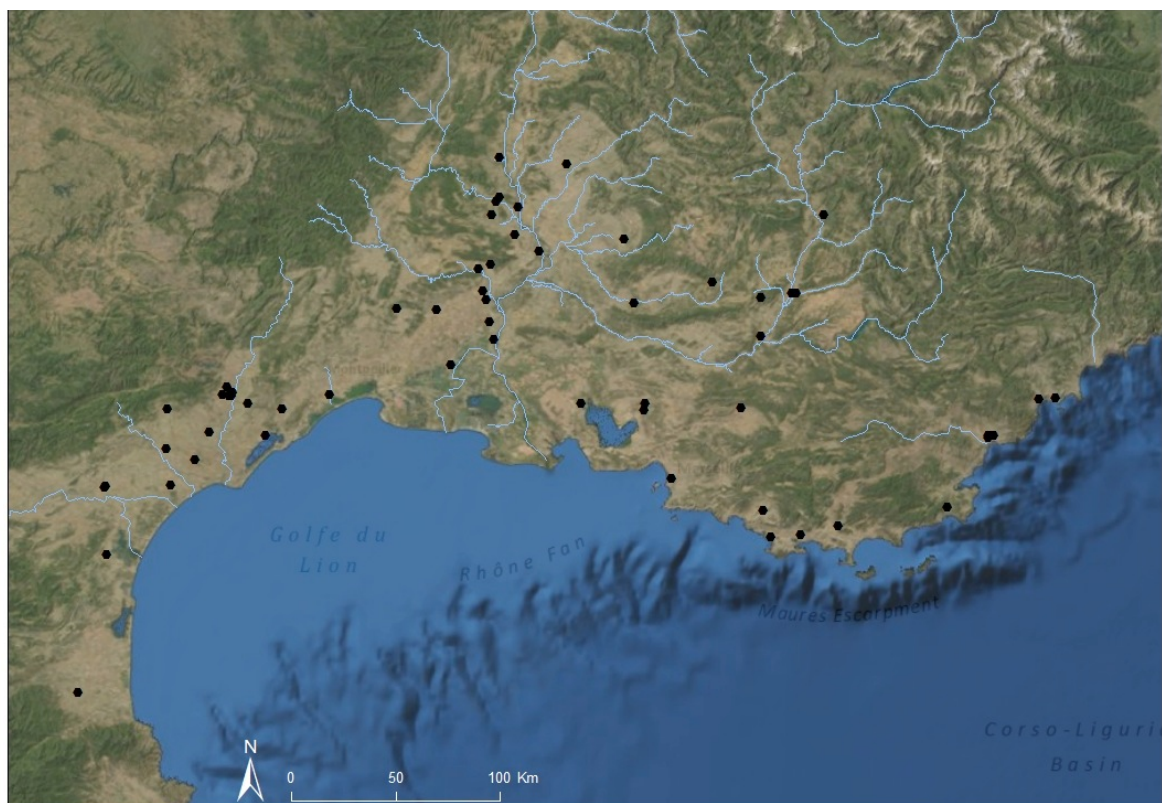


Figure 128. Map of amphora kiln sites in southern Gaul (author) .

⁹⁰⁵ I would like to thank Tyler Franconi for information and discussion relating to amphora assemblages in Germany.

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Figure 129. Gauloise 1, 4 and 5. (University of Southampton (2005) *Roman Amphorae: a digital resource*. York: Archaeology Data Service (doi:10.5284/1000021)).

Gallic wine amphorae are also found at Mediterranean sites and Ostia and Rome were fairly large consumers (See Chapter 1). Chemical analysis of twenty-five Gauloise 5 amphorae and sixty-eight Gauloise 4 amphorae from Ostia has shown that they come from a variety of

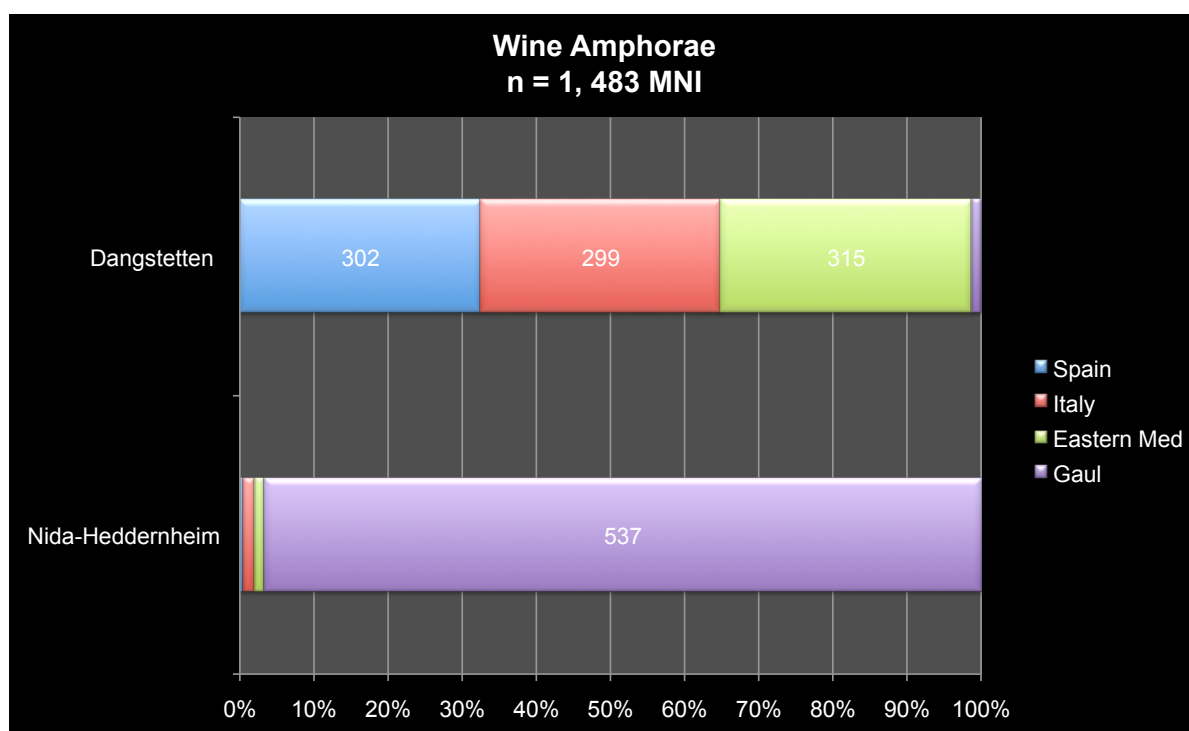


Figure 130. Graph of wine amphorae from the sites of Dangstetten and Nida-Hedderheim (author's graph, data from Ehmig 2010 and Ehmig 2007, respectively).

regions; 48% are from the Rhône valley, 18% are from coastal Provence and 24% are from a chemically distinct, but unknown area, while 9% are unknown. This variety contrasts with the northern sites of London and Tongres whose Gallic amphorae come almost entirely from the Rhône valley (95% and 86% respectively).⁹⁰⁶

The cessation of production of amphorae across Gaul in the third and early fourth century complicates the interpretation of wine production considerably and it is difficult to know how much emphasis one should place on the role of barrels.

Pitch

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Pitch, or more precisely resin, would have been in high demand in southern Gaul and would have been readily produced given the prevalence of pine in the region. The amphorae workshops would probably have been the largest consumer of resin; it would also have been used in ship production and in the

Figure 131. Mosaic depicting the production of resin and the lining of a *dolium* from the late second / early third rustic calendar mosaic, Saint-Romain-en-Gal (Villa, villae en Gaule romaine, http://www.villa.culture.fr/mediatheque/communs/images/grandFormat/1/398_2.jpg, last accessed July 20, 2012).

lining of the *dolia* in the wineries. A mosaic from Saint-Romain-en-Gal actually depicts the process of pitching a *dolium* presumably for the fermentation of wine (Figure 131).

⁹⁰⁶ Laubenheimer and Schmitt 2009, 149.

Four probable temporary pitch production sites have been identified in the interior of the Var region; three were located in the commune of Castellet at La Roche Redonne, Le Matelas, Pied de la Roche Redonne, and one in the commune of La Cadière at Les Valouches.⁹⁰⁷ One has also been discovered on the slopes of the Séranne in Hérault.⁹⁰⁸

Pitch production stations are not always readily identifiable archaeologically due to the fact that they only required minimal infrastructure; production was seasonal, and the resources were quickly exhausted, requiring movement to a new area. An interesting case is, however, known from the Lozère department in the Causses. In the pine forests of the Causses Méjean and the Sauveterre, some thirty pitch production stations have been identified.⁹⁰⁹ Many of these are located within close proximity to the sigillata production site at Le Rozier and it is believed that the pitch production arose as a complementary industry to that of the timber being supplied for kiln fuel. The stations are linked to agricultural farms and most have only been identified through survey.

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Figure 132. Reconstruction drawing of an urn used in the production of pitch (Trintignac 2003, Figure 5).

Those that have been excavated, however, reveal buried urns which contain pitch residue. The production process has been verified using experimental archaeology (Figure 132).⁹ Pitch was produced using two urns with a screen in the middle; a screen was placed over the

⁹⁰⁷ CAG 83/1, 160.

⁹⁰⁸ Balsan 1951, 55.

⁹⁰⁹ Trintignac 2003, 242.

⁹¹⁰ *Ibid.*, 243.

buried urn and a second urn filled with small branches was inverted onto the buried urn. A fire was lit around the top urn causing pitch to be distilled from the twigs and drip through the screen into the buried urn. As an additional byproduct, the branches are carbonized and can then be used as fuel; it is proposed that in this particular case the charcoal was used by local artisans for the reduction of iron ore.⁹¹¹ The resulting pitch, or more precisely, wood tar, would need further refinement and this was probably done at nearby villas. For example, at the Rouveret villa in the Causses Méjean a kiln was discovered along with the remains of 5,000 urn sherds with pitch residue and was seemingly a centre for refining the pitch and processing it into solid form for export and sale.⁹¹² Such blocks can be seen in the museum at Agde and have been recovered from numerous shipwrecks.⁹¹³

While this example is some distance from the ports under consideration in the chapter, it is a useful example to illustrate the processes involved. Given the number of amphorae produced in the coastal region, they would have either been importing their pitch from production centres in the interior such as the in the Causses, or producing pitch in a similar manner at closer locations which have simply not yet been identified.

Salted Fish Production

Archaeological evidence of salted fish production in southern France is rare and given the relative durability of fish-salting vats and the ease with which they can be recognized, it seems probable that this was not a major part of the economy of the southern coast of Gaul. The exception is, of course, the area between Forum Julii and Cemelenum. Kilns producing amphorae for fish sauce are known from Forum Julii (Dressel 14) and Cannes (Dressel 16). Interestingly, however, no vats have been securely identified as being for the production of salted fish. Where vats have been identified, they have either been later shown to be *vivaria*,⁹¹⁴ or are unable to be shown without a doubt to have been for salting fish as opposed

⁹¹¹ *Ibid.*

⁹¹² *Ibid.*, 245.

⁹¹³ The Gallo-Roman wreck, *Guernsey I*, contained a particularly large load of resin (Rule and Monaghan 1993). See also footnote 599.

⁹¹⁴ As at Forum Julii (CAG 83/1, 160).

to being used for live fish or even for salt production. As indicated by the ceramic assemblages discussed above, salted-fish products were frequently imported from Spain.

Oil Production

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Figure 133. Map of Olive Production Zones in southern Gaul (Leveau 2003, Figure 1).

