TRAVEL IN THE LATE ANTIQUE LEVANT

A STUDY OF NETWORKS OF COMMUNICATION AND TRAVEL INFRASTRUCTURE IN THE 4TH-7TH CENTURIES

VOLUME I: TEXT



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Abstract

The purpose of this thesis is to study the travel infrastructure that existed in the Late Antique Levant (defined as extending from southern Asia Minor to the Sinai Peninsula), and how it enabled people to travel around the region for a variety of official, professional or personal reasons.

What were the motivations, and what mechanisms facilitated or constrained travel for different groups of people? Road conditions and road maintenance are discussed, as is the availability of amenities, and the means of transport (wheeled vehicles, animals) and the various hazards that travellers might have faced.

Chapter 3 addresses the conception of space and distance. This includes not only how geographical space was described, but also how distance was measured and broken up into manageable increments for travel. This chapter details how the incremental landscape was applied, e.g., through the staging posts of the *cursus publicus* and set itineraries for pilgrimage.

Chapter 4 focuses on travel by water, examining the different factors, such as ship construction, seasonal weather patterns, navigation and hazards, to determine whether the risks and benefits were in balance. An examination of the Tigris, Euphrates, and Orontes and their role in transportation relies on a combination of texts and archaeology from Late Antiquity itself, and ethnographic comparanda from both earlier and later periods.

Chapter 5 is devoted to specific evidence for networks in the Late Antique Levant. The four case studies look at the connections between the Levant and the imperial capital, military routes to the Mesopotamian frontier, caravan routes through Syria, and pilgrim roads leading to Jerusalem. These strands are brought together in Chapter 6, a regional study of southern Palestine and Transjordan. Changes in routes over time reflect military and commercial concerns, as well as the interest of pilgrims in the holy sites of the area.

Acknowledgments

This project was initially sparked in 2001, working on the excavation of the mountain-top pilgrim hostel at Jabal Harun near Petra. The questions about who had stayed there, how they had gotten there, and what had motivated them to climb the vertiginous path in the first place, developed first into a BA thesis at Wellesley College and then into an MPhil thesis in Byzantine Studies at Oxford, and have now expanded into this study.

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List of Abbreviations

CE = The Catholic Encyclopedia

CIL= Corpus Inscriptionum Latinarum

CJ = Codex Justinianus

Corr. Sarg. = Correspondence of Sargon II (Parts I and II)

C.Th. = Codex Theodosianus

IGLJ = Inscriptions grecques et latines de la Jordanie

IGLS = Inscriptions grecques et latines de la Syrie

IGR= Inscriptiones Graecae ad res Romanas pertinentes

NEAEHL= New Encyclopedia of Archaeological Excavations in the Holy Land

ODB = Oxford Dictionary of Byzantium

PLRE = Prosopography of the Later Roman Empire

PUAAES = Princeton University American Archaeological Expedition to Syria

SEG = Supplementum Epigraphicum Graecum

Chapter 1 – Introduction

The world of Late Antiquity was a world on the move – a world of speeding couriers, marching soldiers, junketing bishops, wandering monks, intrepid sailors, and merchants steadily making their way across desert sands with an undulating train of camels in their wake. Even for ordinary people, the world was one of broader horizons than one might initially think. This was made possible by the breadth of the Roman imperial road network, mainly a product of the 1st-3rd centuries – the empire's expansionist heyday. And yet travel remained an important component of daily life well after that time as a means of moving not only people and goods, but of transmitting information and ideas as well. The rise of the cult of holy places and holy men made travel even more attractive to all classes of society.

The period of Late Antiquity (4th-7th centuries CE) is often regarded as the period in between. The Islamic world is so recognisably different from the Classical world, the collapse of one and the emergence of the other must have occurred sometime during those murky centuries. Bracketed by these culturally divergent episodes, Late Antiquity is sometimes treated as a sort of dumping ground for all major changes. The aim in this work is to disentangle the assumptions and generalisations, and to look for genuine evidence of change and transformation, and, where possible, to date these changes and understand the true factors behind them rather than accepting the grandiose picture of decline and fall.

The issue of communications networks and the infrastructure that supported them provides a useful lens through which to examine these changes. Communications and infrastructure are necessary for all that makes an empire great: its administration,

protecting its borders, and importing and exporting goods to keeps its citizens both fed and happy.

My objective in this study is not to redress this gap in our knowledge of the east Mediterranean road network as a comprehensive entity – this would be an undertaking far greater than the scope of this work. Likewise, my interest is not in how the road network came to be laid out in the 1st-3rd centuries. Instead, I am interested specifically in the road network's condition in – and contribution to – the changing cultural and political contexts of the fourth through seventh centuries.

Some Notes on Terminology

Periods

The timespan covered in this work is the 4th century CE to the 7th century CE; in terms of relevant historical events the period could be envisioned as bracketed by the accession of Diocletian in 284 and the loss of Syria and Palestine to the Arabs at the battle of Yarmuk in 636. The accession of Diocletian is a defining moment because Diocletian's reforms result in the creation of the diocese of Oriens, which provides the geographic scope of this study.[1] Diocletian's reforms furthermore had widespread impact on provincial organisation and communications, on trade patterns, and on the disposition of the military, particularly along the eastern frontier. These in turn had an impact on networks of communications, and will be considered individually in a series of case studies in Chapter 5. The choice to end with the Arab Conquests is more a matter of convenience than reflecting the cessation of the patterns of circulation that existed within the region, or even with regions beyond.[2]

In the scholarship of Israel and Jordan, this period of the 4th to 7th centuries is known as 'Byzantine'. However, in Turkey 'Byzantine' is usually taken to refer to the

[1] The Diocese of Oriens is first attested in the *Verona List* of 314. See Rees 2004, Chapter 27.
[2] See Hodges and Whitehouse 1983.

period beginning *after* the 7th century, and is used to mean the medieval period.[3] Since this term furthermore is a construct of the 16th century with no basis in historical usage, I will attempt to avoid it entirely.[4] Instead I will attempt to be as specific as possible with regard to date ranges, otherwise I will use the terms 'Late Antique' and 'Late Roman' to refer to the span of the 4th through 7th centuries. I intend these terms to be understood as more or less interchangeable, although 'Late Roman' may also encompass the 3rd century. 'Late Antiquity' also includes the cultures outside the shrinking boundaries of the Roman Empire: the Sasanians and Arabs, as well as the peoples from the north.

Geography

The geographic expanse covered in this work is commensurate with the diocese of Oriens and encompassing the provinces of Palaestina (I-III), Arabia, Syria (I-II), Phoenicia (Maritima and Libanensis), Euphratensis (and E. South), Osrhoene, Mesopotamia (and M. South), Cilicia (I-II) and Isauria (see Map 1.1).[5] Collectively this area is known as the Levant, and corresponds to the modern nations of Israel, the Palestinian Territories, Jordan, Syria, Lebanon, and parts of Turkey and Iraq. Although part of Oriens, Cyprus has not been included, except in discussion of sea routes. Egypt has likewise been omitted, apart from Sinai, which belonged to Palaestina III. This region thus not only forms a cohesive administrative unit, it also contains within it numerous examples of communications networks operating at the micro and macro level that form the basis for the case studies presented in Chapter 5.

[3] For example, the recent *Cambridge History of the Byzantine Empire* (2008) begins with the 6th century; Mark Whittow's *The Making of Orthodox Byzantium* (1996) starts with the 7th.
[4] The term, which derives from the ancient Greek name of the settlement which eventually became Constantinople, was first employed by Hieronymus Wolf in 1557 in his *Corpus Historiæ Byzantinæ*.
[5] The provinces of Theodorias on the Syrian coast with its capital at Laodicea (Lattakia), and Armenia IV also became part of Oriens. The rearranging of provincial boundaries happened on a number of occasions, notably during the reigns of Theodosius II and Justinian. See Sipilä 2007 and 2009; Jones 1964 Appendix III (esp. 1458-61).

Terminology

Some key elements of terminology must also be highlighted. Throughout this work there will be extensive use of the terms *road* and *route*: it is important to stress that these are being used in two different senses. The term *road* is used when an archaeologically attested structure is preserved, i.e., the physical remains of a man-made ancient structure are visible or were recorded during the modern period. The term *route* is used to describe the probable course of a road that is no longer extant. Furthermore, there are numerous minor routes: paths, tracks, holloways that do not necessarily merit the term 'road' because they lack engineering but are nonetheless evidence of connectivity and movement through the landscape.

Previous Scholarship

As will become evident below, most of the scholarship that I will be engaging with does not focus directly on travel, but on fields tangential to travel, or of which travel is a component, such as the study of the army and warfare, or the economy and trade.[6] Pilgrimage has similarly been the exclusive subject of a number of studies.[7]

While there have been large-scale studies conducted by previous scholars (notably Denys Gorce, *Les voyages, l'hospitalité et le port des lettres dans le monde chrétien des IVe et Ve siècles* [1925]; B. Kötting, *Peregrinatio Religiosa* [1950]; and L. Casson, *Travel in the Ancient World* [1974, reprinted 1990]) these are nearly exclusively based on textual sources. There is a great deal of recent archaeological work to be analysed and incorporated. The publication from a relatively recent symposium on travel in Byzantium (R. Macrides, ed. *Travel in the Byzantine World* [2002]), despite an article by Michael

[6] The proceedings of the LIMES conferences on Roman Frontier Studies contain the latest in the field of military studies. *The Late Roman Army in the Near East* (A. Lewin and P. Pellegrini, eds, 2007) contains many valuable contributions. On the subject of trade specifically in Late Antiquity, the recent volumes edited by Marlia Mundell Mango (2009) and Sean Kingsley and Michael Decker (2001) are useful.
[7] The definitive introduction to early Christian pilgrimage remains David Hunt's *Holy Land Pilgrimage in the Later Roman Empire* (1982).

McCormick opening up interesting new methodological avenues, focuses on the medieval Byzantine period and bypasses Late Antiquity entirely. This is the methodology employed by McCormick in his *Origins of the Mediterranean Economy* (2001), which, like Casson's work, relies heavily on textual sources.

Modern Atlases and Online Tools

In the past few years, an abundance of online resources have been made available for the study of Roman road networks.

The *Barrington Atlas of the Greek and Roman World* represents the most recent cartographic undertaking for the Classical world. It was published in 2000, and is not available in a separate electronic edition. After 2000, the wide-spread and free availability of detailed maps, satellite images and route planners provided by, e.g., Google Earth and Google Maps has increased interest in computer-generated geospatial maps. These tools are invaluable to archaeologists as well.

One programme doubtless directly inspired by the journey planner facilities offered by Google and the like is Omnes Viae (http://omnesviae.org/), which directly overlays the routes of the Peutinger Map (supplemented by the Antonine Itinerary) onto a modern satellite image. The roads – as on the original map – are not given topographical accuracy, but are rendered as straight lines between cities and road stations. The programme, like the online journey planner of Google Maps, allows the user to plot a route between destinations by typing them into the proper fields, either by giving the modern place name or the name as it appears on the Peutinger Map. A drop-down menu makes it possible to select the correct location from a number of locations with the same name, or with idiosyncratic spellings on the original document. A simple experiment to find the route between Antioch and Apamea reveals the glitches inherent in the system, but does provide a good example of precisely how sketchy the information to be gleaned

from ancient itineraries is. As Figure 1.1 demonstrates, the programme selects the route according to stops mentioned on the itineraries, but overlooks the shortest route, which would make use of the Antioch-Chalcis road and turn south at the Dana plain (see Chapter 5.3).

Other online tools used to map the ancient world are specifically related to academic projects.

The ORBIS project (The Stanford Geospatial Network Model of the Roman World) is designed to calculate the speed and expense of communications between locations within the Roman world.[8] The user can choose between 751 locations, and make use of 84,631 km of road, 180,033 km of sea routes, and 28,272 km of navigable rivers and canals. The settings allow the user to factor in variables such as season and mode of transport.

The Digital Atlas of Roman and Medieval Civilizations, allows users to select layers to be displayed on the background of a basic topological map. These layers represent a wide range of data, from 'Bishoprics ca. 600' to 'The Archaeology of Rats 1-1500'. A subcategory of the 'Roman Empire' displays the road network, as well as other features such as road stations, forts, churches, aqueducts, etc.[9]

The final example is the online companion to Richard Talbert's 2010 publication on the Peutinger map. Maps A and B use a full-colour reproduction of the original Peutinger Map (now in the Österreichische Nationalbibliothek) as their base. Maps C-F use the Barrington Atlas as their base, and users can select features from the Peutinger

[8] W. Scheidel, and E. Meeks, (2012). ORBIS: The Stanford Geospatial Network Model of the Roman World. Retrieved 07 Oct, 2013, from http://orbis.stanford.edu.
[9] M. McCormick, E. Turnator, B. Maione-Downing, G. Zambotti, et al. (2010) DARMC: Digital Atlas of Roman and Medieval Civilization. Retrieved 07 Oct, 2013, from http://darmc.harvard.edu/icb/icb.do.

Map to see where they are physically located on an accurate cartographic rendering. [10]

The Nature of the Source Material

The primary aim of this study is to attempt to answer questions regarding the state of travel infrastructure in Late Antiquity from an archaeological perspective. To this end, published reports of excavated sites and landscape surveys have been consulted. However, to answer broader questions about connectivity and the experience of travel in Late Antiquity, a wide range of sources must be consulted. The primary body of archaeological material in a study of communications networks ought to be the roads that formed those communication networks. In many cases, ancient road surfaces do survive and can be analysed using the archaeological methods described below. In addition to modern archaeological studies, the accounts of early modern scholars such as Gertrude Bell or Howard Butler and his team are a valuable source. They contain not only detailed observations about archaeological sites and antiquities, but because they were travelling in an era before motorised vehicles and tarmacked roads, their observations about the nature of travel through the region offers a point of analogy with travel a millennium and a half before.

What follows is a brief introduction to the different types of literary material consulted in this work. It includes geographical texts, itineraries, pilgrim accounts, hagiography, histories and chronicles, and documentary papyri.

Itineraries

As we shall see in Chapter 3, the Romans appear not to have developed a tradition of accurate map-making. Examples of maps are few, as are references to them. However,

[10] Talbert, R. (2010). Rome's World: The Peutinger Map Reconsidered. Retrieved 07 Oct, 2013, from http://www.cambridge.org/us/talbert/index.html.

geographical texts, such as those of Ptolemy and Strabo, were known, which lay out both the theory of map-making and provide detailed geographical descriptions of the known world and its inhabitants.

As I argue in Chapter 3, the Roman viewed their world mainly as a series of interlinking roads. This is evident in the preponderance of the genre of the itinerary. Works such as the 2nd century CE Antonine Itinerary, or the 4th century Bordeaux Itinerary, are representatives of this genre, which consists of lists of place names and the mileages between them. Similarly, the *Onomasticon*, a gazetteer of Biblical place names compiled by Eusebius in the 4th century (and later translated into Latin by Jerome), relies on roads and mileages for describing the locations of the sites it mentions.

The Ravenna Cosmography is a list of cities without mileages. However, one can detect that, for the cities of Palaestina, the roads of the province underlie the way the list is ordered. Jerusalem is the first city listed, then Bethlehem and cities on the Hebron road. Then it follows the Jerusalem-Nikopolis-Antipatris route, and, after a strange interpolation of Nazareth and Bethsaida, which do not lie on this route, it proceeds to Caesarea Maritima and then south down the coastal road extending into Egypt, before looping back north into the Negev (mentioning Nessana and Elusa).[11] See Map 1.2. The interpolations and lack of other information on direction and distances make it unlikely that this work could be of great utility to travellers.

Although no maps *per se* survive from the Late Roman period, one or two exemplars of what can be designated illustrated itineraries (*itineraria picta*), do survive. The term *itineraria picta* derives from the 3rd century military handbook of Vegetius. In it, Vegetius recommends that a commander have at his disposal illustrated itineraries to aid in planning campaigns.[12]

[11] Ravenna Cosmography 2.14.
[12] Vegetius, *De re militaris* 3.6.

While the Antonine Itinerary and Ravenna Cosmography are just lists of place names, the Peutinger Map is a more intriguing document. The Peutinger Map is a parchment scroll, c. 7 metres in length, representing in schematic form the road network of the Roman Empire.[13] The version preserved today is a 13th century copy of a map probably drawn up in the early to mid-4th century, itself possibly based on a 1st or 2nd century original. The map extends from southern Britain and the Iberian Peninsula in the west (the westernmost section with the remainder of Britain is missing) to beyond the eastern boundaries of the Empire into Persian territory. Fig. 1.2 shows the section representing Syria, Mesopotamia and Palestine. The representation is very compressed longitudinally; the Levantine coast extends right to left rather than from top to bottom. Furthermore, the area around the Euphrates is rather garbled. Sura, for example, which is a known crossing point, is shown at some distance from the river (Fig. 1.3).

The orthography is rather idiosyncratic, and place names can be difficult to identify, but the distances between sites have been given, which helps in the process of elimination. Traditional studies have relied on the places in the Peutinger Map to identify unknown archaeological sites. At times toponymy gives a reasonable indication. Some ancient (Greek) place names were variants of existing Semitic names, which have then been back-translated into Arabic. A clear example is the city of Resaina (which came to be known as Theodosiopolis in the 5th century after Theodosius II rebuilt the walls), at the source of the Khabur. The modern Arabic name is Ras al-'Ain, which means 'head of the spring'; the Greek name in turn derives from the Syriac of similar root, Rēsh 'Aynā (ܪܝܫ ܥܝܢܐ). However, in most cases, relying on toponyms is a less than accurate method, as it often requires reconciling misspelled place names or incorrect mile distances on the document.[14]

[13] Talbert 2011, Weber 1999.
[14] For an example of the controversy, see, e.g., Aharoni 1954; contra Isaac 2006, 216.

Pilgrim accounts and saints' lives

The most distinctive and abundantly documented aspect of travel after the 4th century is, of course, Christian pilgrimage, made possible by the public support given to Christianity by Constantine and his successors, and the increased visibility of Christian monuments and the development of the Holy Land as a living *locus sanctus* teeming with holy sites and holy people. For an introduction to the main pilgrim accounts from the 4th century onward, see Wilkinson 1977. One of the most detailed pilgrim accounts is that of Egeria, c. 384 CE. Egeria wrote her account for her 'sisters', fellow nuns at home in Spain, possibly Galicia.[15] The beginning of Egeria's account is lost, and the extant text picks up in Sinai. Over the course of three years, she energetically travelled in Sinai, Palestine (spending a long time in Jerusalem), journeying all the way to Edessa before making her way back to Constantinople.

The second significant pilgrim account is that of an anonymous pilgrim from Piacenza dating from around 570 CE. It is similar to Egeria's account in that he visited many of the same sites, and it is autopsic: it appears to be put together from the first-hand experiences of the pilgrim or tales he heard of sites not on his route.[16] The Piacenza pilgrim was writing at a time when pilgrimage was much more popular, and itineraries such as the Breviarius of Jerusalem (a short guide to the holy sites of the city) circulated widely.[17] However the volume of surviving monuments and texts relating to pilgrimage belies the extent to which travel for other purposes – administrative, military and mercantile – continued unabated into the later centuries.

Saints' lives serve to demonstrate how far from sedentary the life in Late Antiquity actually was. Hagiographies of holy men and women record a variety of journeys, from pilgrimages made to the holy persons (see, e.g., the *Lives of the Monks of Palestine* by

[15] Hunt 1982, 164.
[16] Wilkinson 2002, 7.
[17] Wilkinson 2002, 4-5.

Cyril of Scythopolis), to journeys undertaken by them for a variety of reasons (for example, Porphyry of Gaza travelled to Constantinople to petition the emperor). Some of the stories were collected by monks who were themselves itinerant, like John Moschos. Despite being infused with the miraculous and the supernatural, these texts include anecdotal details that in many instances can be regarded as reliable sources for travel experiences. Similar anecdotal nuggets can be extracted from historical accounts of the time, or from letters (such as those sent by Jerome or Libanius).

Historical sources and documentary evidence

The classicising historians of Late Antiquity who impart the most information for understanding imperial and military communications networks are Ammianus Marcellinus and Procopius of Caesarea. In recounting the events of the 4th and 6th centuries respectively, these authors describe movement of armies in great detail, which translates to information about troop movement, communications, roads, etc. Furthermore, Procopius' panegyric on Justinian's building works specifically describes improvements made to roads and bridges. Procopius shows great interest in the feats of engineering that go into the building works, showing the emperor triumphing over nature. Procopius draws attention to the fact that in rebuilding bridges at Tarsus and Antioch, the rivers were rerouted by constructing channels to divert the flow.[18]

When compared, most obviously, with Egypt, the Near East suffers from a dearth of surviving documentary archives. Two preserved papyrus archives, from Nessana and from Petra, represent the sum total of Late Antique papyrus documents from the Levant. Other documents, like edicts, survive carved into stone, and inscriptions frequently provide us with a great deal of detailed information. Other texts preserved from antiquity include the legal texts of the Theodosian and Justinianic Codes, and the Rhodian Sea

[18] Procopius, *Buildings* 5.5.19-20 (Tarsus); 2.10.6-9 (Antioch).

Laws, which reveal a great deal about the state of maritime communications in Late Antiquity. The sections of the Theodosian Code regarding the public post are the most extensive of the entire text, and the sections on sea-faring and the transport of the grain *annona* are equally detailed.

Finally, some evidence can be gleaned from iconographic representations of travel and transport, particularly on mosaic pavements. Notable examples include a representation of a camel caravan at Bostra bearing the name of the camel driver, a camel laden with amphorae found at Kissufim, and a mosaic showing a river ferry found at Apamea.[19] This will be discussed in more detail in Chapter 2.

Methodology

To date, there is no grand, comprehensive, study of the Roman road networks of the eastern Mediterranean. Even regional studies, such as the *Tabula Imperii Romani* or *Tabula Imperii Byzantini*, have not been undertaken for all areas.[20] Elsewhere, the roads have not been systematically studied as part of an integrated whole; rather, descriptions exist for only short, disjointed sections of road, the gaps making the entire system often a matter of speculation rather than fact. The introductions to the maps of the Barrington Atlas of the Greek and Roman World supply thorough bibliographies, collating the disparate observations by early explorers and present day archaeologists, but are regionally segregated and make no attempt at analysis.[21]

A prime example is the 2nd century highway from Bostra in Syria to Aila on the Red Sea. We have a considerable amount of data on this road thanks to the number of

[19] Donceel-Voûte 1988, 54; Cohen 1993, 277-282; Balty 1981, 101.
[20] While the titles of each volume reflect Roman provincial divisions, it has remained for each national academy to prepare the volume that best accords with the present-day political boundaries. Thus, *TIR* and *TIB* volumes exist for Turkey and Israel, but not yet for Syria or Jordan, although the *TIB* for Syria (*TIB* 15, K.-P. Todt and B.A. Vest) is about to appear. Tsafrir, Di Segni and Green 1994, viii. For the relevant regions of modern-day Turkey, see Hild 1990.
[21] See introductions to Maps 66-71 and 76 (Talbert 2000).

milestones that survive recording the date (111-114 CE) of its construction and the cities at each terminus – the *capita viae*. Sections of the road have been described and discussed by, *inter alia*, David Graf and Zbigniew Fiema for southern Jordan and Thomas Bauzou for the sections within northern Jordan and Syria, and its relationship to the desert fortifications is discussed by, e.g., S.T. Parker and A.C. Killick in conjunction with their excavations at the fortresses of Lejjun and Udruh respectively. However, no study attempts to merge the multiplicity of publications and provide a detailed discussion of the course of the entire road and its integration into the regional network. However, my objective in this thesis is not to redress this gap in our knowledge of the east Mediterranean road network as a comprehensive entity – this would be an undertaking far greater than the scope of this work. While there is need for such a study, I will instead be investigating micro regions on a variety of thematic levels.

The methodology employed is broadly phenomenological in its approach.[22] Emphasis is placed on the role of the landscape in shaping routes and journeys and other factors, such as seasonality. I also extensively consult historical sources in an effort to contextualise them within the archaeological landscape in order to extract a more developed understanding of the conditions under investigation. Another important aspect of my methodology is to consider the Late Antique Near East as but one phase in a millennia-long continuum of indigenous practices based around the local conditions that existed in the region. This approach is applied in Chapter 2 when discussing transport, and again in Chapter 4 when discussing rivers. With the exception of a few empire-wide institutions, such as the *cursus publicus* and possibly the army, it is unlikely that native solutions to issues of transportation and navigation attested since the Neolithic period were supplanted by 'Roman' practices. It is more fruitful when considering something as

[22] See, e.g., Tilley 1994.

quintessential as travel and transport, to try to understand the Near East in the 4th century CE by drawing comparisons with the Near East in the 4th millennium BCE, rather than contemporary Italy or Gaul.

The aim of my study is to better integrate archaeology into the discussion of travel, and to use road remains, buildings, inscriptions, and artefacts in tandem with written sources to describe the movement of people through the Levant in Late Antiquity. Of these sources of archaeological evidence, the remains of the roads themselves are, paradoxically, the least informative. Roads are notoriously difficult to date. Some effort has been made to date roads 'stylistically' based on their construction method.[23] For the most part, Roman roads differ from their indigenous predecessors in that they are built, or, to employ Israel Roll's favoured term, 'engineered'. However, this does not mean that all Roman roads were paved; in some cases a road could involve as little 'engineering' as simply clearing a track of scattered natural rock, perhaps using some of the rocks to form a rudimentary kerb. Chevallier calls this technique *via terrenae.* Even in cases where roads are paved, the construction technique employed (layering and composition) can vary considerably; in some cases this variance is taken to represent changes over time. Chevallier, on the other hand, sees varying construction technique as a response to the natural conditions and the stability of the terrain (e.g., marshland versus rocky desert), and evidence of the 'adaptability of road builders' rather than chronological development.[24]

In very rare cases pottery might be used in the fill underneath the pavers, providing a slightly more secure date for construction or, what is more likely, some phase of road work or repair. A.C. Killick uses ceramic evidence to attribute construction of walling for a road in his survey area around the legionary fortress of Udruh to the Roman period,

[23] See, e.g., Beauvery 1954.
[24] Chevallier 1976, 92-3; French 1993, 449.

contesting the conventionally accepted Islamic date.[25] Chevallier cites an example from France of coin evidence providing a *terminus post quem*.[26]

In most cases, the initial construction of a particular road can be dated, not from its physical remains, but milestones recovered from along its length. These milestones can be extremely informative, recording the names of the ruling emperors – sometimes even consuls or governors, providing accurate dates – and in some cases the name of the legion that undertook the work, and even the type of work carried out, whether constructing the road *ex novo*, or making repairs to an existing road.[27] Often the dates on the milestones make it possible to link the road work with historically known military campaigns, further testimony to the impact of military priorities on road construction. This principle is followed, e.g., by Michael Avi-Yonah who attributes much of the development of the road system in Palestine to the reign of Hadrian and the suppression of the Bar Kokhba revolt.[28]

While milestones are enormously informative for understanding the chronology of how the road infrastructure was initially laid down, they provide far less of an indication of road maintenance and the state of the infrastructure in Late Antiquity. This is because new milestones cease to be erected and new milestone inscriptions cease to be carved after the mid-4th century (the last dated milestone in Arabia dates to the reign of Julian; the latest in the east to the reign of Anastasius).[29] This issue is discussed in detail elsewhere, but it most likely reflects a change in epigraphic custom rather than neglect of the road system. The longevity of the roads themselves is attested to by the fact that long stretches were preserved until early modern times and are recorded by 19th and 20th

[25] Killick 1986, 436.
[26] Chevallier 1976, 93
[27] See Thomsen 1917 for a thorough, although no longer exhaustive, catalogue of the milestones of the Roman East.
[28] Avi-Yonah 1950.
[29] French 1988, Nos. 845 and 848 – both reused from earlier, found near Bodrum on the west coast of Asia Minor. See also Chapter 3.

century explorers to the region. Often the traces of the Roman road have only recently been obliterated by modern tarmac highways that make use of the course selected by the Romans, following what was the topographically optimal path both then and now.

In the absence of the evidence from milestones and precise information from the physical remains of roads regarding the state of the network in the Late Antique period, instead of attempting to describe the network as a whole, a more fruitful avenue of approach is to select a few areas of known activity in Late Antiquity and examine these areas through specific 'lenses' to understand the way in which a defined set of users might have experienced the roads and what impact they might have left on the archaeological record.

Structure of the Thesis

The discussion that follows is divided into four chapters (Chapters 2-6). The first two chapters ('Impetus and Infrastructure' and 'Going the Distance') deal with general aspects of travel, such as travel infrastructure – how roads were built, and how they were maintained. The chapter also looks at why people travelled, and how. The issue of transport is a particularly vexed one for Late Antiquity, as it is frequently assumed that the transition to the Islamic world from the Classical one meant a transition from the wheel to the camel. This probably overstates the role of both the wheel and the camel in the Late Antique Levant, and merits closer investigation.

While Chapter 2 focuses on the *realia* of travel – what Bernard Kötting referred to as *Reisetechnisches* – Chapter 3 looks at how travel and the landscape were conceived. The most apt model is that of hodology, the world as divided up into a series of connecting lines between A and B, i.e., roads. This found manifestation not just in the minds of late antique people, but in the physical world as well. The landscape was divided into increments determined by natural factors such as available daylight and human exertion,

and marked out by deliberately placed landmarks such as milestones marking each mile, and inns and resting stops for imperial couriers and pilgrims alike.

Chapter 4 considers travel by water as part of an integrated communications network. Late Antiquity is a period during which changes in ship construction potentially redefined maritime routes and the scale of shipping and transport (see Chapter 4.1). Additionally, the role played by rivers in communications will be examined, and how the Euphrates, Tigris, and Orontes might have contributed to the movement of people and goods (see Chapter 4.2 'A River Runs Through It').

As mentioned above, the road network in Late Antiquity was being used much as it had in the earlier Roman period: for administrative, military, and mercantile reasons, with the introduction of the widespread travel of people of all classes on pilgrimage to holy places and shrines. The concerns of each of these groups of road users is particularly evident in at least one area in the Levant; to this end, I have drawn up a list of case studies to highlight the way in which each group made use of the Roman road network in Late Antiquity. Each of these case studies requires a slightly different methodological approach depending on the group of users and the type of record they are likely to leave, whether it be in the form of official inscriptions, or the types of buildings found along the routes they favoured.

Firstly, the concerns of the central government in keeping routes of communication open between the imperial capital at Constantinople, the diocesan capital at Antioch, the various provincial *metropoleis* and other administrative centres would have been paramount throughout Oriens and, indeed, the empire as a whole. This concern is particularly evident in the number of inscriptions bearing names of emperors or high ranking imperial officials that attest to road and bridge maintenance in the geographically crucial but topographically challenging areas of Cilicia and northern Syria that link the

Anatolian Plateau with Syria and the rest of the Levant, and from there provide overland connections to Egypt and the Mesopotamian frontier.

The imperial government's concerns are inextricable from the military's. The military, as can be seen not least from the milestone evidence mentioned above, was the prime mover of the road system: the roads were built by soldiers, in the interests of facilitating the movement of troops, the shipment of supplies and communication with command centres. Once in place, however, the road became available for use by secondary users who may eclipse the original, primary road users, as is especially the case with, e.g., pilgrims in the Jerusalem area. This is the result of a two-fold phenomenon, first, the shifting of military priorities away from Jerusalem in the 4th century, and the rise of Jerusalem as the focus of Christian pilgrimage.

In some ways, the demands of the military on the road system – movement, supply, command – remained the same in Late Antiquity. However, there were noticeable changes in the structure of the army. The size of the legions appears to have diminished – through subdivision and partitioning – from 6,000 during the height of the Empire to 1,000.[30] The chain of command was revised through the separation of the duties of the *dux militum* from those of the civilian provincial governor. The nationality of recruits, even the role of the standing army in the 'grand strategy' – if such it can be called – changed, as increased reliance was placed on *foederati*, the non-Roman tribes employed in border regions.[31] The 6th century historian Agathias states that the 'fighting force' under the reign of Justinian numbered just 150,000, compared with the 645,000 of some (unspecified) earlier period. Jones finds that the number of 645,000 can be justified for the period of the compilation of the *Notitia Dignitatum*, c. 400.[32] Of these some were

[30] Jones 1964, 681.
[31] Edward Luttwak (1976 and 2009) proposed that the Roman (1st -3rd centuries) and Byzantine (4th-15th centuries) Empires followed a grand military strategy, although the trend for Late Antiquity seems to be more reactive than pro-active.
[32] Jones 1964, 685.

permanently stationed on the eastern frontier.[33] For the campaigns waged against Persia, contemporary historians give us numbers of the forces involved: 65,000 for Julian's campaign in 363, 52,000 for Anastasius' in 503, and 20,000 to 30,000 between 530 and 543.[34] Open warfare was sporadic, but also seasonal. In the winter, troops were billeted in local towns, from where they were assembled into a mobile force in times of need.[35] However, this affected the responsiveness of the army to threats.[36]

The area along the frontier with Persia is where the activity of the army can best be observed in the East, particularly in the provinces of Euphratensis and Osrhoene. They became a focus of concerted military campaigns and new building starting in the 4th century, especially the fortification of Amida in the 350's, the construction of Dara in 506, and the work carried out on fortresses under Justinian. However, an appreciation of the impact of this military activity on the road network depends on an evaluation of the changes in military personnel mentioned above. The number of troops, where they were stationed, the extent to which they were moved between purpose-built fortifications and the fortified civilian settlements would have repercussions for the amount of pressure there would be on the road system, and the extent to which the network had to be integrated into a wider network, not only for communications with command centres such as the provincial, diocesan and, ultimately, imperial capitals, but also to the agricultural production centres whose role was to keep the army fed.

The issue of transport of agricultural produce for the army dovetails with the issue of trade. While much of the produce of many fertile regions was levied in tax and deployed to provide food for the army, it has become increasingly apparent, thanks to archaeological evidence of amphora distribution, etc., that some of the agricultural

[33] Agathias, *Histories*, V.13.7. (148).
[34] Zosimus, *Historia Nova*, 3.12-13; Ps.-Joshua the Stylite 54; Procopius, *Persian War* 1.13.23, 1.18.5, 2.24.16; Jones 1964, 684-5. See also Treadgold 1995, 43-64.
[35] Whitby 2000, 305.
[36] See Agathias, 2.20, where a premature disbanding of the army leads to disaster.

surplus formed an important component in a commercial economy, rather than driven solely by the concerns of the military and government. Trade could take place at both a local level and a long-distance level. The government levied customs duty on trade from outside its borders, and therefore had an interest in ensuring that trade routes passed through points of control, and followed the roads that were monitored. This may have required little inducement, as main roads often followed the topographically easiest route and would therefore have been preferred anyway.

It might even be possible to achieve some understanding of the relationships between settlements in agricultural regions and differentiate between production and processing sites, and entrepots and larger markets, based on the proximity of these settlements to a hierarchy of roads and a comparison of the development of each site in terms of the specialisation and sophistication of archaeological remains. An outline of this method as might be applied to the Syrian Limestone Massif is set out in Chapter 5.3, however, the archaeology of the region has not been sufficiently well published to develop any sort of comprehensive model based on these factors. However, a similar model might be applicable to the long-distance and local trade routes leading to the Mediterranean port at Gaza, which will be studied in Chapter 6. Commercial routes can be understood by making use of the 'pots to people' theory, i.e., that a distribution of artefacts or transport containers represents trade patterns, but also by studying buildings that could have served a mercantile function, such as markets or warehouses or caravanserais, and also production sites of various commodities.

A similar principal – identifying routes based on specialised architecture – can be applied to pilgrim routes. Pilgrims have the same basic needs as ordinary travellers, e.g., the need for water and shelter, but the nature of pilgrimage means that there is usually an element of ritual inserted. The vitality of routes used for pilgrimage – especially those leading to and from Jerusalem, as discussed below in the case of the roads between

Jerusalem and Jaffa, on the coast, and Jericho to the east, can be inferred from the number of shrines and monasteries to be found along that route.

A regional study

One place where all these various phenomena treated in the separate case studies can be observed operating within one geographic context is in southern Palestine; the particular area under consideration extends from Gaza on the Mediterranean to Aila on the Red Sea, and encompasses the Negev Desert, the Wadi ʻAraba and Southern Transjordan. Despite its apparent barrenness and marginality, this was a very dynamic region. Prior to the annexation of the region to the Roman Empire, it was the heartland of the prosperous Nabataean kingdom that governed the long-distance caravan routes. Trade continued to play an important part in the region as the shortest overland connection between the Red Sea port at Aila and the Mediterranean shores of Palestine. This area also provided the overland link with Egypt, especially via the coastal road, but later also via the Sinai Peninsula. Sinai most famously became a centre for pilgrimage – and pilgrims definitely left their mark on the landscape – but continued to play an important role in trade, especially providing an overland link with the northernmost Red Sea ports at Aila and at Clysma on the Egyptian side.

In this area particularly we can see the shift in military priorities that took place between the second and sixth centuries CE. The region was highly militarised in the second and third centuries, and even under Diocletian the military infrastructure continued to be developed through the relocation of legions, the construction of roads and the building of lines of fortifications. However, the fourth through seventh centuries witness the clear gradual abandonment of the military infrastructure and either its fragmentation and abandonment – as is the case with the *Via Nova Traiana* highway and many of its fortifications – or its usurpation by other users such as merchants or pilgrims.

These various facets will be explored in detail to provide a picture of how the road network continued to play an active role in the economic, military and cultural development of the region throughout Late Antiquity.

Chapter 2 – On The Road: Impetus and Infrastructure

It may seem very modern to ask 'why did people travel?', perhaps even anachronistically so, living as we do in an era where travel is seen as a personal or private undertaking, for reasons of leisure and tourism, business, etc.[1] Apart from the few names of famous ancient travellers – Herodotus, Strabo, Pausanias, etc. – who are taken as anomalies, it is tempting to simplify ancient peoples as tied to the land unable to undertake journeys as we do, for reasons of recreation and adventure. Nevertheless, the *Wanderlust* experienced by most humans cannot merely be a modern innovation. Certainly the wealth of archaeological material that is recovered thousands of kilometres from its point of origin belies this idea, as the finds bear silent witness to the human agency responsible for their distribution. Onomastic studies of names recorded in inscriptions and letters tell us that the people who patrolled the borders of the Empire were often a long way from home. Finally, the texts, relics and even graffiti left by those undertaking holy pilgrimage provides us with a lens on a very private motivation for travel.[2]

The Impetus for Travel

Essentially, the impetus for travel can be broken down into four categories: travel for military purposes (e.g., troop movement and supply), travel by the imperial administration, travel for trade and mercantile operations, and private travel for religious or medical reasons – i.e., pilgrimage.

Soldiers probably represent the largest and most significant group of 'travellers' of the period, yet, because they are not travelling as individuals or for their own, private,

[1] For the sites mentioned in this chapter, see Map 2.1
[2] See, most recently, Handley 2011. See also Matthews 1989.

reasons, it can be easy not to think of them as travellers in the same ways as pilgrims or merchants. Nevertheless, the infrastructure that the latter two groups make use of to facilitate their own journeys would hardly exist if there had not been a military motivation to supply that infrastructure, or the soldiers to build it.

Members of the imperial administration were required to travel extensively in order to transmit information from the periphery to the administrative centre(s) of the Empire. Information could not be transmitted if there was not a human being to deliver the message. This was the only way decisions could be made and courses of action be implemented.

Social mobility translated to actual geographic mobility, as the restructuring of the imperial administration meant that offices of the traditional *cursus honorum* could involve postings in any part of the empire.[3] This is reflected, for example, in the catalogue of correspondents of great epistolarians such as Libanius, Jerome or Augustine.[4]

Reconstructing trade routes and pathways of exchange from the distribution of artefacts – particularly ceramics – has become the standard methodology for understanding ancient economic models in the last few decades. [5] Underlying these distribution patterns is human agency: at the macro level this comprises the market forces of demand and consumption as well as government involvement in circulation and distribution. At the micro level, the human agency equates to the individual merchants selecting their cargoes and selecting their routes with an eye to minimising risk and maximising profit. However, while it is possible to roughly describe the path of an object from production centre to point of consumption, objects themselves do not preserve traces of the sets of hands through which they passed. It is likely that most long-distance trade

[3] Heather 1994; Bradbury 2004, 74.
[4] Whiting 2013, 72.
[5] Papaioannou 2010; Wickham 2005 (693-708; with specific reference to the Levant, 770-780, 710, 768, 781); Kingsley 2001a; Mundell Mango 2009 applies a similar methodology to the circulation of Late Roman metalware.

would have involved the transfer of goods from one set of merchants to another at entrepots, ports, markets, etc. Thus, the journey of a single object, say, an LR1 amphora from Cilicia found in Marseille is likely a composite of several shorter journeys, first from kiln to port, then via ship to the next port, and then from port to market to table, each stage possibly involving different sets of people with different agendas.

The idea that the movement of objects represents the movement of people can be extended to the more ephemeral movement of ideas. In particular the distribution of sacred and religious objects, especially those employed in the liturgy, can be used as a proxy for the spreading of practices and beliefs.[6] The bond between a sacred object and its source, say a pilgrim token or relic from the Holy Land, generates a powerful incentive for pilgrimage.

In the Late Antique world view, and the early Christian world view in particular, travel for religious purposes and travel for medical purposes were largely inextricable. Ailments of the body or ailments of the soul were often one and the same, and therefore the treatment was often the same. Christians did not differ markedly from pagan forbears with regard to their attitude, but merely in their observances. 'Pagan' healing shrines had been the object of visits for centuries, some people even making long journeys to do so, and some – such as the shrine of Aesclepius – persisted in their pagan habitus well into the 5th century, only gradually replaced by competing Christian shrines.[7] What separates Christian pilgrimage from the religious/medical travel of earlier centuries is the sheer scale on which it appears to be taking place, and the evidence that suggests that even those low down on the socio-economic scale were participating in the phenomenon of visiting saints and shrines, often travelling for days or weeks at a time.

The written accounts of the lives of the saints and of the holy places make it clear

[6] Meredith 2011, 3.
[7] Kötting 1950, 160; Csepregi, forthcoming.

that members of both sexes and all classes of society undertook pilgrimages over both short and long distances. Those who wrote accounts of their own pilgrimages, such as Egeria from Galicia, or the Piacenza Pilgrim from Italy, were typically members of the elite who had travelled a very long way.[8] Those who appear in the hagiographies represent all classes, but most typically common farmers, artisans, merchants, etc. Cyril Mango says of this mixed pilgrim population that the rich – from the west or the capital – were the trendsetters, who could afford to undertake long pilgrimages, but that the majority of pilgrims were local.[9] However, a network of free accommodation and possibly free alimentation would reduce the cost. Many of the saints' lives and anecdotes that preserve this information about travel and pilgrimage were in fact written by itinerant monks, such as John Moschos or John Cassian. In a recent study, Maribel Dietz even goes so far as to suggest that travel itself was a form of monasticism.[10] The buildings that served as pilgrim accommodation are largely impersonal and anonymous. They suggest more the mass housing for ordinary people rather than any particular distinction made on the basis of rank.

The pilgrimage infrastructure, which will be explored in greater detail in Chapters 3 and 5, enabled people of lower economic status to make these journeys. However, truly long-distance travel remained something for the wealthy, which can be seen, for example, in the wealthier upper classes fleeing the West during the invasions of Italy by the Huns. Many found their way to North Africa or the Holy Land where they used their funds, or whatever they had fled with, to found monasteries and religious institutions.

[8] See Hunt 1982, 164-6 for ideas on Egeria's identity (possibly a member of Theodosius I's court?), and Wilkinson 2002, 12-13 for the origins of the Piacenza Pilgrim.
[9] Mango 1997, 6-7.
[10] Dietz 2005, 2.

Infrastructure: Road Conditions and Maintenance

Road construction

It is important to dispel certain myths that may exist about Roman roads: first, that they are always straight, and second that they are always paved.[11] There is a hierarchy of routes with the public – often paved – highways at the very top, but even routes that are at the top of the hierarchy may not have paving if the natural terrain is conducive to easy passage without the need for human intervention.

The placement of roads in antiquity typically depended on two major factors: the natural terrain and the need for access to the two sites to be connected by the road. These two objectives were not always compatible. In following the natural terrain it would be preferable to follow the contours of the landscape, avoiding having to cross obstacles such as rivers, wadis and mountains. While roads that required steep ascent were avoided (e.g., along mountain ridges), roads through plains and valleys might encounter marshy ground or seasonal flooding, and were therefore likewise problematic.[12] Wadi bottoms, though otherwise attractive passages, were prone to flash floods, and therefore dangerous. Elevated, but not impassable, terrain afforded the most preferred routes, also because it afforded increased visibility for the traveller. Israel Roll divides a road's *raison d'être* into six categories, the first being natural terrain as mentioned above. The remaining five reflect the second factor, the human need – for whatever motivations – for access between two points. These include 'human geographic factors (i.e., population distribution and density)', 'economic factors', 'geo-political factors (which dictated the purpose of the road network, the routes followed, and the resources invested in its construction and maintenance)', 'the region's geographical location', and 'the means of travel and level of technology'.[13]

[11] Casson 1974, 169-72, Roll 2005, 107-8.
[12] Dorsey 1991, 40.
[13] Roll 1983, 137-8 (in Hebrew, quoted in Mattingly 1996, 90).

The construction of a road, at its most fundamental, was predicated by a need to connect two places. Some of these roads might be ancient. Especially routes that follow the natural features of the landscape tend to remain in use for longer periods of time, as the landscape itself changes very slowly. The more 'artificial' routes that were constructed originally out of some social or political need, and following more difficult terrain out of necessity, may fall out of use once circumstances change. For the Romans in the Levant, the principal need for roads was to secure military supply for soldiers on the frontier expanding Roman territory, as well as to consolidate the power of the government apparatus once the area had been annexed. It stands to reason that the majority of the Roman roads were built initially to serve the needs of the military, as it represents a body whose needs were important enough to initiate such a project, with its attendant expense. The military would also have the available manpower to undertake such a task, including not only labourers from among the common soldiers, but also trained professionals, including surveyors, engineers, and stonemasons, to undertake the planning and supervisory work.[14]

Before the road was laid out, its line was first plotted by surveyors. The plan is evident from the general straightness of the roads, although perhaps they should be seen as a multiplication of shorter straight sections, measured between two points of visibility.[15] Lewis gives an overview of the equipment and possible methods for plotting road courses. The most pragmatic of these is 'successive approximation', whereby a series of intervisible points is taken between two termini with no direct sightline. The intermediate points are then adjusted using surveyor's tools such as a *groma* or a *dioptra* which allow the plotting of straight lines between two visible points. Once the intermediate points are adjusted, the line between the termini should be straight. If it is

[14] Southern 2006, 102-3.
[15] Chevallier 1976, 84; Horden and Purcell 2000, 126.

not physically possible for the road to follow a straight line all the way between the termini, it will nonetheless be straight between any two intermediate points.[16] (See Fig. 2.1) The same method was used for laying out city streets at right angles; in fact, the intersection of the *cardo* and the *decumanus* was where roads were considered to begin: Mile Zero.

Once the course had been laid out, the stretch would be dug down to a stable foundation, levelled with layers of stone, gravel and sand. If the road was paved, paving slabs would be fitted across the topmost layer, held in place at the side by kerb stones. Often, the paving would be placed so as to leave a ridge down the middle, to facilitate water run-off (Figs 2.2-3). This basic principle varied considerably – as Chevallier states, 'no construction can be regarded as typical.'[17] Construction is not uniform, and takes the requirements of the terrain into consideration. As a result, many of the roads found in the arid deserts of Palestine and Transjordan lack the central ridge, as drainage is frequently less of a concern (Fig. 2.4). Roads constructed into slopes made use of kerbstones to prevent erosion. The kerbs formed a retaining wall which was packed with earth to form a walking surface (Figs 2.5-6).

It is difficult to assess what proportion of the Roman roads in the Levant were paved. Certainly not all were. David Graf argues that the *Via Nova Traiana* was paved along its entire extent from Bostra to Aila, as the inscription on its milestones indicates, but argues that the military supply line he identifies to the east of the *Via Nova* was most likely unpaved (being an 'outer road on the desert frontier').[18] In Syria, the highway leading northeast from Apamea towards Chalcis was paved in the fashion described above (see Fig. 2.3).[19] However, in the spring of 363, Julian, on campaign in the area of Chalcis,

[16] Lewis 2001, 218-245. See Dilke 1962, 66-81 for more on the *groma* and the *dioptra.*
[17] Chevallier 1976, 86
[18] Graf 1995a, 264; Graf 1997b, 125.
[19] Mouterde and Poidebard 1945, 43; Chevallier 1976, 91;

bemoans the haphazard construction of a road he and his army encounter:

> [T]he road… was partly swamp, partly hill, but the whole of it was rough, and in the swamp lay stones which looked as though they had been thrown there purposely, as they lay together without any art, after the fashion followed also by those who build public highways in cities and instead of cement make a deep layer of soil and then lay the stones close together as though they were making a boundary-wall.[20]

To dismiss a road without paving as being of lesser importance would be erroneous: unpaved roads merely enjoyed the natural advantages of the terrain without requiring additional intervention for the ease of passage. In some cases, it is possible that any stone paving may have been washed away or robbed out over time. However, it is more likely that some roads were never paved to begin with. The type of construction described by Julian above is common in many areas. The road would take shape simply by clearing a pathway of natural debris (piste aménageé), with the stones removed placed along the sides, serving as a kind of kerb, marking the edge and course of the road.[21] David Graf asserts that this is particularly true of 'areas of difficult terrain, provincial peripheries, and desert frontiers.' However, the presence of milestones along even unpaved roads indicates that their significance to the road network was not diminished by a lack of stone paving.[22]

Extreme solutions

In some cases, simply following the natural contours of the terrain was not feasible. Mountain ranges had to be crossed, as did rivers. Procopius provides us with a vivid description of Justinian constructing a road through a mountain pass in the vicinity of Antioch.

> As one goes from the city of Antioch, which is now called Theopolis, into Cilicia, there is a suburb lying very close to the road, Platanôn by name; and not far from this city lay a path which

[20] Julian, *Ep.* 58 (Wright 1969, 201).
[21] Dorsey 1991, 31; Kennedy 1982, 138.
[22] Graf 1997b, 125.

> had long been compressed into a very narrow track by the overhanging mountains; and after being washed by rains for a long time it was destroyed for the most part and afforded only dangerous passage to travellers. When the Emperor Justinian heard of this, he took the matter under careful consideration and straightway found a remedy for the trouble. He spent a sum of money past reckoning, cutting through, for a great distance, all the mountains which rose there to a great height and overcoming impossible obstacles; and he constructed a waggon-road, contrary to all reason and expectation, making flat and open ground of what had previously been broken by precipices, thereby clearly demonstrating that nothing could prove impossible for a man of discerning judgment who was ready to disregard expense.[23]

Although the text is mainly panegyrical, juxtaposing the danger to the traveller from the decrepit road with Justinian's might in conquering the mountain, he notes specifically that the new mountain pass is intended to bear wheeled traffic (ὁδόν ἁμαξήταλον).[24]

Rivers, riverbeds or wadis, or sudden changes in altitude could be compensated for by bridges, which will be discussed below. In other instances, where the gradient was too steep to level the road out, switchbacks were employed, or in some cases, even stepped roads. [25] In the case of the ascent to the monastery on Jabal Harun near Petra, both solutions are employed (Fig. 2.7).

Approximately twenty sections of carved or built steps have been identified along major public roads in Tres Palaestinae by Israel Roll, and examples exist elsewhere in the Levant, such as on the processional way linking the village of Deir Sim'an with the shrine of St Simeon the Elder (Fig. 2.8).[26] Many of the stepped roads identified in Palestine are on routes that saw high volumes of traffic in the Late Roman and Byzantine periods. The most significant example is Jerusalem, where only one of the east-west routes connecting

[23] Procopius, *Buildings* 5.5.1-3 (Dewing 1940, 335-337)
[24] Procopius often focuses on the engineering aspects of Justinian's building projects – this has led James Howard-Johnston to propose that Procopius may have been trained as an engineer himself. Howard-Johnston 2000.
[25] Dorsey 1991, 40; Kloner 1996.
[26] Roll 1995, 1167; Kloner 1996, 111.

the holy city with the coast does not have a stepped ascent. Moreover, the Jerusalem-Hebron-Mampsis-Aila highway that rose to prominence in the 4th century, and maintained its importance into the late 7th century, has two stepped sections (Ma'ale Dragot between Hebron and Mampsis, and Ma'ale 'Aqrabbim, the Scorpions Ascent, between Mampsis and Hatzeva).

At Ma'ale Dragot the steps are built, using paving slabs and dirt fill (see Fig. 2.9). The road ranges between 4.80 and 7 metres wide, and has built up wall-like kerbs preserved to a height of 0.50 m in places and ranging from 0.50 to 1.50 m in width. The road follows the edge of a ridge and occasionally makes steep descents down the side of the ridge. The distance between the steps varies from 12 to 32 m.[27]

At Ma'ale 'Aqrabbim, on the other hand, the steps are cut into the bedrock (see Fig. 2.10). The gradient of the slope is very steep at this point, over 38%, and the road engineers employed a combination of curving switchbacks and steps cut directly into the bedrock to alleviate this. The preserved section of road is 7 km long, with steps preserved at seven sections. The average width of the road is 2-3.4 m, and the steps are 1-1.5 m wide. Pavers were added where the natural rock sloped away or was damaged, and a retaining wall was built to prevent erosion. Menashe Harel comments on the level of engineering that went into the construction of this section of road, that it is indicative of the route's importance for communications in the 'Roman-Byzantine' period.[28]

These stepped roads raise an interesting question about the use of wheeled traffic. A gradient of over 30% disadvantages wheeled vehicles. The steps not only reduce the gradient, but also provide a stable walking surface that would prevent slipping. However, as can be seen from a map (refer to Map 1.2), while many of these stepped roads led to Jerusalem, there were alternative routes still available that did not entirely preclude the

[27] Kloner 1996, 123-7.
[28] Harel 1959, 175-7.

use of wheeled vehicles.

Bridges

Bridges constitute a standard Roman engineering solution to problems presented by rivers, gorges, or sudden changes in levels of terrain. Roman bridges could be constructed of masonry, brick, or wood. Naturally enough, it is the masonry bridges that are most likely to survive, and the surviving examples of Roman bridge construction in Oriens belong to this type of construction. Predicated on the form of the arch, masonry bridges comprised a series of arches – or spans – covered by a level pavement, linking the two banks of the river together. The piers from which the arches spring were frequently massive and the resulting structure very sturdy. Many medieval and even modern bridges incorporate Roman foundations into current bridges. This method of construction meant there was little constraint on how long a bridge could be – some could only be one or two spans (the width of the arches also varies), while some could be more than thirty spans long. For example, the Severan bridge over the Kahta has a single arch spanning 34.2 metres (Fig. 2.11). The bridge with the greatest number of spans in the Levant is the Taşköprü bridge at Adana with 21 spans, and a length of 320 metres. The greatest number of spans in the east is found on the bridge at Band-i-Kaisar in Shuhstar, Iran, with 35 spans, but only a total length of ca. 300 metres.[29]

In terms of topography, it is often simplest to construct a road following the path of least resistance along the natural contours of the landscape, often alongside a river as it carves out a natural valley for itself.[30] The exception to this rule are coastal roads, which, in following the coastline, naturally must cross the rivers at the point where they flow into the sea. This is especially evident in the number of ancient bridges attested spanning rivers near the southern coast of Cilicia, such as at Seleucia, Tarsus, and Adana.

[29] O'Connor 1993, Appendix Table A.8, E36, E28, E42. Also pp. 127, 130.
[30] O'Connor 1993, 5.

Although the catalogue of extant ruins is less extensive for the southern Levant, there are several places where the north-south coastal road would have had to cross a river. These crossings are represented by extant remains of bridges near Antioch (R. Orontes), Berytus (R. Maameltein) and Tyre (R. Litani) (see Map 2.1).[31]

Contrary to expectation, bridges are most commonly found on smaller, tributary streams. For example, downstream below Zeugma the Euphrates did not have a major bridge crossing in the Roman or Late Roman period. The river was wide and fast-flowing and easier to cross by ferry or by fording. Upstream from Zeugma, however, and on the tributaries, while the river was narrower and more shallow, seasonal fluctuations could wash away road surfaces, making bridges a sensible investment for securing year-round communications. The Roman bridges spanning the Maameltein and Litani rivers consist of a single arch.

Bridges are the most expedient form of getting large volumes of goods and people across an obstacle created by a river. Vegetius describes the hazardous process of fording rivers and constructing temporary wooden bridges for an army on the move.[32] The effort, expense, and coordination that goes into the construction of bridges suggests that, like the roads themselves, they were constructed to meet the needs of the military. The presence of masonry bridges especially seems to indicate long-term planning and need for supplies. Some bridges bear inscriptions that specifically link them to emperors known to have been on campaign on the region (e.g., Vespasian's bridge over the Göksu River at Seleucia, dated 77/78, Septimius Severus' bridge over the Kahta in Euphratensis[33]) while others are dated on the basis of their physical attributes to the third/fourth centuries, also known to have been a time of much military activity in the region.[34]

[31] O'Connor 1993, Appendix Table A.8, E31, E51, E52.
[32] Vegetius, *De re militarii* 7.
[33] Göksu Bridge: O'Connor 1993, 126; Kahta Bridge: *CIL* III.6709, 6712-14.
[34] See Comfort 2009.

Bridges built initially for military use likely used military personnel as manpower. There was no separate engineering corps specialising in military works. However, every legion included within it some men with professional training, whose skills were recognised. It became the duty of these men to execute the works according to their training, in return for which they were exempted from general military duties. This group, according to the late second century list of Tarruntenus Paternus, included, amongst others, surveyors, ditchers, architects, water engineers and stonecutters.[35]

The fate of the Roman bridges in the Eastern Mediterranean during Late Antiquity is, as with many things, difficult to document. As mentioned above, some bridges are given the somewhat vague 3rd to 4th century date, which corresponds with intensive military activity in the area. However, like the roads, they would have been used by all sorts of travellers, and the cost of their upkeep was transferred to local landholders. Bridges enhanced the internal connectivity of the region, which was good for transporting trade goods, and also enabled relatively hassle-free travel for the pilgrims who flocked to the area.

The location of the bridges in the area is a key to how they served the communications and economy of the region. The example of Antioch is particularly illuminating, as it was not just the point where many of the roads of the area converged, but it was a communications nexus for the entire region, and the entire Empire. First of all, the city is not located on the Mediterranean itself, but is connected by road to its associated port of Seleucia Pieria. Access to the hinterland from the port would require the Orontes at some point, as cities such as Apamea, Chalcis, and Beroea, as well as Hierapolis as a nodal point for several road networks, were to the east of the river, but not accessible by navigating the waterways. There were good roads, however, with bridges

[35] Watson 1969, 76; Southern 2006, 103-4.

at critical points. There are bridges over the Orontes at Antioch and Derkush. There is a bridge over the river Afrin on the way to Cyrrhus, possibly dated to the fourth century (Fig. 2.12).[36] A 'companion' to it is situated to the north, 70km from Aleppo, on a tributary of the Afrin. It is possible that these bridges should be considered as originating with the need to connect the Euphrates *limes* with Antioch, but the result is a very efficient network connecting Antioch with the interior.

Justinian's building campaign in the Levant included the restoration of several bridges at three locations in Cilicia and at Antioch.[37] It seems that the existing bridges had deteriorated to the point where they were hazardous to cross.[38] Procopius is understandably vague about when these bridges were originally built, nor is he able to record whether repairs had been made in the interim. However, it seems that most were built in the 2nd -4th centuries, and that several centuries of buffeting by river currents had eroded the masonry of the interval piers of several bridges. In a detailed description of the repair work done on the Taşköprü bridge near Adana, Procopius describes how the river was temporarily diverted into a specially dug channel, and the eroded piers refaced.[39] Given that the current bridge is 21 spans long and the river is very wide at that point, diverting it was no minor engineering feat.

The bridges that Justinian either repaired or rebuilt at Tarsus, Adana, Mopsuestia and elsewhere in Asia Minor indicate that the roads that they were on were still being actively traversed in the sixth century – Procopius makes the threat to travellers posed by the unsafe crossings feel very immediate – and the repair of the bridges is in each case associated with the promise of renewal for the city and the region.[40]

[36] O'Connor 1993, 127, E32.
[37] Procopius, *Buildings* 2.10.8 (Antioch) and 5.5.
[38] Procopius, *Buildings* 5.5.6; 5.5.12.
[39] Procopius, *Buildings* 5.5.13.
[40] For more on the roads and bridges of Cilicia and Syria, see Chapter 5.1.

Road and bridge maintenance

Once built, the maintenance of the bridges, like the roads, was the responsibility of the government, trickling down from the office of the prefect, through the vicars and provincial governors, and paid for by local landowners.[41] Maintenance of the roads and bridges was a compulsory public *munus* required of all provincials. It fell under the category of compulsory public services which were a form of taxation. Other *munera* included accommodating soldiers and imperial officials, providing building supplies, supplies for maintaining the *cursus publicus* (horses, fodder, etc.). So-called 'menial and physical compulsory services' (*sordida munera*), to which road maintenance belonged, included limeburning, charcoal burning, and breadmaking, as well as conscription labour for quarries, armouries, and mines. The labour was carried out on a conscription basis by the lower classes.[42] By the end of the fifth century, conscription had been replaced by hired labour, and public works were funded by money from tax revenue.[43] Bishops played a role as civic officials under whom building projects could be organised. The two bridges at Cyrrhus were paid for by Theodoret from revenues raised by his see.[44]

The Codex Theodosianus contains legislation on road repair, usually regarding designating those eligible for exemptions, which was hardly anyone. The civic government, the church, and tenants of imperial estates all had to do their part towards road and bridge maintenance. Any exemptions that were granted were only for the person's lifetime and could not be inherited by that person's successors. A law of 397 decreed that material from the demolition of pagan temples could be used for civic projects, chiefly 'roads and bridges over which journeys are regularly taken'[45] A 1st century edict of Ulpian, promulgated in the Digests of Justinian, emphasises preservation

[41] Jones 1964, 456.
[42] Pharr 1952, 577.
[43] Jones 1964, 462.
[44] Theodoret, *Ep.* 81, dated c. 449. See Jones 1960 on church finances.
[45] *C.Th.* 15.1.36, Pharr 1952, 427.

of road conditions:

> If anyone makes the road worse under pretext of repairing it, force can be used against him with impunity. Because of this the employer of the interdict cannot make the road broader or longer, higher or lower, on pretext of repair, or lay gravel on a road, pave a dirt road with stone, or turn a stone-paved road into a dirt road.'[46]

Procopius mentions that the bridge in Mopsuestia had fallen into disrepair due to the neglect of the authorities (τῇ τῶν προεστηκότων ὀλιγωρίᾳ).[47] Whether we are to infer corruption or simply a lack of funds, imperial intervention was necessary to restore the bridge and the communications route.

Quantifying Movement: Rates of Travel

A number of factors govern the speed at which travel can be undertaken. These are, naturally enough, the terrain, mode of transport, and seasonal variations in environmental conditions such as number of daylight hours and ambient temperature. While the amount of time required to travel a given distance would of course vary according to terrain, these variations were somewhat ameliorated by the existence of well-engineered highways and roads that reduced the impediments that might be inherent in the natural landscape. The exception to these would be ascents and descents where one's rate of travel would necessarily be slower.

The choice of mode of transport is an important determining factor for travel speed. Although wheeled vehicles could increase the ease of movement, they do not necessarily increase the speed, as they move at the speed of the animal pulling them. Animals used for transport in antiquity included equines (horses, mules, donkeys), bovines (oxen), and camels. Bovines would be used as draught animals as opposed to

[46] *Digest of Justinian* 43.11 (Watson 1998, Vol. II).
[47] Procopius, *Buildings* 5.5.6.

beasts of burden – for more on the use of drawn wheeled vehicles in the Late Antique Levant, see below.

Contrary to expectation, using animals for transport would not have greatly enhanced travel speed. Although capable of great speeds – horses and other equines can gallop at 20-25 km/h and racing camels can attain speeds of over 60 km/h – the normal walking speed of these animals is much closer in range to the walking speed of the average human being. A camel averages just under 5 km/h and can travel approximately 40 km per day when fully laden.[48] Horses and other equines, particularly mules and donkeys, have a normal walking speed of 6-8 km/h – trotting can bring them up to 15 km/h, although the time for which this can be sustained is of course determined by the amount of burden the animal is carrying (either a rider or goods).[49]

In most cases, apart from messengers on horseback, animals on long journeys would be led by humans on foot, thereby reducing any minute gains in speed by riding the animal, as the party would be moving at the rate of its slowest members, i.e., the people.

As regards human locomotion, the preferred walking speed of the average person across smooth, level terrain is about 5 km/h.[50] This is reduced to 2.5 km/h or slower depending on the gradient of the path, in accordance with Tobler's Hiking Function, as formulated by the geographer and cartographer Waldo Tobler. The expression derived by Tobler is as follows

$$V = 6e^{-3.5\left|\frac{dh}{dx}+0.05\right|}$$

Slope:

$$\frac{dh}{dx} = \tan\Theta$$

[48] Information from the British Llama Society (http://www.britishllamasociety.org/camels/camels.html); Kempton 2007.
[49] The American Donkey and Mule Society (http://www.lovelongears.com/faq.html).
[50] The average walking speed is 1.47 +/- 0.04 m/s for women; 1.41 +/- 0.03 m/s for men. Browning et al. 2006.

(Where V = velocity in km/h; dh = elevation difference; dx = distance difference; θ = angle of slope [inclination]).
On level ground (dh=0), this corresponds to 5 km/h. Off-piste travel should be multiplied by 3/5, and travel on horseback by 5/4.[51]

These various calculations provide us with the maximum possible projected daily distance. If a person walked at 5 km/h for 10 hours, he or she would cover 50 km in a day. While it is possible mathematically and also within the realm of human ability, we know from our sources that such long distances were rarely covered in one day: for pilgrims part of the day was taken up with performing liturgies at sites, for Theophanes it was taken up with purchasing supplies for the next leg of the journey. The more realistic daily distance is therefore about 25 miles, or 37 kilometres, a distance enshrined, e.g., in the staging of the *cursus publicus*, where the overnight stops (*mansiones*) are stationed c. 25 Roman miles (36.9 km) apart. This corresponds well both to the distance traversed by individuals on foot in one day, as well as to the distance a horse can cover at full gallop in an hour.

Procopius often specifies days of travel for an 'unencumbered traveller' (εὐζώνῳ ἀνδρὶ). This phrase occurs 23 times throughout the Wars, Buildings, and the Secret History. While it is not clear what exactly this rate is, it suggests a slightly higher speed than someone travelling, e.g., with a cart or pack animal, or in a large group, possibly corresponding to the 5 km/h cited by Tobler. It should of course be noted that a 'day's journey' is not a fixed unit: it is in fact extremely variable, what Klaus Geus calls a 'subjective perception'.[52] This is especially evident from even a cursory glance at the itinerary of Theophanes: the daily rate varies from the desert rate of 10-11 to 64 miles in one day.[53] When a distance is given as a 'day's journey', it is usually based on experiential evidence that a day is how long it takes to cover the particular distance cited. Pre-20th

[51] Tobler 1993, 2, Fig. 2.
[52] Geus 2012, 110.
[53] Matthews 2006, 59. For the variable rates of travel by sea, see Chapter 4.1.

century travel accounts and travel guides, such as Baedecker's guide to Syria and Palestine published in the latter half of the 19th century, reflect similar travel conditions using unmetalled roads and pack animals as existed in Late Antiquity.[54]

The length of a day's journey depends not only on how fast one can walk, but also on the length of the day, which fluctuates throughout the year. Table 1 shows the hours of daylight available at the northern and southern extremes of the area under consideration at the summer and winter solstices, as well as on the equinox.

Table 1

City	Summer Solstice	Hours of daylight	Winter Solstice	Hours of daylight	Equinox	Hours of daylight
Adana	05:20-20:02	14h 42min	06:48-16:26	9h 38min	06:26-18:38	12h 12min
Antioch	05:19-19:56	14h 37min	06:43-16:24	9h 41min	06:22-18.34	12h 12min
Jerusalem	05:34-19:48	14h 14min	06:35-16.39	10h 4min	06:27-18:38	12h 11min
Aila	05:41-19:43	14h 2min	06:31-16:46	10h 15min	06:28-18.38	12h 10min

Sunrise and sunset times calculated using http://www.sunrisesunsetmap.com/. Dates used were 21/6, 21/9, and 21/12/2010.

On the whole, the variations are fairly minor. We would expect this to yield 8-10 hours of travelling time during autumn, spring and summer, 6-8 in winter. The walking was probably concentrated in the morning hours, before the heat of the day (2 P.M.-4 P.M.), which could be 4-7 degrees higher in coastal areas or 15-20 degrees further inland.[55] Seasonal temperature variations should also be taken into account for the amount of distance it is possible to cover to conserve energy and water resources.

Means of Transport

While most people probably travelled on foot, as discussed above, overland transportation in the ancient world relied entirely on animals. It is therefore worthwhile to consider animals more closely. Horses, as mentioned above, were mainly reserved for the use of

[54] Wilkinson 2002, 33.
[55] Shereshevski 1991, 17.

soldiers and the swift messengers of the *cursus publicus*. Although the horse is capable of pulling great weight (1125-1500 kg), inefficiencies in pre-medieval harnessing technology means that they were not used for heavy loads. 'Sports' chariots and other light vehicles were drawn by horses and mules. These remained popular among the upper classes, and chariot races were a popular form of entertainment. Hippodromes existed in many of the major cities of the Levant, and in many cases continued in use into 6th century.[56] Donkeys were similarly limited by inefficient harnessing, so they were also more likely to be used as pack animals than for traction. Changes in harness technology were introduced into Europe via Central Asia in the 5th-8th centuries, although the earliest evidence for the adoption of this shoulder-padded harness comes from the western parts of the Empire.[57]

Oxen, on the other hand, have strong protruding thoracic vertebrae on the back which allow a very simple yoke harness to be employed: the traction force is exerted against the back, not the neck. The pulling power of a single ox is 500-750 kg; a pair of oxen can haul 1,000 kg.[58] A law of 368 limits the load of a post wagon to 1,500 pounds (500 kg): this low figure probably reflects the poor harnessing techniques that prevented horse traction being exploited to the fullest, as well as a desire to extend the working life of the animals.[59]

[56] Humphrey 1986, 438-539. There is archaeological evidence for 6th-century activity at Caesarea Maritima, and textual evidence for Edessa, Apamea, and Gaza.
[57] Parain 1966, 144.
[58] Bartosiewicz et al. 1997, 26
[59] C.Th. 8.5.30, 47.

Table 2 [60]

Animal	Load	Draught	Speed
Camel	150-200 kg	-	4-5 km/h
Donkey	150 kg	-	5-8 km/h
Horse	170 kg	1000-1500 kg (500 kg)	5-8 km/h
Mule	150-200 kg	1500 kg (500 kg)	5-8 km/h
Ox	-	750 kg (500 kg)	3-5 km/h

A distinct geographic, economic, social and ethnic hierarchy for the use of various animals is apparent. The geographic distribution of different animals is expressed well by Henriette Kroll's diagram, reproduced here as Fig. 2.13. It shows the clear delineation presumably based on climate and terrain of areas where the splay-footed camel is better suited, and areas where hoofed equids are. Further north, the grazing opportunities, particularly for horses, improve, whereas the climate becomes cooler and damper, and less comfortable for dromedaries. Bactrian camels are potentially more suited to the Anatolian climate, and were present in the region from the 7th century BCE.[61] Both dromedaries and Bactrian camels were widely exploited, which extends the 'zone of the camel' even further north into Anatolia.[62]

There are clear elements of socio-economic as well as cultural status connected with certain animals. In terms of equids, horses are the noblest – and most expensive – followed by mules. The difficulties involved in breeding, and the expense (as it requires possession of a horse to create a mule!) meant they also had a higher status.[63] Donkeys are less expensive to maintain, and were the most ubiquitous pack animal, used by peasants, monks, and pilgrims, as well as the military and the imperial administration. The evidence of the Nessana papyri suggests that even though there were plenty of camels

[60] Information on load-bearing capacity from Adams 2007 and Bartociewicz et al. 1997. For speeds, see above.
[61] Bulliet 1975, 231-2; 29; see Adams 2007, 52-3 for descriptions of camels by Roman authors mentioning both one and two-humped camels. Cooper and Decker 2012, 101-2.
[62] A 5th century epitaph near Ankara mentions a *kamelarios* – possibly driving Bactrian camels. Decker and Cooper 2012, 101.
[63] Adams 2007, 62.

at Nessana, donkeys were still being used to transport agricultural produce. Kraemer notes that the units of volume recording a shipment of dates from Nessana to Egypt (P. Colt 90-91) correspond to a donkey-load rather than a camel-load, suggesting that they were being transported by donkey caravans rather than camels.[64]

Camels are overall an interesting case. Despite their obvious advantages as pack animals across desert sands of Arabia and North Africa, they are nonetheless not suited to the entire Levant, which includes stony terrain and rocky mountains to which a camels wide feet and awkward gait would not be suited. The climate also varies, and dromedaries from the south would not be comfortable in the cooler mountains of Northern Syria or Cilicia. An examination of the written and iconographic sources confirms this rough geographic spread.[65]

References to camels are ubiquitous throughout Tres Palaestinae, Arabia and most of Syria. The question of ownership, however, is interesting. Although camels appear regularly, their owners and people they are associated with, with the exception of the army, are identified vaguely as Arabs, Saracens, etc., i.e., non-Greek speaking nomads. In Sinai, Egeria marvels at the agility of the camels ridden by her Paranite guides, but the suggestion is that she herself and her retinue are riding donkeys.[66] In the *Life of St Sabas*, a monastery hires a Saracen camel driver to transport grain from Transjordan.[67] The monastery likely owned donkeys. Papyri from Nessana record a lawsuit regarding camels in which the parties accused are named as Saracens, although Stroumsa thinks this is intended more as an insult by the plaintiffs rather than an an actual ethnic designation.[68] In graffiti attesting to the early 2nd century presence of the Roman army in the Arabian Peninsula, an *ala dromadarium* is mentioned. Despite being the 'Roman' army, many of

[64] Kraemer 1958, 268-270.
[65] See, e.g., Seland 2011.
[66] Egeria 6.1-2 (Wilkinson 1999, 114-5), 11.4 (*asellis*).
[67] Cyril of Scythopolis, *Life of Sabas*, 81.
[68] Stroumsa 2009, 167.

the names are of Nabataean origin.[69] The inscription on the mosaic at Bosra depicting a camel caravan identifies its donor as Moukhasos – probably a name of Semitic, rather than Greek, origin.[70] This rough sketch suggests that a more thorough study of the possible ethnicity of camel drivers compared to, e.g., muleteers, is called for.