While olive cultivation occurred in southern Gaul, it was on a much smaller scale than that of the vine.⁹¹⁵ Recent studies confirm that it was not until the middle ages that southern Gaul became a major producer of olive products and that the importance of this in antiquity has previously been overestimated.⁹¹⁶ The major areas of olive production are shown in Figure 133. Even in the region of Var where a significant portion of olive production is concentrated, there are some 30 olive mills as compared with 164 remains of wine presses.⁹¹⁷

⁹¹⁵ C.f. Brun 2005, 98-102.

⁹¹⁶ Leveau 2003.

⁹¹⁷ CAG 83/1, 156.

The largest oil production site is the villa of Saint-Michel à La Garde. The villa was constructed during the third quarter of the first century BC with oil pressing installations inserted during the beginning of the first century AD.⁹¹⁸ The production was initially on a small scale with only a single press and small basin, but by the first half of the second century AD, the villa had six presses and six basins, by far the highest number of oil presses in Gallia Narbonensis.⁹¹⁹ The excavators have tentatively suggested production on the level of 10,000 to 30,000 litres annually, corresponding to some 100 hectares of olive groves.⁹²⁰ Oil production ceased by the mid-third century, and the pressing area was used as a slaughter house for cattle before being abandoned altogether by the beginning of the fifth century AD.⁹²¹

The scarcity of oil production in Roman Narbonensis should be viewed as an economic decision. As has been illustrated in this chapter, one of the major economic activities of southern Gaul was the transshipment of products intended for riverine transport to the northern provinces. The most significant such product in the high Empire was Baetican olive oil. Given the vast amounts of olive oil shipped in Dressel 20s into southern France, there was no need to produce large amounts of olive oil. Particularly true for western Narbonensis and the areas around the Rhône, it explains why the only concentrated areas of oil production in the Roman period occur to the east of Massalia (Figure 133). Gaul was unlikely to obtain any economic advantage in the production of olive oil given the dominance of Baetica in this area. By producing relatively small amounts of oil for local consumption and supplementing this by purchasing olive oil from Baetica which was going to be shipped through southern France regardless, the agriculturalists of southern Gaul could focus on a product for which there was a place in the market and for which they could obtain an economic advantage—wine.

⁹¹⁸ Brun 2005, 88.

⁹¹⁹ Brun *et al.* 1989.

⁹²⁰ *Ibid.*, 131.

⁹²¹ *Ibid.*, 132.

Additional Exports: Timber, Salt, Hides, Sigillata and Metals

There are several other products which were probably exported from southern Gaul that have not been discussed in detail above but deserve mention. Some of these are archaeological invisibles. Timber would have been easily accessible throughout most of southern Gaul and particularly east of Massalia. The kilns (amphorae, *dolia*, finewares, coarse wares, tiles, bricks) would have consumed large amounts of timber locally. The pitch used to line the amphorae and *dolia* would have also used considerable timber resources. The inscriptions of *dendrophoroi* from Massalia and Cemenelum⁹²² attest the importance of timber and perhaps an export trade.

Salt is, of course, a classic example of a product which is often invisible in the archaeological record. It is, however, extremely probable that the Gallic coast was engaged in the production of salt in the Roman period, particularly given the ideal natural conditions of the lagoonal Camargue delta and the vast salt industry present there today. In 2005, France produced 1,026,000 tonnes of sea salt, the vast majority of which comes from the two main saltworks in the Camarge, Les Salines at Aigues Mortes and Salin de Giraud.⁹²³ Salt had numerous applications in antiquity and in Gaul would certainly have been needed for the production of salted fish, murex dye and tanned hides. The potential of salt as an export product both to Mediterranean and interior markets is high, but not certain. The only evidence at this time is an inscription of a *salinator* from Narbo Martius.⁹²⁴

Hides and skins are another product with very low archaeological visibility. It is known that there was early trade in hides and skins with Gaul. Pliny the Elder records an amusing anecdote about Claudius fighting an orca in the Claudian harbour at Portus that had been drawn into the harbour on account of a shipwreck containing hides from Gaul.⁹²⁵ Epigraphic evidence, again from Narbo Martius, records several tradesmen who worked with leather.⁹²⁶

⁹²² *CIL* 5.71a, 72.

⁹²³ British Geological Survey 2011, 51.

⁹²⁴ *CIL* 12.5360.

⁹²⁵ *Natural History* 9.5.4.

⁹²⁶ *CIL* 12.4466; 4980; 4500; 4510 and 4513.

The production of sigillata and the metal trade have not been discussed in detail here because they are not coastal industries.⁹²⁷ The majority of sigillata production was aimed northwards, though Italy and Spain also imported sigillata produced at La Graufesenque, and it appears in small quantities at Carthage.⁹²⁸ Production at La Graufesenque began around AD 20 and continued until approximately AD 120 with its peak in the Flavian period.⁹²⁹ Ceramic vessels destined for Mediterranean markets were primarily exported from Narbo Martius.

Some references to mining and mineral resources have been made above, for example the basalt from Agde and the iron from shipwrecks at Saintes-Maries-de-la-Mer. To go into mining in detail is beyond the scope of this thesis, but a very brief overview is warranted.⁹³⁰ Broadly speaking, the Montagne Noire contained iron, lead and silver and the Cévennes contained silver, lead and copper.⁹³¹ Narbo Martius and Arelate would have been the major points of export for these regional products. The Maures Massif between Olbia and Forum Julii also contained deposits of copper, iron and lead. In addition, there were numerous limestone quarries which provided local building materials, and even porphyry quarries near Forum Julii. Mines were often under imperial control and Hirt's recent book provides an excellent overview of such administration.⁹³² A first-century AD inscription of an equestrian *promagister f[errariarum] provincia[rum] Narbonens(is) Lu[gdun(ensis)] Aquitanic(ae) Belgi[cae]* comes from Arelate,⁹³³ which is the only attestation to date of a supra-provincial organization in Gaul and is perhaps a representative of the company administering the iron mines.⁹³⁴ The extent to which mines were exploited beyond local needs is difficult to gauge, but the evidence of the iron wrecks from Saintes-Maries-de-la-Mer is certainly suggestive that there was extensive trade in iron. The presence of the *promagister ferrarium* at Arelate and a *conductor ferrarium* at Narbo Martius⁹³⁵ further demonstrates the importance of iron mining.

⁹²⁷ For the most up to date discussion on Gallic terra sigillata see Mees 2011.

⁹²⁸ See Chapter 1.

⁹²⁹ Mees 2011, 202.

⁹³⁰ For the most up to date survey of mining in Gaul see Domergue *et al.* 2006b.

⁹³¹ See the Barrington Atlas for a basic distribution of mines across southern Gaul.

⁹³² Hirt 2010.

⁹³³ *CIL* 12.671.

⁹³⁴ *Ibid.*, 237.

⁹³⁵ *CIL* 12.4398.

Imports

The most archaeological visible imports discussed here are the amphora-borne goods, i.e. wine, oil and salted-fish products. With the exception of eastern Provence, southern France was a fertile area and was not required to import grain. Indeed, the Barbegal mill provides an excellent illustration of the agricultural fertility of western Narbonensis. Few products, in fact, needed to be imported, though as already discussed oil and fish-sauce were imported so that production could be focused on wine. The amphorae assemblages discussed above reveal important trends in the changing trading connections of southern Gaul over the course of the Roman period.

As has been noted numerous times, the first century BC was marked by extensive imports from Italy. This was the era of the massive Republican wine trade the scale of which is represented by ships such as the *Madrague de Giens* as well as the amphorae assemblages discussed above. This particular trade ended rather abruptly, particularly in western Narbonensis, beginning around 30 BC when southern Gaul begins importing wine from Tarraconensis. In eastern Narbonensis there is a larger importation of wine from Massalia. In the mid first century AD, Gallic amphorae become the predominant wine amphorae at most sites. The exception is the domestic assemblage from Narbo Martius where there are very few Gallic amphorae. There are, however, few wine amphorae at all during the first century AD, so perhaps the residents of Narbo Martius were buying local wine in different containers such as glass. Eastern Mediterranean wines are imported throughout the Roman period in varying quantities until Late Antiquity when they appear in large numbers. Oil and salted-fish products are supplied from Spain continuously throughout Roman occupation. Fish-sauce amphorae from eastern Narbonensis do not make a large impact.

Finewares have not been discussed in detail as the basic trends were stated in Chapter I. Southern Gaul imported first ITS and then ARS in significant quantities and was, of course, a large consumer of South Gaulish terra sigillata.

Harbour Construction and Chronology Development

Artificially constructed or enhanced harbours in southern Gaul predate the Roman period, though they were far fewer and less substantial. Dating information can only be obtained from seven of the harbours discussed in this chapter: Narbo Martius, Lattara, Fossae Marianae, Massalia, Telo Martius, Olbia and Forum Julii. Pre-Roman harbours include the small harbour at Lattara, the probable lagoonal structures near Narbo Martius and, of course, the harbour of Massalia. The absence of a built harbour does not, of course, mean that sites did not make use of natural setting for harbours. Lattara is a good example. The site was a major trading centre since the fifth century BC, but artificial harbour structures were not constructed until the second century BC, although the peak in harbour construction did not occur until the first century AD. Artificial harbour construction on the southern French coast significantly increased following the Roman conquest. Figure 134 illustrates the harbour chronology of the seven dated sites; the columns illustrate the phases during which the harbour was in use while the line graph illustrates the main harbour building activities. For example, Massalia had a harbour since the Greek period; as a result, harbour occupation for

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Figure 134. Graph of Harbour Occupation Phases and Building Activity (author's graph).

Massalia is marked for all centuries, but the Roman harbour restructuring and building began in the first century AD and continued into the second century AD—the line graph marks those activities. As is clearly apparent from the chart, harbour construction peaks in the first century AD. While there are clearly several sites for which earlier harbours could have existed, the primary building surge occurs after the first major peak in trade over the last two centuries BC.

It is interesting to compare the chronological development of the harbours with what is known about trading patterns. Over the course of the Republican and early Imperial periods, three major trends with regard to maritime trade may be highlighted. The first is the wine trade between Italy and Gaul; the second is the late first-century BC and early first-century AD wine trade between Gaul and Tarraconensis, primarily visible in western Narbonensis; and the third is the mid first-century AD rise of local wine production which occurs in conjunction with the northerly-aimed Baetican oil trade.

Large-scale Roman trade with Gaul predated the first official Roman urban establishment in the region and the majority of the harbour infrastructure. This of course included, but was not limited to, the well-known and often-discussed wine-for-slaves trade between Italy and Gaul which occurred over the late second and first century BC.⁹³⁶ The late Republican period in fact accounts for the two largest shipwrecks known from the Roman period, the 500-600 ton *Albenga* wreck (100-90 BC) and the 375-500 ton *Madrague de Giens* wreck (70-50 BC), both ships which were carrying Italian Dressel 1B wine amphorae. In western Narbonensis, the sites of Lattara and Narbo Martius provide good chronological resolution for the decline and near cessation of Italian wine imports by the beginning of the first century AD. At Narbo Martius, Italian wine was thoroughly supplanted by Tarraconensian wine around 30 BC. The late first century BC and particularly the early first century AD marked the rise of Spanish imports across southern Gaul. Tarraconensian wine was imported until around the mid first century AD, when local wine takes over. Baetican olive oil imports began in the first century AD and continued until the third century.

⁹³⁶ See above discussion on pages 209-211.

The patterns are slightly different east of Massalia, particularly during the first half of the first century AD. Italian wine was still the dominant import of the first century BC, but there are fewer Tarraconensian wine imports during the early first century AD. Instead, wine from the region around Massalia was briefly prevalent, as evidenced by the assemblages at Olbia and the Porquerolles. By the mid first century AD, however, the more widespread Gallic wine bottled in Gauloise amphorae became the most common. Baetican oil imports were also common, though slightly less so than in western Narbonensis.