The exception to this is the military. Vegetius regards camels as a novelty and not of especial utility in battle, however Procopius states that in the early part of Justinian's reign, the army kept 'a large number of camels, which carried all the baggage when the Roman army marched against the foe', but that the emperor did away with these. Nevertheless, the late 6th century *Strategikon* of Maurice lists camels as suitable pack animals for transporting supplies.[71]

Camels were not used exclusively as pack animals. This becomes clear from an inscription recording an edict of Anastasius, found, amongst other places, at Qasr al-Hallabat in Jordan. This inscription, regarding apportionment of mounts, refers to δρομάδες and δρομάδες κάμηλοι, clearly designating something other than an ordinary κάμηλος. Feissel translates *dromades* as 'chameaux de course', or racing camels. The derivation from the Greek root *dromos*, runner, suggests that speed is the crucial attribute. The distinction between a *kamelos* and (in this instance) a *dromedarios* is also preserved in the Nessana Papyri.[72] Pairing the animals with horses in the edict further suggests that these are military mounts to be ridden into battle like horses by the equestrian cavalry, rather than pack animals, which would be classed with donkeys or oxen.[73] The edict is issued to the *dux Palaestinae* (fragments have been found at Qasr al-Hallabat, Salkhad,

[69] Speidel 1977, 704.
[70] Donceel-Voûte 1988, 480-1. This in contrast to a similar church mosaic from Huarte, depicting a muleteer named Georgios Klaudios.
[71] Dennis 1984, 161.
[72] P.Colt 35. Kraemer 1958, 109.
[73] For an overview of the Qasr al-Hallabat inscription (*PPUAES III* A 2, 24-41, No. 20), see Feissel 2006 and 2010. I am grateful to Professor Feissel for sharing his translation of the relevant passages of the inscription with me (Feissel, personal communication, 20 August 2013).

Umm al-Jimal, and Jerusalem) and concerns military supply in the diocese of Oriens. Two further attestations confirm that camels were used as more than pack animals by the Roman army. The *ala dromadarium* mentioned in the inscription from Medain Saleh (above) demonstrates that camel cavalries were being employed as early as the 2nd century CE. Parker argues that such units served as desert patrols.[74] The practice continued into Late Antiquity. One of the papyrus archives recovered from Nessana relates to a *numerus* (c. 200-900 men) of 'Very Loyal Theodosians' (τῶν καθοσιωμένων Θεοδοσιακῶν) stationed out of the village.[75] The papyri span the period from 505 to 596, and references in undated papyri (P. Colt 35 and 37) to the requisitioning of camels lead Kraemer to conclude that the soldiers stationed at Nessana belonged to a camel corps.[76]

By the 9th century, the *Taktika* of Leo VI echoes Vegetius in regarding camels as ill-suited to combat. However, the manual recommends that the army retain some camels to allow cavalry horses to become accustomed to them. This is so the horses do not panic when confronted with enemy camels in battle, as the Arab armies relied on camel cavalries.[77] This confirms the idea discussed above that camel drivers – and even *dromedarii* in the pay of the imperial army – belonged to groups who, although Romanised and Christianised, traced their ancestry back to the Nabataeans and other nomadic Arabian peoples.

Camel remains have been excavated at Roman and Late Roman sites throughout central and eastern Europe. Individuals have been found at 2nd and 3rd century sites in Slovenia, in Hungary, Austria, the Iberian Peninsula, and as far north and west as Belgium and even Greenwich in London![78] Camel remains have also been recovered from

[74] Parker 1986, 9.
[75] Kraemer 1958, 5-6, 19-24. See esp. P.Colt 15 (Kraemer 1958, 41-44).
[76] Kraemer 1958, 21.
[77] *Taktika* 18.134.
[78] Slovenia: Bartosiewicz 2001; Hungary: Bartosiewicz 1999; Austria: Berger and Thenius 1951, Riedel 1999; Iberian Peninsula: Morales Muñiz et al. 1995; Greenwich: Leake and Hookham, The Sunday

identifiably Late Roman sites, with four individuals recovered so far from the lower town in Justiniana Prima in Serbia, and from a late 3rd/4th century *vicus* at Arlon in central Belgium.[79] At least two camel skeletons have been found in shipwreck excavations at Yenikapı, in Istanbul.[80] The fact that only one or two individuals are encountered at a time, in military or civic contexts, and in areas so far outside their natural habitats, suggest that they were imported to the west not as working animals, but for their novelty value, perhaps displayed at games and public spectacles.[81] This suggests that, despite its utility and the extent to which it was employed, the camel remained something of an exotic creature the breeding and exploitation of which lay mostly in the hands of those who had lived with them since their early domestication.

This situation is not unique to the Roman period. An examination of the administrative letters of the Assyrian king Sargon II, whose empire covered much of the northern Levant (Syria, Mesopotamia and southwestern Asia Minor – as well as extending north to the Black Sea and east of the Tigris to the Zagros Mountains) shows much the same situation prevailing in the 7th century BCE. Horses have pride of place, mules are used for the express post. Donkeys are the preferred beasts of burden, while oxen are classed as livestock and occasionally used for pulling wagons. Camels are exotic creatures of the southern realms, used in raiding and warfare by 'Arabs' (from the region of Damascus and further south). Sometimes camels are captured as prizes of war, and sold for large sums of money, but there is no evidence that they were put to work: they seem

Times, 25 December 2011. See Pigière and Henrotay 2011, Table 3 for a compilation of camel finds from the northern provinces of the Roman Empire.

[79] Justiniana Prima: Ivanisevic, Late Antique and Byzantine Studies Seminar, Oxford University, 8 May 2013; Arlon: Pigière and Henrotay 2011.

[80] Pulak, Late Antique and Byzantine Studies Seminar, Oxford University, 21 November 2007, although archaeozoological analyses are ongoing. From the list published by Vedet Onar (2013) it appears that one individual has been identified as a Bactrian camel.

[81] Morales Muñiz et al. 1995, 369. The remains have been identified, where possible, as a mixture of dromedaries and Bactrian camels. Nothing conclusive can be said about a preference for one type over the other.

to have remained a curiosity.[82]

The camel versus the wheel

In 1975, Richard Bulliet published a book titled *The Camel and The Wheel*. More camel than wheel, it was a more or less ethnographic study of the role of the camel in Middle Eastern societies and the developments in harnessing and saddling technology that allowed this animal to be exploited as both pack and draught animal. In his 1986 essay, 'From Polis To Medina', Hugh Kennedy referred to Bulliet's work and argued that 'the disappearance of wheeled traffic in late antiquity and the early Islamic period must have had a profound effect on urban planning.'[83] Kennedy also states: 'The late seventh-century pilgrim Arculf commented on the absence of carts in Syria and Palestine.'In fact, the passage in Arculf's account reads: 'there are very few waggons or even carts in *Judaea*.' (Italics mine).[84] Judaea mainly comprises the rocky highlands of Palaestina Prima, not all of the Levant.

In fact, Bulliet's argument relies entirely on the observation that early Arabic lacks loan words for wheeled vehicles derived from Greek, therefore the Arabs must not have been exposed to these in the Greek-speaking Roman East around the time of the Islamic conquests. He therefore concludes, 'the only conclusion possible is that the wheel and its associated vocabulary had disappeared sometime prior to the Islamic conquests.'[85] This is an extremely flimsy argument; while it is possible to extrapolate the origins of phenomena based on the etymology of loan words, the reverse is not true. It requires one to presume that an enormous technological revolution took place silently and unnoticed,

[82] Mules and the express post: *Corr. Sarg.* II.24, II.227. Oxen as livestock: *Corr. Sarg.* I.20, III.187, III.318; as transport: III Fig. 12, II Fig. 3, II.280. Donkeys as pack animals: *Corr. Sarg.* I.26, II.119, III Fig. 2, Fig. 12. Camels, used by Arab raiders: *Corr. Sarg.* I. Fig.24, I.175; in the king's camp: II Fig 26; sale of: III.182, III.279.
[83] Kennedy 1986, 26.
[84] Adomnan, *On the Holy Places* 2.12.
[85] Bulliet 1975, 14.

and is completely unconnected to the subsequent enormous political and cultural upheaval instigated by a desert people. This is rather slender evidence to extrapolate a revolution in transportation, the decline of the road system, or to infer change of urban infrastructure.

Bulliet acknowledges the problem, admitting that 'the questions that must be resolved to substantiate this hypothesis are numerous and difficult. In point of fact, this entire book is largely the product of finally realizing just how numerous and how difficult they are.'[86] Bulliet is arguing for a total abandonment of wheeled vehicles, at some unspecified point in the 4th through 7th centuries. Furthermore, his argument is only striking if one presumes, as he appears to do, a total proliferation of the wheel throughout the Roman East prior to its alleged disappearance.

Bulliet makes a further error, propagated by Kennedy as seen above, of assuming that the 'zone of disappearance of the wheel' refers to the entire Near East, without really looking at what was the traditional zone of the camel all along. That is to say, the area of the Islamic conquest consists of two distinct transportational zones: the deserts of North Africa, Palestine, Transjordan, and Syria as far north as Aleppo are the zone of the camel. North of this area is more likely to be the 'zone of the wheel' - or, more likely, the zone of the donkey or ox. This is due to the anatomy of the respective animals: camels' wide, spreading toes are ideally suited to sandy surfaces but less so to stony ones where the smaller hooves of donkeys or oxen are better suited. The latter would in turn sink into sand.

Many scholars appear to be in thrall to the apparent dichotomy of the camel versus the wheel. This obscures an important observation: while the evidence for the proliferation of the camel may not predate the 6th or 7th century, this does not mean that

[86] Bulliet 1975, 21.

the only other alternative was wheeled traffic. Bulliet notes the absence of wheeled vehicles from mosaics of the Late Antique period. However, instead of seeing this as an argument for the rise of the camel, as he does, it seems an even stronger argument *against* the proliferation of the wheel. There is only one surviving floor mosaic in the Levant showing what may be a horse-drawn wheeled vehicle. It is in the central nave pavement of the Church of the Priest Wa'il at Umm ar-Rasas in Jordan (see Fig. 2.14), dated to 586. Although badly damaged by iconoclasts and later repairs, the pavement shows a horse hitched up to a red, boxlike contraption with curved corners, identified by Piccirillo as a carriage.[87] However, as Elizabeth Montgomerie has pointed out, the shape of the 'carriage' bears a strong resemblance to a pavement at the north church at Huarte, Syria, which shows a reliquary being borne on a litter between two mules.[88] Furthermore, the absence of any indication of a wheel in the preserved part of the pavement at Umm ar-Rasas, and the suggestion of a foreleg of a second animal in the sketch plan compounds the idea that what is shown is a litter rather than a carriage. The one alleged depiction of a wheeled vehicle from the Late Antique Levant may well be nothing of the sort.

Conversely, there are a great deal of mosaic pavements showing camels, horses, and donkeys.[89] Hunters on horseback frequently appear in scenes of wild animal hunts.[90] Agricultural and pastoral scenes frequently feature donkeys laden with baskets carrying fruit (Fig. 2.15).[91] Representations of camels include long camel trains, such as those found at Bostra and Apamea.[92] Other representations include individual camels laden with

[87] Piccirillo 1993, 243-3, Figs 396 and 400.
[88] Montgomerie, personal communication, 24 June 2013; Donceel-Voûte 1988, 108, Fig. 75.
[89] Looking only at the corpus of pavements from ecclesiastical contexts in Syria (Donceel-Voûte 1988) and Jordan (Piccirillo 1993), we can count 4 mosaics with camels, 10 mosaics with donkeys laden with baskets, 2 unsaddled or wild donkeys, 11 mosaics with horses (6 unsaddled, 2 saddled, 4 mounted) and 2 mosaics with hitched horses/mules. This cursory list excludes more recent finds such as the Petra Church mosaics, mosaics from secular contexts, and mosaics from Israel.
[90] Piccirillo 1993, Figs 148, 166, 279, 400; Balty 1995, Figs 1-2.
[91] Donceel-Voûte 1988, Figs 344, 403; Piccirillo 1993, Figs 109, 202,242, 253, 273, 345, 404, 470.
[92] Donceel-Voûte 1988, 47; Balty 1977, 110-1.

trade goods being led by a *kamelarios* (Figs 2.16-17).[93] The mosaic in the north aisle of the Petra church plays with the visual space of the vine scroll, showing a camel carrying a long wooden beam which spans three of the cells of the scroll (Fig. 2.18).[94]

It seems very likely, given the terrain, that use of wheeled vehicles was at all times extremely restricted. Although we cannot ignore the archaeological evidence of wheel ruts present in many of the paved streets of the cities of the Levant, their absence in paving preserved outside urban areas is telling. David Graf may well be correct when he estimates that pack animals were used for long hauls, whereas wheeled vehicles were used for transporting goods into the city.[95] Not only would bringing a train of 40-odd camels into the city centre have caused serious congestion, but the hard paved surfaces of streets (and paved roads in general) are uncomfortable to camels' feet and may cause discomfort in other joints from impact on a hard surface.[96] Caravanserais on the outskirts of the city could be used for offloading goods from caravans and transported into the city by individual merchants on wagons or even hand-carts.

Examination of the Late Antique evidence reveals that the full range of transport was still being employed into the 7th century. However, wheeled transport was probably more likely employed by the administration and the military: empire-wide institutions with an element of universal cohesion. The *cursus clavularis* made use of ox-driven carts, although this was abolished in Oriens by Leo - this was probably replaced by private hire, which could have been either carts or pack animals, including camels, depending on region. *C.Th.* 8.5.41, addressed to the *comes Orientis*, suggests that the *cursus publicus* in the east made use of donkeys.

[93] Piccirillo 1993, Figs 277 and 456. For the so-called Obrikon mosaic from Kissufim now in the Israel Museum, see Cohen 1993, 277-282.
[94] Waliscewski 2001, 232-3.
[95] Graf 1997a, 49.
[96] Wilson 1989, 15.

Hazards

Despite the general good condition of the central road network, any journey was fraught with risk. Of these, sea voyages were probably the most perilous, as the numerous shipwreck fallen afoul of storms and reefs attest. The dangers of travel by sea will be discussed in detail elsewhere (Chaper 4.1). However, overland travel was also far from being a risk-free enterprise. A wide range of imponderables, from natural disaster to threats of violence from other people afflicted ancient travellers.

Possibly the most dangerous yet recurring natural phenomenon could be the otherwise seemingly innocuous spring rains. They could cause mudslides and wash away roads. They could cause rivers to burst their banks and become impassable. Even in desert regions, rains miles away in the mountains could incite flash floods that would course through the wadis that people used as access routes with lethal force.

Earthquakes are common in the region. The Dead Sea Tranform System, which runs from the Red Sea, through the Dead Sea and the Jordan Valley, is paticularly volatile. In addition to the damage caused to cities and settlements, earthquakes can also destroy bridges, disrupt access routes with debris, and obliterate landmarks. Particularly cataclysmic earthquakes are known to have to have occurred in the Levant in 363 (Southern Levant), 365 (Crete), 526 (Antioch), 551 (Berytus), and 749 (Southern Levant). All these earthquakes have left their mark in the archaeological record. Several of them triggered tsunamis which wiped out coastal areas. The earthquake of 526 at Antioch prompted extensive rebuilding of the city, including improving communications by constructing bridges across the Orontes and constructing ascents on roads through difficult terrain.[97] It is possible that a bridge carrying the *Via Nova Traiana* across the Wadi Hasa was destroyed by an earthquake, and was never rebuilt, thus permanently

[97] Procopius, *Buildings* 2.10.2-14.

altering the course of the route.[98]

At the opposite end of the spectrum, forest or brush fires in the summer could have a similar effect of making certain areas impassable. Dust storms often seem to come out of nowhere in the desert, and although they are usually of short duration, can have a damaging effect, blowing away supplies, and, more seriously, covering up the track and disorienting the traveller. In the desert it was, and is still, advisable to have a guide, and camels and their drivers attracted admiration from authors as diverse as Egeria and Vegetius for their ability to find their way in desert wastes. On the road, the risk of accident was high. Descriptions of main roads describe the traffic as heavy, fast, and at times reckless. A correspondent of Julian's preferred taking back roads for this reason.[99] Libanius also bemoaned the traffic. However, he had good cause: his own son had been killed as the result of a fall from a carriage (ἀπήνη).[100] Illness could also befall travellers, or illness or plague could prevent people from travelling through a particular area.[101] In addition to the risk of injury to one's person, there was risk of injury to one's mount or pack animal. An animal of the *cursus publicus* could be replaced easily enough, but private animals were far more precious. The hysteria of the camel driver whose animal lost its footing and tumbled down the hillside is proof of that.[102] Although people did not sentimentalise their animals, their monetary value as an investment and a source of income meant that care for them was fiscally sensible. Thus the camel driver's concern, and the noble peasant of Libanius' oration, who walks back to his village so that his donkey might not be overburdened.[103]

In addition to the danger from the recklessness of other people on the road, there

[98] See Chapter 6.
[99] Julian, *Ep*. 83 From Eustathius the Philosopher to Julian.
[100] Libanius, *Or*. 1.279.
[101] Libanius, *Or*. 1.14; *Or*. 1.77.
[102] Cyril of Scythopolis, *Life of Sabas*, 81.
[103] Libanius, *Or*. 50.

was a very present danger of direct violence. Thieves, bandits, highwaymen, might not just relieve you of your material possessions, but your life as well. Reformed bandits are something of a trope in apothegmata. In the southern reaches, nomadic desert tribes engaged in raiding and internecine feuds much as they have done into the modern period. While some tribes were in the employ of the Roman Empire to protect its borders and citizens, the Persian Empire similarly had its own clients, who made trouble for each other in a sort of proxy war. Kidnapping and enslavement was a genuine danger. Peter the Iberian and his companion, for example, were afraid of being sold into slavery on their journey from Constantinople to Jerusalem.[104] Although itinerant monks are a phenomenon of the period, monks were supposed to suppress their *Wanderlust*, which was thought to be of demonic origin. If a monk could not prove that he had the permission of his abbot to be abroad, he could be forcibly hauled back to his monastery.

A traveller could also be caught up in outright warfare. The cities of the provinces of northern Mesopotamia, along major trade routes and important sites of pilgrimage, were often put under siege by opposing armies. All those in the cities were expected to take part in the defense, and it was advantageous to do so. Nevertheless, many cities were sacked and people killed or enslaved, which doubtless included people not native to the city who had been unable to flee in time. How, then, could people expect to protect themselves? The sensible precaution was to stick to the main roads, particularly those with a military presence. A symbiotic relationship emerged, as travellers, particularly merchants, wish to have their goods and livelihoods protected, and the military and administration have a vested interest in protecting trade routes, a lucrative source of tax revenue. Pilgrims, too, gravitated towards these protected routes. In an era where faith, religion and superstition were utterly inextricable and events were governed by demons

[104] John Rufus, *Life of Peter the Iberian*, 36. A tax collector mistook the men for runaway slaves and tried to capture them.

and unseen hands, precautions would be taken on another plane altogether. Amulets, charms and magic formed an important part of daily life.[105] Although specific travellers amulets may not yet have been identified, general amulets protecting against the evil eye and unseen threats would have served that purpose.[106]

The *eulogiae* acquired at pilgrim locations, although they may heve been intended as a cure for a specific ailment, could also protect the pilgrim on the journey home. The lives of both the elder and the younger Simeon Stylites record the efficacy of the saints' tokens for quelling storms at sea.[107] A 6th century flask of St Menas has an image of a boat on the reverse, not specifically associated with the saint, but as an apotropaic device (See Fig. 2.19), while the image of 'the Tempest Calmed' is popular on tokens and amulets and even appears on pilgrim tokens found near Qala'at Sim'an.[108] A visit to a holy man or his memorial meant you had obtained the favour of a powerful protector. Other measures could be employed to ensure a safe journey. Auspicious days could be selected for the commencement of travel. Certain rituals could be observed en route, on one voyage the priest on board continuously recited psalms.[109] Graffiti show that short prayers invoking saints were another way travellers attempted to protect themselves and their families.[110] More mundane objects could also make the journey more endurable. Theophanes purchased a special hat at Pelusium, his last stop before crossing the desert of Sinai.[111] Synesius of Cyrene had a travel bed that was greatly coveted by his friends.[112]

Though the perils were many, they in no way stopped people from setting forth. The late antique world was one in which travel networks remained diverse and vibrant,

[105] Even clothes could be encoded with amuletic designs. Maguire 1990.
[106] Vikan 1991, 74.
[107] Vikan 1991, 75-6.
[108] Vikan 1991, 76-7.
[109] Gorce 1925, 128.
[110] Figueras 2007, No. 1.
[111] Matthews 2006, 55.
[112] Synesius, *Ep*. 60.

and the infrastructure created to support them developed and diversified as well. In the following chapter, we shall look at how these travel networks might have been experienced first-hand by the people who traversed them.

Chapter 3 – Going the Distance: Travel through an incremental landscape in the Late Roman Levant

To understand how the Romans conceived of their landscape, it is necessary to dispose of our modern conceptions based on an awareness of the Earth from the air: aerial photographs, satellite images, and accurately surveyed maps all give us knowledge of what our world and our native regions look like in two dimensions.[1] We are then trained to translate this information to the three-dimensional landscape, and are thus able to navigate based on a knowledge of the relationship between the two-dimensional representation and its physical manifestation, even though we may never observe the landscape from the same angle as the representation was taken.

The Romans, of course, lacked satellites and airplanes, but they also lacked a cartographic tradition on a par with modern map-making: the few Roman 'maps' that survive do not employ standards of scale and accurate rendering of topographic detail that we would consider essential for navigation. The debate then concerns the purpose and function of these 'maps'. Are they truly intended to be aids to travellers, or are they cosmographic representations of the Roman *imperium*, illustrating military triumph and serving as propaganda?

Roman treatment of the landscape is often divided by scholars into four categories: geography, chorography, cartography, and hodology. In this chapter, I will primarily be arguing for spatial awareness based on the concept of hodology. First propounded as such by Pietro Janni in 1984, it is based on the premise that the Roman Empire was viewed by its administrators and inhabitants as a series of intersecting roads. My extension of Janni's thesis is that this Roman 'road-scape' was broken down into

[1] For the sites mentioned in this chapter, see Map 3.1

easily manageable increments, thanks to which the traveller did not need to have accurate information about terrain or cardinal directions. A vague notion about the distance between points A and B, easily converted into the amount of time the journey would take, thanks to standard staging, would suffice.

However, it is important to discuss the other three categories mentioned above, if only to explain why they would have been of limited use to travellers, as opposed to the landmarks on the ground.

Lessons from Strabo and Ptolemy: Geography, Chorography, and Cartography

According to the ancient geographers, in particular Strabo (ca. 63 BCE-ca. 24 CE) and Ptolemy (ca. 90-ca. 168 CE), geography, cartography, and chorography are all components of how the world should be studied and represented. Firstly, modern definitions must be cast aside, as we would recognise geography as the study of the Earth in both its natural and man-made features. Cartography in modern parlance is simply the drawing of charts or maps, whereas chorography is a rather unfamiliar, antiquated, term. Strabo, in his *Geography* (*Geographika*), defines the distinction between chorography and geography. The latter (contrary to modern expectations) is defined as 'knowledge both of the heavens and of the things on land and sea, animals, plants, fruits, and everything else to be seen in various regions'[2] – in short, the οἰκουμένη, which by Late Antiquity had taken on overtones firstly of Roman dominion and secondly of Christian ecclesiology.

Strabo's definition of chorography appears to link it with the natural world, as opposed to human or political manifestations of space: 'It is the sea more than anything else that defines the contours of the land (γεωγραφεῖ) and gives it its shape, by forming

[2] Strabo, *Geo*. 1.1.1 (Jones 1932).

gulfs, deep seas, straits and likewise isthmuses, peninsulas, and promontories; but both the rivers and the mountains assist the seas herein. It is through such natural features that we gain a clear conception of continents, nations (ἔθνη), favourable positions of cities (πόλεων) and all the other diversified details with which our geographical map (χορογραφικὸς πίναξ) is filled.'[3]

Ptolemy defines the three fields slightly differently. According to Ptolemy, geography regards the world as a whole, while chorography is concerned with its component parts.[4] According to Ptolemy's definition, the aim of chorography is to describe in precise detail the topographical layout of a specific area or region. However, Ptolemy regards chorography as a visual art, a specialist aspect of cartography, which he defines as the 'diagrammatic imitation of the known parts of the World with its unique features.'[5] Ptolemy's *Geography* was intended as a manual for map-makers to produce accurate maps using his projection system and coordinates. Although no Ptolemaic maps have survived from antiquity, the earliest surviving medieval copies do include maps based on these instructions.[6]

Geographic texts remained popular in Late Antiquity, including scientific texts such as Eratosthenes as well as what we would consider more ethnographic treatises, such as the *Expositio totius mundi et gentium* and the many examples from the genre of the *periplus*. New texts were also being written, such as the no longer extant work by Marcellinus Comes (6th century) on the cities of Jerusalem and Constantinople and the *Cosmographia* of Julius Honorius (c. 4th-6th century), or the *Pinax mundi: descriptio orbis* by Dionysius Perigetes (2nd century CE). These works are all mentioned as worthy of study by Cassiodorus in his *Institutiones* of the mid-6th century. Stephen of Byzantium's

[3] Strabo, *Geo*. 2.5.17 (Jones 1932).
[4] Ptolemy, *Geo*. 1.1.3 (Francis 1994).
[5] Ptolemy, *Geo*. 1.1.1 (Francis 1994).
[6] See Mittenhuber 2010 for recension and textual tradition.

Ethnika (6th century) contains many references and quotations from contemporary and ancient authors, including Herodotus, Xenophon, and Strabo.[7] Cosmas Indicopleustes, in his *Christian Topography*, also draws on what he calls 'pagan' texts for his cosmology, although he relies more heavily on exegetical analysis of the Old and New Testaments to construct his vision of the *oikumene* as a tabernacle with the earth as the bottom of the box and the heavens as the arced lid.[8] Ptolemy's *Geography* was certainly being read in Late Antiquity – it is referred to by Cassiodorus and by Ammianus Marcellinus as well.[9]

Strabo's *Geography*, however, may be another matter. While his *History* was well known, the *Geography* (possibly written when Strabo was of advanced years) was unpublished and its degree of influence prior to the 6th century is minimal.[10] A palimpsest, dated to the late 5th/early 6th century, is the earliest extant copy of Strabo's *Geography*, which may have influenced Stephen of Byzantium and Procopius.[11] Michael Maas argues that Procopius made use of Strabo, especially in using geography as a method of celebrating Justinian's reconquests and 'Christian imperialism', although it is unclear whether actual distances given by Procopius, usually in stades instead of miles, derive from Strabo.[12]

However, despite Ptolemy and Strabo's emphasis on representing the world in a visual way and breaking it down along geometric lines, the lack of surviving evidence makes it difficult to extrapolate a thriving practice of mapmaking in antiquity. Certainly the products themselves do not survive, nor do references to specialised craftsmen who might have produced them. Richard Talbert, on the other hand, takes a much more post-positivist approach, arguing that a document as detailed as the Peutinger Map must have

[7] Billerbeck et al. 2006-11.
[8] In the introduction to Book 5, Cosmas in fact argues that 'pagan' science is ultimately derived from biblical sources, and that pagan authors are thieves (κλέπται ὑπάρχοντες) .
[9] Amm. Marc. 22.8.10; Cassiodorus, *Institutiones*, 1.25.
[10] Diller 1975, 7-18; Dueck 1999, 146-153; Maas 2007, 67.
[11] MSS Vaticanus Graecus 2061 and 2306; Mittenhuber 2010, 113.
[12] Maas 2007.

drawn on skilled craftsmen and widely available sources, pictorial as well as textual. Talbert further suggests that the title of *pictor imaginarius* found on Diocletian's Price Edict may encompass map producers as well.[13] Florian Mittenhuber also argues that Late Antique and Byzantine editions of Ptolemy's *Geography* would have included maps from when it was first composed in the 2nd century until the first attested maps of the 13th century.[14]

Of the three surviving examples of Late Antique maps worthy of the name, the Peutinger Map most closely corresponds to what Ptolemy argued should be a cartographic representation, i.e., it 'requires merely unadorned linear drawing with directional annotations, to direct the eye to a position'.[15] The 3rd century Dura Europos shield, although only partially preserved, appears to be similarly very schematic.[16] The 6th century mosaic Madaba Map is a topographic map, showing the cities, settlements, and locations of scriptural importance in the Holy Land with Jerusalem at its centre (Fig. 3.1). Only limited geophysical elements, such as the Dead Sea and the Jordan River and some mountain ranges, are included. Given its location in a church, however, one must imagine that it was intended not to be a concrete guide but to serve as an aid to reflect on the Christian *oikumene* as contrasted with the divine realm.[17]

A further tantalising hint of the Late Antique cartographic tradition is to be found in a letter written by the emperor Julian acknowledging receipt of a gift:

> It happened that when you sent me your map (γεωγραφία) I had just recovered from my illness, but I was none the less glad on that account to receive the chart (πινάκιον = tablet [for painting upon]) that you sent. For not only does it contain diagrams (τα διαγράμματα) better than any hitherto made; but you have embellished it by adding those iambic verses…such as beautiful Sappho is wont to fashion for her songs. In fact, the gift is such

[13] Talbert 2010, 95-6, 136-9; 134.
[14] Mittenhuber 2010, 116.
[15] Ptolemy, *Geo*. 1.i.6 (Francis 1994).
[16] Cumont 1925. Pascal Arnaud (1988) argues the object should not be regarded as a shield *per se*, but is an example of a *pinax* or circular *mappa mundi*.
[17] On the Madaba Map generally, see Piccirillo and Alliata 1999.

> as no doubt it well became you to give, while to me it is most agreeable to receive.[18]

It is difficult to visualise what Julian is describing. The word πινάκιον echoes the πίναξ of Strabo (used by Ptolemy as well), and suggests a single image rather than a literary composition, with text added to the picture, rather than vice versa. Whether this is a whole map, of the chorographic or cartographic traditions propounded by Strabo and Ptolemy, or a series of geographical vignettes (such as those in the *Notitia Dignitatum*) with accompanying poems is unclear.[19] The vignettes in the *Notitia Dignitatum* do show some elements of terrain and topography, such as the illustration of the territory of the *comes per Isauriam*, which shows the relative position of the Mediterranean, the city of Tarsus, the Cilician Gates, and the cities north of the Taurus (see Fig. 3.2). However, for the most part the illustrations are probably too generalised or stylised to be very informative for strategic purposes.

Despite the absence of maps, geographical (or chorographical) knowledge was imperative, especially to the military and administrative elite charged with making decisions about far-flung areas of the empire.[20] While the limits of the empire were known, they were never formally proclaimed. The various administrative units of the interior of the eastern provinces were clearly demarcated, but no inscriptions have been found that identify an actual 'international' border.[21] The eastern boundary between the Roman and Persian empires was defined by cities and fortifications – when they changed hands as a result of military action, the border shifted. Maps and itineraries illustrate the level of information available about the lay of the land and the relative locations of

[18] Julian, Ep. 7 (Wright 1923 Vol. III, 19).
[19] *Notitia Dignitatum*: Seeck 1876; the copy held at Oxford (Bodley MS. Canon. Misc. 378), dating to 1436, is thought to be a reliable imitation of the 5th century iconography (Berger 1981, 13-16) and shows labelled walled cities in their approximate locations, along with rivers and mountains.
[20] Sipilä 2009, especially Chapter 3.
[21] Isaac 1990, 397.

different places. However, on the whole, cartography represents an abstract level of knowledge that is not necessarily directly relevant to the process of undertaking a journey. Our third category of spatial awareness, hodology, represents a much more practical, specific, and focused way of conceiving of space and movement.

Hodological Space

The term 'hodological space' ('spazio odologico') was first employed with reference to the ancient world by Pietro Janni in 1984.[22] He used the one-dimensional idea of hodological space as opposed to two-dimensional cartographic space to express how ancient peoples comprehended the world through which they moved. Derived from the Greek word ὅδος, this one dimension was linear – a single road or path.[23] The world was a 'force field of points and preferred directions'.[24]

Furthermore, Janni attributes errors in Roman map-making to a lack of correlation between the hodological experience and the cartographic model: information about distances between two points or the time it takes to cover that distance does not contain geographic information about terrain, changes in elevation, or even slight changes in direction.[25] Janni described this as a lived space ('uno spazio vissuto') as opposed to the abstract perception derived from a map.[26] It seems an appropriate description of the human experience of space when travelling.

Further developments in the study of 'behavioural space' have led to the development of the term 'Common sense geography' and its application to classical texts. Common sense geography (CSG) employs cognitive behavioural, sociological and

[22] See Janni 1984, 82-3, for a discussion of the theoretical behavioural models he consulted.
[23] 'Il loro movimento avviene lungo una linea al di fuori della quale per loro c'e ben poco: avviene in uno spazio unidimensionale.' Janni 1984, 80.
[24] 'Il suo spazio non è omogeneo e non è isotropo; è un campo di forze con punti e direzioni privilegiate.' Janni 1984, 77.
[25] Janni 1984, 87.
[26] Janni 1984, 94.

linguistic theory to '(re)construct mental models in ancient orientation'.[27]

Relative Orientation[28]

A further aspect of common sense navigation is orientation. Cardinal points can be roughly determined using celestial phenomena, but the system of roads and increments described above makes constant awareness of orientation redundant. In descriptions of space, often the relationship between places is given in terms of relative rather than absolute knowledge. We have already looked at how well-marked roads obviate the need for extensive geographical knowledge, and that distance is often commuted to more relatable divisions, such as time. This all derives from being in the landscape, rather than viewing it from outside or above. When describing three-dimensional space verbally, ancient authors demonstrate knowledge based on relative, rather than absolute, orientation. This is particularly true, even today, of bodies of water that have their own directionality from currents. We continue to make use of this concept when talking about the left or right banks of a river. This is defined by the downstream flow of the river, rather than the river's orientation in geographic space, so that, in Paris, the left bank of the Seine lies to the south of the river, whereas the left bank of the Euphrates lies to the east (or the north in the middle region). For example, in his description of the Red Sea, Procopius provides a very practical, 'mariner's eye' view of the lay of the land:

> The boundaries of Palestine extend toward the east to the sea which is called the Red Sea… And there is a city called Aelas on its shore, where the sea comes to an end, as I have said, and becomes a very narrow gulf. And as one sails into the sea from there, the Egyptian mountains lie on the right, extending toward the south; on the other side a country deserted by men extends northward to an indefinite distance; and the land on both sides is visible as one sails in as far as the island called Iotabe, not less than one thousand stades distant from the city of Aelas… From there on there comes a great open sea. And those who sail into this part of it no longer see the land on the right, but they always

[27] Geus and Thiering 2012, 2.
[28] Derived from the expression 'orientamento relativo' used by Janni 1984, 115.

anchor along the left coast when night comes on.[29]

This further emphasises the greater relevance that physical presence has for navigation as compared to knowledge based on the far less pervasive cartographic perspective. Similarly, Cosmas Indicopleustes uses this sort of relative orientation, taking his bearing from the position of the sea, in his description of the flight of the Israelites across the Red Sea and into Sinai:

> Now that very place is in Clysma, as they call it, on the right hand as you go to the mountain, where also the tracks of the wheels of their chariots are visible, and can be traced for a considerable distance as far as the sea, and are preserved even to the present day, as a sign to unbelievers and not to believers…Then again setting out from Merrha (Marah) they came to Elim which we now call Raithu, where there were twelve springs of water…which exist to the present day… Up to this point they had the sea on their right hand, and on their left the wilderness, but thenceforth they advanced into the interior towards the mountain, leaving the sea behind them as they marched forward into the wilderness.[30]

The anecdotal observations about what is visible in the 'present day' (εἰσέτι καὶ νῦν σῴζονται) suggests that Cosmas is relying on his memory of a journey he has made himself. He is therefore describing the geographical setting based on his own experience, relative to his place in and movement through the landscape, rather than abstract cartographic knowledge.

These approaches are well worth embracing, despite modern authors' somewhat pejorative description of it as 'lower' and 'naïve'.[31] The success of satellite navigation devices which provide both a cartographic road map and verbal commands based on relative orientation ('turn left') demonstrate that we continue to experience our environment in this way, and therefore it is very applicable to the day-to-day experiences

[29] Procopius, *Persian Wars* 1.19.3-5 (Dewing 1971, 179).
[30] Cosmas Indicopleustes, *Christian Topography* 5.8-14 (Crindle 1897).
[31] Geus and Thiering 2012, 2.

of travellers in ancient times. Although the bulk of the scholarship on mental maps in the ancient world has focused on earlier Classical and Roman authors, the texts of Late Antiquity, including as they do many first-hand accounts of travel, indicate that conceiving of space as a) hodological, a linear progression from one point to another regardless of obstacles, and b) relativistic was alive and well. They mentally mapped out the space they occupied not from above, but from within.

This method of spatial awareness presupposes an easy-to-follow road with clear markers. It necessitates far less geographic knowledge from the travellers: all they need to know is whether they are going to or from points A and B. The scholars mentioned above have mainly looked at this from the perspective of how itineraries or geographies reflect these mental maps. However, what these scholars fail to take into account is that both the written itineraries and the mental maps they reflect are determined by physical constraints. The limitations of human capacity, such as the need for shelter and water, as well as other natural constraints, such as the number of hours in the day, are what determine not only what constitutes a day's journey, but also determine the shorter intervals between rest-stops. This is evident in the archaeological record, not just in the literary one.

An excellent visualisation of how the landscape was divided into increments can be obtained by analysing the find-spots of official imperial milestones. These bear inscriptions with basic information about distances to and from the two end points (*capita viae*) of the road, and also create a series of artificial landmarks that enable travellers to follow the road even in the absence of paved road surfaces. This method of conceiving of distance in terms of physical landmarks set at predictable intervals would make travel without either maps or itineraries much easier. The information provided on milestones would inform a traveller how far they had come and in some cases how far they had left to go. Whereas in some cases distances could be in meaningless units, if these could be

mentally converted into hours, given a constant rate, then this would simplify the experience of travel.

There is a noticeable correspondence in the texts of distances given and how they relate to the personal experience of the traveller actually making the journey. This is expressed through the use of miles to describe distances up to c. 30 miles, i.e., how far one could expect to travel on foot in one day. Larger distances are then given in a larger increment, namely the number of staging-posts encountered, or in terms of days of travel for even longer distances.