It is moreover instructive to compare this with the known shipwreck data. Including data from Parker's catalogue and the subsequent updates by Strauss, 391 ancient wrecks have been identified off the French coast. When graphed according to Wilson's method of probability per annum, an intriguing pattern arises (Figure 135). To some extent, this follows the basic pattern of the Mediterranean-wide graph as already discussed in Chapter II, but given the more specific dataset, more clearly defined patterns can be distinguished. First of all, the graph shows a substantial increase in wrecks in the Republican period—exactly in

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Figure 135. Graph of shipwrecks off the French coast (author's graph, data from Parker 1992 and Strauss 2007, collected in the OXREP database).

line with the well-documented wine trade between Italy and France. This is to be expected. A greater increase during the first 50 years of our era is also rather to be expected. This traffic is no longer largely dependent upon trade with Italy, but comes at a time when Tarraconensian wine and Baetican oil dominate the ceramic assemblages of southern France. What is, of course, surprising is the initial drop around AD 50 followed by the drastic drop in AD 100 because this is precisely the period in which the economy of southern France reaches its peak.

The decline in the number of wrecks along the French coast thus occurs at precisely the same time as the peak in harbour construction and the rise of the local wine industry. We might consider three possibilities:

- The local wine industry means that fewer amphorae were being imported and we are therefore seeing fewer wrecks.
- The fact that the majority of the exports of southern Gaul are going northwards as opposed to into the Mediterranean means that the export side of the Mediterranean wrecks is missing, thus greatly reducing the overall Mediterranean traffic.
- Better harbours = fewer wrecks.

While all of these are likely to contribute to the overall decline in the number of wrecks, I would argue that the construction of harbours is the most significant explanation. Although less wine is being imported overall, the amphora assemblages still show a variety of imported vintages. Furthermore, the number of Baetican oil amphorae which were being both imported and transhipped remains very high, and we would expect that they would show up in the wreck evidence if ships were lost frequently. While it is true that the majority of exports were moving northwards, the wine and the amphorae in which it was shipped were produced over a relatively large part of southern Gaul and in many cases would have been shipped by sea to the Rhone—for example it would have been more efficient to ship the products from the production sites around Forum Julii via sea rather than overland.

It would seem therefore that the initial rise in trade in the late-Republican period occurs prior to the construction of most harbours. That this trade flourished is clear from the terrestrial

evidence, but the wreck evidence also proves that it involved substantial risk. This seems to have spurred the development of a more sophisticated network of harbours aimed at the reduction of ship losses. Given the drastic decrease in the number of wrecks so far discovered from after the first century AD, it would seem that the venture was successful. The site of Saintes-Maries-de-la-Mer provides a contrasting example in support of this argument; this site marks the location of what was the mouth of the westernmost branch of the Rhône. While the branch was navigable, no harbour structures have been found, perhaps because of the investment of the canal and harbour at Fossae Marianae, the easternmost branch. Fossae Marianae was a full day's sail from Saintes-Maries-de-la-Mer, however, and this apparently encouraged ships from the west to attempt to sail up the nearer branch. Over thirty wrecks, dating predominantly to the early Roman period, have been found at this location; these wrecks cogently illustrate the hazards of attempting to navigate an area without artificial harbour works.

A Third-Century Crisis?

But if the previous section argues that trade did not decline in the second century AD, what about the third? The third-century crisis in the Roman Empire has been the subject of considerable controversy; scholars differ on whether or not there was such a crisis, the extent of its effects and what the causes of crisis might have been (organization, administration, plague, etc). It has been suggested that idea of a crisis has been overemphasized and that the third century was instead a period of transformation.⁹³⁷ While I would agree that the idea of an Empire-wide crisis is an over-simplification (and as was clearly illustrated in the previous chapter), the evidence for southern France strongly suggests that there was indeed a period of crisis in this area.⁹³⁸ The economic impact therefore warrants discussion.

The economic activities of the region seem to decline relatively early; wine and oil production ceases in most areas by the third century AD, and imports decline. Of the 64

⁹³⁷ Liebeschuetz 2007 provides the most up-to-date summary of the debate. For Narbonensis in particular, see the edited volume, *Le IIIe siècle en Gaule Narbonnaise. Données régionales sur la crise de l'Empire* (Fiches 1996). More generally, see Walser 1965; Alföldy 1974; MacMullen 1976; De Blois 1984; De Blois 2002 and Witschel 2004.

⁹³⁸ *Cf.* Fiches 1996.

amphora kiln sites identified thus far in southern Gaul, only five appear to have continued into the third century.⁹³⁹ Many of the pitch production sites of the Causses also cease by the beginning of the third century,⁹⁴⁰ a fact which is surely tied to the cessation of amphorae production. Barrels for wine, however, also required pitch, and therefore a complete switch to barrels would have presumably required fairly similar amounts of pitch.

Recent climatological reconstruction on the basis of dendrochronology in continental Europe has shown serious climatic fluctuations in the third century, as precipitation and mean

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Figure 136. Graph of temperature fluctuations over time (Büntgen, *et al.* 2011, Figure 4).

temperature begin to fluctuate considerably (Figure 136).⁹⁴¹ In addition, the sea level of the Rhône delta changed drastically, rising between 0.5 and 1 m since antiquity. Importantly, this change occurred over a relatively short time period between AD 300 and 900.⁹⁴² This change in sea level resulted in the loss of upwards of 500 m of coastline and the transformation of a lagoonal zone into a pond.⁹⁴³ Outside of the Rhône delta, the sea level of the southern French coast has risen 0.5 m since antiquity.⁹⁴⁴

⁹³⁹ Sanary-sur-Mer, Le Castelet, Sallèles-d'Aude, Saint-Pargoire, and Tourbes.

⁹⁴⁰ Trintignac 2003, 245.

⁹⁴¹ Büntgen *et al.* 2011.

⁹⁴² Vella and Provansal 2000, 37.

⁹⁴³ *Ibid.*

⁹⁴⁴ Vella and Provansal 2000; Morhange and Marriner 2007.

Coring at Arles has been particularly revealing for flood patterns during the Roman period. Flooding occurred during the latter half of the first century BC, raising the water level to 2 to 3 m above the zero point.⁹⁴⁵ From the second half of the first century through the second century, flooding did not exceed the banks of the Rhône at Arelate. From the late second century onwards, floods increase in height, causing the Rhône to overflow at Arelate and one or two deposits cover the circus some 2.8 m above sea level and seriously threatened the Trinquetaille suburb. At this time the roads were raised and canal systems were put in place to assist with drainage.⁹⁴⁶ Trinquetaille was, however, virtually abandoned by the second half of the third century.⁹⁴⁷ From the fourth century onwards, Rhône floods and sedimentation rates were sufficient to change the habitation and exploitation patterns of the river banks. There is surely a connection between these factors and the activity of the Rhône. As most of the wine was being produced to be sent north into Gaul and Germany, a disruption in shipping along the Rhône-Saône corridor would seriously hinder economic investment at every level.

Signs of decline are also seen in Spain, and in Britain and Germany with the cessation of amphorae imports. But what is the cause and what is the result? The coastal zones of Gaul are inextricably linked with Spain and the northwestern provinces and when one part of the system breaks down, so must the others to some degree. Determining which part of this system collapsed first is, however, quite difficult given the lack of chronological precision. Given that the development of such a large wine industry seems to develop in large part due to the traffic in Baetican olive oil, it stands to reason that a disruption in the supply of Spanish oil by means of a state-subsidized transport network would have had significant consequences for the wine industry which developed around it. If Spanish oil ceased to be exported in large quantities ca. AD 260,⁹⁴⁸ we may expect this change to be reflected in the archaeology of this period in Gaul. Yet the decline in southern Gaul seems to begin before this date. A number of different explanations can be posed for the late-second century

⁹⁴⁵ Provansal *et al.* 1999, 28.

⁹⁴⁶ *Ibid.*

⁹⁴⁷ Loseby 1996; Arcelin *et al.* 1999.

⁹⁴⁸ The latest *titulus pictus* from Monte Testaccio dates to AD 259 (Carreras and Williams 2003, 64). See also Martin-Kilcher 1987, 58 and Blázquez 1992.

decline in productive capabilities in southern Gaul, not the least of which are the Antonine Plague and the Severan civil wars.

Could environmental factors have led to the cessation of the regular riverine supply to the northern provinces resulting in the drastic reduction of a market for Gallic wine? It is perhaps impossible to know as it is unlikely that the chronological resolution will ever be such that one can date the environmental changes precisely, but it seems a viable possibility. Given the strong focus of the region on the production of wine, this market loss would have been devastating. As northern Gaul began producing its own wine later in the third century, Narbonensis would never recover its once substantial consumer basis.

Conclusions

This chapter has illustrated that southern France was a highly productive and economically prosperous region, but more importantly, it has contextualized the economic activities of the region. Chronological patterns have been highlighted by examining the region in detail; while the early economic ties were with Italy and the Mediterranean, the predominant focus by the early first century AD was northward, particularly in the western part of the region. This can be seen in the overall development of the southern Gallic port system, which not only connected the coastal cities to each other, but also connected the Mediterranean to the North. From the first century AD onwards, the region was part of a market zone which was sufficiently integrated to allow for specialized production. The importance of this interconnectivity is seen not only by its success in the high Empire, but by the drastic decline in the region in the third century when external factors break market ties.

Figure 137 and Table 6 illustrate my classifications of ports based upon the methodology explained in Chapter III. The importance of the geographical setting of the ports is clear; the large regional ports are mostly located on major rivers. Narbo Martius was on the Aude, Arelate on the Rhône, as with Fossae Marianae, Forum Julii was near the Argens river, as well as the pass between the Maures and Estérel mountain ranges. Massalia is the exception; it was established due to its natural harbour basin and had long been the most prominent port of southern France. In the Roman period, it had a good road connection to the Via Domitia.

The large local ports were similar: Telo Martius was at the western end of the Permian depression between the Maures mountain ranges (Forum Julii was at the other end). The size of Antipolis is debatable given our lack of understanding of the city's archaeology. It was not situated with good hinterland access, but did have a good natural harbour setting on a very rocky coastline.

While Massalia and Forum Julii were major and important ports during the Roman period, they appear to have been less economically active than Narbo Martius and Arelate. In general, the ports east of Massalia were smaller and more numerous—they include not just the ports discussed specifically above, but also those shown on Figure 95 about which very little is known (Carsicis, Citharista, Tauroentum and Lero). This difference can be linked with the landscape and the variable levels of production in the hinterlands of these cities. The fertile plains of Languedoc funnelled their products into the major ports of the region, much of which was aimed at subsequent transshipment up the Rhone from the river port of Arelate. To the east of Massalia, the high peaks of the Alps limited the accessible hinterland,



Figure 137. Map of suggested ancient port development (author).

Modern Terms	Ancient Infrastructure	Ancient Activities	Possible Ports
Small local port	None, Beach, Breakwater, Quays	Villas, Small ports- very small scale export, mixed imports Not dealing with re-distribution	Agatha, Lattara, Olbia, Porquerolles
Large local port	Breakwater, Quays, Small warehouses	Moderate export on regional scale, perhaps some direct imports, but probably imports collected from the two higher port levels	Telo Martius, Antipolis
Large regional port / Emporium	Breakwater, Quays, Enclosed Harbour with depth of 2-3m, Warehouses for both imports and exports, Lighthouse, Possible Crane, Fresh water source	Substantial import/export. Involved in re-distribution on a regional level.	Narbo Martius, Arelate, Fossae Marianae, Massalia, Forum Julii
Large redistribution port / Emporium	Breakwater, Quays, Large Enclosed Harbour with depth above 3m, Extensive warehouses for both imports and exports, Lighthouse, Cranes, Fresh water source	Large scale imports / export and re-distribution in Mediterranean and beyond.	Portus, Alexandria, Ephesos

Table 6. Ancient Port Development (author).

creating a situation similar to that of southern Turkey, where smaller ports developed in order to communicate with each other by sea. It is no coincidence that industries similar to those seen in Turkey developed in this region, particularly the production of fish-sauce and murex dye; lacking a fertile hinterland, the cities of eastern Narbonensis and Alpes Maritimae focused on maritime-based production.

Southern France provides an interesting and informative contrast with southern Turkey, both in terms of chronology and maritime strategy. Southern Gaul develops early, reaching its peak under the Principate and going into significant decline by the third century. The reorganization of the Tetrarchy did not help the region regain its former productive abilities, and while Narbo Martius, Arlelate and Massalia maintained importance in Late Antiquity, this might be seen as an administrative and religious importance, not an economic one. During the early Empire, the port cities of Narbonensis acted as important focal points of local production, interacting with both the Mediterranean and inland Gaul. In this position,

these ports act as a midpoints in trade between Spain and Italy, but also the entire Mediterranean and northern Gaul, Germany and Britain. An inscription from Lyon—a large altar bearing the epitaph of Q. Capitonius Probatas, a *navicularius marinus* and *sevir Augustalis* in both Puteoli and Lugdunum—illustrates this connection eloquently.⁹⁴⁹ The initially huge demands placed upon the core regions of the Mediterranean by military activity in these northern regions allowed southern Gaul to flourish. The subsequent decline in long-distance demand by the military and civilian populations of these regions over the second century meant that Gaul was no longer able to take advantage of these markets.

Southern Turkey, as illustrated in the previous chapter, peaked later, reaching its zenith in the late second century, and continuing in prosperity into Late Antiquity. The rugged landscape of southern Turkey allowed little access to the interior; instead, the harbours created a complex façade maritime which ultimately aimed its products abroad.

Both regions contributed to the overall economic prosperity of the Roman world, but they did so in very different ways. A comparison such as this allows for such nuances to be brought to the fore, revealing the different economic trajectories amongst regions around the Mediterranean.

⁹⁴⁹ *CIL* 12.1942.

CONCLUSION

This study set out to explain how connectivity was accomplished. It also addressed the question of regional interdependence, which is an altogether different matter from connectivity.

Chapter I illustrated that trade in ceramics and in amphora-borne goods throughout the Mediterranean was significant and sustained from the late Republic through the high Empire. Four main points arose from the evidence considered in this chapter. Firstly, amphorae and finewares were traded through separate and distinct mechanisms. Secondly, market demand varied; each city did not have the same array of ceramics. The most palpable example of this is the difference between the amphorae at Portus and Ostia. Thirdly, wine amphorae account for the largest share of the amphora-borne product market. Fourthly, and most importantly for this thesis, there is a distinct difference between assemblages from a harbour zone and assemblages from a habitation zone. This lucidly illustrates that ports did not function simply as a conduit for products to be consumed within their immediate vicinity, but also in some cases functioned as emporia and served as junction points for transshipment.

Chapter II dissected shipwreck cargoes to gain information concerning loading patterns. Shipwrecks with a range of cargo compositions were analysed and divided into three main categories: local cargoes, regional cargoes and supra-regional cargoes. It was argued from the cargoes that the ships were most commonly loaded in a single operation and not through successive loadings. This was the case for even the highly heterogeneous cargoes, which must therefore have been loaded at emporia. The chapter reiterated that commodities were transported in a variety of ways. Crucially, the cargoes provide the evidence to identify and disentangle the multifarious shipping patterns which characterized Roman maritime trade.

The purpose of Chapter III was to draw on the evidence from the first two chapters and provide a model for Roman maritime trade and to highlight the physical infrastructure and social networks which facilitated this trade. Three fundamental stages of the trading process were examined: product acquisition, transport and sale. A model was proposed for

distinguishing port development and hierarchies and this was linked with four basic shipping patterns. This chapter also examined the social network within which Roman trade operated, a network which was absolutely essential in attenuating the communication difficulties inherent in pre-industrial trade.

The first three chapters unequivocally illustrate that the Roman world was connected on a scale hitherto unparalleled in antiquity; this was accomplished not only through observations of artefact distribution but also by highlighting the sophistication of the trading process and the infrastructural investment, both physical and social, which facilitated transport and communication. The evidence in these chapters hints at both economic rationale and interdependence, but has not yet provided sufficient proof to argue indubitably that they were an inherent part of the economic milieu of the Roman period. For this, we must turn to the regional case studies.

Chapter IV surveyed the coast of southern Turkey assessing the region's landscape and geology; it looked in detail at the coastal port cities in terms of their harbour infrastructure, related urban development, and the productive capabilities of the associated cities and their hinterlands. In doing so, a comprehensive picture of the economic development of the region was developed. I have argued that over the course of the Roman period, the inhabitants of southern Turkey increasingly focused their attention on producing products for which they could obtain a comparative advantage. The products were unsurprisingly those which were well-suited to the landscape. It is at this stage that the interdependence of the Roman Mediterranean becomes apparent. Specialization requires interdependence and integrated markets; in order to focus their resources on the large-scale production of a few select commodities, the residents of Lycia, Pamphylia and Rough Cilicia had to be certain that their other needs could and would be supplied through trade. The high degree of coastal connectivity present in the Mediterranean during this period provided sufficient certainty that a regular supply of basic commodities was feasible, thus opening the door for economic development.

Following the same methodological queries of the previous chapter, Chapter V turned to southern France. The differences between southern France and southern Turkey in terms of landscape, productive capabilities, chronology and urbanism are stark. Despite this, the overall picture of economic development is similar. Indeed, the principles of comparative advantage are even more obvious in southern France, a region which had the potential for self-sufficiency. By the first century AD, the residents of southern France had made a conscious decision to concentrate their resources on the production of wine. Again, economic success was dependent upon consistent interdependence amongst provincial regions. The connectivity and subsequent interdependency were achievable because of the dense network of ports which developed around the Mediterranean in the Roman period. It is now to the overall development of this port network to which we turn.

The Ports

As illustrated throughout this thesis, ports provided the interface between land and sea and were the primary facilitators of maritime trade. Technologically, economically and socially, they were absolutely critical to the economic success of the Roman Empire. Ports had been an important aspect of previous Mediterranean societies, but it was only really under the Roman Empire that an integrated port network on a Mediterranean-wide scale truly developed. The defining characteristics of this network were both political and technological. In terms of the political determinants, the Roman period saw the unification of the Mediterranean under a single political entity. For Walter Scheidel, this was “the single most important determinant of the scale, structure and productivity of maritime commerce in the Roman period”.⁹⁵⁰ While imperial state formation created the conditions which allowed for the development of a port network, the state did not necessarily create the port network, nor did the Romans initially realize that a port network would be critical to their prosperity.

The re-foundations of Corinth and Carthage in 44 BC, following their destruction some 100 years earlier, perhaps best represent the realization by Rome that their plans for Empire required the existence of large ports in key locations. Yet it seems to have taken another 100

⁹⁵⁰ Scheidel 2011a, 21.

years to realize that developing only large ports was insufficient. While better chronological resolution is needed in many regions, it appears that the relatively systematic development of harbour infrastructure across the Mediterranean develops only under the Empire and peaks only after the mid first century AD. This certainly seems to be the case for southern Turkey and southern France.

While it is difficult to date much of the harbour infrastructure proper of southern Turkey due to the fact that many of the harbours were natural and little has survived in terms of artificial additions, associated port constructions support a period of development between the mid first and mid second century. The lighthouse at Patara is Neronian, the warehouses at Patara and Andriake are Hadrianic. Most building projects at Phaselis occur during the reigns of Trajan, Hadrian and Antoninus Pius. At Side, the major harbour construction works occur even later around AD 200. Elaiussa-Sebaste expands significantly during the second century AD. The artificial harbour at the site of Soli-Pompeiopolis in Cilicia Pedias has recently been shown to have been constructed with pozzolana and dedicated by Antoninus Pius.⁹⁵¹ In some respects, the harbour construction of southern Turkey matches the overall pattern for the development of the region in the Roman period. The state of archaeological research in southern Turkey makes documentation of Republican period trade difficult, but the evidence of the Neronian customs law from Lycia and the fact that the Customs Law of Asia was translated in Rome in AD 62, show that by the mid first century, the region's trading practices were significant enough to warrant imperial intervention. As has been shown in Chapter IV, the region's prosperity seems to have peaked in the second century AD and then again in Late Antiquity.

The chronological trajectory of Gaul differed from that of Turkey. The Republican period expansion of trade is well documented in southern France; the shipwreck evidence and the terrestrial ceramic assemblages clearly illustrate the extensive wine trade, and in particular the wine-for-slaves trade between Italy and Gaul. It would therefore be reasonable to assume that the large-scale development of ports would have occurred within the Republican period. Yet as was discussed in Chapter V, the development of ports and harbours in Gallia

⁹⁵¹ Brandon *et al.* 2010.

Narbonensis occurred over a century after Roman conquest. The ports of Narbo Martius, Lattara, Massalia, Telo Martius and Olbia are all constructed or expanded in the first century AD. In Chapter V, I argued for a correlation between the construction of harbours and a reduction in ship losses. This is an impossible correlation to make for southern Turkey due to the lack of shipwreck documentation, but it is striking that in both regions what seems to be targeted harbour construction and port enhancements occur after the initial expansion of trade in the Republican period.

I would argue, therefore, that the construction of harbours and the development of ports occurred as a means of ensuring that significant expansion in maritime trade during the Republican period would not only continue, but expand. Unsurprisingly, state investment in port and harbour infrastructure seems limited to large ports,⁹⁵² but in many ways it was not just the development of these large ports which characterized the Roman port network and set it apart from previous centuries. For every large redistribution port and large regional port, there are many more local ports.

Economic Implications

Where then does this leave us in terms of the larger issues of Roman trade and the economy addressed? What are the wider economic implications of this research? It is worth a brief look at the implications of this thesis on the recent arguments of Bang and Morley, as well as those of Whittaker as his work on trade is still being cited in modern scholarship.⁹⁵³

This archaeological excursus presents a fundamentally different picture of Roman trade from that presented by Whittaker and Bang, and to some extent even Morley. Whittaker's objections to market exchange in the Roman world have been addressed throughout this

⁹⁵² The state certainly had a discernible role in the development of maritime commerce the most important part of which was arguably the pacification and unification of the Mediterranean. This pacification and unification created an environment in which maritime commerce could prosper largely free from concerns of piracy or war. The state also invested in developing transportation infrastructure for imperial needs which could be then used for non-imperial purposes. These factors certainly worked to reduce predation costs and therefore to encourage maritime trade, but while they facilitated the process, they were not wholly responsible for the developments which followed. *C.f.* Scheidel 2011a and Wilson 2011b.

⁹⁵³ Bang 2007; 2008; Morley 2007a; 2007b; Whittaker referenced positively in Morley 2007a (see Introduction) and Bang 2007; 2008.

thesis.⁹⁵⁴ For Whittaker, a market economy either existed as the sole mechanism of exchange or not at all, but this is far too simplistic a view; throughout the Roman period, multiple systems of distribution undoubtedly co-existed and even complemented each other.⁹⁵⁵ Supplementary cargoes are not, as Whittaker suggests, objections to a model of market competition, nor do they suggest a trade network suppressed by transport costs. The market in low-value goods existed primarily because there was already a market system in place which allowed for ancillary products. If this market had not existed, products such as finewares would never have been produced on an export-oriented scale. Rather, complementary cargoes expose the workings of integrated market with a high-degree of organizational complexity amongst producers, merchants and consumers.