Understanding Space as Time and Distance

Units of measurement

The standard unit of measurement in the Roman Empire, with a few regional exceptions, was the Roman mile. A Roman mile (*mille passuum*, Greek μίλια, consisting of 1,000 paces) is equivalent to approximately 1.48 km. This was the measurement according to which the imperial milestones were marked out, and is also the measurement that occurs in official documents, such as itineraries, Eusebius' *Onomasticon*, the Peutinger Map, etc.[32] There were, however, also regional measurements that continued in use despite the standard use of the Roman mile. These include the leagues recorded in Gaul from Bordeaux to Toulouse in the Bordeaux Itinerary, Persian parasangs on the Peutinger Map and in the Armenian Guide,[33] and distances given in stades in the more anecdotal accounts of Theodoret and Cyril of Scythopolis in their collections of saints' lives. Procopius also uses stades when describing distances, even in regions of the Roman Empire that likely used miles as the official measurement. However, the length of a stade (originally a Greek measurement) varied by region from the Hellenistic period onward.

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32 For more on the official character of the *Onomasticon* and the Peutinger Map, see below.

33 The Armenian Guide is a guide to the churches of Jerusalem and the Holy Land, possibly dating to c. 625, which appears as part of *The History of the Caucasian Albanians* (Book II, ch. 51). See Wilkinson 2002, 16 for dating.

Table 3.

Stade name	**Length (approximate)**	**Description**
Itinerary	157 m	used in measuring the distance of a journey.[34]
Olympic	176 m	600 × 294 mm
Attic/Italic	185 m	600 × 308 mm
Babylonian-Persian	196 m	600 × 327 mm
Phoenician-Egyptian	209 m	600 × 349 mm

(http://en.wikipedia.org/wiki/Stadia_(length))

According to Horn and Phenix, the stade used by John Rufus in his life of Peter the Iberian 'equals 125 Roman steps, which equals one eighth of a Roman mile', or 0.185 km , or roughly 200 m.[35] One ancient source, based on an inexact Syriac rendering of Acts 1:12, gives a mile as seven stades.[36]

There are usually specific reasons for preferring one unit of measurement over another, which I will discuss below. However, in almost all the sources, the more precise units are used for short distances, whereas longer distances are given in terms of number of staging-posts or number of days of travel.

[34] According to Pliny (Natural History 12.53), this is the stade used by Eratosthenes in calculating the circumference of the earth. Said to be used in measuring the distance of a journey, it is also known as the Egyptian stade. Hoyle 1962, 84, Nicolet 1991, 60-61.

[35] Horn and Phenix 2008, 50 n. 5. R.M. Price gives the same approximate length for a stade in his translation of Theodoret's *History of the Monks of Syria* (1985, 57 n. 5)

[36] Theodosius, 6; Wilkinson 2002, 107 n. 19.

Text	Total	Stades	min/max/mode	Miles	min/max/mode	Staging-posts	min/max/mode	Days	min/max/mode	Paces	min/max/mode	Leagues	
Ammianus	39	13	20 / 23000 / 1040 (median)	17	2 / 100 / 3			6	2 / 40 / 2			1	14
Arculf	15	6	23 / 580 / 30	6	1 / 6 / 3			3	0.5 / 40 / 4 (ave.)				
Egeria	54			37	0.5 / 35 / 6	13	1 / 25 / 5	4	1 / 3 / 3				
Epiphanius	47			31	1 / 24 / 6 (ave.)			16	0.5 / 16 / 4				
Eucherius	10			10	4 / 46 / 20								
Peter the Iberian	11	2	2 / 10	9	2 / 15 / 2								
Piacenza Pilgrim	33			27	0.5 / 130 / 3	1	8	3	1 / 8 / 5	2	50 / 80		
Procopius	33	21	10 / 1000 / 50					13	1 / 30 / 3				
Theodoret	11	6	10 / 30 / 20			2	2 / 20	3	2 / 4 / 3				
Theodosius	61			50	1 / 120 / 25 (ave.)	4	3 / 25 / 11 (ave.)			7	15 / 200 / 100		

Table 4

Table 4 attempts to tabulate the number of times distances are measured in a selection of Late Antique sources. From this table it becomes clear that the most commonly occurring measurements are in miles, staging-posts and days. The latter should still be considered as a unit of distance rather than exclusively as a unit of time, as the constraints of travel were such that, barring great changes in landscape and anomalous individual circumstances, the rate of progression along a good stretch of highway would be roughly uniform throughout the region. For example, if one author describes a journey as taking eight days, it would probably require a significant feat of speed to make it in six.[37]

To return to Table 4, it should be noted that there are units other than the ones mentioned above included in the lists. These include stades, parasangs, and paces. The pace is the smallest increment of distance – it is usually used for distances between shrines in Jerusalem. The pace is the measurement on which the mile is predicated (the Roman term, *mille passuum*, literally means 'one thousand paces'), and represents two steps – left foot, right foot. Distances to sites outside the city walls are not given in paces, but in miles.

The parasang is a Persian unit of measurement, and is used, for example, on the Peutinger Map for distances in areas outside immediate imperial control, presumably where mileposts have not been set up and the distances have not been recorded in miles for the imperial or provincial authorities as they have for other parts of the empire.[38] The parasang is also included in the Armenian Guide, where one expects that the author or subsequent redactor has used an indigenous measurement; it is likely that Armenia's long history with Persia means that the parasang is the standard measurement in that region.

[37] Theophanes provides an example of such a burst of speed, where, possibly to make up for lost time covering the Sinai desert, on his last day he covers a Herculean 64 miles to arrive in Antioch on that day. He is escorted by a troop of Sarmatian knights, so he was probably on horseback, which made such a speed possible. Matthews 2006, 50.
[38] Talbert 2010, 141.

In any case, the distances given in the Armenian Guide, both those in parasangs and in stades, are wildly inaccurate and should not be taken as reflecting official knowledge. The unit parasang appears twice in the Chronicle of Pseudo-Zachariah Rhetor.[39]

Finally, the use of stades occurs in several of the texts. Theodoret uses stades exclusively, and does not record distances in miles. It is clear from the distances given, however, that he is referring to a unit of distance considerably shorter than a mile, and not merely using a Greek term as a substitute for the Latin word for mile. Other authors use a mixture of stades and miles; generally, a stade being one eighth of a mile, is a useful subdivision of the mile, much as we today estimate sub-kilometre distances in increments of 100 metres. However, as stades are also used for distances considerably longer than a mile, it is necessary to consider in more detail how the knowledge of these distances is obtained when the distances on the roads themselves are recorded exclusively in miles. It is not a simplistic matter of Western or Latin authors using miles and Greek authors using stades. In fact, stades commonly appear as part of geographic descriptions, e.g., the width of mountain ranges or the length of lakes.[40]

An in depth analysis of the reception of classical geographical texts and the extent to which they served as reference material for distances cited by Late Antique authors is beyond the scope of this particular study, but it is clear that Late Antique authors relied on a variety of ancient sources, ranging from Strabo and Ptolemy, as mentioned above, to texts that circulated for their theological relevance, such the Old and New Testaments, the

[39] *The Chronicle of Pseudo-Zachariah Rhetor* (Greatrex et al. 2007).This reflects the patchwork nature of the chronicle, assembled as it is from many different sources translated from a variety of original languages. Miles are used in a story reported by a local (Syriac-speaking?) man. (7.5) and in the description of the city of Rome (derived from *Notitia Urbis Romae*). Days indicating distance are recorded in a letter from the Bishop of Persia to the Archimandrite of Gabbula (8.3); stades are employed in a narrative that may be translated from Greek, although told from the point of view of a Persian (9.5) – the distance given (4 stades) is apparently inaccurate.

[40] Particularly in Amm. Marc. 23.6, the description of Persian territory.

Onomasticon in both Greek and Latin, or the chronicles of Josephus and Hegesippus.[41] This diversity of original sources, written in a wide range of languages, doubtless accounts for the mixture of units found in later texts.

As can be seen from Table 4, the smallest increment of a mile given is 0.5 ('about a half'), and the longest is 120. The distance of 130 miles given in the Piacenza Pilgrim is actually not a distance he travelled, but the length of the Jordan River from Lake Tiberias to the Dead Sea, and is clearly being quoted from another source.[42] Some other large distances are also dimensions of geographical features such as lakes or mountain ridges, and are given for information's sake, not in the expectation that someone would travel that length. The longest distance cited between two cities is 120 miles, which is given by Theodosius as the distance between Edessa and Dara on the Persian frontier in a section on the cities of Mesopotamia that gives the actual mileages from cities (clearly derived from some written source, possibly an itinerary) but little detail on how to get from one or the other or what to see. This is very unlike the detail provided elsewhere by him for the Holy Land and other areas closer to home.

Once we account for some of these longer distances, (even the maximum distance in Eucherius of 46 miles refers to the distance between Jaffa and Jerusalem, a well-travelled route for which the total distance must have been well known),[43] the longest mile distances recorded are between 25 and 30 miles, and mileages of 20 to 25 miles occur regularly. From this I would strongly argue that this is a reflection of the nature of travel. One only counts the miles that one travels in a day; anything above that is counted

[41] Josephus and Hegesippus (to whom a Latin translation of Josephus' *Jewish Wars* is attributed) have been identified as underlying sources for, e.g., Eucherius (Wilkinson 2002, 96 n. 17) and Adomnan (Wilkinson 2002, 18).
[42] This need not be a written source; the number could have been reported by a local guide.
[43] See Fischer, Isaac and Roll 1996, 289-93 for the inventory of about 50 milestones found along this route. Nikopolis (Emmaus) was one of the *capita viae* and distances are from that city, meaning that the distance in Eucherius combines two days' travel, and that the distances between the *capita viae* would have been within a standard day's travel.

in terms of the larger units, either staging-posts or days. What is interesting is that this is even true of Eusebius' *Onomasticon*, which it has been argued is a sort of 'desk-based assessment', i.e., compiled from existing official documents, rather than first-hand experience on the road.[44] Even in the *Onomasticon*, the largest distances recorded in miles do not exceed 25 miles; anything longer is given in days of travel.[45]

The use of staging-posts as a unit of distance reflects the nature of travel. These distances are not necessarily fixed; when an author like Egeria mentions the number of staging-posts, it is not entirely clear whether, like the Bordeaux Traveller, she is counting every single one regardless of whether she stops off at it, or whether she is only counting the ones where she and her retinue actually stopped for rest and refreshment. The word in Latin is '*mansio*' which is usually equivalent to an overnight stop, but it does not necessarily follow that the group stopped at only one *mansio* per day.[46] This would affect the mile distance that references to 'staging-posts' were meant to represent. However, assuming that they would need to stop at least two or three times a day the distance between staging-posts would be about 10 miles, which corresponds by and large to the distances given in the Bordeaux Itinerary.

Staging-posts are described both in an abstract sense in terms of distance or time, but also in a more material sense as places of lodging. For example, Theodoret, when describing the distance between Cyrrhus and Antioch, states that it is 'two stages', but gives neither the name of these stages, the distance between them, nor the total distance.[47]

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[44] Although the information about Petra leans more towards the anecdotal, possibly indicating first-hand experience, possibly as a 'tourist'. It has been noted that information about places outside the boundaries of Tres Palaestinae is sometimes wildly inaccurate (Isaac 1996), such as the location of Paran in Sinai. Since travel above one day would take one beyond the boundaries of the province, this may affect the quality of information available.

[45] 'Adraa II', 25 miles from Bostra. (12), Freeman-Grenville et al. 2003, 16.

[46] Egeria might also be using the term indiscriminately for any major stop; it should be noted that the term used by Jerome for the hostel set up by Paula for pilgrims to Bethlehem is also *mansio*, although it clearly had no association with the *cursus publicus* (Jer. *Ep.* 108). Jerome specifically compares it to the inn in Luke 2:7, although the term employed in Jerome's Vulgate translation is *diversorium.*

[47] Theodoret, *Ep.* 2.19.

A glance at the Peutinger Map and the Antonine Itinerary reveal that these stations are Gephyra (22 miles from Antioch) and Gendaro/Gendarum (Gindaros) (22 miles from Gephyra and 36 miles from Cyrrhus), and the journey is a total of 80 miles. The two intermediate stages then make it a minimum of a three day journey from Antioch to Cyrrhus. The use of the term staging-post not only adjusts for the difference in mileage between the stations, but also gives the reader an idea of distance and duration of the journey. The Peutinger Map and the Antonine Itinerary do not record any official secondary stops along this route.

In that particular passage, Theodoret is supplying the information almost as an aside; its relevance to the story he is telling is incidental. He is not personally undertaking the journey, nor is he advising anyone to, it is merely an embellishment on the narrative. Conceptually, the staging-post stands for a unit of distance, in the same way as stades elsewhere in his text.

In Egeria's account, the concept of the staging-post as a unit of distance and its physical manifestation as a place of lodging are combined. She speaks both of the distance between two places in terms of staging-posts ('Jerusalem is eight staging-posts from Carneas'[48]) and of the staging-posts themselves as elements in her journey:

> It is 35 miles from the Mount of God [Mount Sinai] to Paran, and, when we arrived there, we needed two days' rest. On the day after, we pressed on and reached once more the staging-post in the desert of Paran where, as I have told you, we stayed the night on our way in. Next day we renewed our supply of water, and after a short journey through the mountains we left the mountain road and came to the staging-post beside the sea.[49]

This passage shows the arduousness of trying to cover 35 miles in a single day, especially across desert terrain. It also illustrates both the distances between two staging-

[48] Egeria 13.2, (Wilkinson 1999, 124).
[49] Egeria 6.1 (Wilkinson 1999, 114).

posts – starting out in the morning and arriving at the next one before night – and the types of amenities available at such establishments (lodging and water).

Egeria also repeatedly says that she and her retinue returned by the same staging-posts through which they had travelled on the journey out. Unfortunately, the first half of the manuscript detailing Egeria's journey south from Jerusalem to Egypt has not survived. Therefore, we do not know if she included a detailed list of place names and mileages in the manner of an itinerary, or if she mentioned the number of staging-posts she passed through and felt no need to reiterate it. However, for her trip to Edessa the outbound journey is preserved, and she does not provide detailed information, mentioning by name only Antioch, Hierapolis, Batanis and Edessa. She does note that it is 15 miles from Hierapolis to the Euphrates, which is the only mile measurement she gives on that leg of her journey. For the journey from Antioch to Batanis via Hierapolis, she says only 'I passed through a number of staging-posts' and 'After several more staging-posts I came to Batanis.'[50] She does, however, provide details on provincial boundaries, which suggests that she was accompanied by a guide with greater awareness and knowledge of their surroundings than Egeria herself.

As seen in Table 4, days are used by many authors as the unit for longer distances. The correlation between the maximum mile distances given being the length of one day's journey and anything longer being described in days of travel is striking.

This could in part be a facet of desert travel. Distances given in days of travel are often used by travellers crossing the Sinai desert. Travel conditions there are vastly different from the more densely settled areas of the Levant to the north. Not only is the terrain difficult to traverse, but settlement is less dense and the travel infrastructure less developed. The popularity of Mount Sinai as a pilgrimage site completely changed the

[50] Egeria, 17.1 (Wilkinson 1999, 130), 19.1 (132).

routes of travel across Sinai: previously, most travellers would follow the coastal route from Pelusium to Gaza which was a good road with plenty of road stations (see Chapter 6). This is the route used, e.g., by Theophanes and by Paula on her way to Egypt.[51] Now, pilgrims were voluntarily trekking across dangerous deserts to a site far from the major imperial highways. Egeria is accompanied by local guides and by a military escort and is led from fort to fort; the Piacenza pilgrim spends at least one night camping out of doors before reaching the next settlement. Even Theophanes, travelling along the relatively more comfortable coastal road, travelled at a significantly slower rate of 10-11 miles per day, less than half of his average daily speed.[52] Paula made the return journey by boat and the speed of the voyage by comparison is commented on.[53]

From the few milestones found in the Negev, it is clear that Diocletian's highway ran through there to Aila, however, it is likely that the Sinai itself was lacking in imperial roads, and possibly therefore in milestones. The lack of distances given in miles may be a reflection of the absence of milestones to give information on the number of miles travelled. However, given the absence of settlements, the smallest increment was probably a day's travel between where you started in the morning and where you set up camp or found lodgings at the end of the day. Hence Egeria's great push of 35 miles to make it back to the *mansio*, and counting of days rather than miles may simply reflect the absence of anything of interest out in the desert to break up the journey.

It is interesting to note that the use of the staging-post (*mansio*) as a unit of measurement transcends linguistic barriers. In *The Lives of the Eastern Saints*, by John of Ephesus, long journeys are on several occasions measured using the term *masīōnīn* (ܡܣܝܘܢܝܢ), which the editor, E.W. Brooks, translates as ‘days’ and argues entered Syriac

[51] Matthews 2006, 59; Wilkinson 2002, 90: Map 15.
[52] Matthews 2006, 59.
[53] Jerome, *Ep*. 108.14: *tanta velocitate reversa est, ut avem putares.*

via the Greek, μανσίων, itself clearly a loan word from the Latin.[54] This would seem to indicate both widespread usage of the term, and possibly the facilities themselves. Similarly, the mile appears as a unit of measurement in the Syriac text, transliterated as *mīlīn* (ܡܝܠܝܢ).

As noted above, the staging-post and day are not necessarily equivalent measurements, the first being contingent on the spacing of the staging-posts, and the latter of course on the individual's own rate of travel. However, as we have noted, the spacing of the staging-posts is often very deliberately based on the estimated daily distance, so the variations are indeed minor. This demonstrates how easily distance and time can be conflated. In the absence of regular landmarks, it can be difficult to calculate distance in the desert. It is interesting to note that in early modern travellers' chronicles, such those of Gertrude Bell or the description of Butler's expedition in Syria, 'distance' is often given as duration, even down to minutes.[55] Baedeker's travel guide to Palestine and Syria also gives distance as time, reflecting the varying road conditions and modes of transport that affect travel duration.[56] The existence of modern, accurate timepieces makes such a reckoning possible.[57]

Telling time

Devices for monitoring the passage of time, such as water clocks and sundials, did exist in antiquity. However, these devices were for the most part luxury items and not commonplace. Although portable versions of these devices existed, they were unlikely to be carried by travellers. A sixth/seventh century portable clay sundial was excavated at

[54] See, e.g., Chapter 10 (PO 17), and Chapter 25 (PO 18).
[55] E.g., Bell 1907, 260 ('About half an hour to the north of Kefr 'Abīd…'), 280 ('We rode almost due east for rather less than an hour to Burjkeh…') For Butler's expedition, see Garrett 1914, 15, 28-9, 41.
[56] Baedeker 1898, 148: 'Riders from Jerusalem to Jericho take 6 hrs., the Jordan 1 ½ hours… Carriage road from Jerusalem to Jericho (carr. in 5 hrs.).'
[57] The distances between milestones found by Thomsen (1917) are given in minutes rather than miles or metres, possibly because he had an accurate watch, but lacked means of accurately measuring the distance elapsed.

Apollonia (Sozousa), 17 kilometres north of Jaffa on the Levantine coast. An object of this sort could easily have been carried in a traveller's pack: it is very compact (7.0 cm × 9.6 cm × 2.0 cm) and only weighs 173 grams. (See Fig. 3.3) While Vitruvius argues that travellers should carry portable sundials (*viatoria pensilia*), their utility is limited, as in order to gain an accurate reading the radials on the face of the dial and the length of the central *gnomon* must be set for a specific latitude, and they must be oriented correctly along cardinal points.[58]

Simply tracking the angular movements of the sun across the firmament also makes rudimentary time-keeping possible. The sun's position in the sky changes at a rate of 15 degrees per hour, which is approximately the distance between the extended index and little fingers on an outstretched hand. The width of an adult little finger corresponds to 1 degree, or 4 minutes (see Fig. 3.4). A person using only the sun for time-keeping, provided they did not shift course or could relate the sun's position to objects in the distance, is more or less able to keep time to 5 minute increments. A similar rule of thumb is applicable to the moon and other celestial bodies for nocturnal navigation.

While this is an example of what is theoretically possible using astronomical observations, it appears that while Greeks and Romans were able to determine the hour with scientific accuracy, which is partly reflected in their record-keeping, it was not essential as part of everyday practice.[59] Increasingly into the Christian era, the day was focused around the hours of prayer, corresponding roughly to dawn, mid-morning, noon, and other hours divisible by three.[60] This lack of exactitude is evident even on the Apollonia sundial, as can be discerned from the attempted experiment with the sundial on the summer solstice at a similar latitude to where it would have been used (Tel Aviv).

[58] Vitruvius, *De Architectura* 9.8.1
[59] Remijsen 2007, 134; Hannah 2009, 143.
[60] Kubitschek 1928, 187.

Milestones

On the ground, distances were measured out and indicated with milestones. Milestones are a universal feature of the road system of the Roman Empire. They occur, with varying degrees of frequency, from Britain to Arabia, and are especially plentiful in the eastern provinces (see Fig. 3.6).[61] Generally speaking, the milestones of the Levant follow a set pattern. Thomsen characterised the 305 milestones in his collection as each having a rectangular base (planted in the ground, often out of sight), with a round or elliptical column with well-smoothed sides, tapering somewhat towards the top.[62] The average height he gives as 2.5 m, the average diameter of the shaft between 0.45 m and 0.60 m (at the base), while the dimensions of the base are 0.60 m on a side. (Graf emends this to an estimated height of 2 to 4 m and base diameter of 0.5 to 0.8 m.[63]) The stones are typically made of the local stone – usually limestone. Milestones therefore constitute a highly visible monument, and they served a number of functions (see Fig. 3.7).

It should also be noted that not all roads appear to have had milestones, but the ones that did were classified as imperial highways, and doubtless had higher levels of traffic than other, minor roads, although some military roads were also not categorised as public highways (see below). Miles and the course of the road could be marked off with cairns rather than official milestones. Furthermore, not all official milestones bear inscriptions – only about a quarter of the existing corpus of milestones from the Levant are inscribed. Those that are, however, typically record a) the mile point, i.e., the distance either to or from the *caput viae*, b) the city that is the road's starting point or major junction, c) the emperor during whose reign the work was carried out, d) the provincial governor or other official in office at the time, and sometimes e) the type of work carried

[61] For catalogues of Roman milestones from Asia Minor and the Levant, see, e.g., French 1988, Thomsen 1917, *CIL* XVII and *IGLJ* XXI, etc.

62 Thomsen 1917, 10.

63 Graf 1995, 417.

out (e.g., building of new road, extending, repaving). The majority of the inscribed milestones of the eastern provinces were in Latin (Thomsen only records 18 in Greek). Thomsen describes the lettering as initially representing 'die schönen Formen der Kaiserzeit' with a tendency in the later period towards a 'Verschlechterung' through the introduction of a more cursive style. The letter height is between 4 and 10 cm, covering an area, depending on the length of the text, that is between 40 and 60 cm wide and 60 to 130 cm high.[64]

Milestones can bear multiple inscriptions, recording both the initial construction of the road, and subsequent repairs. This appears to be the case especially in the fourth century, where many of the inscriptions naming Constantine and his various co-emperors are additions to existing milestones.[65] The habit of erecting new milestones appears to cease by the mid-4th century. This has led to a number of erroneous assumptions about road conditions and road usage in the Late Antique period, some of which I hope to dispel in the discussion below.

At its most simplistic, the role of milestones is to record the number of miles travelled from one point on the road, or the distance remaining to the next. Some milestones record the distances to both points. The traveller could then use the milestones as reference points, to measure the absolute distance to and from his or her destination. Their usefulness could then be compounded if used in conjunction with an itinerary, whether written or illustrated, which would provide the distance from cities and resting points in miles. The Bordeaux Itinerary, which gives distances in Gaul in leagues, as mentioned above, and in miles for the rest of the empire, may be reflecting the units given on milestones in the different regions, and therefore the change in units was of greater utility in orienting travellers using the Itinerary as their guide.

64 Thomsen 1917, 10-11.

65 See, e.g., French 1988, Vol. 2, passim.

Milestones could also serve as markers of boundaries between two cities, or even between provinces.[66] This function is less widely attested, but shows that milestones were erected and maintained by a central authority, whether it be municipal or at the provincial level. Roads were often initially laid to serve the needs of the military, but often they were maintained for the convenience of different sets of users. Milestones could therefore also serve the needs of the imperial administration, providing information to the central authority on the extent and conditions of roads, and of the limits of various settlements and provinces. The 3rd-century Antonine Itinerary, rather than reflecting an actual journey, is in fact a record of the existing road network. Benjamin Isaac has convincingly argued that Eusebius was working from a similar record of road distances between cities when compiling his gazetteer of Biblical place names.[67]

In addition to having a utilitarian function for road users, and an administrative function for provincial and imperial authorities, milestones also had an ideological dimension. Since they recorded, primarily in Latin, the names of the Roman officials and emperors under whom the work was commissioned, milestones served as an advertisement of Roman hegemony. This was especially significant in the first two centuries CE, as Rome asserted its dominance in the area of the Eastern Mediterranean through annexation and conquest – an increased military presence that led, naturally, to the construction of roads. Clifford Ando argues that milestones continued to have such meaning for the provincials who had been integrated into the Roman Empire:

> Over time provincials learned to view milestones, dedicated to the emperor by the procurators and engineers who built the roads, as testaments of personal and communal loyalty, and they began to refurbish milestones with civic funds, recording on them civic acclamations or honorary decrees.[68]

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66 *IGLS* 5975. Barag 1973, 52 n. 7. See Barag 1973 for a milestone found near Raphia mentioning the border of *Syria Palaestina*.
67 Isaac 1998, 292-303.
68 Ando 2000, 323; cf. Pekáry 1968, 16-22.

Benjamin Isaac, when discussing the propagandistic value of milestones, stresses that the native language of most of the population of the eastern provinces was not Latin, but Greek and various Semitic languages. To him the fact that the inscriptions on milestones were in Latin is an indication that they were meant to be read by the military, and that milestones should not necessarily be seen as 'helpful markers for travellers, but an exercise in political control'. He states that the distribution of milestones is far from consistent, with milestones clustered near cities and other centres of habitation, and appearing only infrequently in desert regions.[69] However, it is possible that this distribution reflects not areas in need of displays of power, but merely the roads more travelled – an imperial message was more likely to be effective if placed somewhere where the greatest number of people were likely to see it. Also, the milestones are not exclusively in Latin: there are a number of cases where, in addition to the formal inscription which is indeed in Latin, the Greek number for the mile-distance has also been carved onto the milestone, which to my mind stresses their practical function (see Fig. 4).

As mentioned above, the practice of erecting new milestones and commemorating road work with milestone inscriptions appears to cease in the mid-4th century. Only a handful of milestones date to the reign of Constantine and his immediate successors, with inscriptions ceasing after Julian in Arabia, in the region of the Decapolis, between Philadelphia, Gerasa, and Madaba.[70] The last dated inscribed milestone in the entire Levant dates to the reign of Arcadius.[71] By comparison, the latest milestone inscriptions in Asia Minor bear the name of Anastasius, and were found near Bodrum on the south-

69 Isaac 1990, 304-6; cf. Goodchild's (1949) reconstruction of the route of the Antioch-Ptolemais highway based on milestones and itineraries.

70 Thomsen 1917 Nos. 126a-e, 127a-b, 203a,c, 204a, 208c-d. Nos. 200 and 210 only bear one preserved inscription, that of Julian, but both lack the mile number, suggesting that there may have been an earlier inscription that has since become illegible, rather than that these milestones are new erections. The inscriptions for Julian are uncharacteristically in Greek, doubtless a reflection of his Philhellenism.

71 Thomsen 1917, No. 297b, ten miles from Jerusalem on the Jerusalem-Hebron road, secondary inscription originally of Marcus Aurelius (170 CE), *CIL* III 13592-3.

west coast of Turkey. [72] In all these cases the inscriptions were secondary.

The question of why there are no new milestone inscriptions from the late 4th century onward has excited some debate. First of all, is it entirely true that no milestones can be dated to this later period? As mentioned, nearly three quarters of all milestones bear no datable inscription. Other milestones clearly belong to a post-Constantinian date, such as a milestone found near Antipatris that is inscribed with a cross.[73] Yet others bear traces of painted text, which may suggest that the now blank milestones may once have borne inscriptions of their own which have since weathered away. It has been suggested that the anepigraphic trend, especially the use of crosses, is a product of the Late Antique period.[74] It has been argued that the habit of commemorating emperors and officials on milestones did not stop, but rather that the medium changed, and instead of being inscribed the texts were painted onto the milestones. As most milestones bear multiple inscriptions, and as space on the stone surface ran out, perhaps they were plastered over to create blank spaces for more up-to-date information to be painted on.

David Graf collected a small sample of six painted milestones found in Palestine and Transjordan. Two are located along the *Via Nova Traiana*, while the remainder are on the road network connecting Caesarea Maritima, Scythopolis, and the Decapolis. According to reports, similar painted milestones have not been found in other parts of the empire.[75] The content of the texts seems to be similar to their inscribed counterparts, including the name of the reigning emperor and the name of a high-ranking provincial official, although in two of the cases the painted words were mostly illegible.

This would affect the survival rate considerably and might account for the smaller

[72] French Nos. 845 and 848 (French 1988, 301-303) In the case of 845, the earlier inscription mentions Severus, Caracalla, Iulia Domna (and Geta, whose name has been struck off) and so dates to 198; No. 848 has earlier inscriptions of Diocletian and Maximus with Constantius and Galerius (293-305 CE).

[73] Roll 2000, No. 11. The inscription is in Greek, and appears to be primary, suggesting that this may be a new milestone of the mid-4th century or later.

[74] See Graf 1995b, 417, Chevallier 1976, 41.

[75] Graf 1995b, 418.

number of dated milestones, despite the fact that travel in the area was still intense, and the intermittent but on-going war with Persia meant continual troop movement, which in turn would necessitate road maintenance, if not new construction.

Of David Graf's six examples, one painted text (No. 4) was too illegible to provide any reading, and consequently, any date, but the underlying inscription provided a clear terminus post quem of 333-337, as it mentioned Constantine, as well as his sons Constantius and Constans. The earliest inscription is dated to 236 (No. 1), and the latest securely dated one to between 324 and 326 (No. 6). The available evidence does therefore not encourage arguing for the longevity of the practice of setting up milestones, either inscribed or painted, later into the Late Antique period, although the poor preservation of the painted text does not permit ruling out that old milestones were being repainted and roads maintained into the 5th and 6th centuries.

There is another possibility for why no new milestones were erected from the late 4th century on: there already were enough. The survival of hundreds of Roman milestones *in situ* attests to their longevity; if they are still standing and legible now, surely they were serviceable in the first centuries after they were first put up. The only reason, then, to erect a new milestone would be to commemorate an emperor or work done, or to make a political statement, as Julian did to promote his Philhelllenism by placing Greek inscriptions on existing milestones. However, such statements are often found in other inscriptions that are not specifically milestones. For example, from Procopius we know that Justinian was responsible for a number of road and bridge repairs in Asia Minor, although only one of these is accompanied by an inscription of the correct date, and it is carved directly onto the rock face of the defile, not a milestone.[76] Boundary stones bearing the name of Justinian have been found, showing that the imperial name continued to adorn

[76] Heberdey and Wilhelm 1896, 36, no. 86 (date 536/7). See also Gough 1952, 101-2.

landscape markers.[77] Christianity and pilgrimage also provided another arena for imperial patronage towards travellers; by founding charitable institutions and monasteries that also served pilgrims, members of the imperial family simultaneously exhibited their piety and their concern for the needs of travellers.

There is a tendency, principally amongst those who specialise in the Roman period, to state that the lack of milestones from Late Antiquity suggests a change in road usage. Goodchild suggests that the absence of recarved mile numbers along the Antioch-Ptolemais road suggests that milestones were not being used for measurement.[78] This suggestion is easily disproved by reading any Late Antique text in which miles feature prominently as units of measurement (see Table 4 above). C.R. Whittaker, in an article arguing for a hodological view of the Roman world, mistakenly correlates the sudden increase in travellers' (i.e., pilgrims') accounts from the 4th century on with a change in world view, stating that 'travel made the world a smaller place'.[79] This is directly contradicted by a series of milestones on the roads leading to Nikopolis in Palaestina Prima. These milestones bear secondary inscriptions – in Greek – providing only the most basic and useful information: the *caput viae*, and the mile number. One of these milestones, found on the Beit Horon road leading north from the city, has an original inscription dated to 333-7, dating the Greek secondary inscription squarely in the Late Antique period, probably related to increased pilgrim traffic in the 5th and 6th centuries (see Fig. 3.8).[80]

I would argue that, while the religious motivations, especially the desire to reach Jerusalem, might have provided noticeable impetus for travel, and that the number of

[77] For example, the boundary stone bearing the names of Justinian and Theodora (dated 527-48) found in the hinterland of Andarin, marking the property of 'the martyr Jacob'. See, e.g., Mundell Mango 2011, 108 and Fig. 19b.
[78] Goodchild 1949, 115.
[79] Whittaker 2002, 98.
[80] Fischer, Isaac and Roll 1996, 294-5; 431.

people making the journey from the western parts of the Empire therefore increased, most of the people who took to the roads were on relatively short journeys; they did not make use of the exceptional itineraries such as the one compiled by the Bordeaux traveller, if such documents were even widely circulated.[81] Furthermore, the way they perceived their journey as a series of miles and stops at intervals did not change.

The continued importance and visibility of milestones in the 4th, 5th and 6th centuries is evident from the texts, where milestones serve as landmarks, and the location of a particular site is given in terms of the milestone that it is closest to.[82] Furthermore, Late Antique toponyms also record the importance of milestones; there are numerous settlements that derive their names from their mile posting, such as Ad Nonum (9th) in Phoenicia[83], the fashionable suburb of Constantinople, Hebdomon (7th), and three Egyptian monasteries of the 5th century that are named Enaton (9th), Oktokaidekaton (18th), and Eikaston (20th), after their respective distances from Alexandria.[84]

That milestones were still considered landmarks even in Late Antiquity is also borne out by Eusebius' use of the word σημειόν to describe both the milestones and the distances that they represent. This word clearly derives from the Greek word for sign, and is also used by Plutarch and Herodian to denote milestones.[85] However, Eusebius' choice of this word, instead of the Latin loan word μίλια, suggests a connection between the landmarks and the abstract concept of distance. Milestones were prominent on the ground, and therefore easy to count off when making one's way from one location to the next. One could measure the distance travelled by the number of milestones passed.

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81 The existence of multiple versions of the Breviarium of Jerusalem suggests a wider circulation of such a text – perhaps available in the city itself, but the information it contains is limited to the city and immediate environs of Jerusalem.

82 Eusebius, *Onomasticon*; Piacenza Pilgrim 28 (3rd); Egeria 3.V7a (20th), 10.8 (6th), 12.7 (6th).

83 Goodchild 1949, 103.

84 John Rufus, *Life of Peter the Iberian*, 91.

85 *LSJ*, s.v. σημειόν.

Institutions Using Incremental Travel

Cursus publicus

The best known example of an institution employing incremental travel is the Roman imperial post, the *cursus publicus*.[86] It relied on couriers on relays of horses to carry messages quickly from one end of the empire to the other. First formally organised under Augustus, it was hardly the first institution of its kind.[87] However, the sheer expanse of Roman territory meant that the imperial post was a highly bureaucratised and heavily monitored tool of the imperial administration.

At its most basic, the *cursus publicus* (or δεμόσιος δρόμος) consisted of two branches: the *cursus velox* (ὀξὺς δρόμος, also βήλοξ δρόμος) and the *cursus vehicularis/clavularis* (πλατὺς δρόμος), established under Septimius Severus. As its name implies, the *cursus velox* was for the speedy transmission of information by messengers on horseback or in horse-drawn vehicles. The baggage weight a single horse could carry was limited to 30 pounds (e.g., *C.Th.* 8.5.28, see also 8.5.47), and horses could be exchanged for fresh ones at regular intervals, secure that state provisions meant there would be one in readiness. There were two types of road-station integrated into the *cursus publicus*. The more frequent was the *mutatio*, a horse-changing station. These were placed about 5 to 10 km apart, which corresponded to about 2 hours travelling time at a leisurely pace.[88] Overnight stops, placed about 25 km apart, were known as *mansiones* and offered a more diverse range of services (see Chapter 2).

The *cursus clavularis* or *cursus vehicularis* was a slower mode of transport, which relied on pack animals or oxen-driven wagons. These would be used to transport goods, such as taxes received in coin. Taxed produce was also transported on the *cursus*

[86] For a recent detailed study of the *cursus publicus* in general, see Kolb 2000; on Late Antiquity in particular, see Hendy 1985, 602-613. See also Di Paola 1999.
[87] Silverstein 2007.
[88] Remijsen 2007, 134.

vehicularis once it had been collected, as were 'public supplies' (*publicas species*) and even marble.[89]

Intensive state regulation was necessary to ensure that such a vital information transmission system remained functional and free from abuse. The system was overhauled as part of the reforms of Diocletian and Constantine. Many of the extensive collection of laws pertaining to the public post in the Codex Theodosianus date from the fourth century. In fact, the first reference to the *cursus publicus* by that name appears in the early fourth century.[90]

The system was an easy target for abuse. Unauthorised users could acquire the necessary warrants through influence or bribes. In theory, following a law of 362, warrants were issued only by the praetorian prefect (which represented a considerable curtailing of this privilege), and countersigned by another official, allegedly to circumvent abuses of the privilege by the praetorian prefect.[91] Despite these safeguards, it seems that most of the historically known users of the *cursus publicus*, such as Pliny the Younger, Libanius, or Melania the Younger, came by their warrants by slightly dubious means: Pliny gave one to his wife for her to visit her family, Libanius' journey to Athens was cut short because the friend who was to issue him with a permit had fallen from power, and Melania the Younger succeeded in obtaining a permit to travel from Jerusalem to Constantinople to visit her uncle (who held a senior office, but not that of praetorian prefect!).[92] The emperor Julian, who strove in many ways to curtail excessive use of the *cursus publicus*, frequently issued permits to his friends to pay him visits.[93] A new strain on the *cursus publicus* that emerged in the 4th century was its use by Christian bishops

[89] Taxed goods: *C.Th.* 8.5.13, public supplies: 8.5.16, marble: 8.5.15.
[90] Paneg. Lat. 6.7.5; Lactantius. *De mort. Pers.* 24.7; *C.Th.* 8.5.1. Kolb 2000, 49.
[91] *C.Th.* 8.5.12, John Lydus, *De Magistratibus*, 2.10.
[92] Pliny the Younger: Ep. X.120; Libanius: Oration 1.14; Melania the Younger: Vita s. Melaniae 52. *PLRE* II, 1184-5 (Rufius Antonius Agrypnius Volusianus 6).
[93] Julian, *Ep*. 58, *Ep*. 1, *Ep*. 15, *Ep*. 26, *Ep*. 43, *Ep*. 44, *Ep*. 54.

attending the many synods and councils taking place as Christian orthodoxy was being defined. Both the councils and the law issued rulings in an effort to curb these so-called 'junketing bishops'. Ecclesiastical travel was so popular among bishops that it had to be restricted by the ecumenical council of Sophia (Laodicea?) in 343.[94]

There were two types of warrant. The first, the *evectio* (σὺνθημα), entitled the holder to animals and vehicles as stipulated in the warrant itself. The second type of warrant, the *tractoria*, entitled the holder to food and lodging, in addition to transport. For example, the absence of animal fodder from Theophanes' list of expenses suggests that he was licenced with a *evectio*, which covered the provision of food for animals, but did not extend to food for Theophanes and his entourage.[95]

The continual need for legislation suggests that the system required constant supervision by the central authority to keep it from breaking down. Repeated iterations of similar laws pertaining to the requisitioning of animals and the misuse of warrants and the steady limiting of these with the authority to grant warrants suggest that corruption was rampant. Modifications of the fifth and sixth centuries appear heavily indicative of economising measures taken by an imperial administration stretched to the limits of its resources: privatisation is a familiar austerity solution among modern governments as well.

In addition to curtailing who was eligible to use the public post, and who was able to issue warrants, significant changes were also made to its geographic extent in the 4th through 6th centuries. In 363, Julian abolished the *cursus velox* on the island province of Sardinia, on the grounds that it was but rarely used, and extremely costly to the provincials, at whose expense it was maintained. The exception to this was the

[94] Gorce 1925, 36-7; Casson 1974, 300-1. See Amm. Marc. 21.16.18: 'throngs of bishops hastened hither and thither on the public post-horses to the various synods... cut the sinews of the courier-service'.
[95] Matthews 2006, 67.

transportation of 'public supplies' from the ports.[96] In 467/8, the emperor Leo abolished the *cursus vehicularis* in the diocese of Oriens, effectively privatising the bulk transportation in the region.[97] Presumably, the *cursus velox* continued to function.

Both Procopius and John Lydus have much to say about the reforms to the *cursus publicus* that took place during the reign of Justinian (although John Lydus directs his ire at the praetorian prefect, John the Cappadocian).[98] Both the express and cargo posts were abolished throughout Asiana. The exception is the 'road to Persia', presumably one of the routes to Mesopotamia that runs north of the Taurus. Both accounts specifically mention Asiana; whether similar cuts had been made in Oriens is unclear.

The routes covered by the *cursus publicus* were quite limited due to the expense of maintaining it in readiness. The warrants pertained only to public highways. A law of 365 stipulates that anyone deviating by 'five hundred paces from the direct highway' will face punishment.[99] Furthermore, the law makes a distinction between public highways and military roads, which are not covered by the *cursus publicus*. The military had their own courier system which was organised along similar lines, although military officials could also make use of the *cursus publicus*.[100]

Our knowledge of the locations of way stations of the *cursus publicus* derives primarily from itineraries that list place names of official stops at which amenities were presumably available. Often the places named are major cities. In other cases toponyms can be associated with known settlement sites, e.g., villages, or in other cases with military outposts.

When it comes to archaeologically attested examples of official way stations, the usual caveats apply: the difficulties of excavating in built up urban areas, the difficulties

[96] *C.Th.* 8.5.16.
[97] *C.J.* 12.50.22.
[98] John Lydus, *De Magistratibus*, 2.10.24, 2.23.22-6; Procopius, *Secret History*, 30.
[99] *C.Th.* 8.5.25.
[100] See Remijsen 2007; Procopius, *Persian Wars* 20.20.

of positive identification, etc. Many of the villages of the Syrian Limestone Massif have buildings that can be identified as inns.[101] However, given that they are not located along public highways, it seems unlikely that they served the *cursus publicus*. E.W. Black carried out a survey of the infrastructure of the *cursus publicus* in Roman Britain.[102] Many of the sites identified as *mansiones* in that survey were in fact attached to military forts. These were generally characterised as located outside the perimeter of the fort. They are typically courtyard buildings, sometimes with bath houses attached. By using the same criteria used to identify *mansiones* in Britain, several structures in Oriens can be identified as *mansiones*.

Lejjun (Legio)

The first example is the Western Vicus building next to the legionary fortress of Lejjun in Jordan. The building is isolated from the main complex, lying to the west of the fortress, nearer to the modern road. The excavated building is a simple quadrilateral structure (c. 35 × 25m) with 13 rooms arranged around a courtyard with a strong gate (Fig. 3.9). Datable evidence suggests a limited period of use in the 'late Roman/Early Byzantine' period, with the coin evidence predominantly of the early to mid-4th century, suggesting that the building was built during the reign of Diocletian, and abandoned c. 363. [103] The lack of evidence of intensive, single purpose use, such as cooking, storage, or specialist workshops supports the interpretation that this was a lodging for people on the move.[104]

Bir Madkhur (Calamona? - Not. Dig.)

Like the Western Vicus building at Lejjun, the building identified as a caravanserai

[101] Mundell Mango 2000a, 941.
[102] Black 1995.
[103] Crawford 1987, 385-398.
[104] See Whiting, forthcoming 2014.

or *mansio* lies at a remove from the main fortress. Lying to the southeast of the fortress at Bir Madkhur in the Wadi ʻAraba (and therefore along the Jerusalem-Aila highway), the building (30 × 25 m) consists of rooms measuring 5 × 5 m built around a courtyard (Fig. 3.10-11).[105] Additionally, this building contains bathing facilities, allowing parallels to be drawn with *mansiones* in Britain, e.g., at Godmanchester or Chelmsford (Figs 3.12-13).[106]

Andarin (Androna)

The village of Andarin is a substantial settlement on the road between Chalcis and Palmyra. It is listed as a way station on the Antonine Itinerary, which suggests there was at least a *mansio* at the site in the 2nd and 3rd centuries. However, the village expanded to include 11 churches, a bath complex of c. 560, and a Justinianic *kastron* dating to 558. It seems likely, therefore, that the settlement derived its importance from its position on the road, and that the settlement grew, first to support the *mansio*, much as civilian settlements developed around forts, except that its importance was not derived from strategic location but from being integrated into an incremental landscape with easy communications and transport options. The hinterland of Andarin was agriculturally diversified to produce the main elements of military rations: pork, wine, wheat, and oil. The site's communication links made it convenient to transfer this produce to the army on the Euphrates frontier.[107]

Edessa

Another example of a secular inn exists in eastern Turkey, on the road to Edessa, about 17 km SE of the city. A bilingual Latin-Greek inscription indicates that it was commissioned as an inn (πανδοκεῖον in Greek; the Latin is not preserved) and a rest stop

[105] Smith 2010, 39-42
[106] Black 1995, 39-42. Fig. 1:41,51.
[107] Mundell Mango 2011, 116.

for travellers by the governor of the province, c. 260. There is a series of three caves with stabling installations constructed inside the caves. The area with the caves is naturally sheltered on three sides. There were remains of a masonry construction running along the exposed side, these could either have been a low wall, possibly to keep out predators, or a base for a platform to level the sloped area in front of the caves. The human occupants of the site may have slept out of doors, or in the caves with the animals in cold weather. Joists in the cliff face above the entrances may have supported beams for a roofed porch, affording some shelter.[108]

The archaeological remains discussed above probably are disproportionately biased towards *mansiones* attached to forts, to the exclusion of their urban and suburban counterparts due to their survival and the scholarly emphasis. However, the needs of the administration and the needs of the military were often inextricably linked, and therefore housing one apparatus of the state on the premises of another makes a great deal of sense, especially since urgent information transmission would often be about military affairs.

Desert forts could serve as accommodation. Egeria's journey across the vast expanses of the Sinai desert required that, for security and for lack of alternatives, she and her entourage stay with the garrisons en route. She describes staying at both 'staging posts with quarters for soldiers' and 'forts'.[109] Inscriptions indicate that the military did build inns, called *metata* in Greek – the word is possibly derived from the Latin *metatum*, meaning something measured, i.e., a staging post.[110] The village at Umm al-Halahil (c. 45 km NE of Hama/Epiphania in Syria) contains a Late Roman structure identified from an undated inscription as a *xeneôn*. In form it corresponds exactly to the caravanserai type – it measures 60 × 44 m, with four corner towers and a guarded gatehouse in the southern

[108] Mango 1986, 223-31.
[109] Egeria, 7.2-4.
[110] E.g., *IGLS* no. 1610 (date: 526), no. 2155 (date: 524/5)

part of the east wall (Fig. 3.14). The inscription also invokes St. Theodoros, a patron saint of the military, which suggests that the complex was a military establishment.[111]

From the examples above we can infer the symbiotic nature of the *cursus publicus* and military travel. It is also frequently assumed that the *cursus publicus* existed simply as a bureaucratic overlay, making use of an already existing commercial network of inns, and that private persons would have access to the same accommodation and amenities, with the sole exception of animals.[112] Certainly the imperial administration guarded their animals jealously, with penalties issued for those who took animals reserved for the public post without a warrant, or who took too many, or overworked or overburdened the animals, or requisitioned farm animals for transport. It was forbidden to pay wagoners, veterinarians, or mule drivers, who were regarded as public slaves who received their subsistence from the state.[113] If there was no commercial aspect to the facilities reserved for the *cursus publicus*, no wonder the system was ruinously expensive for the state. If the state and private networks were operating in tandem, one could expect the leasing of animals for money to be a major problem, as profit-seeking innkeepers might rent out animals intended for state use, leaving none for couriers. *C.Th.* 8.5.10 explicitly states: 'to no person…shall animals of the public post be furnished for a private conveyance.' However, unlike other laws, this law was never reiterated. The legislation suggests that the real problem lies in people with authorised warrants (perhaps unnecessarily issued or illegally obtained) requisitioning more than their share of horses or transport, not in fee-paying persons using horses intended for the state. Furthermore, no legislation is issued that punishes those running the stations for renting out government horses, it is always

[111] Lassus 1935-6, 65-7; Mundell Mango 2000b, 207; IGLS no. 1750. The inscription reads:
[κ(ύρι)ε φύλαξο(ν) τὴν εἴσοδ[ον —
…….] ἐν τὸν ξενεῶν[α τοῦ —
.. ἁγίου Θεοδώρου
[112] E.g., Casson 1974, 189.
[113] *C.Th.* 8.5.31, 8.5.58.

assumed that they were requisitioned by force by the warrant holder.

The law iterating that rest-stop personnel may not be paid as they receive maintenance from the state and the emphasis on the ruinous cost of fodder suggest that the *cursus publicus* was not piggy-backing on a commercial enterprise, although innkeepers must have been able to charge holders of the limited *evectio* warrants for food and lodging. The disproportionate volume of legislation suggests that the *evectiones* were much more common than the *tractoria*. Furthermore, governors and other officials who were granted food allowances as part of their office were not entitled to animals of the public post; they were to use their own.[114] However, is one to infer from this that they made use of the same stopping points and used their allowance to pay for provisions? In either case, it is very much an argument *ex silentio*.

Pilgrimage

Regardless of whether the same establishments served both private travellers and the *cursus publicus*, neither was considered particularly suitable for those travelling for spiritual reasons. Throughout the 5th and 6th centuries there is a marked increase in the number of buildings associated with Holy Land sites. Set pilgrim itineraries developed, some following the courses of Biblical events which naturally set out a course to be followed. However, underlying these itineraries are the same stages and increments that govern any sort of travel. This issue is examined in detail for the roads around Jerusalem in Chapter 5.4.

The placement of pilgrim shrines reflects not pure opportunism, but a concern for the logistics of travel that not even pious travellers could hope to escape. One case is the episcopal complex at Dor on the Levantine coast, c. 10 km north of Caesarea Maritima. The shore there afforded a natural landing spot, and so it had been used as a harbour since

[114] *C.Th.* 8.5.3.

the second millennium BCE. C. Dauphin suggested that the complex may have served as a resting place for pilgrims when they first arrived in the Holy Land by ship, before beginning the three day trek to Jerusalem.[115] The complex, covering an area of 1,000 m^2, consists of a three-aisled basilica (18.5 × 14 m) preceded by a peristyle atrium (18.5 × 13.25 m) with a covered cistern beneath its pavement (capacity 69.9 m^3). To the north and south were 'external aisles' extending the full length of the building, and between 4 and 4.5 m wide, subdivided into several ancillary rooms and spaces (including a smaller atrium and a piscina).

While no monastery or guest-house *per se* was found at the complex, a connection with pilgrimage is suggested by the tomb of two unknown 'saints' found in a reliquary grave in the southern aisle of the basilica, and a stone reliquary made from stone of Golgatha. Dauphin supports the likelihood that such an episcopal complex had facilities for caring for strangers by citing a canon law of the 4th century that stipulated requirements for atria (of cathedrals) to be 'surrounded by buildings to provide food and lodging for pilgrims, a residence for the bishop, gardens, bathhouses, porticoes and colonnades' and furthermore suggests that the southern aisle of the basilica, near the saints' tombs, was an incubation chamber.[116] The earliest stages of the church can be dated, on the basis of a coin of Constantius II (337-361) found on the pavement in the western end of the atrium, to the first half of the fourth century. Dauphin emphasises that the significance of the complex arose primarily from its proximity to the Dor anchorage, which was itself a convenient harbour for Jerusalem, and only secondarily from the relics that it housed.

A similar role has been imputed to a Christian settlement at Khirbet Zikrin, located about halfway between Caesarea Maritima (or Dor, for that matter) and Jerusalem, on the

[115] Dauphin 1993, 90-7.
[116] Dauphin 97, 95. See also Hunt (1982, 65-66) for the development of facilities for Christian hospitality.

main Roman inland road (see Map 1.2).[117] This settlement, which in its entirety appears to have been occupied from the 1st century CE until the Ottoman period, consisted in the early Byzantine period (5th-7th centuries) of a village and an acropolis, upon which a building identified as a monastery was situated.

The excavated buildings described as a monastery comprise a building of several rooms and cisterns, built around a central courtyard. This courtyard was porticoed, the portico apparently supported on arches that sprang from capitals decorated with crosses. There is a large room identified as a refectory, another large room to which no function has been attributed, smaller rooms identified as monks' cells and storage rooms, as well as an 'industrial area' in an apparent extension built against the southern part of the main building, which included an oil press and storage jars, and may have been the food preparation area. Nothing that could be identified as a chapel was found. A separate building, oriented somewhat differently from the main building, consisted of a heated bath, an oil press, and two storerooms that the excavators think might have been a *xenodochion*. I suspect that Fischer may be stretching the evidence too thin when he declares, 'both the monastery and the village were *created* (emphasis his) together like two counterparts: one for the attraction and safeguarding of the pilgrims, the second as the material base of the first', as unfortunately none of the physical evidence offers a concrete link with pilgrim activity.[118] The location of the site, however, near a crossroads in on the main road to Jerusalem, and near an existing milestone, is extremely suggestive.

The army

The army should be regarded as a mobile institution. It is, however, comprised of different units that travel at different speeds. The cavalry is capable of moving faster than the

[117] Fischer 1989, 1788-1807. The site lies near the fourth milestone from Antipatris, on the road to Jerusalem via Gophna. See Roll and Ayalon 1986, 114 (fig. 1); 118 (fig. 4).
[118] Fischer 1989, 1805.

infantry, while the baggage train in turn moves slower. Vegetius summarises the different inconveniences that afflict an army on the move. Firstly, size is an encumbrance: 'on marches it is always slower… a longer column often suffers ambush even by small numbers; in broken country and at river-crossings it is often caught in a trap as a result of delays caused by the baggage-train.' The second problem derives from keeping men and animals supplied with food: 'Also it is an enormous labour to collect fodder for large numbers of animals and horses. Difficulties again with the grain-supply, to be avoided on any expedition, afflict larger armies sooner. For however thoroughly rations may have been prepared, they run out more quickly, the more they are distributed to.' Another crucial problem is the provision of water for drinking, let alone other purposes: 'water itself sometimes hardly suffices for too large a number.'[119] All of these factors, from speed to the ability to carry supplies of food and water and how long those supplies would last, determined the intervals at which military installations would need to be placed and new stocks of provisions would have to be available.

The first factor is the variable speed of an army on the march. How far could they go in a day? According to Vegetius, new recruits should be able to maintain the military step of twenty miles (30 km) in 5 hours during the height of summer.[120] The rate given varies in different sources and manuals, with the average being about 18 miles (27 km) a day for a legionary carrying a pack between 55 and 90 pounds (25-40 kg).[121] This was naturally contingent on road conditions, weather, and the urgency of the situation. According to Maurice's *Strategikon*, the proper order for an army to proceed is with the commanding general and his honour guard at the front, followed by '*spatharioi*, then the bucellary troops, and finally their supply train'. These were followed by the individual

[119] Vegetius, 3.1 (Milner 1996, 64).
[120] Vegetius, 1.9.
[121] Bodinier and Childs, 'Transport' in *A Dictionary of Military History*, Blackwell 1993.

units (*meros* or *moira*) in orderly columns, each unit followed by its own baggage train, making sure that the various units and their baggage were kept distinct.[122] Quartering parties (*mensores*) rode on ahead to scout out the terrain, signs of enemy activity, and finding locations for the next camp.[123] As we can see, the rate of military travel is slightly less than Procopius' 'unencumbered traveller', as the soldiers were both encumbered by their packs and moving in large numbers. It does, however, correspond well to the daily distance attained by individual travellers.

A soldier's pack included his rations. The sources vary as to how many days' rations a soldier carried with him at a time. For Julian's campaign on the Rhine the standard rations were to last 17 days[124], whereas Josephus says that they carried only enough for three days at a time.[125] Typical rations included bacon fat (*laridum*), hard-tack (*bucellum*), and sour wine (*acetum*).[126] Rations were supplemented by foraging and bread baked from grain supplied by the *annona*, and often at the inconvenience of local inhabitants (although technically prohibited by law, it seems to have been common practice). From the 4th century onwards the grain allowance, the *annona militaris*, was in effect – this would have mainly been packed into the baggage train as opposed to personal luggage. The introduction of the *annona* reduced what each individual soldier had to carry, but would increase the load of the baggage train.[127]

On the one hand, travelling light was desirable to increase speed of movement, but water was absolutely essential, especially in the arid climate that governs much of the Levant. Water is also heavy, so how much water – and for how many days – did soldiers carry with them at a time?

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[122] *Strategikon* 1.9, Dennis 1984, 21.
[123] Syrianus 1.25, Dennis 1985, 83.
[124] Amm. Marc. 17.9.2; although this passage describes removing and storing part of the rations to lighten the load and increase travel speed.
[125] Jewish Wars III.5.5.
[126] Déry 1997, 84.
[127] Déry 1997, 85.

The military manual of Syrianus stresses the importance of the above-mentioned *mensores* for finding a good supply of water at each camping site.[128] This seems to suggest that water supplies were replenished daily, if possible. Efficient scouting would also determine where the next water stop was, so that the troops could carry enough.

According to the Piacenza Pilgrim, when crossing the Sinai desert their water rations were limited to 2 *sextarii* (or 1.092 litres) per day.[129] This is really the very lower limit of what is comfortable for the human body, normal rations should be at least 2 litres per day.[130] Under normal conditions, water supplies could be topped off at regular intervals, meaning that soldiers would probably only carry water for one or two days at a time which would weigh 2-4 kg.[131] However, conditions in the arid desert that covers much of the Levant are different from the conditions of Central Europe and Armenia for which the military manuals were mostly written. In the desert, where natural sources of water are scarce and seasonal, water must be collected and stored in cisterns and reservoirs. Forts were always equipped with cisterns, and therefore these forts would form part of the chain of water supply for an army on the move.[132] Unlike temporary camps that could be set up when a day's march had been completed and a nearby water source was located, desert camps were crucial for providing water foremost and protection secondarily. However, standing water is less desirable than freely flowing water, and the 6th century *Strategikon* of Maurice contains its own warnings for water sources near enemy territory: 'Water from the wells should not be drunk for it will often have been poisoned.'[133]

At night, Vegetius recommends constructing 'entrenched camps' (*castra*) with

[128] Syrianus I.26, Dennis 1985, 82-85
[129] Piacenza Pilgrim 36.
[130] Roth 1998, 119.
[131] Syvänne 2007, 77.
[132] Kennedy 2004, 28.
[133] Strategikon, 9.3 (Dennis 1984, 100).

ditches and palisades for added security, but notes that this skill is 'entirely lost' (*prorsus intercidit*), possibly because troops relied on existing forts and cities?[134] The military manual of Syrianus discusses fortifying makeshift camps with trenches, embankments, and caltrops.[135] And in the Levant, particularly in northern Mesopotamia, the soldiers could be billeted in towns and villages, obviating the need to construct forts at every halt.[136]

If we translate the daily distance that an army could march and add to that that water sources should be available at the end of each of those stretches, then we arrive at an interval between overnight stops of c. 30 km. Examining the map of Roman forts in modern-day Jordan compiled by David Kennedy shows that military installations appear roughly 15-20 km apart, well within the desired distance. This seems to be especially clear in the forts located along the *Via Nova Traiana* between Aqaba and Humayma (region 19, the Hisma, on Kennedy's Map) where the distance between forts is, respectively, 16, 17, 16, and 15 km (see Fig. 3.15). Naturally, we must not enter into the fallacy of assuming that this represents a single snapshot in time, or would have been the functional reality in Late Antiquity, but it supports the idea that a legion on the move could move from one fortified location to another within one day with ease. Although excavation has shown that not all the fortresses located along the *limes* were contemporaneous, the abandonment of a fortress by a permanent garrison does not mean that the site was completely disused. Unless robbed of their stone, the exterior walls would have remained standing even for centuries, providing travellers of all ilks with shelter for camping in the ruins. Some of the cisterns might still have been in use and containing potable water, although cisterns require maintenance and frequent cleaning out

[134] Vegetius, 1.21. According to Josephus, the previous night's camp was customarily destroyed, 'because it will be easy for them to erect another camp, and that it may not ever be of use to their enemies.' (Jewish Wars 3.5.4, trans. W. Whiston)
[135] Syrianus, Chapter 29.
[136] Kennedy 2004, 28.

– neglected cisterns are likely to have dead animals in them that contaminate the water. These lines of fortifications represent networks of communications rather than networks of defence: 'The Roman army was organized to secure and manage its own communications rather than to interdict movement to others.'[137]

[137] Isaac 1990, 416. See also Parker 1986, 6.

Chapter 4 – Sea Routes and River Courses

To achieve an integrated understanding of communications networks in the Late Roman empire, it is essential not to overlook travel by water. This involves not only facing to the west to the sea channels across the Mediterranean, but also examining the major rivers of the Levant to understand the role that they might have played in shaping the events and culture of the region.

4.1 Travel by Sea

Horden and Purcell observed that the Romans conceived of their empire as comprising many different regions bound together around a single body of water – the *mare nostrum* or *mare internum*, known from the 6th century as the Mediterranean Sea.[1] Although this belies the fact that the Mediterranean in antiquity was conceived of as having different nautical regions (the Aegean and Adriatic seas in particular form their own, high-traffic, circulation patterns), the existence of a single, navigable, and intercommunicating body of water joining the extreme limits of the empire had a strong impact on notions of Roman hegemony, and the diffusion of cultural ideals and material culture.

It is well known among students of the ancient economy that the transport of goods by sea was quicker, cheaper, and, therefore, preferable to transport by land. A.H.M. Jones quipped, in his history of the Later Roman Empire, that it was cheaper to send cargo from one end of the Mediterranean to the other by ship than it was to haul it 75 miles over

[1] Horden and Purcell 2000, thesis summarised in Horden 2005, 27.

land.[2] Greater efficiency and advantage was therefore to be had by making use of waterways and the sea rather than using the roads.

But to what extent would these economic considerations have influenced people entrusting their person, rather than their property, to the vagaries of sea travel? Was the advantage of speed gained from the sea enough to outweigh considerations of personal safety? I will be looking at some of the advantages and detractions of sea travel, as expressed by sea-goers of the 4th-7th centuries. While remarkable advances have been made in our understanding of Rome's maritime trading networks with the East Indies via the Red Sea, purely in the interests of space, the analysis here will focus primarily on the nautical history of the eastern Mediterranean coastline of Oriens.[3] By way of clarification, the term 'Levantine coast' should in this case be understood as referring to the north-south coastline of Syria and Palestine between Antioch and the Nile Delta, as its hydro-geological attributes are different from that of the rocky and sinuous coastline of Cilicia and Isauria (see Maps 4.1.1 and 4.1.2).

The Sea

The first observation that must be made about travel by sea is its seasonality and its dependence on weather. While land travel can in part be affected by seasonal factors, particularly in areas likely to experience snow or extreme weather, land travel nonetheless affords far more flexibility for choosing the time of one's journey than sea travel.[4]

The two main factors affecting seasonal circulation in the eastern Mediterranean are the winds and the surface currents. The major surface currents themselves do not appear to alter with the seasons – they flow predominantly in a south-easterly direction, and northwards along the Levantine coast (creating a 'counter-clockwise' circulation in

[2] Jones 1964, 842.
[3] See, e.g., contributions by Sidebotham and Phillipson in Mundell Mango, ed., 2009, various proceedings of the Red Sea Project (vols I-V, 2004-2010). Tomber 2008; Mundell Mango 1996; Raschke 1978.
[4] For the seasonality of land travel, see McCormick 2001, 445-450.

the eastern Mediterranean basin), at a velocity of 12-24 miles per 24-hour cycle (see Figs 4.1.1-2).[5] The direction of the current is significant depending on whether it runs with or against the prevailing winds, especially along the Levantine coast, where the prevailing winds are from the west or north.

The winds pose a noticeable constraint on sailing in the Mediterranean, and they can either be a help or a hindrance. The winds blow primarily from the north and north-west. This facilitates journeys made south through the Aegean or down the Levantine coast. However, it makes westward journeys from the Levantine coast and Egypt more difficult, and sailing west and north might take twice as long as sailing east and south. Regardless of the direction of the wind, strong winds can cause rough seas. According to the *Mediterranean Pilot*, 'moderate to rough seas are encountered, in winter, on about 35% to 40% of occasions in the W and N of the area and 25% to 30% in the SE. In the summer the percentage decreases to around 20% to 25% of occasions around Kríti [Crete] and about 10% to 15% elsewhere.'[6] (See Figs 4.1.3-4)

The prevailing winds vary with the seasons, being more forcefully from the NW in the summer months, whereas in the winter months the directionality is more evenly distributed but the storms are more violent. (See Fig. 4.1.5) There are also seasonal regional winds to be taken into consideration, the most significant in the eastern Mediterranean basin being the southerly sirocco and khamsin winds that blow in late spring and autumn (which can be associated with sandstorms and fog and thus poor visibility), and the etesian winds that blow from the north to northwest in the summer.[7]

[5] Lambrou-Phillipson 1991, 12; *MP*5, NP 49, 18-9.
[6] *MP*5, 20.
[7] *MP5*, 25-32 (esp. maps on 29-31)

Local land and sea breezes, generated partly by diurnal temperature differentials, but also by the topography of the land, may either add to or blow against the prevailing winds.[8]

From earliest antiquity, sailing during the winter – from about October until April – was avoided, especially across the open sea.[9] This custom was given force of law in 380 by an edict that restricted the shipment of grain from Alexandria to the months between April and October. Although this law applied only to the grain shipments, and other sailing did take place in the winter months, the restriction on shipping such a vital commodity as the grain *annona*, that was needed year-round, demonstrates that the risk of loss was so high as to be considered unacceptable by the state.[10] Vegetius offered even more conservative sailing dates for military campaigns, describing March through May, and September through November as 'incerta nauigatio' as well.[11]

Winter was an awkward time for sailing not just because of the winds, but because of the winter conditions: storms, limited daylight, and frequent low visibility.[12] While it is clear that winter sailing did actually take place, this was usually down to the initiative and skill of the individual sailors. The accounts of two winter journeys, those of Synesius of Cyrene and Bishop Willibald, testify vividly to the practical demerits of winter sailing.[13]

As noted above, even within the primary sailing season, the direction and force of the winds varied. A skilled sailor, however, could make use of coastal sea breezes and

[8] *MP5*, 32. As the temperature on the land increases due to solar exposure during the day, and then decreases in the evening, the change in temperature causes air to flow from the cooler zone to the hotter, meaning that winds blow away from the sea during the day and towards it in the evening.
[9] The 8th/7th century BCE poet Hesiod, in the *Works and Days*, sets out the seasons for sailing, bracketed by observable astronomical phenomena, such as the summer solstice and the heliacal setting of the Pleiades in early November, and natural phenomena such as the arrival of new leaves on the trees in spring (618-694, West 1978, 126-9).
[10] *C.Th*. 13.9.3 (Pharr 1952, 399).
[11] Vegetius, *De re militari*, 4.39; McCormick 2001, 454, n. 38.
[12] McCormick 2001, 459.
[13] Synesius, *Ep*. 4; Willibald 29 (Wilkinson 2002, 248), sets sail from Tyre on November 30, 724, and arrives in Constantinople in April of the following year.

currents. Trials with replicas of ancient ships demonstrate that they were capable of sailing into the wind; ships could also be equipped with oars and could thus progress into a headwind using manpower rather than sails.[14]

The coasts of both Asia Minor and the Levant are dangerous for different reasons. The coast of Asia Minor is rocky, with many submerged off-shore reefs. The most perilous areas are easy to identify by the sheer number of archaeological wrecks found there! Most wreck find-spots will have many shipwrecks from many different periods in close proximity, having foundered on the same treacherous bit of coastline centuries apart. Thus, the wrecks found off the island of Yassıada Tektaş north of Kos in the Aegean include a 4th-century wreck, a 7th-century wreck, and even a 20th-century freighter all caught afoul of the same reef that surrounds the island.[15]

The natural geology of the Levantine coast is completely different from that of Asia Minor, with a sandy shelf concealing submerged sandbars and shoals that ships can be battered against by strong winds. It is what Robert Hohlfelder has characterised as 'an inconvenient coastline'. There are no naturally occurring harbours – although some sheltered anchorages exist, e.g., at Dor (Tantura) – and so any ports must be artificially constructed using breakwaters and moles. These in turn cause rapid erosion and build-up of sand along the coastline and require constant maintenance and dredging to remain usable.[16] Even so, few large ships could make port. Ships would lie off the coast at anchor and offload their cargo into smaller boats.[17] Additionally, much of the coastline of the Levant is totally exposed to the open Mediterranean, and the wave fetch across the open water can cause waves of over 10 metres to crash against the coast.[18] Even the anchorages

[14] See the trials with a replica of the 4th-century BCE ship, Kyrenia II, Katzev 1990, using both sail and oars; Murray 1995, 39 and n. 12.
[15] Bass 2012, xviii.
[16] See Kingsley 2004b, 28-9, for modern coastal erosion rates.
[17] Kingsley 2004b, 35-6.
[18] R. Hohlfelder, 'The fortunes of Caesarea Maritima's harbours in Late Antiquity: riches to ruins', Late Antique and Byzantine Art and Archaeology Seminar, Oxford University, 23 May 2013.

can be hazardous. At Dor, the sand bar at the mouth of the bay which shelters the lagoon from the open sea can itself be a danger, as attested by the 25 shipwrecks found there.[19]

These various natural factors would have more or less dictated the preferred sailing routes. The extent to which open-water sailing was practised is unknown. This is largely because of the limitations on recovering shipwrecks from deep water; remains of ships are much more accessible – and the ships more likely to have been wrecked in the first place – in shallow waters.[20] The 4th-century Isis wreck, however, found in the Skerki Bank deep-sea excavations, may represent a shipment of grain and other products destined for Rome from Carthage, and does testify to the existence of ships ('small, sturdy traders') that would have plied the open waters.[21]

The excavations at the Theodosian Harbour at Yenikapı in Istanbul are shedding new light on ship construction in the Late Antique and Byzantine periods, which will reveal new information about the seaworthiness of these vessels.[22] A.J. Parker's catalogue of shipwrecks in the Mediterranean – both east and west – includes 140 shipwrecks dated to between 300 and 700 CE.[23] However, this catalogue was published in 1992, and excludes not only the Skerki Bank shipwreck, but also the discoveries at Dor/Tantura and Yenikapı, so the picture has changed considerably (see Map 4.1.3 for shipwrecks discussed in this chapter).

Changes in Technology: Sails and Shipbuilding

While our understanding of Late Antique and early medieval ship construction is currently in flux, there are two technological developments that had a significant impact

[19] The work carried out at Dor, including surveys and excavations, has been undertaken by a number of different institutions, including the Institute for Nautical Archaeology and Haifa University's Center for Maritime Studies.
[20] See Parker 1992, 3-4 on the problems of statistical distortion in shipwreck archaeology.
[21] McCann and Oleson 2004, 154-170, McCann 2004, 56. The original dimensions of the ship are calculated to be 12-15 m length, 5 m width.
[22] See e.g., Kocabaş, ed. 2008 (2012), and Özsait Kocabaş 2012.
[23] Parker 1992, 14-15.

on maritime capabilities in Late Antiquity, and it is therefore worthwhile going into a bit of detail on each. The first is the lateen sail. The lateen sail, compared to a square sail, enables the ship to tack further into the wind, and provides greater manoeuvrability, especially for coastal sailing (see Fig. 4.1.6). The primary evidence for the introduction of the lateen sail in the Mediterranean is iconographic, and there is some debate as to what can be construed from these representations, and how it affects dating. The most frequently cited example from before the 5th century is the Alexander of Miletus tombstone of the 2nd century CE, which appears to show a lateen – or more accurately, a quadrilateral settee – sail. Julian Whitewright rejects this as a true lateen/settee sail, however, because the representation of the rigging is not consistent with how such a sail would be rigged.[24] In Whitewright's view the two other key iconographic representations, a mosaic from Kelenderis in Cilicia (6th century) and a graffito from Kellia (early 7th century), represent the earliest examples of a lateen sail with appropriate rigging in the Mediterranean sphere (see Fig. 4.1.7-8).[25] If anything, therefore, the development of the lateen/settee sail and its rigging was a long process, but once the technology was perfected, the iconographic evidence suggests that the lateen superseded – but did not entirely replace – the square rig.[26]

Another crucial issue regarding the lateen sail is the question of direction of influence. Many of the modern terms used (lateen deriving from 'Latin', a quadrilateral settee sail referred to as an 'Arab' sail) are confusing and potentially misleading as to origin and diffusion. Although traditionally the direction of influence has been seen as flowing from east to west, i.e., from the Indian Ocean to the Mediterranean, the early, pre-Islamic iconographic representations of true lateen-settee sails cited above suggest

[24] Whitewright 2009, 102.
[25] Also Pomey 2006 and Roberts 2006.
[26] Polzer 2008, 226.

that the Mediterranean peoples may have developed the lateen sail independently, and the representations collected by, e.g., Casson represent stages in this development.[27] In the sixth century rigging became stabilised allowing for the maximum potential of the sail type to be realised, thus it became the predominant type in the Mediterranean. However, the square rig probably continued in use throughout the medieval period.[28]

The second major development in ship construction that took place at some point from the 5th century onward was a reduction in ship size and, therefore, carrying capacity. The 'supercargo carriers' of the 1st and 2nd centuries CE were up to 20-40 metres in length, with a draught of 2 to 2.5 m. The shipwrecks of the 4th century onward are all considerably smaller than this: a cargo vessel from Yenikapı (Yenikapı 22), carbon-14 dated to 430-606, has an estimated original length of only 14 metres, similar to the dimensions of the 4th century Skerki Bank wreck (estimated length 12-15 m).[29] The hull construction also underwent gradual changes; first, with the hull being built frame first with the hull planking affixed to the frame. Previously, the traditional method was constructing the shell of the hull first joined with closely-fitted mortise-and-tenon joints with the frame merely providing additional support (Fig. 4.1.9).

The result of these smaller ships is not only a reduction in the cargo capacity of each ship, but the change in hull construction meant the that the structural integrity of the ship was less flexible, more rigid and, therefore, more prone to breakage under stress. However, the smaller, frame-first ships are cheaper to manufacture, which has led to the suggestion that private enterprise began to take over from imperial monopoly in maritime trade during Late Antiquity.[30]

[27] Casson 1966, 811. Campbell (1995, 4, 8-11) argues for the development of the Mediterranean lateen sail taking place independently of developments in the Indian Ocean.
[28] Castro et al. 2008, 348. A second Kellia graffito dated to 600-630, exactly contemporary with the one showing the lateen sail, still appears to depict a square sail. Whitewright 2008, 287.
[29] Kocabaş 2012, 109.
[30] Arnaud 2011, 73; Wilson 2011, 42; Kingsley 2004a, 72-85.