Whittaker's final and "principal" objection is that any model of market exchange ignores the the behavior of elites. In his view, the movement of goods across the Mediterranean and the changing patterns in major trade commodities throughout the Roman period, i.e. the Republican period export of Italian wine, the Spanish oil trade, the rise of North African amphora-borne products, are all due to landed elites moving the products of their own estates through mechanisms such as private euergetism, gift exchange and patronage (slaves and freedmen).⁹⁵⁶ The evidence presented in each chapter in this thesis unambiguously demonstrates that this was not the case.

Bang is disturbed by the "extravagant claims" of Roman market integration made by Horden and Purcell, Harris, Temin and others.⁹⁵⁷ For Bang, "subscribing to a *Ricardian* vision of the Empire...involves positing a radical, artificial, commercial remoulding of production patterns in the Roman world." Instead, he prefers to view trade as a result of tribute extraction and the state.⁹⁵⁸ As has already been pointed out by Temin, Bang fails to take into account the progression of the theory of comparative advantage that has occurred in the 200 years since Ricardo first formulated the theory. As has been argued in this study, the Heckscher and Ohlin theory of comparative advantage, modified by the requirement of unequal resource

⁹⁵⁴ Whittaker 1985.

⁹⁵⁵ C.f. Mattingly 1997a; Temin 2001; Harris 2011, 147-148, 293-300.

⁹⁵⁶ Whittaker 1985, 59.

⁹⁵⁷ Bang 2008, 71.

⁹⁵⁸ *Ibid.*, 78.

distribution, effectively explains the archaeologically informed picture of Roman production and trade.

Even Morley, whose work on trade is typically well-researched is too conservative in his conclusion regarding Roman trade; he surmised the following in his recent chapter on distribution in the *Cambridge Economic History of the Greco-Roman World*:

There is no evidence of the sort of sustained year-on-year expansion of economic activity which is seen in the European economy from the early modern period. The economy of the Principate experienced some measure of growth (and one could argue that the establishment of Roman hegemony in the Mediterranean might have reduced the incidence of shipwreck in relation to the number of voyages and the volume of shipping), but the great expansion of activity had already taken place under the Republic. This reflects above all the relative environmental uniformity of the Mediterranean, the absence of technological developments that might give a region a comparative advantage in the production of a particular good, and the limits on the expansion of demand.⁹⁵⁹

This thesis has disproved each of these summations. Economic growth has been charted not only in the Republican period, but also throughout the first two and a half centuries of the Empire. Southern France witnessed a period of crisis in the late third century, but not before reaching an economic peak in the late first and early second centuries AD. Southern Turkey was apparently less negatively affected during the third century and indeed prospered in Late Antiquity. Morley's reasons for attributing the majority of economic expansion to the Republican period are due to his failure to understand the limitations of Parker's shipwreck graph. The success of harbours in the reduction of ship losses means that at least with regard to shipwrecks, the archaeological indicators of maritime trade become less visible.

Moreover, Chapters IV and V have clearly shown that the so-called relative environmental uniformity of the Mediterranean breaks down when one zooms in on specific regions. The environmental landscapes of southern France and southern Turkey have very little in common. Finally, technology is not the only factor which can lead to a comparative

⁹⁵⁹ Morley 2007b, 589.

advantage. This thesis has in fact shown that it is regional diversity across the Mediterranean which allows for the development of comparative advantage. It must be remembered that in order for a region to develop a comparative advantage in a product it simply must be able to produce a product more efficiently than its trading partner. If one assumes that most products were produced with equal ease across the Mediterranean, comparative advantage would indeed be difficult to obtain, but this was simply not the case. The Romans clearly recognized this. The notable construction of ports following the initial expansion of Roman trade was surely a conscious decision to facilitate a trading network which would allow for regional specialization and therefore economic prosperity.

Final Thoughts

The Roman economy was not a modern economy, but this is not to say that it did not experience growth, or that it was not developed. One of the major themes throughout this thesis has been specialization. Specialization was seen in the first half of the thesis throughout the various stages of product manufacture and distribution. As illustrated, there was a distinguishable division of labor within the sphere of maritime trade. Specialization is particularly clear amongst *negotatiores*. Specialization is also clearly demonstrated in the second half of this thesis, most notably with regard to the production of commodities for which a region could obtain a comparative advantage. Specialization, be it a merchant's decision to concentrate on trade only between particular cities, or the decision to devote all of one's resources towards producing wine, is only financially viable in environments with sufficient demand and stable market conditions. In unstable economic environments, specialization would not serve to increase profit, but rather to create risk. In an unstable or primitive economy, diversification rather than specialization would be the preferred mode of operation. Without an integrated port network, such sophisticated economic development would not have been possible. As has been acknowledged elsewhere, the dichotomy between the ancient and the modern is far too strong and consequently disadvantageous. It is more productive to measure the Roman economy not against what came after, but rather what came before, and in this respect it was something very different. This thesis opened with a call to de-theorize connectivity and posed a series of questions: What does it mean that the

Roman world was highly connected? Importantly, what did it mean to the Romans? What were its causes and effects? These have been addressed throughout the thesis, but to conclude, the development of the Roman economy is the most spectacular effect of connectivity, and this could not have been achieved without the Roman port network.

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APPENDIX I: NEGOTIATOR INSCRIPTIONS

Number	Type of Specialization	Specific Indicator	Inscription Reference	Province	City
1	Trade	Wool	<i>CIL</i> 11.862	Aemilia / Regio VIII	Modena / Mutina
2	Trade	Timber	<i>CIL</i> 11.363	Aemilia / Regio VIII	Rimini / Ariminum
3	Trade	Iron	<i>AE</i> 1922.82	Aemilia / Regio VIII	Bologna / Bononia
4	Trade	Pigs	<i>CIL</i> 9.1506	Apulia et Calabria / Regio II	Pesco Sannita
5	Trade	Iron	<i>CIL</i> 2.1199 = <i>AE</i> 1999.822	Baetica	Sevilla / Hispalis
6	Trade	Bolts / Doors / Gates	<i>AE</i> 1976.484	Belgica	Metz / Divodurum
7	Trade	Clothes	<i>CIL</i> 13.4564	Belgica	Marsal / Vicani Marosallenses
8	Trade	Pottery	<i>CIL</i> 13.4336	Belgica	Metz
9	Trade	Ars ?	<i>CIL</i> 13.3703	Belgica	Trier / Augusta Treverorum
10	Trade	Beer	<i>AE</i> 1928.183 = <i>AE</i> 1941.168	Belgica	Trier / Augusta Treverorum
11	Trade	Beer	<i>AE</i> 1998.954	Belgica	Trier / Augusta Treverorum
12	Trade	Salted vegetables	<i>CIL</i> 13.5221 = <i>AE</i> 1998.978	Belgica	Windisch / Vindonissa
13	Trade	Silver vessels	<i>AE</i> 1996.416	Campania / Regio I	Pozzuoli / Puteoli
14	Trade	Pottery	<i>AE</i> 1994.1350	Dalmatia	Kastel Sucurac / Salona
15	Trade	Pottery	<i>AE</i> 1992.1374	Dalmatia	Putalje / Salona
16	Trade	Timber	<i>CIL</i> 3.12924 = <i>AE</i> 1892.123	Dalmatia	Salona
17	Trade	Wine	<i>CIL</i> 3.2131	Dalmatia	Salona
18	Trade	Wool	<i>AE</i> 1925.60	Dalmatia	Salona

19	Trade	Oil	<i>CIL</i> 3.2936	Dalmatia	Zadar / Iader
20	Trade	Ivory	<i>CIL</i> 11.3948	Etruria / Regio VII	Capena
21	Trade	Seplasian unguent / perfume	<i>CIL</i> 11.1621	Etruria / Regio VII	Firenze / Florentia
22	Trade	Timber	<i>CIL</i> 11.1620	Etruria / Regio VII	Firenze / Florentia
23	Trade	Wine	<i>AE</i> 1982.357	Etruria / Regio VII	Pisa / Pisae
24	Trade	Gladiatorial Families	<i>CIL</i> 12.727	Gallia Narbonensis	Arles / Arelate
25	Trade	Wine	<i>AE</i> 1900.203	Gallia Narbonensis	Nîmes / Nemausus
26	Trade	Grain	<i>CIL</i> 13.8725 = <i>AE</i> 2007.1024	Germania inferior	Nijmegen / Noviomagus Batavorum
27	Trade	Grain	<i>CIL</i> 13.7836 = <i>AE</i> 2005.1061	Germania inferior	Aachen / Aquae Granni
28	Trade	Pottery	<i>AE</i> 1931.27 = <i>AE</i> 1932.8 = <i>AE</i> 1939.235	Germania inferior	Bonn / Bonna
29	Trade	Wine	<i>CIL</i> 13.8105	Germania inferior	Bonn / Bonna
30	Trade	Allec	<i>AE</i> 2001.1460 = <i>AE</i> 2003.1228	Germania inferior	Colijnsplaat / Ganventa
31	Trade	Allec	<i>AE</i> 1973.365	Germania inferior	Colijnsplaat / Ganventa
32	Trade	Allec	<i>AE</i> 1973.375	Germania inferior	Colijnsplaat / Ganventa
33	Trade	Salt	<i>AE</i> 1973.362	Germania inferior	Colijnsplaat / Ganventa
34	Trade	Salt	<i>AE</i> 1973.364	Germania inferior	Colijnsplaat / Ganventa
35	Trade	Salt	<i>AE</i> 2001.1464 = <i>AE</i> 2003.1228	Germania inferior	Colijnsplaat / Ganventa
36	Trade	Salt	<i>AE</i> 1973.378	Germania inferior	Colijnsplaat / Ganventa

37	Trade	Dyes	IKoeln 00157	Germania inferior	Koln / Colonia Claudia Ara Agrippinensium
38	Trade	Foreign currency	<i>CIL</i> 13.8353	Germania inferior	Koln / Colonia Claudia Ara Agrippinensium
39	Trade	Pottery	<i>CIL</i> 13.8350	Germania inferior	Koln / Colonia Claudia Ara Agrippinensium
40	Trade	Stone	<i>CIL</i> 13.8352	Germania inferior	Koln / Colonia Claudia Ara Agrippinensium
41	Trade	Timber	IKoeln 00428	Germania inferior	Koln / Colonia Claudia Ara Agrippinensium
42	Trade	Wine	<i>AE</i> 1984.661	Germania inferior	Koln / Colonia Claudia Ara Agrippinensium
43	Trade	Clothes	<i>CIL</i> 13.8568	Germania inferior	Stockum
44	Trade	Iron	<i>CIL</i> 13.6851	Germania superior	Mainz / Mogontiacum
45	Trade	Pottery	<i>CIL</i> 13.7228	Germania superior	Mainz / Mogontiacum
46	Trade	Swords	<i>CIL</i> 13.6677	Germania superior	Mainz / Mogontiacum
47	Trade	Pottery and cloaks	<i>CIL</i> 13.6366	Germania superior	Rottenburg / Sumelocenna
48	Trade	Pottery	<i>CIL</i> 13.07588	Germania superior	Wiesbaden / Aquae Mattiacorum
49	Trade	Lime	<i>CIL</i> 10.3947	Latium et Campania / Regio I	Capua
50	Trade	Wine	<i>AE</i> 1968.119	Latium et Campania / Regio I	Casamari / Cereatae Marianae
51	Trade	Silk	<i>CIL</i> 14.2812	Latium et Campania / Regio I	Gabii / Gabiae