It is generally assumed that these smaller types of ships would keep to the coast as much as possible, probably within sight of land (see Fig. 4.1.10). Crews would need to replenish supplies of fresh water and food; the extent to which ships would sail at night has also been debated. The 3rd-century Papyrus P. land. inv.no. 616 from Oxyrhynchus is a lease of a ship in which the sailors are expressly forbidden from sailing at night, although this refers to sailing on the river, where chances of running aground would be higher.[31]

Travellers coming to the Levant from western Europe appear mostly to have arrived by ship. The notable exception is the author of the Bordeaux Itinerary. There are two possible explanations for this: the first is that, if he arrived, as he states, in Constantinople on the 25th of May, he would have set out from Bordeaux in February, and as we have seen, seafaring was curtailed in the winter months. The second possibility is that he was travelling with a diploma for the *cursus publicus*, which would have been valid for travel overland, but not for travel by sea. Egeria is another unknown, as she makes no reference to how she came to the east from her home in Galicia, although her journey to the Holy Land begins in Constantinople. Paula, setting sail from Rome, travelled in stages via the island of Ponza south of Rome, to Methoni on the coast of the Peloponnese, then via Rhodes and Cyprus to Antioch. The Piacenza Pilgrim made landfall at Antaradus (Tartus) in Syria, having come via Cyprus as well. Cyprus was an important layover point for travellers making the east/west journey; the islands of Rhodes and Kos were similarly important for those sailing north/south between Egypt and Constantinople. The islands of the Aegean and the Marmara coast served as stepping stones to reach Constantinople itself.

[31] Sijpesteijn and Worp 1976, 162-5

The obvious advantage that sea travel has over land travel is that of speed. For example, between 401 and 402, Porphyry of Gaza sailed from Gaza to Constantinople, via the island of Rhodes, which was a common intermediate stop. The journey there took 20 days – 10 to Rhodes and a further 10 to Constantinople, and the return journey, aided by the prevailing northerly winds, took half that, at 10 in total.[32] As a comparison, by joining two journeys together, we can see that it took the early 4th century traveller Theophanes 14 days to go from Gaza to Antioch.[33] Then, a few decades later, it took Caesarius the *magister officiorum* just over 5 days to reach Constantinople from Antioch, going at breakneck speed.[34] Measuring the halts recorded by the Bordeaux Traveller, his journey from Constantinople just to Caesarea Maritima took over 7 weeks.[35] Turning further south, Jerome notes that Paula took a ship from Pelusium and arrived in Gaza, 'with such speed, you would think she was a bird'. The same journey took Theophanes six days on foot. The advantage of travelling by water, especially with favourable winds and currents, is incontestable.[36]

Ports, Harbours, Anchorages and Other 'Coastal Gateways'[37]

The word 'port' often conjures images of the great harbour installations of Portus in Rome or, for the Levant in particular, of the great concrete breakwaters of the Sebaste harbour at Caesarea Maritima. In fact, the absence of such massive installations dating to the later centuries is sometimes taken as an indication of both decline in maritime traffic and Byzantine technological know-how.[38] However, it is important to bear in mind that elaborate artificial harbours were more the exception than the rule. Natural harbours and

[32] Mark the Deacon, *Vit. Porph.* 26-7; 34, 37, 56-7. Pryor 2002, 36 expresses scepticism about speeds cited in the *vita*.
[33] Matthews 2006, 61
[34] *Lib. Or.* XXI, 15
[35] It. Burd. 571-584.
[36] Jerome, Ep. 108.14: *tanta velocitate reversa est, ut avem putares*. Matthews 2006, 61.
[37] The evocative term 'coastal gateway' derives from Kingsley 2001, 69.
[38] Gertwagen 1988; contra, Hohlfelder 1988, 1997.

anchorages that needed little in the way of construction to be serviceable to maritime traffic were readily available along the shores of the Mediterranean. Thus a 'graduated system' of landing stages – with varying degrees of amenities – existed throughout the eastern Mediterranean and, as we shall see, persisted well into Late Antiquity and beyond.[39]

Analysing ports with datable Byzantine remains and correlating them with landing sites mentioned in texts provides an idea of movement by sea – and subsequently by land. Like roads, landing stages for ships, such as ports, harbours and havens, need continuous maintenance. Harbours can easily silt up, and man-made structures, such as moles, if left to disintegrate, can be as hazardous as reefs for ships. For example, some of the ports of the Roman period, such as the Sebaste harbour at Caesarea Maritima, which is hailed as a marvel of Roman engineering, was in a state of serious disrepair by the late 5th century, and may not have been in use. In fact, it may have been in a ruinous state as early as the 2nd century.[40]

However, the derelict state of the artificial harbour – which may well have exceeded the needs of the city and was therefore not maintained – in no way correlates to a decline in the importance of Caesarea Maritima as a major administrative and economic centre and communications hub, as other sources abundantly attest to the city's vitality in later centuries.[41] Indeed, repairs known to have taken place on the outer breakwaters during the reign of Anastasius attest to the city's continued maritime connections, and perhaps even a surge in the late 5th century that would prompt the partial restoration of the artificial harbour.[42]

[39] Leonard 1995, 240.
[40] Raban 1995, 172.
[41] See, most recently, Patrich 2011, esp. Chapter Four and Chapter Five.
[42] Pottery finds indicate that the harbour was functioning to the 7th century, but from the late 6th century regular maintenance ceased, and the sea gradually reclaimed its own. Hohlfelder, 23 May 2013.

How does one then reconcile the apparent paradox of the expanding urban parameters of cities such as Caesarea Maritima or Ptolemais, and their apparently crumbling harbour infrastructure? One possible explanation is a change in patterns of municipal patronage. Harbours were civic monuments, and therefore a civic responsibility, and where harbour fees were insufficient for maintenance, private patronage would have been sought.[43] An inscription dated to 524 details harbour repairs carried out at Seleucia Pieria by the *comes Orientis*, Ephrem.[44] This suggests that, as with the roads, local officials and patrons had fallen lax in their attention to infrastructure maintenance, and so, following the Codex Thedosianus (15.1.36), road and bridge repairs fell to the office of *comes Orientis.* The other possibility is that later repairs were indeed carried out but are simply no longer visible, having either disintegrated over time, or the materials used might have been salvaged for reuse elsewhere.[45]

From the coast of Isauria all the way to Gaza, the eastern Mediterranean shoreline has been the subject of many archaeological surveys in the past few decades. These include, for example, the Survey of Ancient Harbours in Rough Cilicia, followed by the Rough Cilicia Maritime Archaeological Project.[46] Geomorphological studies have been carried out on the harbours along the coast of Phoenicia Maritima – Tyre, Sidon, and Berytus (Beirut) – analysing the build-up of sedimentation in the harbour basins to understand patterns of usage and abandonment.[47] The overall pattern seems to show no outright abandonment of ports, especially not when connected with continuously

[43] Hohlfelder 1997, 374.
[44] *IGLS*, no. 1142. See *PLRE* II, Ephraemius, for his career and works. He was made patriarch of Antioch in 527 in recognition of the building works he carried out on behalf of the city after the earthquake of 525.
[45] Kingsley 2004a, 155; Vann 1998, 80.
[46] See Vann 1993, Vann 1995, 'Cilician Harbor Survey: 1993 Survey of Soli-Pompeiopolis,' XII Araştırma: 529-34. See also 'Cilician Harbor Survey,' in Robyn P. Woodward and Charles D. Moore, eds. *Underwater Archaeology Proceedings from the Society for Historical Archaeology Conference* (Uniontown, PA: Society for Historical Archaeology, 1994) 68-73; with Stephen Sachs, 'Cilician Harbor Survey,' AJA 98(320-21); 'Street and Harbor: the Urban Axis of Soli-Pompeiopolis, AJA 97(341-42).
[47] Marriner et al. 2006 and 2008.

occupied or even expanding settlements. The reign of Anastasius in particular is associated with continued prosperity on the Levantine coast. Repairs were carried out on the outer breakwaters at Caesarea Maritima, and a large quantity of coins found at Berytus also testify to its continued prosperity in the late 5th/early 6th century.[48] The surveys at Dor/Tantura under the auspices of various institutions similarly attest to an image of commercial vibrancy in Late Antiquity.[49]

The density and spacing of ports, especially along the Levantine coast, seems to suggest that they formed part of an integrated maritime, as well as terrestrial, network. The evidence suggests that the most common maritime trading patterns involved coastal tramping, that is, trading from port to port and exchanging cargos, rather than direct trade which would involve only the point of origin and the final destination.[50] This of course belies the fact that the *annona* was still being supplied, and included oil and other products as well as grain. An edict of Anastasius preserved at Abydos in Egypt specifically mentions ships from Cilicia. The edict lays out tax exemptions for the *navicularii*, those merchants engaged in transporting the *annona*.[51]

The large number of available ports would give many alternatives to a traveller, particularly in the case of pilgrims making their way to Jerusalem. Even ports that did not possess a direct inland access towards Jerusalem or other cities would be easily linked by the coastal highway to another city that joined with the road network of the interior. For example, there is no evidence that Dor was connected by a road directly with the interior, despite its proximity to Legio and Scythopolis, and traffic from Dor likely made its way either south to Caesarea Maritima (a distance of about 13 km) or north to Ptolemais (c.

[48] Hohlfelder 2000; Hohlfelder 1985; Hall 2004, 24.
[49] Raveh and Kingsley 1991; Kingsley and Raveh 1996, 10.
[50] Arnaud 2011, 76.
[51] *SEG* 34 1243.

35 km) before linking up with inland routes (refer to Map 1.2). This terrestrial connectivity affects a port city's status in the graduated system.

The mid-4th-century text, the *Expositio totius mundi et gentium*, as part of its description of the geography and trade of the Mediterranean region, names several port cities on the Levantine coast. It specifically mentions Tyre, Berytus, Caesarea Maritima, Laodicea, Seleucia Pieria (and the harbour works carried out there under Constantius), Ascalon, Gaza, Tripoli, Byblos, Sarepta, and Ptolemais, as well as Tarsus on the Cilician coast.[52] The grouping of these cities suggests that the author was recording them in the manner of a *periplus*, and that he was familiar with approaching them from the sea. Other landing places known from pilgrim accounts include Antaradus and Joppa. Epiphanius gives Tyre as a port for Jerusalem, an 8-day journey from the Holy City, but with good access to the holy sites around the Sea of Galilee.[53]

One might assume that the different scale of construction work, and even the size of the settlement it was attached to, would factor into the harbour's place in the graduated system, mentioned above.

The Navy

Prior to the Vandalic conquest of North Africa and the central Mediterranean islands in the fifth century, the Romans had maintained more or less complete control of the coastal areas of the Mediterranean. Therefore, apart from punitive expeditions against sea-raiders, there was little need for an extensive fleet to be maintained to engage in naval operations against hostile sea-borne powers. The last great true naval battle of the 4th century took between the naval forces of Constantine and Licinius at the Hellespont near

[52] Rougé 1966, XXIV-XXXIX.
[53] Antaradus: (Piacenza Pilgrim 1, also Willibald 12); Joppa (Arculf, Book 2); Tyre: Epiphanius 1, see also Willibald 29.

Byzantium in 324.[54] The navy was subsequently used mainly for transporting troops for land-based engagements, and for maintaining the supplies of the troops on land.[55] Naval engagements that did take place at sea mainly involved the bombardment and boarding of enemy ships for hand-to-hand skirmishing: essentially, land battles on water.[56] Even during the Vandal wars, the naval campaign mainly took the form of troop transport. Belisarius himself recognised that the strength of his troops lay in fighting on land, and that a naval engagement with the Vandals would be to the Romans' disadvantage.[57] He therefore urged his men to make land with all possible haste, to disembark the horses and weapons, and to set up camps and stockades in preparation for engagement on land.

Despite this, the construction of naval warships continued to develop. The classic medieval Byzantine *dromon* gradually evolved from the *liburnae* of the earlier imperial period. The earliest reference to an oared galley as a *dromon* may date to the 5th century, but the term was definitely in confirmed use by the mid-6th century.[58] The relationship between the changes in terminology and the actual changes in technology remains unclear, however. Nevertheless, the developments from the sixth century onward included the use of a lateen sail as opposed to a square one, replacing the ram with a spur, changes in configuration of the oar decks, changes in hull design, and probably the transition from shell-first to frame-first construction, which resulted in a faster, more manoeuvrable ship that was recognisable enough to acquire a sort of 'brand recognition'

[54] According to Zosimus, *Historia Nova* B.22, Licinius' forces had 350 ships at their command whereas Constantine's navy was made up of 200 ships. Pryor and Jeffreys 2006, 7.
[55] MacGregor 306-311; Elton 1996, 220. According to Pryor and Jeffreys 2006, 7-9, the Roman navy nonetheless maintained a large number of ships. This is attested in historical sources that record fleets from a total of 550 ships in the combined fleets of Constantine and Licinius at the Battle of the Hellespont in 324, to 1,100 ships sent by Theodosius II against Gaiseric in 448/9. More fantastical figures are given: 3,700 ships raised by the rebellious *comes Africae* in 413, and 100,000 launched against Gaiseric by Leo in 468/9 (at a cost of 130,000 pounds of gold, Theophanes would have us believe). (Theophanes Chr., Theodosius II: AM 5941, AD 448/9 (Mango and Scott 1997, 157), Leo: AM 5961, AD 468/9 (Mango and Scott 1997, 160, who suggest that 100,000 is an error and should probably be closer to 1,100).
[56] Elton 1996, 257.
[57] Procopius, *Vandalic Wars* 3.25.25-31; Elton 1996, 247.
[58] Pryor and Jeffreys 2006, 123-5.

in different languages, such as Arabic and Latin.[59] Our understanding of the chronology of these changes is currently being revised thanks to the discoveries at Yenikapı. To date, six galleys have been identified from different periods. The wreck Yenikapı 13 has been identified as a *dromon*, carbon-14 dated to 690-890. Its preserved length is 20.8 metres, with a width of 2.8 m. Some of the seats for the rowers have even been preserved.[60] A diachronic study of the construction techniques is underway.

Immediately after the fall of Palestine and Syria, as well as Egypt, to the Arab conquest, the Roman navy nevertheless still had 'mastery of the sea', and was able to harass the coastlines of their former territories. However, very soon the Arab governors of Syria and Egypt began creating naval forces to rival and contain the Roman navy. In 655, the 'maritime integrity of the Mediterranean fell', as the territorially truncated Roman Empire lost its crucial island stepping-stones to Arab forces: Rhodes was lost in 667 (garrisoned by the Arabs in 673), and Cyprus was occupied c. 670.[61]

Experiencing the Sea

The first challenge to anyone undertaking a sea voyage was finding a captain willing to take on passengers. Some troublesome petitioners from Egypt found themselves stranded in Chalcedon when the emperor Julian forbade captains from taking them on board.[62] Finding a ship headed for the desired destination could also be a problem.

A recurring *topos* in the texts is the intractable captain who reneges on an agreed-on itinerary, usually citing the wind as reason for not putting his passengers ashore at the agreed spot. This happens in the 6th century to Nicholas of Sion on his way back from Ascalon to Myra – his captain wanted to take him to Rhodes instead of Andriake, a

[59] Pryor and Jeffreys 2006, 446.
[60] Kocabaş 2012, 108.
[61] Pryor & Jeffreys 2006, 24-5.
[62] Amm. Marc. 22.6.4.

considerable detour that would have left them stranded.[63] Similarly, a captain prevents Porphyry of Gaza and his party from visiting a holy man on Rhodes, lest the delay cause them to lose the favourable wind, despite their logical argument that, if they went to visit the holy man, he could pray for another favourable wind for them.[64] In the first instance, divine intervention persuades – or enables – the captain to change course. In the second, the captain is revealed to be an Arian, which not only puts the entire ship at risk from divine wrath, but also shows his judgment to be impaired.

There was also the risk of being left behind, should the ship put to shore for any reason. This contingency seems to have been common enough to warrant being covered in the Rhodian Sea Laws, a 7th/8th century compilation of maritime law. Basically, the law stipulates that those left behind are entitled to receive back what they own, but receive no other compensation if the captain was forced to flee by robbers or pirates.[65]

The risk of not finding passage, of being taken to the wrong place, or abandoned someplace wholly unexpected, are, in the grand scheme of things, merely inconveniences. But travel on the sea was also fraught with very real threats to life and limb. The distribution of shipwrecks of all periods especially off the rocky coastlines, attests to the adverse weather conditions that prevailed. In the texts, storms seem to appear out of nowhere, and disappear almost as quickly, and are often ascribed to a supernatural source. Synesius of Cyrene, sailing westward along the North African coast between Alexandria and Cyrene in the winter of 396, was caught in several squalls, stranded in the desert, becalmed, and run aground on a reef, all in the course of a single voyage of less than 800 kilometres.[66] His retelling of the rather harrowing experience does manage to bring out the comic elements – he certainly does not seem to have expected that what was probably

[63] Nicholas of Sion, 59. See Map 4.1.1. Andriake is the port for Myra.
[64] Mark the Deacon, *Vit. Porph.* 55.
[65] Rhodian Sea Law, 3.15.
[66] Synesius, *Ep*. 4.

a routine journey would have been quite so problematic! Overland the journey would have taken at least 3 weeks. The uninterrupted sea voyage should have taken about 10 days.[67]

The other source of danger on the seas was pirates and hostile nations. In the 4th century, piracy was in decline, but the conquest of western North Africa by the Vandals changed the game after the mid-5th century. The Vandals were adept sailors and menaced the seaways of the western Mediterranean. In addition to the Vandals in the 5th century, the inhabitants of Isauria and Cilicia were known for engaging in raiding and piracy.[68] Piracy also features in the Rhodian Sea Laws, which make provisions for the restitution of property carried off by pirates.[69]

Another acute danger, especially given the tendency for unexpected delays, was running out of fresh drinking water. According to the Rhodian Sea Laws, drinking water was to be strictly rationed, but if the voyage was prolonged and there was no rainwater collected, supplies could run out.[70] Such an episode is vividly described in John Moschos' *Spiritual Meadow*, where those on board suffer for three days without fresh water and are near death before the captain's prayers are answered and a rain cloud appears.[71] Furthermore, the efforts of the Roman army sailing to North Africa were nearly scuppered when it turned out that their drinking water, stored aboard their ships, had spoiled.[72] This would affect not only the troops aboard the ships, but all the animals they had brought with them as well. *Dromon* crews had enough water supplies to last them for 3-4 days (a

[67] These calculations are based on a conservative estimated speed of 1.8 knots. See Casson 1971, Table 5, 289.
[68] Amm. Marc. 14.2; *Expositio totius mundi et gentium*, 45.
[69] RSL 3.4.
[70] RSL 2.12.
[71] John Moschos, *The Spiritual Meadow*, 173-4.
[72] Procopius, *Vandalic Wars*, 3.13.21-3.

distance of 330 km), but if they were also transporting horses the water would last much less long.[73]

Looked at in this way, the time-saving benefits of sea travel seem to be overwhelmingly offset by its overall unpredictability and danger. One vital factor that might have influenced people's decision regarding their mode of travel is cost. Unfortunately, the sources are remarkably silent regarding the cost of passage on board a ship. This was probably something negotiated with the captain when one embarked. The cost was presumably not exorbitant, although the professions of passengers, when recorded, give an idea of the sorts of people who could afford it. In addition to the holy men and women who are frequent protagonists, others mentioned include aristocrats, bishops, soldiers, a scribe and his family, merchants, and a high-end craftsman: a gem-engraver.[74] All of these were people of professional status and reasonable means.

However, most of the accommodation was decidedly unluxurious – the Rhodian Sea Laws stipulate that men and women are entitled to a space three cubits long and one cubit wide, and children to a space half that width.[75] According to Synesius, the 50 passengers on board his hapless cruise slept on deck, with a sheet separating the women from the prying eyes of the men.[76] The Rule of Pachomius forbids monks from sleeping in the bilge-sink on ships.[77] There is some suggestion that the 7th-century Yassi Ada wreck may have been a passenger ship, due to the presence of the well-appointed galley (with a tiled roof), fine table wares and a large quantity of cooking pots and resin-coated pitchers – far more than would have been necessary for just the crew of a ship of that size (see Fig. 4.1.11).[78] Although there may have been some differentiation, with more luxurious

[73] Pryor and Jeffreys 2008, 449.
[74] Scribe: John Moschos, *Spiritual Meadow*, 174; Gem-engraver: John Moschos, *Spiritual Meadow*, 203.
[75] RSL 2.9 and 2.13.
[76] Synesius, *Ep*. 4.
[77] *Rule of St Pachomius Pt. 1*. See Casson 1971, 181.
[78] Bass 1982, 188; van Doorninck 2004, 49.

berths available for higher status passengers on some ships, on the whole, sea travel sounds rather unglamorous. Passengers were still responsible for their own bedding and food, and it is utterly unclear whether the cost of passage and arranging provisions would have been less than the cost of nightly lodgings and food (and any extra charges for animals) when travelling by land.

In the end, the tales of experiences on the sea passed down to us tend to reflect abnormal experiences: something goes wrong, necessitating divine deliverance that makes it worth recording. Unremarkable voyages are precisely that, and shipwrecks comprise a sample set made up 100% of unsuccessful voyages, and so our evidence is prejudiced towards negative maritime experiences.

There does not seem to be a pervasive cultural fear of sailing, and the threat of mishap is not enough to act as a deterrent against setting foot on board a ship. It is also interesting to note that the law codes, both the Rhodian Sea Laws and the Codex Theodosianus, deal extensively with robbery and jettison and partial loss of cargo, but have very little to say on the subject of total loss. While it is impossible to make an argument ex silentio, it nonetheless seems that there were many ways in which a ship caught in a perilous situation on the sea could limp home, rather than outright loss of ship and all on board being the predicted outcome. However, as Synesius' final friendly advice of 'never trust to the sea!' demonstrates, a sufficiently bad experience might just be enough to change one's views.

4.2 A River Runs Through It

Analysis of the networks of the Roman Near East is often fixated on the terrestrial road networks, the movement of troops and caravans, and it is easy to overlook the rivers that give the region its shape. The rivers are seen as boundaries marking the limits of the empire, and their role as communications channels in their own right remains largely unexplored.

The discussion will be divided into three parts: 1) The physical – geographical, topological and hydrological – realities of these river systems. 2) A wider chronological and ethnographic perspective on how these rivers were used in antiquity and pre-modern times. 3) An examination of the evidence for the use of rivers specifically during the 4th-7th centuries CE; how they were experienced by the military, merchants and pilgrims.

This chapter will look at the Tigris, Euphrates, and Orontes. The Tigris and Euphrates flow through the Roman provinces of Euphratensis, Osrhoene, and Mesopotamia. We will also follow the course of the rivers beyond the limits of the Roman Empire, especially in connection with Julian's expedition to Ctesiphon in 363. The Orontes is located in Syria Prima and Secunda. The Jordan River, although it occupied a place of great spiritual and ritual significance, especially for pilgrims, does not constitute an important waterway. It could easily be crossed by fording, and does not appear to have been used for transport.

Geography

Tigris

The Tigris rises in the Taurus Mountains, at Lake Hazar, at an altitude of 1,150 m, and flows along the plain at the foot of the Zagros Mountains to the Persian Gulf (see Fig. 4.2.1 and Map 4.2.1). Various tributaries fed by rain and meltwater from the Zagros mountains, such as the Khosr, and Greater Zab (Anzaba) and Lesser Zab, feed into the

Tigris, but it is not until the Diyala River joins the Tigris at Baghdad that there is enough water in the Tigris for the river to be navigable year round. The Tigris and Euphrates flow together at Kurnah, just north of modern day Basra in Iraq, at which point the landscape transforms into a watery marshland known as the Shatt al-Arab.

In the north, within the territory of the Roman Empire, the river does not have abundant water, and its use as a waterway is restricted by the seasons. For example, the city of Amida, located on the right bank of the Tigris, would not be able to rely on the river for supply and communications year round. A bridge spanning the Tigris was built at Amida by the metropolitan bishop John Sa'oro c. 484 (see Fig. 4.2.2).[79] In other places, fording is probably the most expeditious method of crossing the river. The water level is low enough apart from the spring meltwater season to make this possible.

Euphrates

Unlike the Tigris, which is rather paltry in its upper reaches, the Euphrates is the queen of rivers. The river forms high in the Taurus from the confluence of the two mountain streams the Kara Su and the Murat Su, at an altitude of around 830 m (see Fig. 4.2.3). As these two rivers are fed by rain and meltwater from the mountains, the Euphrates also experiences seasonal variations in water volume, the water naturally being at its highest in the spring, in April and May. However, it is in the region of Zeugma (Birecik) that the river becomes properly navigable.[80]

Further downstream, the Euphrates is fed by its two main tributaries, the Balikh and the Khabur. These two tributaries are seasonally navigable, but only for floating rafts and light craft. There is abundant water in the Euphrates year round, although the current is subject to variations that can at times make navigation challenging.

[79] *Chronicle of 819*, 4. Parker 1990, 12

[80] Documents from the 19th and early 20th centuries stress Birecik as the starting point for river transport on the Euphrates. Issawi 1988, 265, 240.

The Euphrates can be forded where the bed of the river is higher. There are at least five crossings near Zeugma, for example, on the way to Edessa.[81] In places where the river is both wide and deep, ferries were employed, both in antiquity and today, for transporting both people and livestock (see Fig. 4.2.4).

There is no archaeological evidence for bridges from the Roman or Late Roman period spanning the main course of the Euphrates. Zeugma was famous in antiquity for its bridge; it is now thought that this was likely to have been a pontoon bridge, rather than a masonry bridge. Ammianus makes reference to dismantling the bridge in times of threat, and no masonry footing has been found at the site.[82] At its start, the river's gradient is quite steep – once it reaches Syria, however, the grade drops, and below Hit the gradient is negligible. This is important for considering the possibilities of moving upstream.

The recent damming activities on the Euphrates, for example the building of the Tabqa dam and the subsequent creation of Lake Assad, have significantly altered the hydrological properties of the river, to say nothing of the loss of the archaeological sites in the area under the reservoir. For this reason, earlier descriptions of the river are invaluable. A particularly rich example is the account of the 1835-7 Euphrates Expedition undertaken by General Francis Rawdon Chesney at the behest of the British Government to look into the feasibility of using steamships on the Euphrates as a short-cut to India. This was of course before the construction of the Suez Canal in 1859-69 made the issue moot. The expedition itself met with limited success; one of the steamships sank with great loss of life, although steamships did come to be used subsequently on both the Euphrates and the Tigris, not, however, as a link to India. Regardless, the report compiled by Chesney and his associates is a detailed account of logistics, geographical realities, and ethnographic observations, as well as some excellent lithographs.

[81] Mango 1986, 223; Comfort 2000.
[82] Comfort 2000, 107.

Orontes

Finally, let us address the Orontes, the lesser cousin of the Tigris and Euphrates. The Orontes rises in the Lebanon Mountains, makes its way north across the plains past Hama and Apamea, before curving south at the Amuq plain near Antioch, and draining into the Mediterranean (see Fig. 4.2.5). The river alternates between plunging through mountainous gorges and meandering through sluggish river plains. It is only on the plains, such as the Middle Orontes plain around Hama, or in the Amuq plain between Derkush and Antioch, that the river can be harnessed for human enterprise.[83] The Orontes powers the norias, the waterwheels used for lifting water for irrigation, and water is diverted elsewhere for this purpose. The land along the Orontes is lush and well irrigated, and the river itself is full of catfish (Fig. 4.2.6).

It is, however, largely unnavigable. The Arabic name for the river, Nahr al-ʿAṣi, 'The Rebel River', is illustrative of its 'unruly flow'.[84] The river is narrow, shallow and meandering. The river's course covers a distance of about 350 kilometres, but the meanders add 68% to its total length, 588 km. Closer to Antioch and the sea, where the tributaries, the Afrin and the Kara Su[85], add their waters via the Antioch Lake, one might expect that navigation could be possible, especially joining the city of Antioch with its Mediterranean harbour at Seleucia Pieria. However, steep changes in elevation mean that the water is extremely fast-moving, and there are rapids and rocky hazards. Members of Chesney's Euphrates Expedition learned this to their cost when they attempted to use first rafts and then one of their steamships to mount the rapids to get from the mouth of the Orontes to Antioch: the attempt was a disaster and the journey had to be finished on foot.[86]

[83] Weulersse 1940, 15-20.
[84] Wilkinson 1997, 560. Although the river is said to derive its name from the direction of its flow, which runs from south to north, contrary to the other rivers in the region.
[85] Not the same as the source of the Euphrates mentioned above.
[86] Chesney 1896, 185.

One could then argue that the benefit from the Orontes is that it carves a path between the mountain ranges that can be used for overland transport and communications. While this is to a certain extent true, the terrain on the banks of the river alternates between mountainous chasms and flat plains (near Hama and Antioch). In the plains, the ground is often boggy and would not necessarily be ideal for bulky, wheeled or even animal traffic. For example, Julian complains of the state of a road near Antioch during the winter – if it was within the Amuq floodplain, rising groundwater might have destabilised the foundations of the road; Chesney's horse found crossing the boggy terrain difficult.[87] Bridges at Derkush and at Antioch further indicate that this was a river that was meant to be crossed, not sailed down (see Chapter 2).

Historical and Ethnographic Comparisons

Empires come and go, but to the people who live alongside them, the rivers are a fact of life. Continuity of tradition can be seen for example in the lifestyle of the so-called Marsh Arabs who until recently lived on the Shatt al-Arab, where the two rivers merge and form a great watery marshland. Brought to popular attention by Wilfred Thesiger in the 1960s, the lifestyle of the Marsh Arabs – particularly the way in which they interact with their native landscape in the construction of their reed houses and the construction of their boats that they use for transportation – seems to have remained unchanged for millennia.[88] For example, an early Sumerian alabaster mould (3250-3000 BCE), bears a representation of what looks like a Marsh *mudhif* or ceremonial building.[89] From the early 7th century BCE, there is a relief from the palace of Sennacherib at Nineveh that depicts the reed boats typical of the Marshes; in the 14th century the traveller Ibn Battutah described this region as 'a water-logged jungle of reeds'; and the members of Chesney's Euphrates

[87] Wilkinson 1997, 560; Julian, *Ep*. 58.
[88] See also Kubba 2011, 68-70.
[89] See Strommenger 1962, Pl. 23.

Expedition observed 'a great many canoes of very light build, and coated with bitumen, which are used for taking the inhabitants from house to house and are paddled with great ease and swiftness by one man' (see Fig. 4.2.7).[90]

This demonstrates the importance of bearing in mind that, when discussing the Mesopotamian provinces during the centuries of Roman rule, they should not be considered merely as another region of the Roman Empire, but an ancient landscape, the cradle of civilisation, among the earliest in the world where agriculture, urbanism and writing were practised.

The Land Between the Rivers and the dawn of civilisation

The awareness of early Mesopotamians of their rivers as means for communication and travel, not just irrigation, can be dated archaeologically at least as early as the Ubaid period, the early sixth to fifth millennium BC, based on the finds of pottery boat models found in Iraq and notably at Tell Mashnaqa on the Khabur (see Fig. 4.2.8).[91] The reconstruction of these reed boats bears a strong resemblance to the boats of the marshes described above.

Iconographic representations of boats are abundant in the early Sumerian period. Cylinder seals appear to show some sort of ferry used for crossing the river with livestock (see Fig. 4.2.9). Cylinder seals were personal items and the choice of iconography may represent the owner's profession – possibly a merchant of some sort.

In addition to the iconographic representations there is strong suggestion from the archaeological evidence that the rivers, particularly the Euphrates, played an important role in the earliest colonial expansion. The presence of goods that were manufactured at Uruk in Southern Mesopotamia at the site of Habuba Kabira (3600-3400 BCE) on the Upper Euphrates – and the absence of goods of local production – suggests a) that Habuba

[90] Strommenger 1962, 235; Ibn Battutah, ed. Tim Mackintosh-Smith 2002, 59; Chesney 1868, 286
[91] Akkermans and Schwartz 2003, 167-8.

Kabira (and other similar sites) were colonies of Uruk, and given the amount of pottery whose origin has been petrographically traced to Southern Mesopotamia b) that the river played an important part in, firstly, transporting the goods found at Habuba Kabira from the south, and, secondly, in transporting whatever goods or raw materials the colony was set up to acquire back downriver to Uruk. Bitumen residue found on the pottery may be from Hit on the central Euphrates and may have been used to caulk boats.[92]

River transport in the Neo-Assyrian Empire (934-609 BCE)

From the 4th millennium to the 8th century BCE: the Neo-Assyrian Empire. Separated as they are by nearly a millennium in time, it might seem something of a stretch to directly compare the Neo-Assyrian and Roman Empires, But there are definite similarities between the two in that both empires spanned a vast yet disparate territory, both were militaristically highly developed, and had a complex administration whose purpose was to maintain communications between the central power and the periphery, and to organise the distribution of resources and supply.

It is this administration that interests us particularly for the Neo-Assyrian Empire, because what is conspicuously lacking for the Mesopotamian provinces in the Roman and Late Roman period is an administrative archive, such as can be found in Egyptian papyri and that provides invaluable information about traffic on the Nile.[93] For the Mesopotamian empires we do have a record in the comparatively indestructible cuneiform tablets, and the administrative letters of the court of Sargon II (721-705 BCE) found at Nineveh contain exactly the sorts of minutiae that inform us about different forms of river use. Casting back in time to the Neo-Assyrians can in fact be more informative for Late Antiquity than seeking out comparative material from contemporary

[92] Akkermans and Schwartz 2003, 196.
[93] Although even papyri related to river traffic are relatively rare among Egyptian papyri, but this is an artefact of preservation conditions. Adams 2007, 15.

Egypt, as the cuneiform texts tell us about specific responses to the conditions that exist on the Tigris and Euphrates, which are different from those on the Nile.[94]

A look through the administrative correspondence of Sargon II yields a number of letters that deal specifically with river traffic. Of particular relevance are those regarding the military and those regarding the transport of goods – particularly building materials.

The letters regarding the military are particularly informative because they address the identical problems faced by the Roman army in their wars against Persia: how to get the army across the river. Even the solutions seem similar: a combination of fording, swimming, ferrying, or building bridges. The first letter is addressed by a general to the king, and deals with getting the army – and the king himself – across a river that is flooding. It seems that the solution is to build a bridge.[95] The bridge is likely to be a temporary structure, possibly a pontoon bridge such as those used by both the Romans and the Persians later on. Animal skins could be inflated and attached to a raft, several of which could be linked together to form the bridge (Fig. 4.2.10).[96]

In the second excerpt, a general objects to the King's choice of route, as it requires crossing a difficult river (possibly the Diyala, high in the mountains), which is described '…the waters are constricted and the current is strong, not fit for using either wineskins or *kelek*s. The king, my lord, knows that the men cannot swim.'[97] *Kelek*s are rafts; inflated wineskins can be used either to add buoyancy to the raft, or as individual flotation devices (see Fig. 4.2.11). This echoes a similar problem recorded in Ammianus, where many men

[94] The river flows from south to north, while the winds are from a northerly direction and enable travel upstream. For more on river traffic on the Nile, see, e.g., Bagnall 1993, 34-38; Casson 1971, 11-20, 340-3; Adams 2007, 208.
[95] Corr. Sargon I.47.
[96] Amm. Marc. 24.3.11 mentions using skins to make bridges (*constratis ponticulis multis ex utribus*).
[97] Corr. Sarg. II.200 (p. 145).

die in a retreat across the river because they do not know how to swim. The Assyrian general proposes finding another route.

It seems from the letters that most of the transportation of grain, foodstuffs and commercial items in Assyria was done over land, using carts, mules, etc.[98] The items that were shipped by river were bulky construction materials: timber, beams and stone lintels, mostly intended for the construction of Sargon's palace at Dur-Šarruken (Khorsabad), located 20 km up the Khosr from Nineveh. The Zagros Mountains are a natural source of timber – in fact, timber is relatively rare elsewhere in Mesopotamia. The construction of the palace required vast numbers of large timber elements for roof beams and gates. The easiest way to transport the timber was of course by river, floating the logs downstream, as is still common practice today. This was not without its problems, however. One complaint is that the water is too low to transport the timber: '[Because] it has neither rained nor snowed […], the[re is] no water in the river.'[99] 'As to the message [*which I got*]: "Why [are the beams late]?"… the water in the river is [low], and the difficult spots of [the river *are many*].'[100]

This helps to demonstrate the seasonality of the rivers, especially the tributaries of the Tigris, whose flow of water is dependent on the snowfall in the Zagros. At other times, low water levels could be a bonus, as with the hauling of the colossal winged bulls which came to adorn Dur-Šarruken: 'Aššur-šumu-ke'in called me to help and loaded the bull colossi on the boats, but the boats could not carry the load (and sank). Now, although it cost me a great trouble, I have now hauled them up again.'[101] A more successful

[98] The exception is Corr. Sarg. II.233, which specifically mentions an 'old boat we use for shipping straw, fodder and all sorts of things'.
[99] Corr. Sarg. II.26
[100] Corr. Sarg. II.117.
[101] Corr. Sarg. I.119. An interesting corollary to this story: when the excavators of the site attempted to ship the artefacts back to Europe, most of the shipment sank: 'The major part of these (stone sculptures, objects of art in bronze and terracotta) were laden upon four *keleks*, or native sheep-skin boats, and upon one larger boat, and sent down the river. Two of the *keleks* and the larger boat were scuttled by Arabs at Kurna and the contents sunk in the river.'Rogers 1915, 199.

alternative was to wait until the water level was low, and then haul the statues across the river 'manually', as can be seen from palace reliefs, where an unworked block of stone is being dragged ashore by a cast of thousands (Fig. 4.2.12).