52	Trade	Baetican oil	<i>CIL</i> 14.4458 = <i>CIL</i> 6.1625b = <i>CIL</i> 6.31834b = <i>AE</i> 1987.138	Latium et Campania / Regio I	Ostia Antica
53	Trade	Grain from Colonia Iulia Curubis	<i>CIL</i> 14.4549	Latium et Campania / Regio I	Ostia Antica
54	Trade	Silk	<i>CIL</i> 14.2793	Latium et Campania / Regio I	Ostia Antica
55	Trade	Wine	<i>AE</i> 1955.165 = <i>AE</i> 1999.407	Latium et Campania / Regio I	Ostia Antica
56	Trade	Wine from the city	<i>CIL</i> 14.409 = <i>AE</i> 1999.407	Latium et Campania / Regio I	Ostia Antica
57	Trade	Cloaks	<i>CIL</i> 10.1872	Latium et Campania / Regio I	Puteoli
58	Trade	Iron and Wine	<i>CIL</i> 10.1931	Latium et Campania / Regio I	Puteoli
59	Trade	Young Cattle	<i>CIL</i> 10.5585	Latium et Campania / Regio I	San Giovanni Incarico
60	Trade	Purple dye / Purple dyed Cloth	<i>AE</i> 1982.709	Lugdunensis	Lyon / Lugdunum
61	Trade	Seplasian unguent / perfume	<i>AE</i> 1982.702	Lugdunensis	Lyon / Lugdunum
62	Trade	Cloaks	<i>CIL</i> 13.2010 = <i>AE</i> 1999.1039	Lugdunensis	Lyon / Lugdunum
63	Trade	Grain	<i>CIL</i> 13.1972	Lugdunensis	Lyon / Lugdunum
64	Trade	Italian merchandise	<i>CIL</i> 13.1962	Lugdunensis	Lyon / Lugdunum
65	Trade	Meat seller	<i>CIL</i> 13.2018	Lugdunensis	Lyon / Lugdunum
66	Trade	Muria	<i>CIL</i> 13.1966	Lugdunensis	Lyon / Lugdunum

67	Trade	Rafts	<i>CIL</i> 13.2035	Lugdunensis	Lyon / Lugdunum
68	Trade	Silver	<i>CIL</i> 13.1948	Lugdunensis	Lyon / Lugdunum
69	Trade	Special Fabrics	<i>CIL</i> 13.2023	Lugdunensis	Lyon / Lugdunum
70	Trade	Unknown	<i>CIL</i> 13.2003 = <i>AE</i> 1977.536	Lugdunensis	Lyon / Lugdunum
71	Trade	Wine	<i>CIL</i> 13.1921 = <i>AE</i> 1974.422	Lugdunensis	Lyon / Lugdunum
72	Trade	Wine and pottery	<i>CIL</i> 13.2033	Lugdunensis	Lyon / Lugdunum
73	Trade	Pottery	<i>CIL</i> 13.6524	Noricum	Lorch / Lauriacum
74	Trade	Wine	<i>AE</i> 1984.707	Noricum	Passau / Boiodurum
75	Trade	Oil	<i>CIL</i> 9.5307	Picenum / Regio V	Civita de Marano
76	Trade	Clothes	<i>CIL</i> 3.5800	Raetia	Augsburg / Augusta Vindelicorum
77	Trade	Clothes	<i>CIL</i> 3.5816	Raetia	Augsburg / Augusta Vindelicorum
78	Trade	Pottery	<i>CIL</i> 3.5833	Raetia	Augsburg / Augusta Vindelicorum
79	Trade	Purple dye / Purple dyed Cloth	<i>CIL</i> 3.5824	Raetia	Augsburg / Augusta Vindelicorum
80	Trade	????	<i>CIL</i> 6.9672 = <i>CIL</i> 6.25081 = <i>AE</i> 1999.205	Roma	Roma
81	Trade	Baetican oil	<i>AE</i> 1973.71 = <i>AE</i> 2001.518	Roma	Roma
82	Trade	Bronze and Iron	<i>CIL</i> 6.9664	Roma	Roma

83	Trade	Cattle	<i>CIL</i> 6.1035 = <i>CIL</i> 6.31232 = <i>AE</i> 1993.118 = <i>AE</i> 2002.148 = <i>AE</i> 2005.183	Roma	Roma
84	Trade	Celebrated Pigs and Cattle	<i>CIL</i> 6.33887 = <i>AE</i> 1892.27 = <i>AE</i> 2001.200	Roma	Roma
85	Trade	Chickens	<i>CIL</i> 6.9674	Roma	Roma
86	Trade	Cloaks	<i>CIL</i> 6.9675	Roma	Roma
87	Trade	Food and wine of Velabro	<i>CIL</i> 6.9671	Roma	Roma
88	Trade	Grain	<i>CIL</i> 6.814	Roma	Roma
89	Trade	Grain	<i>CIL</i> 6.9668	Roma	Roma
90	Trade	Grain	<i>CIL</i> 6.9683 = <i>AE</i> 2001.169	Roma	Roma
91	Trade	Iron	<i>CIL</i> 6.9666	Roma	Roma
92	Trade	Iron	<i>CIL</i> 6.9665	Roma	Roma
93	Trade	Ivory	<i>CIL</i> 6.33885 = <i>AE</i> 1891.14 = <i>AE</i> 2007.125	Roma	Roma
94	Trade	Ivory and citrus wood	<i>CIL</i> 6.33885 = <i>AE</i> 1891.14 = <i>AE</i> 2007.125	Roma	Roma
95	Trade	Marble	<i>CIL</i> 6.33886	Roma	Roma
96	Trade	Purple dye / Purple dyed Cloth	<i>CIL</i> 6.33888	Roma	Roma
97	Trade	Salsamenta	<i>CIL</i> 6.9676	Roma	Roma
98	Trade	Salted food	<i>CIL</i> 6.9677	Roma	Roma
99	Trade	Timber	<i>AE</i> 1960.29	Roma	Roma
100	Trade	Urban clothing	<i>CIL</i> 6.33889	Roma	Roma
101	Trade	Vessels	<i>CIL</i> 6.1065	Roma	Roma
102	Trade	Wine	<i>CIL</i> 6.9627	Roma	Roma
103	Trade	Wine	<i>CIL</i> 6.33927	Roma	Roma
104	Trade	Wine	<i>CIL</i> 6.712	Roma	Roma

105	Trade	Wine	<i>CIL</i> 6.1101	Roma	Roma
106	Trade	Wine	<i>CIL</i> 6.9679	Roma	Roma
107	Trade	Wine	<i>CIL</i> 6.9680	Roma	Roma
108	Trade	Wine	<i>CIL</i> 6.9681	Roma	Roma
109	Trade	Wine	<i>CIL</i> 6.9682	Roma	Roma
110	Trade	Wine bottles	<i>CIL</i> 6.37807 = <i>AE</i> 1910.74	Roma	Roma
111	Trade	Wool	<i>CIL</i> 6.9669	Roma	Roma
112	Trade	Wool	<i>CIL</i> 6.9670	Roma	Roma
113	Trade	Wine	<i>CIL</i> 9.4680	Samnium / Regio IV	Rieti
114	Trade	Linen	<i>CIL</i> 10.7330	Sicilia	Palermo / Panhormus
115	Trade	Clothes	<i>AE</i> 2000.632 = <i>AE</i> 2003.699	Transpadana / Regio XI	Fara Novarese / Novaria
116	Trade	Cloaks	<i>CIL</i> 5.5925	Transpadana / Regio XI	Milano / Mediolanum
117	Trade	Cloaks	<i>CIL</i> 5.5928	Transpadana / Regio XI	Milano / Mediolanum
118	Trade	Cloaks	<i>CIL</i> 5.5929	Transpadana / Regio XI	Milano / Mediolanum
119	Trade	Lentils?	<i>CIL</i> 5.5932 = <i>AE</i> 2000.255	Transpadana / Regio XI	Milano / Mediolanum
120	Trade	Silver offerings	<i>CIL</i> 5.5892	Transpadana / Regio XI	Milano / Mediolanum
121	Trade	Wine	<i>Pais</i> 00855	Transpadana / Regio XI	Milano / Mediolanum
122	Trade	Pearls	<i>InscrAqu</i> -1.007 18 = <i>IEAquil</i> 00290	Venetia et Histria / Regio X	Aquileia
123	Trade	Clothes	<i>Pais</i> 01096 = <i>InscrIt</i> -10-01.16 3	Venetia et Histria / Regio X	Pula / Pola
124	Trade	Wine of the pagus	<i>AE</i> 1984.427	Venetia et Histria / Regio X	S. Anastasia

125	Location	Canosa di Puglia	<i>AE</i> 2001.866 = <i>AE</i> 2003.360	Apulia et Calabria / Regio I	Canosa di Puglia
126	Location	Ravenna	<i>CIL</i> 9.469	Apulia et Calabria / Regio II	Venosa / Venusia
127	Location	Brittania	<i>CIL</i> 13.634	Aquitania	Bordeaux / Burdigala
128	Location	Apulia	<i>CIL</i> 3.1500 = <i>AE</i> 1995.1302	Dacia	Sarmizegetusa
129	Location	Syria	<i>CIL</i> 3.7915	Dacia	Sarmizegetusa
130	Location	Civitate Viminacium	<i>CIL</i> 3.14904	Dalmatia	Salona
131	Location	Dacia	<i>CIL</i> 3.2086	Dalmatia	Salona
132	Location	Syria	<i>CIL</i> 3.2006	Dalmatia	Salona
133	Location	Brittania	<i>CIL</i> 13.8164a = <i>AE</i> 1893.31 = <i>AE</i> 1953.269 = <i>AE</i> 2004.967	Germania inferior	Koln / Colonia Claudia Ara Agrippinensium
134	Location	Cisalpinus	<i>ZPE</i> -73-107	Germania superior	Augst / Augusta Raurica
135	Location	Cisalpinus and Transalpinus	<i>CIL</i> 13.5303 = <i>CIL</i> 13.11547 = <i>AE</i> 1988.899	Germania superior	Basel / Basilia
136	Location	Mogontiacum	<i>CIL</i> 13.6797	Germania superior	Mainz / Mogontiacum
137	Location	Mogontiacum	<i>CIL</i> 13.7222	Germania superior	Mainz / Mogontiacum
138	Location	Pannonia	<i>CIL</i> 13.6744	Germania superior	Mainz / Mogontiacum
139	Location	Brittania	<i>AE</i> 1975.651 = <i>AE</i> 1982.724	Germania superior	Colijnsplaat / Ganventa
140	Location	Brittania	<i>AE</i> 1983.722	Germania superior	Colijnsplaat / Ganventa
141	Location	Brittania	<i>AE</i> 1983.721	Germania superior	Colijnsplaat / Ganventa