Another typical vessel type in Mesopotamia is the *quffa*, a type of coracle made from wicker or leather. Neo-Assyrian reliefs show them to be multi-purpose, used to ship heavy stone elements, like the stone lintels and basalt blocks mentioned in the Sargon archive (see Fig. 4.2.13).[102] Identical vessels are visible in the lithographs from the Chesney Euphrates expedition, one that shows similar coracles, and another that shows swimmers on inflated skins, identical to the one being used as a flotation device by the fisherman in the in the Assyrian relief (Fig. 4.2.14). They are easy to control in strong currents, and are unlikely to capsize even in windy conditions.[103]

This description of ancient and ethnographic comparanda has provided some sort of an idea of the types of vessels and river use we might expect to have persisted in the Late Antique period. After all, it is far more likely that, rather than the suppression of indigenous practices by an external imperial power and the imposition of 'imported' practices, we might expect that local traditions would have persisted through the centuries of Late Antiquity as well. This is especially likely given that evidence for indigenous vessels exists on both sides of Late Antiquity, and they were designed specifically for the local conditions. For example, the type of river boats found on the Rhine in Germany – between 10 and 21 m in length – would not have been successful on the Euphrates.[104]

The reason for this excursion into ethnographic comparanda is that there is very little in the way of direct evidence for the use of the Tigris and Euphrates as channels of communication and transport in Late Antiquity – certainly not in terms of archaeology.

[102] Corr. Sarg. I.56 and I.58.
[103] Issawi 1988, 265.
[104] Höckmann 1993, 133; the Rhine boats may have been adapted from Nile boats of Hellenistic and Roman Egypt.

There have been no discoveries of riverside quays or preserved examples of boats, such have been found on the Rhine. It is not even entirely possible to create a find distribution map – like ones created for the distribution of 6th – 7th century CE Egyptian copper vessels found in the Rhine valley – where the scatter of finds so clearly reflects the location of the river and its tributaries as to make it quite evident that the river provides the underlying mechanism of their distribution.[105] This is because while there are obviously sites that are located along the Tigris and Euphrates rivers that have occupation at the correct time, and their *raison d'être* is clearly related to the river, it is nonetheless impossible to infer that the objects found there reached the site by the river, because in the case of the Tigris, Euphrates and Orontes, the valleys and plains along the river provided an excellent basis for land routes, which were extensively used.

There and Back Again?

This brings us to one final issue, the matter of propulsion. In most cases, the current alone would be enough to carry a craft downriver, using just poles, paddles or a rudder for steering. The big question then becomes: how do you get back upriver? Not everyone could do what Julian did and just burn their ships when they got to their destination.

One method is of course manual propulsion – i.e., rowing. Some of the ships we see have oars, and textual sources specific to the Late Antique period mention oars and rowers. However, the oars are intended primarily for steering the boat as it moves downstream.

However, what is extremely noticeable about the representations of ships from the early millennia is the absence of sails. Nile boats and seagoing vessels had sails by that period, and certainly in the lower reaches the Euphrates and the Tigris would both be wide enough for ships to manoeuvre with sails. What is less clear is whether some of the

[105] See Mundell Mango 2001.

sketchy representations of boats from mosaics in Late Antiquity are in fact showing boats with masts and therefore sails. One must conclude that the current prevents sails from being effective in manoeuvring a boat upstream. We know very little about the craft that might have sailed along these rivers apart from what we can infer by analogy from earlier and later periods. The extent to which vessels had sails is unclear, but many were equipped with oars and could thus manage the voyage upstream as well as down, where the river gradient is low enough.

Towing is another option, although it is really only feasible in lower Mesopotamia, where the flat alluvial plain provides an adequate walking surface adjacent to the river.[106] Frustratingly, there are no accounts from Late Antiquity that I have been able to find of river traffic on the Euphrates or Tigris going upstream. Herodotus mentions that light craft were dismantled and carried back by donkeys.[107] Similarly, documents from the Ottoman period also suggest that small craft were broken up and the wood of their planking was sold.[108] See also Fig. 4.2.15, showing two men with their *quffa*s strapped to their backs, preparing to carry them upstream. The only modern account of struggling against gravity and the current that I have found so far is in Freya Stark's 1966 account on the Upper Euphrates:

> I have been towed up it for an hour or two to the castle of Rum Kalesi in the southern defile, in a boat like a box, with an old fisherman punting and three chairs set for me and my companions, so that we must have looked from outside like those half-figures of late Greco-Roman tombs. Two men clasped a rope knotted over short sticks for holding, swung us clear of boulders in the windless reaches…[109]

[106] See Thesiger 1964, Fig. 83. See also Issawi 1988, 240.
[107] Herodotus, *Histories*, 1.194.
[108] Issawi 1988, 240.
[109] Stark 1966, 110.

Late Antiquity

Iconography

The rivers continued to be an important part of the 'environmental psychology' of the empire. In polytheistic practice the rivers were deified and both celebrated and appeased by means of ritual.[110] In a Christian context, the Tigris and Euphrates were two of the rivers of Paradise.[111] However, unlike in the ancient Near Eastern material we have just seen, iconographic representations of the rivers are far from realistic – in fact, the most common representations take the form of personifications. Sometimes, in the absence of labels, the identity of the river personified is a matter of educated guesswork. A personification of the Euphrates has been excavated at Zeugma, and another of the Orontes found at the baths in Ghallineh near Latakia (Figs 4.2.16-17) Both are dated to the 3rd century, and there is one of the Tigris found at Antioch that dates to at least the 2nd century (Fig. 4.2.18).[112] It was probably paired with a medallion with a personification of the Euphrates, which has been lost. Generic personifications of Oceanus or Tethys or unidentified river nymphs are also common. What are commonly termed 'Nilotic' scenes are abundant, with a wealth of different species of fish depicted. While such scenes are of course almost universal, appearing with equal likelihood in sites in the middle of deserts as in those close to rivers, one likes to think that some inspiration was drawn from the local riverine life, not just idealised concepts of the Nile derived from a pattern-book.

Textual Sources

In the Late Antique period, the region of Mesopotamia was highly militarised. The entire zone between the Tigris and Euphrates was contested territory, and the actual 'border' if such it could be called – or who controlled which bank of which river – reverted from one

[110] Kennedy 1998, 241; Braund 1996, 46.
[111] Levi 1947, 59.
[112] Zeugma: Onel 2009, 63; Tigris: Levi 1947 Ixb; Orontes: Balty 1977, 14-15.

side to the other with some frequency. Recent studies into Roman frontiers and the concept of the *limes* have cautioned against understanding rivers exclusively as demarcations of boundaries, but to bear in mind that they are permeable, both laterally and longitudinally.

However, an examination of the textual sources, particularly the accounts of the campaigns of the mid-4th century in Ammianus Marcellinus, and the mid-6th century in Procopius, shows that in Roman military consciousness, the lateral permeability was emphasised: *crossing* the river occurs far more frequently than *navigating* along it. I use the second term advisedly – while movement and transport by land following the course of the river is frequently referred to, very little indication is given of the extent to which transportation on the water itself was carried out.

As was the case in the Neo-Assyrian period, there were three principal ways of crossing the river with an army. One could ford the river at a shallow spot, one could swim or be ferried across, or a temporary bridge could be built. These are not especially complex or localised solutions: Ammianus describes similar practices along the Rhine, and Vegetius recommends just such a practice in his military handbook, and the builders of bridges, even pontoon bridges, were part of a corps of specialists.[113]

In Ammianus' account of the campaigns, pontoon bridges are used by both sides. The construction of a pontoon bridge, familiar to most of us from the representation on Trajan's column, required the hauling of small boats and boards, as well as having skilled engineers to set it up. However, once accomplished, the army could cross the river with relative ease.

Procopius comments on the Persians' use of portable timbers with which they 'improvise a bridge on the spur of the moment wherever they desire' (2.21.26). Curiously,

[113] E.g., 17.10.1, or crossing the Danube on a bridge of ships, 17.12.4. Vegetius, *De re militari* 3.7.

there is no reference to the Roman army constructing temporary bridges as was clearly the common practice in Ammianus' day.[114] Instead, the Romans seem to rely more on local boats to ferry themselves and their equipment across (while ordinary soldiers have to swim).[115] The *Strategikon* of Maurice does however mention the practice of building temporary bridges on campaign, so the technique was not totally lost.[116] The passages in Procopius dealing with war on the Euphrates are few, as not much fighting took place in this area. The Persians avoided the Middle Euphrates for their incursions because it was well-fortified, instead attacking the less well-defended cities of Mesopotamia, Syria, and Palestine.

Despite the profusion of heavily garrisoned forts along its banks, the Romans never maintained a fleet on the Euphrates.[117] The only description of the river being used for navigation in a military campaign is the discussion in Ammianus of Julian's fleet in his campaign to Ctesiphon in 363. Arriving just downriver of Callinicum, 'the broad Euphrates was almost too narrow for it, consisting as it did of a thousand cargo-carriers of varied construction, and bringing an abundance of supplies, weapons, and also siege-engines; there were besides fifty warships and an equal number which were needed for making bridges.'[118] The ships for the fleet were built at Samosata, where timber was abundant.[119] According to Magnus of Carrhae, there were 1,250 vessels in total, some made of wood, and others of leather. Tardieu argues that these ships were not *quffa*s or *kelek*s, but larger vessels known as *šaḫtūr*s or *shakhtur*s, a sort of flat-bottomed barge. *Kelek*s are not used on Euphrates because the current is much faster than the Tigris.[120] *Shakhtur*s were still visible on the Euphrates in the early modern period. They are

[114] Trombley 2007, 327.
[115] Procopius, *Persian Wars*, 1.18. 49-50.
[116] Maurice, *Strategikon* 11. 4.75.
[117] Dabrowa 2007, 239; Dabrowa 1997, 109; Saddington 2001, 583.
[118] Amm. Marc. 23.3.9.
[119] Malalas 13.21.
[120] Dabrowa 2007, 238 n. 22; cf. Tardieu 1990, 85-102.

constructed of planks of wood rather than leather, and have a shallow draft and a box-like outline (Fig. 4.2.20). They can be lashed together and sailed in pairs, or they can be used to create a platform for a ferry (Fig. 4.2.21). The *Military Report on Mesopotamia* (1923) notes that they are built near Birecik, and are capable of carrying a cargo of five tons. The document also comments on the speed and efficiency with which they can be constructed.[121]

Julian's fleet, which was supplemented by additional ships bringing supplies, proceeded downriver from Samosata. Just past Anah (Anatha), the fleet was struck by a sudden wind storm, followed by the flooding of the river which resulted in the sinking of several ships, including ships carrying grain.[122] Chesney noted that this location is not far from the spot where one of the steamers of the Euphrates Expedition was overturned and sank in a sudden violent squall that lasted no more than 12 minutes from start to finish and resulted in the death of 20 men.[123]

The remainder of Julian's fleet continued downstream. However, the majority of the infantry, cavalry and pack animals were of course on foot. This caused problems as the terrain became increasingly marshy, or animals and men had to swim across the river.[124] Having eventually reached Ctesiphon on the Tigris via an artificial channel ascribed by Ammianus to Trajan and Septimius Severus, but in reality probably much more ancient, Julian rashly decided to burn his boats in order to save on manpower and prevent the ships falling into enemy hands. He kept enough to build a bridge with. But as the season of flooding was at hand, they could no longer build a bridge long enough to cross the river in spate, so the army was trapped on the left side of the Tigris with the enemy closing in. When the army finally did make it across the river, after Julian's death,

[121] *Military Report on Mesopotamia* 1923, 12.
[122] Amm. Marc. 24.1.11.
[123] Chesney 1868, 261.
[124] Amm. Marc. 24.2.7-8; 3.10-11.

the situation resembled precisely the sort of chaos that the Neo-Assyrian general of 1,200 years previously tried to prevent:

> Each man strove to outstrip all others and hastened to save himself from so many terrors; some used the hastily constructed rafts, holding to their horses as they swam here and there, others seated themselves on bladders, still others under the pressure of necessity found various other helps and rushed in an oblique direction into the waves of the onrushing waters. The emperor [Jovian] himself with a few others crossed in small boats, which, as I have said, survived the burning of the fleet, and ordered the same craft to go back and forth, until we were all transported. At last all of us (except those who were drowned) reached the opposite bank, saved from danger by the favour of the supreme deity after many difficulties.[125]

Overall, it seems that the rivers were not used for the transport of troops or even supplies for the army on the march with regularity. Julian's expedition to Ctesiphon was likely an exception, due to the distance covered. Marcian similarly attempted to march to Ctesiphon, however, the attempt was unsuccessful, and the ships transporting supplies were burned at Callinicum when the venture was cancelled.[126] It is abundantly clear, however, that smaller, 'native' or 'civilian' ships – fishing vessels and freight boats – were common on both the Euphrates and the Tigris. Theodoret's *Historia Ecclesiastica* mentions the exiled Bishop of Samosata who 'embarked on a boat and told the oarsmen to row to Zeugma'.[127] The Neo-Platonist philosopher Simplicius, in his commentary on Aristotle's question of whether inflated skins are heavier than uninflated ones, observed that 'once they are inflated and placed upon the water, they are capable of carrying a heavy cargo, as I myself have experienced on the river Aboras [Khabur].' This appears to testify to the continued use of *kelek*s for transportation through the Late Antique period.[128] Very few western pilgrims to the Holy Land made it all the way to

[125] Amm. Marc. 20.8.1-3 (Rolfe 1935-40, 537-9).
[126] Trombley 2007, 327.
[127] Theodoret, *Historia Ecclesiastica*, 4.13.
[128] Simplicius, *In De Caelo*, quoted in Tardieu 1990, 74.

Mesopotamia: Egeria, however, on her way to Edessa, records that she crossed the Euphrates, which she describes as huge ('*ingens*') and terrifying ('*terribilis*') – probably her crossing occurred at the height of springtime meltwaters. She and her retinue made the crossing on big ships ('*navibus maioribus*'), possibly one of the cattle ferries seen above.

Tigris and Euphrates sites

Given the status of the area between the Tigris and Euphrates as a *limes*: a frontier area of vacillating ownership, high military presence and repeated threats for civilian communities, it is unsurprising that archaeological research has focused on the military aspect of the region. Because much of the work undertaken has been survey work – in particular the aerial surveys done by Poidebard – it is also easy to lose track of the fact that the *limes* and its fortifications were far from static. There is no time here to go into the intricacies of the disposition of legions rearranged at various times under, e.g., Diocletian, Theodosius and Justinian, but this meant that 3rd century forts might easily be abandoned by the 4th, only to be refortified in the 6th. This is the case with Qreyie-'Ayyash, which was built and occupied briefly in the 3rd century, but the fortified Late Roman settlement is located at Tall ar-Rum on the opposite bank of the river (which turns out not to be contemporary with the fort, as was originally assumed).[129]

Surveys have been carried out on the area between where the river's course turns east and Circesium, showing that the area actually enjoyed a degree of stability and development after the 4th century. The survey counted 17 Late Roman settlement sites, and an additional four of unconfirmed Late Roman date.[130] The fortresses at Circesium and Zenobia were renovated under Justinian.[131] There are also a number of sites of Late

[129] Gschwind 2009.
[130] See Geyer and Monchambert 2003.
[131] Procopius, *Buildings* 2.6.1-11; 2.8.11-35.

Roman date on both sides of the river along this stretch, possibly related to the new military road that crossed the river at Susa and proceeded down the left bank towards Circesium.[132]

Zeugma, on the other hand, also suffered from the departure of its legion, and its Late Roman settlement has yet to be properly explored.[133] The stretch of the Euphrates between Zeugma and Callinicum has been affected by the Birecik and Tabqa dams which have flooded many of the settlements that would have lain on the banks of the river. The Tigris-Euphrates Archaeological Reconnaissance Project in the late 1980's conducted surveys prior to dam construction on the upper Tigris and Euphrates basins (near the Turkish-Syrian Border) and also found several Late Roman military sites along the upper Tigris.[134]

The question then arises of to what extent the rivers might have been preferred over land routes for supplying these various forts. There are numerous problems with answering this question. The first is that there is no way of knowing precisely how goods were transported to these various sites. The presence, for example, of amphorae manufactured Zeugma among the Late Roman assemblage at Zenobia located downriver is suggestive but not conclusive of products being shipped downriver.[135] The land routes also follow the rivers, and unlike the rivers are less likely to be subject to sudden change brought about by the seasons or the weather upstream. Another potential problem of using the rivers to supply the forts could also be one of security: ships on the river would be quite exposed, especially given the uncertainty of enemy movements along the rivers.

[132] Gschwind 2009, 1600.
[133] Elton 2013, 378.
[134] See Algaze 1989.
[135] Nairusz Haidar-Vela, 'Halabiya Zenobia: boire, mangér, stockér au VIIème siècle', Between Constantines: Manifestations on an Empire, Oxford, March 5, 2011. See also Reynolds 2013, 105, who notes that the 7th century amphora assemblages at Zeugma are indicative of 'sources along the Euphrates supplying their local regional amphora-borne products more directly to sites on the Euphrates.'

The Orontes in Late Antiquity

Finally, let us return again to consider the Orontes. When regarding its topological and hydrological properties, it is easy to be dismissive. Combining my own observations with the observations of scholars of the ancient world and the observations of early modern travellers, the Orontes makes for poor navigation. There is no ancient evidence comparable to that cited for the Euphrates and Tigris to indicate that it was used for river transport, and there are no early modern ethnographic comparisons of the river itself being used for communications. In fact, one known attempt to use the river for transport to inland Syria, by the Chesney expedition, was markedly unsuccessful.

Nonetheless, there are a handful of anomalies from Late Antiquity that potentially contradict this view and must be accounted for. The first is an inscription dated to 352 found carved into the natural rock at Derkush that identifies Maraonos the *naupegos*, a shipbuilder.[136] How do we account for the presence of a shipbuilder so far inland – is he connected with the Orontes in some way? The editors of the inscription infer a vast shipbuilding industry on the Orontes from this instance. Lionel Casson, however, uses the term as a ship's carpenter.[137] Since the inscription commemorates Maraonos' mother, it might even be possible that Maraonos himself is no longer a resident of Derkush, but has moved to the coast, and has returned only upon the death of his mother.

The second anomaly is the iconographic representation of boats in mosaic pavements known to come from the vicinity of the Orontes. Two, now in the museum at

[136] *IGLS* 665.
῎Ετους τετρακοσιο-
στοῦ μηνὸς Παν-
ήμου ζκ', Εὐτίχις
Μαραωνος ναυπη-
γὸς ἔνθα ἐξεκόμισ-
α Δο<μ>ετίλλαν τὴ-
ν γλυκυτάτην μοῦ
μητέρα. Εὐθύμι,
μήτηρ, οὐδὶς ἀθὰ-
νατος
[137] Casson 1971, 320.

Ma'aret an-Numan, clearly show boats with oars. (Fig. 4.2.22) They are laden with amphorae, suggesting they are being used for transport, not as fishing boats.

Surveys carried out in the Orontes Valley, particularly in the region of the plain of Hama, indicate that, as elsewhere in the Near East, during the Roman and Late Roman periods settlement patterns changed, with settlements spreading out into previously uninhabited areas to the west, away from the river, and extensive agricultural exploitation.[138] The personifications found in mosaic pavements as mentioned above are associated with fertility. Representations of norias for irrigation at Apamea further confirm that the main benefit to the region was the river as a source of irrigation, not transportation.[139]

Yet another mosaic pavement, from Apamea, shows a passenger paying for passage on a small boat, possibly another passenger having disembarked on the other side (Fig. 4.2.23). Are these meant to be representations of genuine activities on the Orontes which flows near where they are found, or are they part of an idealised 'Nilotic' composition bearing no resemblance to local realities? Certainly the quay on this one looks too developed to be a riverside dock – and there is a structure on the left that appears to represent a lighthouse, suggesting a sea port setting. Could it be the tower of Pharos? Is this in fact a representation of Alexandria in Egypt, and not Syria at all? And what are we to make of Libanius' Oration 11, when he praises the river for providing Antioch with all manner of goods, and, moreover that 'the river, as it flows to the sea after leaving the city, is not impassable to ships'? Libanius is engaging in encomiastic hyperbole, he is trying to build up his city's image at the expense of Alexandria, inspiring a comparison between the Orontes and the Nile that leaves the latter the worse, and is patently false.

[138] Bartl 2009, 519.
[139] De Miranda 2007, 53, Fig. 44.

A law of 369/70 discusses the Orontes specifically. The fleet of Seleucia Pieria is ordered to assist the *comes Orientis* with the clearing ('*purgandi*') of the Orontes.[140] This is assumed by Jean Rougé and Andrew Wilson to refer to the dredging of a river port, although the law does not say what is being cleared or for what purpose.[141] Evagrius mentions that the river was used for dumping bodies in the riots of 511.[142] Perhaps the earlier law refers to dredging the river of rubbish.

Between Antioch and the coast is a height differential of 87 m over a distance of less than 40 km, producing a gradient of 0.2% (See Fig. 4.2.5) While this is not a particularly steep gradient generally, the narrow chasms through which the water must flow would increase the rate of flow. The navigability of the river between Antioch and the sea depends on the time of year and flow of water, and also the direction travelled in. The Chesney expedition was trying to get something much too big going in the wrong direction in winter when water is naturally low. Nevertheless, this must leave a narrow window during the summer when the stretch is navigable.

These examples are curious, but far from conclusive about river traffic on the Orontes: while small boats – rafts or punts – might have been used along certain sectors, certainly the whole thing was not navigable from source to sea. The Antioch Lake, drained between the 1940s and the 1970s, was described by Libanius as having a wealth of fish, and also that markets were held along its shores. Photographs from the 1930s do show boats on the lake, small, canoe-like fishing vessels. These types of boats are used even in the present day to ferry people from one side of the river to the other. I suspect that this represents the true extent of riverine activity on the Orontes: small boats used almost as taxis to cross the river.

[140] *C.Th.* 10.23.1.
[141] Wilson 2011, 51; Rougé 1975, 182.
[142] Evagrius, *Historia Ecclesiastica* 3.32.

It is natural for people to maximise the natural resources of their environment. However it would be wrong to assume a grand scale of shipping such as was possible on the Nile, the Rhine, or the Danube, could have taken place on the Euphrates, Tigris, or the Orontes. However, these rivers formed part of the natural environment. They could be harnessed for irrigation, and likewise harnessed for transport, using traditional methods by people accustomed to living on their shores. The rivers played an important part in the 'environmental psychology' of the empire, not just for marking the rough limits of the empire, but also as potent symbols of natural power.

Chapter 5 – Case Studies

This chapter is devoted to four case studies aimed at illuminating specific sectors of the Late Roman road network in response to specific conditions of the 4th-7th centuries that are distinct to that period. These are: maintaining communications with the newly-established imperial capital at Constantinople; maintaining military supply lines and defenses along the Mesopotamian frontier with Sasanian Persia; the shifting caravan routes for long-distance trade and the rise of cultivation and trade in agricultural produce in previously marginal areas; and, finally, the investment in pilgrimage infrastructure to the burgeoning *loca sancta* of Palestine.

5.1 Imperial Connections: Routes of communication between the Levant and Constantinople

The establishment of Constantinople as the capital of the eastern Empire created a new focus of power for the east, with the provinces of the Levant being subordinate to Constantinople for all administrative, military and judicial matters. In the late 3rd century, Diocletian reformed the provincial administration of the Empire. On the one hand, provinces were divided to give individual governors fewer overall duties and enhance their ability to focus on the administrative and especially judicial needs of the populace. The reduction in size of the provinces also shortened the distances required for communication with the governor and thus limited delays and distortions of information.[1] Military command was given over to the *dux* rather than the governor, in order not to

[1] Sipilä 2009, 125.

have too much power concentrated in one place. On the other hand, a new administrative level, the diocese, was created to provide oversight to groups of provinces.

The diocese of Oriens, to which the provinces of the Levant belonged, was headed by a *vicarius* (known as the *comes Orientis*), and its capital was at Antioch.[2] The dioceses were then a subdivision of the praetorian prefectures, formalized as a new administrative level under Constantine. The praetorian prefect of the east (*praefectus praetorio per orientem*) was in charge of the dioceses of Oriens, Egypt, Asiana, Thrace and Pontus; he resided at Constantinople. The *comes* at Antioch answered to both the praetorian prefect and the emperor, and all major decisions regarding the provinces were made at the imperial level.[3] Although changes were made to the extent of the individual provinces throughout the late Roman period, the system of dioceses and prefectures remained more or less the same until the 7th century.

The importance of Constantinople did not diminish through the centuries of Late Antiquity – if anything, it increased, especially as the imperial court assumed its permanent station there around the time of Theodosius II, and emperors rarely led military campaigns in person. Conversely, in the 4th century Antioch was a popular place for emperors to base themselves during the winter, and information would thus have to flow there from Constantinople and the western reaches of the Empire. The fiscal officers travelled with the court, but also increasingly came to be based in Constantinople. The praetorian prefect was in charge of drawing up the state budget, levying taxes from his prefecture, and in charge of the disbursal of tax revenue to the army and public works. His counterpart was the *comes sacrarum largitionum*, who collected other taxes and also contributed to public works.

[2] See Map 5.1.1 for sites mentioned in this section.
[3] Bury 1923, 27.

Communications

Communications were crucial for both the emperor and the praetorian prefect to make informed decisions regarding matters in the provinces. Intelligence was carried by individuals, whether messengers on horseback or by ambassadors, petitioners and other travellers. The constraints of travel therefore impacted the way in which information was delivered – delays due to poor conditions on the road could mean that by the time the information was received it was no longer accurate or relevant.[4] It was therefore in the best interests of the Empire to keep the routes to the capital passable and in good condition.

The transmission of information relied on the transmission of people: the *cursus velox* was at the disposal of messengers on horseback carrying urgent messages from officials to the capital. Less urgent messages could be carried by officials themselves, or on behalf of a colleague, should individuals need to travel to the capital on other business. In the Christian empire, clergy, too, would travel to court or be summoned to councils. For example, Ephesus was chosen as the site of the Council of 431 because it would be easily accessible by sea to delegates from the West, yet it was the eastern delegations that were delayed by the conditions on the roads.[5] There were complaints about the strain placed on the *cursus publicus* by 'junketing bishops'; Julian issued a law curtailing use of the service by both bishops and other officials, although he was not above supplying diplomas for his own friends.[6]

[4] Sipilä 2009, 32; see 32-52 for the role played by communications to and from the provinces in the imperial decision-making process; see also Duncan-Jones 1990, 7-29 and especially Table 5 for delays in official communications.
[5] *CE*, 'Council of Ephesus', quoting a letter from John of Antioch, says 'the journey of thirty days had been lengthened by the death of some horses; he would accomplish the last five or six stages at leisure. But he did not arrive, and it was said that he was loitering because he did not wish to join in condemning Nestorius.'
[6] Casson 1974, 300-4 esp. note on p. 364; *C.Th*. 8.5.12; Julian, *Ep*. 1, *Ep*. 15, *Ep*. 26, *Ep*. 44, *Ep*. 45, *Ep*. 54.

Transporting Revenue in Kind and Coin

Not only would the circulation of information and the mobility of personnel have been necessary for the functioning of the state, but also the circulation of certain goods particularly as part of the gathering and dispersal of tax revenue. While the system is reasonably well understood in the abstract, the actual, physical storing and shipping of revenue is less well known. In the 4th century, as a result of Diocletian's fiscal reforms, taxes were primarily exacted in kind.[7] The primary wealth of the Empire derived from agriculture, and for much of the 4th and 5th centuries, most of the taxes were gathered in agricultural produce. Most of this went directly to feed the army stationed in the province or near-by; being perishable, agricultural produce would have to be used up quickly and could not be used to build up a reserve.[8]

A portion of the taxes in kind levied on agriculture was however shipped directly to Constantinople to feed the citizens of the city. When this grant was first launched in 332, there were 80,000 recipients, which was expanded to 81,000 in 392. In Justinian's time the recorded annual grain shipment to Constantinople was 80,000,000 *artabae*, which Jones estimates would have been enough to feed 600,000 people.[9] However, the principal source of grain was Egypt, rather than the Levant, and the grain shipments reached Constantinople by sea. However, as is discussed below, some of the agricultural surplus of the Levant – olive oil from Syria or wine from Palestine – was intended for Constantinople, either as taxes levied or sold commercially. These products were most likely transported by ship; however, from northern Syria especially the overland distance is shorter than the distance by sea; 1,132 kilometres versus 1,300 kilometres. The relative costs of sea versus land transport are discussed elsewhere, and the prevailing winds in the Mediterranean would impose their own seasonal constraints on sea transport.

[7] *ODB*, 'Fiscal System'.
[8] Jones 1964, 458-462.
[9] Jones 1964, 696-8.

However, land taxes were increasingly commuted to coin, and during the reign of Anastasius the payment of even land taxes in coin (*chrysoteleion*) was reintroduced. This suggests the increased need for cash on the part of the imperial administration, probably in response to the wars on the eastern frontier and Anastasius' fortification projects there. The greatest drain on the imperial revenue was the army, and the soldiers were paid in coin, making the initial levying of taxes in coin a more sensible solution in times of heightened military activity. This is especially true during the reign of Anastasius, as he gave the war-ravaged provinces a relief from taxes, which normally would have been exacted in kind to feed the army.[10]

It is sometimes assumed that the taxes levied in coin were transported to Constantinople from the provinces and disbursed from there; however, this would have been logistically risky given the vagaries of travel at the time. Taxes gathered from non-state owned sources would be held either in the treasury of the praetorian prefect, known as the *arca*, or in the treasuries of the *sacrae largitiones*. The disbursal of this tax revenue in the form of army salary and funds for public works would have been overseen by the praetorian prefect and the *comes sacrarum largitionum*, who would themselves be based in Constantinople (especially after the 4th century). However, given how undesirable it would be to expose the wealth of the Empire to harm by attempting to move it, it seems likely therefore that the physical revenue collected would have been housed in treasuries (*thesauri*) attached to the regional mints, under the disposition of the praetorian prefect and the *comes sacrarum largitionum*, rather than transported over land or by sea to the imperial capital and disbursed from there.[11]

[10] Pseudo-Joshua the Stylite, 92 for Mesopotamia, 99 for Edessa and Amida. Procopius also mentions tax remissions for Amida, *Persian Wars*, 1.7.35.
[11] The Notitia Dignitatum lists *thesauri* attached to regional mints in the west; for the east they are presumed to have existed at Cyzicus, Alexandria, Philippolis, Nicaea, and Antioch. *Not. Dig.* 11.39-44; Hendy 1985, 383-4, n. 51.

Other goods likely to have been travelling either to Constantinople or Antioch are raw materials. The Taurus Mountains, which separate Asia Minor from Syria, abound in mineral wealth, and were exploited since pre-classical antiquity.[12] Other key mining regions included the Balkans, the Pontic coast, Cyprus and the Fainan.[13] A variety of metals, such as copper, iron, lead, tin, silver and gold were extracted from mines in the Taurus, as well as the cobalt used to make blue mosaic tesserae.[14] Some of the gold, silver and copper could have been minted into coins; there were imperial mints at Constantinople and Nicomedia and at Antioch, although after the mid-4th century the regional mints ceased to strike gold coins.[15] There was limited minting of silver coinage before 615; however, silver was nevertheless mined and converted into silver objects, and recent lead isotope analyses show that a high proportion of this silver came from the Taurus.[16] The state controlled the production of silver as is evident from the elaborate imperial stamps that mark silver objects intended for domestic or liturgical use. Some of these stamps clearly indicate that the silver object was produced outside Constantinople (especially Antioch), although Mundell Mango has argued that even silver objects bearing imperial stamps need not have been manufactured in the capital.[17] Other metal would go into producing weapons and armour for the army; there were weapons and armour *fabricae* at Antioch, Damascus and Edessa south of the Taurus, and at Irinopolis in Cilicia to the north.[18]

[12] The mineral wealth of the Taurus is what drew Assyrian traders to Cappadocia in the second millennium BC.
[13] Vryonis 1962, 4; Mundell Mango 2008, 444.
[14] Mundell Mango 2008, 444-5; Yener 1992, 158.
[15] Jones 1964, 437; Hendy 1985, 386-394. The minting of gold coins was given over to the comitatensian mint under the supervision of the *comes sacrarum largitionum*, who as an itinerant member of the court could set up the comitatensian mint in the mint of the region where he was residing.
[16] Mundell Mango 2009b, 222.
[17] Mundell Mango 1986, 207-211.
[18] Jones 1964, 834. Other weapons factories were located at Nicomedia, Sardis, Caesarea of Cappadocia and Hadrianopolis, and at Marcianopolis, Thessalonica, Naissus, Ratiaria, and Horreum Margia (Ćuprija) in the Balkans, although they were likely supplied with ore from mines other than those in the Taurus. See esp. Fig. 15.1 in Mundell Mango 2009b for a map of mines and sites of metal production in Asia Minor.

All these various forms of official traffic were crucial to the functioning and well-being of the Roman state. The part of Cilicia that joins Syria and the Anatolian Plateau is critical for the connectivity of the diocesan capital at Antioch with the imperial capital at Constantinople; therefore keeping the roads between the Levant and the capital passable and in good condition was of paramount importance.

Building Bridges and Clearing Mountain passes

The central Anatolian Plateau and the plains of Syria are separated by two mountain ranges, the Taurus and the Amanus (Map 5.1.2). The roads from Constantinople – coastal and overland – are constrained by the topography to enter Syria at the same point, by passing through the Syrian Gates north of Antioch. There are two main routes across Asia Minor itself; the coastal route, which takes in the cities on the western coast such as Ephesus, and the more direct, cross-country route that goes through Ankara. Both of these routes were established long before Constantinople became the capital. Milestones suggest that the inland road was constructed – or at least paved – in 82 CE under Domitian, with extensions and renovations taking place under Trajan, Severus, Caracalla, Macrinus, and Severus Alexander, between 114 and 230 CE.[19]

William Ramsay gave the inland road the picturesque name of the 'Pilgrim's Road' because of its connection to pilgrims travelling to and from Jerusalem.[20] The Bordeaux Itinerary (333 CE) records each stop and the number of miles from Constantinople via Ankara, Tyana, Tarsus, and Adana to Antioch, with a change of horses near the Syrian Gates. The itinerary records the distance as 850 miles, or 35 days of travel.[21] Egeria (384 CE) also used this road for both her outward and return journeys to the Holy Land, although only a record of the latter is preserved. She travelled from

[19] French 1981, 32.
[20] See Ramsay 1890, 197; Ramsay 1899, 166.
[21] Wilkinson 2002, 23.

Antioch to Tarsus, from which she made a three day detour to the shrine of St. Thekla at Seleucia. She returned to Tarsus, crossed the Taurus, and proceeded to Chalcedon 'passing through the same provinces of Cappadocia, Galatia and Bithynia' where she was ferried to Constantinople. The duration of this part of her journey is not recorded. It is interesting that, despite her desire to see Ephesus, which had many pilgrim shrines, she did not continue along the coastal route from Seleucia, but instead made a six-day detour from Tarsus and chose to make a separate journey from Constantinople to Ephesus.[22]

Picturesque though it is, the title of Pilgrim's Road is somewhat misleading as to the purpose of the road. Its primary function must have been to serve the needs of the military and the government; it is the shortest route across Asia Minor and even before the Tetrarchy it would have been the fastest overland connection between the northern territories and the Levant, as well as the eastern frontier, and was strategically crucial. It is the route followed by Jovian on his way back to the west in 363 following the death of Julian and the loss of Nisibis.[23] It is also the route followed by Caesarius, the *magister officiorum* who during the riots in Antioch in 387, hastened to Constantinople to beg the emperor for clemency for the citizens. Libanius praises his speed and efforts; Caesarius travelled by mule-drawn chariot along the public highways, reaching Cappadocia by the next night and arrived in Constantinople 'on the afternoon of the sixth day'.[24]

The road leads north from Antioch, where it must pass through the Amanus Mountains (max. elev. 2,240 m) to reach Cilicia. This happens at a narrow pass at Belen, the aforementioned Syrian Gates, about 30 km from Antioch. North of this pass the road follows the coast around the bay of Iskenderun before heading due west towards Tarsus via Adana and Mopsuestia (Yakapınar). At Tarsus the road diverges; the coastal route

[22] Egeria 9.2, 10.10.
[23] Amm. Marc. 25.10.4-12. He marched from Antioch via Tarsus and Tyana before reaching Dadastana on the Bithynia-Galatia border, where he died.
[24] Libanius, *Or*. 21.15.

progresses westwards, while the inland route turns north towards the mountains. Before reaching the central plateau, the road crosses the Taurus Mountains (max. elev. 3,000–3,700 m). The easiest access is at a natural pass through the mountains known as the Cilician Gates (elev. 1,050 m). Beyond that the terrain levels out and the highway progresses to Ankara, which served as a communications hub or 'knot' in its own right, and from there to Constantinople.

Traces of the road survive in numerous places, and many more were visible to travellers in the 19th century. David French notes that the road between Tyana and Tarsus is visible in many places, while the road from Tarsus to Adana does not survive apart from a line of stones indicating the direction the road took. Of the overall construction of the road, French has observed that there is no complicated substructure or trenching, but the edging stones were placed directly on the ground, with smaller stones laid out to form the paving in between. Often a central spine was included (Fig. 5.1.1).[25] Ramsay observes that, especially when following along a gorge or valley, the Roman road was '3 or 4 feet' higher than the modern road. This was presumably done to avoid destruction by seasonal flash floods that would course through the valley floor. Building the road higher on the slope would protect it from the worst flooding, but also required that a base for the road be cut into the mountainside to provide level space wide enough for wheeled traffic, and also the building of some sort of wall to support the exposed side of the road, remains of which Ramsay noticed in some areas near the Cilician Gates (Fig. 5.1.2-3).[26] If the technique used to construct the road was as simple as French describes, without packed layers or substructure, the upper paving could easily have been washed away by run-off from the hills. This, in conjunction with falling rocks and other debris, would easily make a road impassable over time.

[25] French 1981, 19.
[26] Ramsay 1903, 19.

Epigraphically, there are numerous attestations to building work and renovation being carried out on the road in northern Syria and Cilicia undertaken in the 4th through 6th centuries. One important undertaking would be the clearing of the mountain passes of blockages. Another of the features of the road, especially near the coast, is the number of bridges needed to cross the rivers that flow into the Mediterranean. Many of the inscriptions that relate to road work refer specifically to bridge repair, and Procopius gave a detailed account of the programme of repairs undertaken on bridges in the province prior to 560.