142	Location	Cantianus et Geserecanus	<i>AE</i> 1973.380 = <i>AE</i> 1975.641 = <i>AE</i> 1983.720	Germania superior	Colijnsplaat / Ganventa
143	Location	Castellum Mattiacorum	<i>AE</i> 1997.1187	Germania superior	Colijnsplaat / Ganventa
144	Location	Aquae Mattiacorum	<i>CIL</i> 13.7587 = <i>AE</i> 1890.131	Germania superior	Wiesbaden / Aquae Mattiacorum
145	Location	Cagliari	<i>AE</i> 1915.59	Latium et Campania / Regio I	Ostia Antica
146	Location	Hispania Citerior	<i>CIL</i> 14.397	Latium et Campania / Regio I	Ostia Antica
147	Location	Lugdunum and Aquitania	<i>CIL</i> 13.2448 = <i>CIL</i> 13.299 = <i>AE</i> 1975.616	Lugdunensis	Genay / Ambarri
148	Location	Lugdunum	<i>CIL</i> 13.2025	Lugdunensis	Lyon / Lugdunum
149	Location	Unknown	<i>CIL</i> 13.2029 = D 07279	Lugdunensis	Lyon / Lugdunum
150	Location	Horrea Cornificiana	<i>AE</i> 1946.230	Macedonia	Amphipolis
151	Location	Cisalpinus and Transalpinus	<i>CIL</i> 5.5911	Transpadana / Regio XI	Milano / Mediolanum
152	Location	Dacia	<i>CIL</i> 5.1047 = <i>AE</i> 1991.768	Venetia et Histria / Regio X	Aquileia
153	Trade and Location	Viennese Wine	<i>CIL</i> 12.1896	Gallia Narbonensis	Vienne / Vienna
154	Trade and Location	Pottery from Brittania	<i>CIL</i> 13.8793 = <i>AE</i> 1973.370	Germania inferior	Colijnsplaat / Ganventa
155	Trade and Location	Pottery	<i>CIL</i> 13.1906	Lugdunensis	Lyon / Lugdunum
156	Trade and Location	Soap	<i>CIL</i> 13.2030	Lugdunensis	Lyon / Lugdunum
157	Trade and Location	Wine from Lugdunensis	<i>CIL</i> 13.1911	Lugdunensis	Lyon / Lugdunum
158	Trade and Location	Wine from Lugdunensis in Canabae	<i>CIL</i> 13.1954	Lugdunensis	Lyon / Lugdunum

159	Trade and Location	Wine in Canabae	<i>CIL</i> 13.11179 = <i>AE</i> 1904.176	Lugdunensis	Lyon / Lugdunum
160	Trade and Location	Pigments on the Esquiline	<i>CIL</i> 6.9673	Roma	Roma
161	Trade and Location	Wine from Lugdunensis	<i>CIL</i> 6.29722	Roma	Roma
162	Local Venue	Area of Saturn	<i>CIL</i> 14.153 = <i>CIL</i> 1.810	Latium et Campania / Regio I	Ostia Antica
163	Local Venue	Forum Vinarium	<i>CIL</i> 14.430 = <i>CIL</i> 10.543 = <i>AE</i> 1999.407	Latium et Campania / Regio I	Ostia Antica
164	Local Venue	Forum Vinarium	<i>AE</i> 1940.65 = <i>AE</i> 1999.407	Latium et Campania / Regio I	Ostia Antica
165	Local Venue	Forum Vinarium	<i>AE</i> 1940.66	Latium et Campania / Regio I	Ostia Antica
166	Local Venue	Forum Vinarium at Ostia	<i>AE</i> 1974.123a	Latium et Campania / Regio I	Ostia Antica
167	Local Venue	In the municipium	<i>Wagner</i> 25	Raetia	Augsburg / Augusta Vindelicorum
168	Local Venue	Campus Pecuaris	<i>CIL</i> 6.9660	Roma	Roma
169	Local Venue	Castrum Praetorium	<i>CIL</i> 6.9661 = <i>AE</i> 2001.169	Roma	Roma
170	Local Venue	Cellum Vinarium Novae et Arrunti	<i>CIL</i> 6.8826 = <i>AE</i> 1937.61 = <i>AE</i> 2000.136	Roma	Roma
171	Local Venue	Sacra Via	<i>CIL</i> 6.9662	Roma	Roma
172	Local Venue	Via Appia	<i>CIL</i> 6.9663 = <i>CIL</i> 05.429,061	Roma	Roma
173	Local Venue	Village	<i>AE</i> 1991.786	Venetia et Histria / Regio X	San Canziano / Aquileia

174	qui negotiantur	Italicei quei Aegei negotiantur	<i>CIL</i> 1.2955 = <i>AE</i> 1954.31	Achaia	Aiyion
175	qui negotiantur	Italicei quei negotiantur Argeis	<i>CIL</i> 3.532 = <i>CIL</i> 3.7265 = <i>CIL</i> 1.747	Achaia	Argos
176	qui negotiantur	Italicei et Graecei quei Delei negotiantur	<i>CIL</i> 1.830 = <i>AE</i> 1908.176	Achaia	Delos
177	qui negotiantur	Italicei et Graecei quei Deli negotiantur	<i>CIL</i> 1.831	Achaia	Delos
178	qui negotiantur	Italicei et Graeci quei in insula negotiantur	<i>CIL</i> 3.7237 = <i>CIL</i> 3.13690 = <i>CIL</i> 1.714	Achaia	Delos
179	qui negotiantur	Italicei et Graecei quei Delei negotiantur	<i>CIL</i> 3.7240 = <i>CIL</i> 3.14203,01 = <i>CIL</i> 1.00738 = <i>AE</i> 1905.00036	Achaia	Delos
180	qui negotiantur	Italici quei Argeis negotiantur	<i>CIL</i> 1.746	Achaia	Delos
181	qui negotiantur	cives Romani qui Thinissut negotiantur	<i>AE</i> 1912.51 = <i>AE</i> 1978.836	Africa proconsularis	Bi'r Bu Ruqbah / Thinissut
182	qui negotiantur	qui Apameae negotiantur	<i>CIL</i> 1.746	Asia	Dinar / Apamea Cibotus
183	qui negotiantur	conventus civium Romanorum qui in Asia negotiantur	<i>AE</i> 1924.69	Asia	Ephesos
184	qui negotiantur	civitatis Ephesiorum qui in statario negotiantur	<i>AE</i> 1975.803	Asia	Ephesos
185	qui negotiantur	conventus civium Romanorum qui Ephesi negotiantur	<i>AE</i> 1990.938	Asia	Ephesos

186	qui negotiantur	Italicei quei Ephesi negotiantur	<i>CIL</i> 3.14195.39 = <i>CIL</i> 1.3443	Asia	Ephesos
187	qui negotiantur	conventus civium Romanorum qui in Asia negotiantur	<i>IvE</i> .409	Asia	Ephesos
188	qui negotiantur	Italicei quei Ephesi negotiantur	<i>AE</i> 1968.480	Asia	Ephesos
189	qui negotiantur	qui in statario negotiantur	<i>AE</i> 1924.72	Asia	Ephesos
190	qui negotiantur	cives Romani qui ibi negotiantur	<i>CIL</i> 1.2970 = <i>AE</i> 1947.55	Asia	Kos.Nisos / Cos
191	qui negotiantur	cives Romani qui Mytileneis negotiantur	<i>CIL</i> 3.455 = <i>CIL</i> 3.7160 = <i>CIL</i> 9.5853 = <i>CIL</i> 3.19	Asia	Mytilene
192	qui negotiantur	cives Romani qui in Asia negotiantur	<i>CIL</i> 3.12266 = <i>AE</i> 2002.1420	Asia	Rodos.Nisos / Rhodos
193	qui negotiantur	Italicei quei Sardibus negotiantur	<i>AE</i> 1996.1453 = <i>AE</i> 2002.1400	Asia	Sart / Sardis
194	qui negotiantur	cives Romani qui ibi negotiantur	<i>CIL</i> 3.7043 = <i>CIL</i> 3.14192.3	Asia	Soilen / Prymnessus
195	qui negotiantur	scaphari qui Romulae negotiantur	<i>CIL</i> 2.1168	Baetica	Sevilla / Hispalis
196	qui negotiantur	scaphari qui Romulae negotiantur	<i>CIL</i> 2.1169	Baetica	Sevilla / Hispalis
197	qui negotiantur	Italicei quei Mallei negotiantur	<i>CIL</i> 3.13617 = <i>CIL</i> 3.14177.10 = <i>CIL</i> 1.3448 = <i>AE</i> 1898.52	<i>CIL</i> Licia	Mallus

198	qui negotiantur	nomine Cyrenensium et civium Romanorum qui ibi negotiantur	<i>AE</i> 1974.671	Creta et Cyrenaica	Cyrenae
199	qui negotiantur	qui Cyrenis negotiantur	<i>CIL</i> 1.2958	Creta et Cyrenaica	Cyrenae
200	qui negotiantur	cives Romani qui Gortynae negotiantur	<i>I.Cret.</i> 4.290	Creta et Cyrenaica	Gortyna / Gortyn
201	qui negotiantur	cives Romani qui Gortynae negotiantur	<i>I.Cret.</i> 4.291	Creta et Cyrenaica	Gortyna / Gortyn
202	qui negotiantur	Romani qui in Salamine negotiantur	<i>CIL</i> 3.6051	Cyprus	Limnia
203	qui negotiantur	cives Romani qui Paphi negotiantur	<i>CIL</i> 3.12101 = <i>CIL</i> 1.3442	Cyprus	Palea Paphos
204	qui negotiantur	qui in dioicesi Synnadica negotiantur Appiani	<i>CIL</i> 11.7288 = <i>CIL</i> 1.2663	Etruria / Regio VII	Volsinii
205	qui negotiantur	Romanis qui vico Aresacibus negotiantur	<i>CIL</i> 13.11825 = <i>AE</i> 1945.87	Germania superior	Mainz / Mogontiacum
206	qui negotiantur	cives Romani qui negotiantur Bracaraugustae	<i>CIL</i> 2.2423 = <i>AE</i> 1966.186 = <i>AE</i> 1967.222	Hispania citerior	Braga / Bracara
207	qui negotiantur	naviculari qui Cantabria negotiantur	<i>CIL</i> 02.242	Hispania citerior	Retortillo de Soria / Iuliobriga
208	qui negotiantur	mercatores qui Alexandriai Asiai Syriai negotiantur	<i>CIL</i> 10.1797 = <i>AE</i> 2002.348 = <i>AE</i> 2005.336	Latium et Campania / Regio I	Pozzuoli / Puteoli
209	qui negotiantur	cives Romani in Sicilia Panhormi qui negotiantur	<i>CIL</i> 1.836 = <i>AE</i> 1900.178	Latium et Campania / Regio I	Terracina / Tarracina
210	qui negotiantur	civi Afro negotianti	<i>CIL</i> 3.5230	Noricum	Celje / Celeia

211	qui negotiantur	cives Latini negotiatores Brigantienses	<i>CIL</i> 3.13542 = <i>AE</i> 1986.530	Raetia	Bregenz / Brigantium
212	qui negotiantur	Italicei qui Agrigenti negotiantur	<i>CIL</i> 6.40903 = <i>CIL</i> 1.2710 = <i>AE</i> 1937.11 = <i>AE</i> 1947.6 = <i>AE</i> 1948.90	Roma	Roma
213	Unknown	Unknown	<i>CIL</i> 11.6779	Aemilia / Regio VIII	Ravenna
214	Unknown	Unknown	<i>CIL</i> 8.11813 = <i>AE</i> 1992.1774	Africa proconsularis	Makthar / Maktar / Mactar / Mactaris
215	Unknown	Unknown	<i>CIL</i> 13.1522	Aquitania	Dome.Puy de / Arverni
216	Unknown	Unknown	<i>CIL</i> 13.4481	Belgica	Herapel / Mediomatrici
217	Unknown	Unknown	<i>CIL</i> 13.4155	Belgica	Neumagen / Noviomagus
218	Unknown	Unknown	<i>AE</i> 2000.980	Belgica	Trier / Augusta Trevorum
219	Unknown	Unknown	<i>CIL</i> 13.8338	Germania inferior	Koln / Colonia Claudia Ara Agrippinensium
220	Unknown	Unknown	<i>AE</i> 2001.1466 = <i>AE</i> 2003.1228	Germania inferior	Colijnsplaat / Ganventa
221	Unknown	Unknown	<i>CIL</i> 13.8224	Germania inferior	Koln / Colonia Claudia Ara Agrippinensium
222	Unknown	Unknown	<i>CIL</i> 13.7300	Germania superior	Kastel / Mogontiacum
223	Unknown	Unknown	<i>CIL</i> 13.7068	Germania superior	Mainz / Mogontiacum
224	Unknown	Unknown	<i>CIL</i> 13.7069	Germania superior	Mainz / Mogontiacum
225	Unknown	Unknown	<i>AE</i> 1990.749	Germania superior	Sankt Johann / Mogontiacum
226	Unknown	Unknown	<i>AE</i> 1916.127	Germania superior	Weisenau / Mogontiacum

227	Unknown	Unknown	<i>AE</i> 1940.64 = <i>AE</i> 1999.407	Latium et Campania / Regio I	Ostia Antica
228	Unknown	Unknown	<i>CIL</i> 13.1996	Lugdunensis	Lyon / Lugdunum
229	Unknown	Unknown	<i>AE</i> 1932.37 = <i>AE</i> 1937.176	Mauretania Caesariensis	Tipaza / Tefessad / Tipasa
230	Unknown	Unknown	<i>CIL</i> 3.5308	Noricum	Slovenska Bistrica
231	Unknown	Unknown	<i>CIL</i> 6.18 = <i>CIL</i> 6.30686	Roma	Roma
232	Unknown	Unknown	<i>AE</i> 1994.296	Roma	Roma
233	Unknown	Unknown	<i>CIL</i> 6.9678	Roma	Roma
234	Unknown	Unknown	<i>CIL</i> 6.9656	Roma	Roma
235	Unknown	Unknown	<i>CIL</i> 6.41256 = <i>AE</i> 1985.151	Roma	Roma
236	Unknown	Unknown	<i>ICUR</i> -10.26884	Roma	Roma
237	Unknown	Unknown	<i>CIL</i> 6.40753	Roma	Roma
238	Unknown	Unknown	<i>CIL</i> 6.9658	Roma	Roma
239	Unknown	Unknown	<i>AE</i> 2005.484	Umbria / Regio VI	Pesaro / Pisaurum
240	Unknown	Unknown	<i>AE</i> 1888.25	Venetia et Histria / Regio X	Concordia
241	Unknown	Unknown	<i>CIL</i> 5.4084	Venetia et Histria / Regio X	Mantua
242	Unknown	Unknown	<i>InscrAqu</i> -1.007 14	Venetia et Histria / Regio X	Aquileia
243	Non- Specialized	None	<i>CIL</i> 9.62	Apulia et Calabria / Regio II	Brindisi / Brundisium
244	Non- Specialized	None	<i>CIL</i> 13.642	Aquitania	Bordeaux / Burdigala

245	Non-Specialized	None	<i>CIL</i> 13.256 = <i>CIL</i> 13.257 = <i>AE</i> 1945.15	Aquitania	Saint-Bertrand-de-Comminges / Lugdunum Convenarum
246	Non-Specialized	None	<i>CIL</i> 13.4156	Belgica	Neumagen / Noviomagus
247	Non-Specialized	None	<i>CIL</i> 13.3666	Belgica	Trier / Augusta Treverorum
248	Non-Specialized	None	<i>CIL</i> 13.3704	Belgica	Trier / Augusta Treverorum
249	Non-Specialized	None	<i>AE</i> 1977.512 = <i>AE</i> 1983.643	Britannia	York / Eboracum
250	Non-Specialized	None	<i>CIL</i> 3.1068	Dacia	Alba Iulia / Apulum
251	Non-Specialized	None	<i>CIL</i> 3.14216,11	Dacia	Drobeta Turnu Severin / Drobeta
252	Non-Specialized	None	<i>CIL</i> 3.7761	Dacia	Alba Iulia / Apulum
253	Non-Specialized	None	<i>CIL</i> 3.2125 = <i>CIL</i> 3.8594 = <i>CIL</i> 11.642a11	Dalmatia	Salona
254	Non-Specialized	None	<i>CIL</i> 3.14927 = <i>AE</i> 1899.159	Dalmatia	Trogir / Tragurium
255	Non-Specialized	None	<i>CIL</i> 11.4067 = <i>AE</i> 2004.554	Etruria / Regio VII	Capena
256	Non-Specialized	None	<i>CIL</i> 11.7052	Etruria / Regio VII	Firenze / Florentia
257	Non-Specialized	None	<i>CIL</i> 12.4496	Gallia Narbonensis	Narbonne / Narbo
258	Non-Specialized	None	<i>CIL</i> 12.5687.10	Gallia Narbonensis	Vienne / Vienna
259	Non-Specialized	None	<i>AE</i> 2001.1475 = <i>AE</i> 2003.1228	Germania inferior	Colijnsplaat / Ganventa
260	Non-Specialized	None	<i>CIL</i> 13.8351	Germania inferior	Koln / Colonia Claudia Ara Agrippinensium

261	Non-Specialized	None	<i>CIL</i> 13.8513	Germania inferior	Koln-Bocklemund / Colonia Claudia Ara Agrippinensium
262	Non-Specialized	None	<i>CIL</i> 13.11644a	Germania superior	Hultenhausen / Hultehouse
263	Non-Specialized	None	<i>CIL</i> 13.11812 = <i>AE</i> 1906.64	Germania superior	Mainz / Mogontiacum
264	Non-Specialized	None	<i>CIL</i> 13.6250 = <i>AE</i> 1994.1301	Germania superior	Worms / Borbetomagus
265	Non-Specialized	None	<i>CIL</i> 13.7360	Germania superior	Heddernheim / Nida
266	Non-Specialized	None	<i>AE</i> 1969/70.436 = <i>AE</i> 2005.23	Germania superior	Marbach am Neckar
267	Non-Specialized	None	<i>CIL</i> 2.4317	Hispania citerior	Tarragona / Tarraco
268	Non-Specialized	None	<i>CIL</i> 14.2465	Latium et Campania / Regio I	Marino / Castrimoenium
269	Non-Specialized	None	<i>AE</i> 1913.204	Latium et Campania / Regio I	Albano Laziale / Albanum
270	Non-Specialized	None	<i>CIL</i> 14.4549.15	Latium et Campania / Regio I	Ostia Antica
271	Non-Specialized	None	<i>CIL</i> 14.4549.16	Latium et Campania / Regio I	Ostia Antica
272	Non-Specialized	None	<i>Suplt</i> -25-AS.4	Liguria / Regio IX	Acqui Terme / Aquae Statiellae
273	Non-Specialized	None	<i>CIL</i> 13.1999	Lugdunensis	Lyon / Lugdunum
274	Non-Specialized	None	<i>AE</i> 1942/43.21	Mauretania Tingitana	Volubilis
275	Non-Specialized	None	<i>CIL</i> 3.7442 = <i>AE</i> 1966.350 = <i>AE</i> 1969/70.565	Moesia inferior	Swischtow / Svishtov / Novae
276	Non-Specialized	None	<i>AEA</i> 2008.98 = <i>AEA</i> 2010.22	Noricum	Salzburg / Iuvavum

277	Non-Specialized	None	<i>CIL</i> 08.7149	Numidia	Constantine / Cirta
278	Non-Specialized	None	<i>CIL</i> 08.7999	Numidia	Skikda / Ras Skikda / Philippeville / Rusicade
279	Non-Specialized	None	<i>CIL</i> 3.10430	Pannonia inferior	Budapest / Aquincum
280	Non-Specialized	None	<i>ILJug</i> -1.289 = <i>CIMRM</i> -2.0184 4	Pannonia inferior	Osijek / Esseg / Eszek / Mursa
281	Non-Specialized	None	<i>CIL</i> 3.14354.22	Pannonia superior	Drnovo / Neviodunum
282	Non-Specialized	None	<i>CIL</i> 3.4250	Pannonia superior	Hegyko
283	Non-Specialized	None	<i>AE</i> 1938.00163	Pannonia superior	Petronell-Carnuntum / Carnuntum
284	Non-Specialized	None	<i>AEA</i> 2009.21a = <i>AEA</i> 2010.42	Pannonia superior	Petronell-Carnuntum / Carnuntum
285	Non-Specialized	None	<i>CIL</i> 3.4251 = <i>AE</i> 1992.1393	Pannonia superior	Unterpetersdorf
286	Non-Specialized	None	<i>AE</i> 1962.383	Pannonia superior	Sopronkohida / Scarbantia
287	Non-Specialized	None	<i>AE</i> 1978.635 = <i>AE</i> 1988.938 = <i>AE</i> 2007.13	Pannonia superior	Pozsonyboldogfa / Boldog
288	Non-Specialized	None	<i>CIL</i> 3.5830	Raetia	Augsburg / Augusta Vindelicorum
289	Non-Specialized	None	<i>CIL</i> 3.5943	Raetia	Regensburg / Castra Regina
290	Non-Specialized	None	<i>Wagner</i> 106	Raetia	Ziegetsdorf
291	Non-Specialized	None	<i>CIL</i> 6.367 = <i>AE</i> 2001.169	Roma	Roma
292	Non-Specialized	None	<i>CIL</i> 6.3687 = <i>CIL</i> 6.30902	Roma	Roma
293	Non-Specialized	None	<i>CIL</i> 6.5197	Roma	Roma

294	Non-Specialized	None	<i>CIL</i> 6.9652 = <i>CIL</i> 10.89.38	Roma	Roma
295	Non-Specialized	None	<i>CIL</i> 6.9653	Roma	Roma
296	Non-Specialized	None	<i>CIL</i> 6.9654 = <i>AE</i> 2000.132	Roma	Roma
297	Non-Specialized	None	<i>RPAA</i> -1978/80- 365	Roma	Roma
298	Non-Specialized	None	<i>CIL</i> 6.3574	Roma	Roma
299	Non-Specialized	None	<i>CIL</i> 6.9657	Roma	Roma
300	Non-Specialized	None	<i>CIL</i> 6.9659 = <i>CIL</i> 6.33814	Roma	Roma
301	Non-Specialized	None	<i>CIL</i> 10.7612 = <i>AE</i> 2008.605	Sardinia	Cagliari / Carales
302	Non-Specialized	None	<i>AE</i> 1906.171	Transpadana / Regio XI	Bussero
303	Non-Specialized	None	<i>CIL</i> 5.8939	Transpadana / Regio XI	Vercelli / Vercellae
304	Non-Specialized	None	<i>CIL</i> 5.6812	Transpadana / Regio XI	Ivrea / Eporedia
305	Non-Specialized	None	<i>CIL</i> 5.5145	Transpadana / Regio XI	Bergamo / Bergomum
306	Non-Specialized	None	<i>CIL</i> 11.5068	Umbria / Regio VI	Bevagna / Mevania
307	Non-Specialized	None	<i>AE</i> 1982.380 = <i>AE</i> 2003.678	Venetia et Histria / Regio X	Aquileia
308	Non-Specialized	None	<i>InscrAqu</i> -1.713 = <i>IEAquil</i> 187	Venetia et Histria / Regio X	Aquileia
309	Non-Specialized	None	<i>InscrAqu</i> -1.715 = <i>IEAquil</i> 155	Venetia et Histria / Regio X	Aquileia
310	Non-Specialized	None	<i>CIL</i> 5.1040	Venetia et Histria / Regio X	Aquileia
311	Non-Specialized	None	<i>InscrAqu</i> -1.148 = <i>AE</i> 1898.85	Venetia et Histria / Regio X	Aquileia