Procopius' account of the road repairs undertaken in Cilicia moves from Antioch towards the border with Cappadocia (oddly, against the flow of his general discussion which progresses from north to south). He first mentions specific road works carried out at a mountain pass near the city of Platanon, north of Antioch, which is taken to be the same as Pictanus in the Bordeaux Itinerary, 24 Roman miles from Antioch, near the Belen pass. According to Procopius, Justinian constructed (διεσκευάσατο) a wagon road (ὁδὸν ἁμαξήλατον) through a pass that had become dangerous over time.[27] According to David French, an Austrian team has observed traces of a rock-cut road in that area.[28] It is interesting that Procopius specifically notes that this road was intended for wagon traffic. For other roads in Asia Minor and Palestine, Procopius states that they are wagon roads, interesting testimony for the use of wheeled traffic in Late Antiquity, to be discussed elsewhere.

From this road through the mountain, Procopius turns his attention to the three major rivers of Cilicia, the Pyramus, the Sarus and the Cydnus. The highway crosses each of these rivers, and major bridges are located in Mopsuestia, Adana and Tarsus. All three of these bridges seem to have been in a state of considerable disrepair by the 6th century,

[27] Procopius, *Buildings* 5.5.1-3.
[28] French 1993, 454.

and extensive renovations were performed on each of them. Procopius is vague about when these bridges were originally built, nor is he able to record whether repairs had been made in the interim. The bridge at Mopsuestia was originally built by Constantius (between 326 and 361), and an inscription datable to c. 384 ascribes the completion of the bridge at Adana to Auxentius, then governor of Cilicia.[29] In the case of Tarsus, Procopius states that the previous bridges had been small, and had been washed away by a flood. Justinian diverted part of the stream away from the city and made the bridges wider and stronger.[30] The remains of a Late Roman bridge are still visible in Tarsus.

Of each of these sites, Procopius goes to pains to stress that the road or bridge had become nearly impassable, and presented a danger to travellers. Another Justinianic inscription (c. 521) from the province of Cilicia, found on the coastal road between Corasium and Corycus, also employs the topos of the 'impassable' (ἀβατόν) road. This inscription is carved into the rock face and commemorates a cutting through the rock (see Fig. 5.1.4).[31]

However, the attention and expense given over to these projects does demonstrate that they were considered important enough to the functioning of the Empire to be addressed. Procopius describes roadworks taking place elsewhere in Asia Minor, and inscriptions found in Cilicia and Isauria demonstrate a desire, in the 4th-6th centuries, to make sure that the region remained part of a well-integrated road network. For example, an inscription of 536/7 in Anazarbus, the *metropolis* of Cilicia Secunda, marks the restoration of a cutting through a cleft in the rock on the road connecting Anazarbus with Flaviopolis to the north and Hierapolis Castabala to the east.[32] Near Philadelphia, a

[29] Mopsuestia: Malalas 13.17; Adana: *IGR* 887, *PLRE* 142 = Auxentius 5.
[30] Procopius, *Buildings* 5.5.17-20.
[31] Mackay 1969, 139.
[32] Although the inscription is dated to the reign of Justinian, the beginning of the text is missing and the name of the patron is not present. Heberdey and Wilhelm 1896, 36, no. 86. See also Gough 1952, 101-2.

military stronghold in Isauria, the *comes Orientis* Auxitius is credited with having spent 3,000 solidi towards restoring a bridge sometime in the 5th or 6th century.[33]

What seems most interesting about Justinian's campaign of roadworks is both its wide range and the fact that it appears to have been the first to have been overseen at the imperial level in several centuries.[34] There are a series of milestones bearing the names of Valentinian and Valens, including one at Mopsuestia which also mentions Gratian, dated to 367-375. However, they are all secondary inscriptions on existing milestones, and none of them refer to any building work carried out. It is likely that the inscriptions were carved to assert the emperors' dominance in the wake of the revolt of Procopius which had centred on Bithynia and Galatia in 365.[35] Despite the lack of new milestones in the later period, other surviving inscriptions recording road works and bridge building give the name of the patron, usually the governor or the *comes Orientis* or some equally highly placed individual, but less frequently mention emperors. Theodoret, Bishop of Cyrrhus (423-457), noted that he paid for two bridges to be built near the city 'from the revenues of [his] see'.[36] Given the overall poor condition of the roads described by Procopius, it seems that the system of maintaining the roads at the expense of the local landowners had to an extent broken down by the 6th century. Laws issued throughout the 4th and 5th centuries stress the importance that no class be exempt from contributing to road maintenance – these laws expand to include imperial domains and the church among those responsible for maintaining roads and bridges.[37] One must question the extent to which Procopius' account is infused with hyperbole, and whether such critical transit points would have been allowed to fall apart. At one point Procopius does mention that

[33] Bean and Mitford, 219-20, no. 251; *PLRE* II, 206 = Auxitius.
[34] The attention lavished on the emperor's construction work by Procopius is of course unique and gives us a better understanding of Justinian's building programme compared to his predecessors'.
[35] French 1981, 94, no. 65(B)ii; Amm. Marc. XXVI 6-9.
[36] Theodoret, Ep. 81, dated c. 449.
[37] *C.Th.* xv.3.1-6. A law of Arcadius and Honorius dated to 399 specifically mentions the 'immense ruin of the highways'. *C.Th.* xv.3.4.

the bridge at Mopsuestia had fallen into disrepair due to the 'negligence of the authorities' (τῃ τῶν προεστηκότῶν ὀλιγωρίᾳ), suggesting that imperial intervention was an extreme response. However, the inscriptions mentioned above, as well as a series of three bridges built leading to Seleucia Pieria (the port of Antioch) in 524 overseen by the *comes Orientis* shows that important engineering works were being funded from official sources.[38]

5.2 Accessing the Mesopotamian Frontier: Routes and Logistics

Geography

The area under consideration extends from the borders of Armenia to the Middle Euphrates in the south, and from the region around Nisibis to the east of the Tigris. The interior of Syria will be considered briefly as part of the connectivity. In Late Antiquity this territory comprised the provinces of Euphratensis, Osrhoene, and Mesopotamia – which I will refer to generally as 'northern Mesopotamia' so as to distinguish it from the Middle Euphrates which will not be discussed in great detail – as well as Syria I and II (see Map 5.2.1). As always when considering issues of communications and connectivity, an understanding of the geography is crucial.

The area is bounded on the north by the Taurus Mountains, with the flat Syrian steppe stretching out to the south. To the east the mountain of Jebel Sinjar rises between Nisibis and Sinjar (Singara), and the Tur 'Abdin (described by Gertrude Bell as containing 'paths unspeakably steep and rocky') rises north of Constantia and Nisibis/Dara and south of Amida and the Tigris.[39] However, the most notable topological

[38] *IGLS* no. 1142.
[39] Bell and Mundell Mango 1982, 27

obstacles are, of course, the rivers, the Euphrates and the Tigris and their numerous tributaries. Most of the routes are oriented east-west and therefore cross the rivers, as opposed to following them. Apart from the Euphrates, the rivers in this region are not navigable, used more for irrigation than transport. The water levels vary seasonally, of course. While some wadis may have been passable part of the year, at the time of spring flooding this might not be the case, possibly requiring the construction of bridges to make a road usable year-round.

Comparatively little archaeology has been done on the Late Roman military installations of northern Mesopotamia, especially in comparison to the wealth of archaeological information regarding the forts of Palestine and Arabia. This is partly because, unlike the southern part of the frontier, northern Mesopotamia relied on fortified cities as a line of defence, and many of these are still inhabited. Also, there is the issue of accessibility, as this region is located on the border between Turkey and Syria, and in recent decades tight control by governments and security concerns have prevented archaeologists from comprehensive programmes of survey and excavation. Most of the archaeological records of the last half-century are derived from surveys undertaken prior to the construction of major dams on the Euphrates and Tigris which resulted in the subsequent flooding of large areas.[40]

Despite the relative lack of archaeological material, there is a wealth of historical data available for the Mesopotamian frontier in the 4th through 7th centuries, thanks to a number of first-hand accounts of people present at campaigns – such as Ammianus Marcellinus in the mid-4th century or Procopius in the 6th century, and the plethora of histories and chronicles preserved in Syriac, such as the Life of Pseudo-Joshua the Stylite (6th century).

[40] Algaze et al 1989, 1991, 1994, French and Crow 1980.

Historical Background

Severans

The history of the Roman-Persian wars is long and convoluted, characterised by border skirmishes, proxy wars, and long-lasting treaties while one side or the other turned its attention to problems on its other borders.

The Mesopotamian provinces were created by Septimius Severus in 198 mainly to form a bulwark to protect the interior of Syria from the Parthians. It is under Severus and his successors that the road infrastructure of Mesopotamia was consolidated. There is abundant evidence for the involvement of the various legions stationed in the area, such as the *legio IIII Scythica* (based at Zeugma between 66 CE and the end of the 3rd century) or the *legio XVI Flavia firma* (Samosata), in the construction of frontier infrastructure, including the fort at Eski Hisar between Zeugma and Samosata, bridges crossing tributaries of the Euphrates at Habeş, Ehneş, Karasu and Kahta Çay. These were all likely built in the 190s CE as part of the Severan campaigns.[41] There are also milestones of Caracalla that have been found at various locations throughout the region.[42] In addition to forts and camps, watchtowers were also constructed, both on roads and along the river, which resulted in an integrated system of frontier defence.[43]

Diocletian

The fourth century saw a northward shift in the focus of military activity. Active fortification and road building were carried out in Syria and Arabia/Palestine under Diocletian (r. 284-305), resulting in the construction of fortresses along the *Via Nova Traiana* between the Red Sea and Bostra, and a similar line of fortresses through the

[41] Wagner 1983, 109; Wagner 1977; Hellenkemper 1977, 465. The Kahta Çay (Chabinas) bridge bears an inscription mentioning Septimius Severus and his sons Caracalla and Geta, as well as attributing the work to the *legio XVI Flavia firma*. For the legions stationed in northern Mesopotamia in the 2nd and 3rd centuries, see Hellenkemper 1977, 467-470.
[42] Poidebard found a milestone of Caracalla dated to 216/7 at Amouda just NW of Nisibis. Poidebard 1928, 222.
[43] French and Crow 1980, 907.

Syrian desert from Damascus to the Euphrates, known as the Strata Diocletiana. It is likely that this concentration on the southern extreme of the eastern frontier had more to do with controlling the so-called Saracens – nomadic tribes from Arabia – than part of a systematic engagement with the ruling Persians at the time, the Parthians.

A new period of Roman-Persian aggression effectively begins with the rise to power of the Sasanians. Once they had overcome the Parthians and consolidated their power in their homeland, they were able to focus their attention on the ancestral enemy to the west. From 226 to the end of the 3rd century, the Sasanians advanced as far as Antioch in their raiding, although did not make permanent advances – the Romans defeated them at a number of pitched battles, in turn making it as far as the Sasanian capital Ctesiphon, but were also unable to consolidate their territorial gains. The Romans achieved a decisive victory led by Galerius in 298 that resulted in Mesopotamia and Armenia being placed under Roman dominion, and four decades of peace ensued.[44] Thus, at the time of Constantine, the Romans held the territorial advantage. Trade goods entered the empire through a customs point at Nisibis and later at Dara.[45] Building works are more likely to take place during times of stability and anticipation of warfare than during crises. Since we are looking at infrastructure development, we will consider these rather than the battles themselves.

It seems that in the 4th century, possibly under Diocletian or Constantine and his sons, forts were being built along the traditional model. Excavation, however, has been limited. The site of Pağnik Öreni located 50 miles north of Melitene, on the west bank of the Euphrates, is 4th century in date. Pottery evidence suggests occupation between c. 350 and 425. Another castellum close to Tell Brak was identified by Poidebard as Justinianic;

[44] Petrus Patricius, frag. 14, FGH IV, in Dodgeon and Lieu, 133, Frye 1993, 130-1.
[45] Dara is confirmed as a customs point in a treaty dating to 561. See Menander Protector, Treaty of 561, Fragment 6,1.5 (Blockley 1985, 72-73).

the Oateses prefer a 4th century date. Much of Poidebard's dating is problematic, as pottery sequencing was not yet available, and in some cases where he did not follow up his aerial observations on the ground subsequent surveys have revealed no Roman material whatsoever.[46]

Oates argues that the loss of Nisibis and Singara in 363 'involved the establishment, and presumably the fortification, of a new frontier from Dara to Circesium by way of the Wadi Jaghjagh and the Khabur' and identifies a few forts that may have belonged to this 'frontier line'.[47] This is slightly problematic, in that, firstly, despite the presence of the two rivers that could serve as convenient boundary markers, the concept of the *limes* and the eastern frontier seems to have been much more amorphous than linear. Secondly, the system of fortifications taking shape in Mesopotamia seems to have relied less on purpose-built chains of forts and instead emphasised fortifying or repairing the existing walls of the Hellenistic cities of the region and supplying them with garrisons and civil populations. This in turn had an impact on the type of warfare that was engaged in – sieges, with the civilian populations participating. Siege warfare had the benefit of slowing down the enemy on the one hand, but could also leave the heartlands vulnerable to raiding if garrisons were trapped in cities.[48]

The structure of the army changed as well. From the *Notitia Dignitatum Orientalis*, it seems that the primary military force in the area from the early 5th century onwards was auxiliaries – local men who lived and earned their livelihood locally, meaning that the traditional type of forts of the 2nd and 3rd centuries were not being occupied in the same way.[49] These structures may have fallen into disuse, which accounts for the absence of material post-dating the 4th century at many of these sites. In the 6th

[46] Pağnik Öreni: Harper 1977, 455; Tell Brak: Oates 1990, 228.
[47] Oates 1990, 228.
[48] Pollard 2000, 67-73. Ps-Joshua 90 reveals that complaints of lack of protection for soldiers assaying from Tella (Constantia) or Amida led to the fortification of Dara.
[49] Oates 1990, 235

century there was a further decrease in military personnel, as the state came to rely on their Arab allies and field armies rather than local garrisons. Wolfgang Liebeschuetz succinctly describes the typical pattern of Mesopotamian warfare:

> In the sixth century there was no way in which the Persians could be prevented from penetrating into the empire. The only way to check an invasion was by means of a field army strong enough to defeat or at least to threaten the invading force. Fortified cities provided no kind of barrier and most of them could be captured easily. Nevertheless, they too had an important function. They provided shelter for the inhabitants, their corn and their animals. They also provided bases for Roman armies operating in the neighbourhood. Moreover, while nothing could stop the Persians from overrunning and plundering the countryside, they could not remain in permanent occupation while the cities were not in their hands.[50]

Constantius to Justinian

There is a tendency to ascribe building works to Diocletian, in the absence of datable evidence, simply following later historical sources.[51] Ammianus Marcellinus attributes the building of walls at Circesium to Diocletian, and building works at Sura and Dibsi Faraj have been given a 'Diocletianic' date. These fortifications along the Euphrates can be considered an extension of the Strata Diocletiana.[52]

Constantius (r. 337–361) based his capital for a time at Antioch. He is credited by Ammianus with building new walls at Amida, and 'he built another town [i.e., Constantia]... enclosed it with strong towers and walls to provide a safe place of refuge for the neighbourhood, and established in it an arsenal of engines to repel any assault on the walls.'[53] The fortification of Amida came just in time – it was besieged in 359 and managed to hold out for 73 days.

[50] Liebeschuetz 1977, 499.
[51] Pollard 2000, 71.
[52] Harper 1977, 458.
[53] Amm. Marc. 18.9.1.

Amida was reclaimed in 363 during Julian's campaign. However, the overall results of the 363 campaign were disastrous for Rome – despite advancing as far as Ctesiphon, gains were not consolidated, and after Julian's sudden death the peace that Jovian struck meant that Rome permanently lost the settlements at Nisibis and Singara (whose walls had recently been rebuilt in the 4th century).[54] The frontier ran roughly along the Khabur River, 'to the junction of the Nymphius (Jaghjagh) and the Tigris'.[55]

Under Theodosius I (r. 379-395), Resaina had its circuit wall rebuilt (it was also granted the status of *polis* and renamed for the emperor), and Leo (r. 457-474) apparently rebuilt the walls of Callinicum on the Euphrates.[56] During the reign of Theodosius II (r. 408-450) the village of Maipherqat was elevated to the status of episcopal see and renamed Martyropolis (410-420). The city was provided with walls and a martyrium designed to hold relics of the martyrs retrieved from Persia. Martyropolis was situated at a 'point of convergence' between the Roman east, the Persian Empire, Armenia, and an important pilgrimage centre. It was eventually refortified and made the provincial capital of Armenia IV during the reign of Justinian.[57] The next major investment in the infrastructure of the region comes with Anastasius. In flagrant defiance of a recent treaty regarding the building of fortifications, Anastasius constructed the city of Dara opposite Nisibis, which remained outside Roman control. Anastastius (r.491-518) also carried out building on the walls of Melitene and at Resafa.

Repairs need not relate directly to a military campaign – Justin (r. 518-527) rebuilt Edessa after a flood damaged it extensively in 525.[58] There is a further buildup of fortifications under Justinian (r. 527-565). Procopius attributes fortifications to him

[54] Amm. Marc. 25. 7, 9-12. Singara: Oates 1990, 229.
[55] Segal 1971, 111.
[56] Malalas 13.39 (345) (Jeffreys et al. 1986, 187), Chronicle of Edessa 70.
[57] Fowden 1999, 54-5. Bell and Mundell Mango 1982, 123-130.
[58] Malalas 17.15 (Jeffreys et al. 1986, 237). The city had previously suffered flood damage during the reigns of Severus, Diocletian, and Arcadius and Honorius/Theodosius (413 CE) (Chronicle of Edessa, 8, 11, 52, 106)

throughout Mesopotamia and the Middle Euphrates, including the restoration of city walls at, e.g., Amida, Edessa, and Dara.[59] Archaeological survey by Croke and Crow has determined that many of the building works in Mesopotamia should probably be ascribed to Anastasius instead.[60] Justinian's works are therefore concentrated on the Middle Euphrates, between Chalcis and the river, in the repairs of the walls at Dibsi Faraj and the construction of a new fortress on the river bank at Zenobia.[61] Liebeschuetz argues that for many of the forts constructed along the Euphrates, especially in the so-called Limes of Justinian, investment in infrastructure did not see a corresponding investment in personnel and that many of the forts were not garrisoned, with the government relying on field armies for large engagements, and local tribes for minor ones.[62]

Maurice (r. 582-602), as *magister militum per Orientem*, mounted a campaign in 578, possibly intending to march south along the Euphrates for Ctesiphon. There are no major building works attributed to Maurice, however, beyond basic repairs, which may be symptomatic of the empire's poor financial situation at the time. It is interesting that no building works are apparently associated with Heraclius either, despite his successful campaign to reclaim territory that had been lost to the Persians two years previously. Admittedly, he did not have much time or much in the way of resources to consolidate his presence in the newly reclaimed eastern provinces before losing them again to the Arab invaders.

Routes

Following the course of these developments and improvements allows us to connect the dots and begin to see the lines of communication that must have existed between these

[59] Procopius, *Buildings* 2.2-9.
[60] Especially work at Dara, which could not have been as run-down as Procopius suggests. Croke and Crow 1983.
[61] Liebeschuetz 1977, 491 following Sauvaget 'Les Ghassanides et Sergiopolis' Byzantion 14, 1939, 115; Harper 1977; cf Croke and Crow 1983, 146.
[62] Liebeschuetz 1977, 494-5.

fortified cities. One could continue the imaginary line of the Strata Diocletiana up the banks of the Euphrates. Connections with Antioch, capital of the diocese and at times seat of the emperor, would be crucial, as would connections directly with the imperial capital at Constantinople (see section 4.1 above).

In addition to the explorations of 19th-century travellers, there have been three main archaeological studies of the roads of the Mesopotamian frontier, as mentioned earlier. These are the aerial surveys carried out by Poidebard and Mouterde in the 1920s and 1930s, published as *La trace de Rome dans le désert de Syrie* (1934) and *Le Limes de Chalcis* (1945). The second is Louis Dillemann's *Haute Mésopotamie orientale et pays adjacents*, published in 1962 and based on a combination of linguistic analysis of toponyms to identify sites from the itineraries, and personal observation. Most recently, Anthony Comfort has investigated the area to the extent that modern political constraints allow, and has mapped the probable courses of the roads of the Mesopotamian frontier.

These studies have all had the same underlying methodology: to take routes known from textual sources, primarily the Peutinger Map, and to a lesser extent the Ravenna Cosmography and Antonine Itineraries, and to try to associate these firstly with known locations, and then, based on distances given in the itineraries, to fill in the gaps and use toponyms or unidentified sites on the ground that could then supply us with the physical route of the road itself.

The Peutinger Map lists six routes across Northern Mesopotamia, and a further seven that cross Syria and terminate in Mesopotamia.[63]

(1) Melitene to Nisibis – this is the main ancient north-east/south-west highway, probably the course of the royal Persian highway; it of course extends beyond Melitene

[63] Comfort 2009, 106-168.

to Cappadocia and Asia Minor, allows for rapid movement of troops from, e.g., the Balkans to Amida;

(2) the road to Armenia from Amida – this route probably had commercial importance as well as military, given Artaxata's status as entrepot after the early 5th century;

(3) from the Euphrates (Zeugma) to Edessa, Batnae and Harran (Carrhae) – Zeugma's status as a crossing point may have declined after the 3rd century in favour of the crossing at Caeciliana;

(4) from the Euphrates (Caeciliana) to Edessa and Nisibis – this route, crossing the Euphrates further south than Zeugma, provides a more direct link to the frontier from Hierapolis, which was Constantius II's base of operations;

(5) from Edessa to Resaina and Singara – about halfway between Resaina and Singara, at Tahat just south of Tell Brak, a settlement with 5th-6th century material was found, near a gravel ford crossing the Jaghjagh;

(6) east from Batnae.

(7) Antioch to Hierapolis and the Euphrates; (8) Antioch to Samosata; (9) Antioch to Zeugma; (10) Antioch to Germaniceia and Melitene; (11) Cilicia to Samosata and Edessa; (12) Sura to Samosata; (13) Doliche to Chalcis

As can be seen from Map 5.2.2, the region is fairly comprehensively covered by its road network, and most of the sites mentioned above are integrated into it. However, the itineraries only describe a selection of the available routes and should not be regarded as absolute. For example, paving has been found on a road connecting Zeugma and Samosata on a route not included in the Peutinger Map or other itineraries, but which is in fact more direct as it does not follow the course of the river, which bends at this point.[64]

[64] Paving found near Ank Köy, SW of Eski Hisar, a Roman fortress constructed by a vexillation of the *legio IIII Scythica* in 197 CE; Wagner 1983, 109.

Furthermore, there are noticeable absences from these routes. The most visible exceptions are Constantia and Martyropolis, but this can be explained by the fact that they likely post-date the Peutinger Map since Constantia is of mid-4th century date and Martyropolis only became the metropolis of Armenia IV after 536, having risen to prominence as a pilgrimage centre after 410.

The second notable omission is the route connecting Edessa with Nisibis via Constantia.[65] Historical sources suggest that this route was of key importance well into the 6th century – indeed, this is the route followed by the main highway today. This was also presumably the route followed by the Arabs in 637/8 when they crossed the Euphrates and conquered first Edessa, then Constantia, then Dara.[66] Dara was integrated into this network by a road that is archaeologically contemporaneous with a structure identified as an inn near the city's western gate. This inn is in turn dated by inscription to 514, and illustrates the joint responsibility of the military and the church for road maintenance and hospitality, as both a military officer and an abbot are mentioned as patrons.

The question remains of the extent to which the network was paved. Dillemann seems to think this was the case for the whole network – if that is what he means by 'en dur'. However, Poidebard's aerial photographs confirm that in many instances the path was simply cleared for traffic, as was the case in many other parts of the Near East. The terrain is mostly rocky and firm, which obviates the need for built road structures, which are necessary in softer terrain, such as swamp or sand.

Comfort lists 15 sites where paving has been detected either by himself or by previous investigations.[67] These are spread out over many of the routes illustrated, and do

[65] See Dillemann 1972, Routes 2 and 4.
[66] Theophanes, *Chronographia* 261 and 340.
[67] Comfort 2009, 103.

not appear to represent a single road or enterprise, although one stretch of paving was observed between Constantia and Resaina, which is not a route given on the Peutinger Map (see Map 5.2.3).[68] The paving at Ank Köy probably relates to the activities of the legions at Zeugma and Samosata and the construction of the fort at Eski Hisar in 197. A pass termed the 'Euphrates Gates' by French that follows the course of the Euphrates north of Melitene where the river passes through a gorge and the banks are rocky and steep, is probably ancient but could have been kept passable in Late Antiquity as it is today (Fig. 5.2.1).[69] A paved ford crossing the Jaghjagh river is probably to be associated with the camp at Saibakh, which probably dates between the Severan campaign and the invasion of Mesopotamia by Ardashir I in 237, but, once again, given its state of preservation today may well have been used in Late Antiquity as well, especially since a similar ford was found near the Justinianic site at Tahat (see Fig. 5.2.2).[70]

The most significant road remains for this particular study are the remnants of paving directly north of Amida. Comfort links this paving with the restoration of the city walls by Constantius II, and dates it to c. 354 CE. What is interesting is that the paving is extremely well-executed, with large rectangular paving stones neatly fitted together and a central spine, creating a road surface similar to the Antioch-Chalcis road (see Fig. 5.2.3). This is a noticeable contrast to paving found elsewhere in Mesopotamia.

For example, in *La Trace De Rome*, Poidebard illustrates three sections of preserved paving that he has photographed on the ground. The first is near Tell Umm Gargan, identified by Poidebard as the Peutinger station of 'Thallaba' between Circesium and Nisibis, and a similar stretch is found just east of Bezabde.[71] Both of these stretches retain clear kerbstones, but the surface of the road consists of irregular 'boulders' –

[68] Comfort 2009, n. 184
[69] French 1983, 91, pl.1.7.2a and b.
[70] Oates 1990, 230, 237.
[71] Tell Umm Gargan: Poidebard 1934, 150, Pl. CXXXVIII; Bezabde: Poidebard 1934, 159, Pl. CLVIII, 2.

probably remains of the foundation layer which underlay the actual pavers or rubble surface, subsequently carried off or otherwise eroded away (See Fig. 5.2.4). On the road linking Singara and Bezabde, east of Demir Qapou, Poidebard found a stretch of road lined with large boulders. At 2.60 m, this road is significantly narrower than the roads elsewhere (6-7 m), leading Poidebard to characterise it as 'une petite voie de communication d'armée', ancillary to the main road that he imagines as the trunk road of a Circesium-Nisibis *limes*.[72] (See Fig. 5.2.5)

An abandoned settlement does not mean that the route it lay along was also abandoned – in this landscape, ancient settlement mounds – tells or hoyüks – that could have lain abandoned since the 1st century CE, the 3rd century BCE or even the 3rd millennium BCE are nevertheless prominent and served as landmarks even in antiquity.[73]

Bridges are equally difficult to date, although they are more likely to be accompanied by inscriptions or more closely identifiable with bridges described in textual sources. What we can see, however, is that the bridge remains identified, with the exception of the bridge at Zeugma and the one south of Amida, do *not* cross either the Euphrates or the Tigris. Although there was no actual international border, at the limes fluctuated back and forth, the great rivers nonetheless represented ideological boundaries – a bridge would have made it permeable. Constructing a masonry bridge might have been deemed either an open invitation to the enemy, or might have been regarded as a risky enterprise for practical reasons – an expensive operation only to have to dismantle or destroy it in times of crisis.

What is noticeable about the distribution of the bridges is that they cross the smaller tributary rivers, allowing the east-west directionality of the road to be maintained. Most of these tributaries do not have much water and could easily be forded, unless the

[72] Poidebard 1930, 40; 1934, 163, Pl. CLXI.2.
[73] Comfort 2000, 112.

river was in spate during the spring, which could make the road impassable or wash away any road construction that did exist. The construction of bridges speaks of an interest in keeping these routes open year-round. They also demonstrate the existence of a network of subsidiary roads not mentioned in the imperial itineraries that was also part of the supported infrastructure. While, as mentioned above, some of these bridges cannot be dated and caution must be used about what period they and the routes that they represent date from, bridges of provably Roman date, and of course those of Late Roman date would have been in use. Those to the east of the Tigris would have been lost to the Roman Empire after 363, it is possible they were maintained by the Sasanians, and many were certainly used in the medieval, Ottoman and modern periods. The bridges further west possibly are earlier in date, part of the Severan consolidation, as they were formally part of the empire earlier than the easternmost provinces.

Two bridges, however, are known from literary sources to be 5th century. These are a bridge near Amida (2.3 km south of the city), built by Bishop Sa'oro c. 484. Comfort speculates this may have replaced an earlier bridge on the spot, possibly built by Constantius II and linked with both the fortification of the city and the well-paved road to the north. [74] The other bridge is located in Syria, crossing the Afrin River near Cyrrhus. This was constructed in 450 by Theodoret as Bishop of Cyrrhus, who writes that he built two bridges from the revenues of his see.[75] It is not at all uncommon to see bishops increasingly taking on administrative duties that would have previously belonged to the imperial or provincial governments or the military. They also acted as intermediaries or peace envoys during times of strife.[76] It was also not uncommon for bishops, monks or

[74] Comfort 2009, 60.
[75] Theodoret, *Ep*. 81.
[76] See Segal 1971, 127-9 for the role played by bishops as the 'champions of people'; generally, see Greatrex 2007.

private individuals to undertake major building works with partial subsidy from imperial funds.[77]

Logistics: Movement of Goods and People

The primary *raison d'être* of the Roman road network was to serve the Roman army and administration: the roads were built by soldiers to consolidate imperial power and facilitate the movement of troops, supplies and military intelligence and commands. As mentioned, however, the road system in Mesopotamia was consolidated during the Severan period and was in many places based on the road networks of earlier empires, such as the Assyrians, the Achaemenids, Seleucids, etc. A map such as 5.2.2, much like the 'traces' seen by Poidebard from the air, show all moments in time at once. It is likely that different routes were prevalent at different times, and concerns beyond the purely military, such as the protection of trade routes, might have influenced which settlements were selected for fortification and investment in the Late Roman period.

The multiplicity of provinces in a relatively small area, compared with the southern extremity of the frontier, the provinces of Arabia and Palaestina Tertia, means that there was a concentration of high-ranking military officials, *duces*, able to make decisions regarding the security of the region, probably based at the provincial metropoleis Hierapolis, Edessa, Resafa, Martyropolis, Amida and Dara. Additionally, because the fortifications were also civilian settlements, civic officials – increasingly clergy such as bishops – were able to take over the overseeing of defence constructions, paid for by imperial grants.

[77] Croke and Crowe 1983, 148. Three inscriptions from Anasartha in central Syria suggest that a man named Gregorios (an Arab phylarch) paid to have the city walls restored (possibly with imperial subsidy). *IGLS* 281, 288, 292, Liebeschuetz 1977, 492 n. 52.

During actual campaigns, or in response to prolonged strife, there would be an influx of military into the provinces. This brings us to the discussion of 'goods'. The biggest concern would be providing food not only for the regular inhabitants and garrisons, but for any additional troops. The Mesopotamian cities relied primarily on food from their own hinterlands. However, this was extremely vulnerable, and could be torched and destroyed by marauding armies intent on starving besieged communities. It could also be torched and destroyed by the defending army in retreat, in an attempt to deny the pursuing invaders a source of food and fodder. In such cases, food had to be transported from the interior of the provinces. It is likely that the area around Chalcis and the marginal lands of the limestone massif, which were extensively cultivated in the Late Roman period, contributed to the supply of grain and olive oil for the Mesopotamian frontier.[78] Comfort argues that the supply to Amida, for instance, arrived from the west, from the direction of Antioch.[79]

The army would also need weapons; raw material was available from mines in the Taurus Mountains, and there were weapons factories, *fabricae*, at Antioch, Damascus and Edessa south of the Taurus, and at Irinopolis in Cilicia.

The most important lines of communication would be with the diocesan capital at Antioch. At times even the imperial court was based in the city, and the army would winter there between campaigns. Even a Persian embassy to Justinian (residing in Constantinople) was instructed to proceed to Antioch first, rather than to Melitene and north of the Taurus directly to the capital (although this may have been for propaganda reasons).[80]

[78] See, e.g., Ps-Joshua 77: 'everything was supplied to them [i.e., the army] in its season, and came down with great care by the order of the emperor.'
[79] Comfort 2009, 115.
[80] De Ceremoniis 89-90 (Greatrex and Lieu 1991, 98, 101).

Despite the emphasis that has been placed on fortified cities for the defence of the frontier, they by no means exist in isolation, as there are numerous rural villages, monasteries, etc. that contribute to the economic networks and communicativity.

We discussed above the extent to which these roads may or may not have been paved. This has implications for the use of wheeled traffic, which is a subject of some debate for the later centuries of Late Antiquity. Like most of the road networks of the Roman east, the Mesopotamian network was probably not paved over its entirety. The paving directly north of Amida is curious for its apparent lack of wheel ruts and wear, which contrasts with the width of the bridges that seem designed to accommodate wheeled traffic. Comfort argues that wheeled traffic, where it was used, was not for heavy loads and that pack animals would most likely be used for this, but that wheeled traffic would likely be used for light vehicles for personal use, such as couriers or officials using the *cursus velox.*[81]

Unlike the wars being waged in western Europe and the Balkans, which were a war for survival, the Persian wars were almost seen as a war of prestige against an ancestral enemy of equal might that might be put on hold in a gentleman's agreement while either side dealt with wars on other fronts. Nevertheless the threat was real, and there was a more or less constant investment in the military infrastructure needed to support the frontier. Although resources were increasingly stretched thin and there is an increasing reliance on civilians and non-Roman confederates for defence, Mesopotamia and the Euphrates remained the main theatre of war into the 7th century. The apparent change of tactic by the Sasanians in 606 to occupy the heartlands of Syria, Palestine and even Egypt, necessitated a major effort on the part of the Roman military machine. Although the lands were reclaimed by Heraclius' victory at Nineveh in 627, this drain of

[81] Comfort 2009, 194.

resources left the empire vulnerable through the south, which in recent times had seen less investment than northern Mesopotamia.

The heavy military presence in these provinces meant that the infrastructure, particularly the roads, was in constant demand to meet the needs of the military in terms of communications, troop movements and supply delivery. Secondary to this, the roads also contributed to the vibrant traffic in long-distance commodities and pilgrims and thus enriched other aspects of Late Antique life.

5.3 Trade: Roads and Caravan Routes through Syria

The distribution of trade goods is usually studied in order to provide answers to questions about the economy: matters of production, circulation, scale, commercialisation, free market, government intervention, etc. I intend to leave aside all matters of economic theory, and focus instead on what the distribution of goods and knowledge of trade routes can contribute to our understanding of the functionality of communications and networks in the 4th through 7th centuries. I shall examine three levels of commercial networks all operating in the province of Syria, proceeding from the macro level of interregional 'caravan' trade to the micro level of local transport of agricultural produce.[82]

Caravan Trade

The trade routes were far from static, and politics – especially international relations – played an important role in the movement of long-distance trade. I shall focus particularly on the matter of long-distance trade with the Orient, and more specifically on the overland transport of goods across Syria between the eastern borders of Roman territory and its

[82] See Map 5.3.1 for sites mentioned in this section.

Mediterranean core. The crucial role played by the Red Sea in networks with south-east Asia is discussed in Chapter 6.

The Levant was the crucial bridge between the lands of the Mediterranean and the Far East long before it was formally part of the Empire, and the Romans made extensive use of strategically placed client kingdoms – the Nabateans and Palmyrenes being the most famous – as middlemen in long-distance trade. Since the 4th century BCE, the Nabateans, whose territories extended from the northern Arabian Peninsula to the area of the Hauran in southern Syria, had controlled the luxury trade in spices, aromatics and other goods between India and China and the Mediterranean. The Nabatean trade routes, particularly the key route connecting the Nabatean capital at Petra with Gaza on the Mediterranean coast will be discussed in a separate case study below; however, following the annexation of the Nabatean kingdom in 106 CE, these routes fell under the direct administration of the Roman Empire.

The Palmyrenes, a client kingdom focused on the caravan city of Palmyra, engaged in long-distance trade with a certain degree of autonomy until their suppression in 273 CE in the aftermath of the abortive revolts of Zenobia and then Antiochus. Initially, the Palmyrenes were ideally situated to take over the handling of goods not only from the northerly overland routes, but also of Indian trade, trading with the Parthians who controlled the Persian Gulf and the mouth of the Euphrates. Goods then travelled up the Euphrates and were transported overland either from Dura Europos or Hit, or were transported further up the Euphrates to Callinicum (Raqqa) or Circesium (at the confluence with the Khabur) (see Map 5.3.2). However, although a legion was stationed at Palmyra and baths were constructed under Diocletian, and archaeology confirms the existence of a modest community with four churches, a cemetery, and some commercial activity from the 4th century into the Islamic period, there is nothing to suggest that

Palmyra retained any of its former prominence as a mercantile centre.[83] By the 6th century, Procopius describes Palmyra as nearly abandoned, but a stronghold of Saracen raiders, probably taking advantage of the old routes and natural causeways used by the caravan routes to enter the province.[84] Justinian was fortifying the settlements on the river, including Zenobia (Halabiyya), against just such a contingency, and the mention of Palmyra as overrun by raiders suggests an absence of trade that would otherwise be protected. Justinian's building programme is more likely to be linked with the military build-up along the Euphrates than anything to do with protecting caravan trade.

A crucial cog in the shifting of the trade routes was the changing political situation with Persia. The mouth of the Euphrates River, which served as an initial stage in the overland transport of goods arriving by sea from India, lay in Persian territory. The Palmyrenes, for example, made use of this route, as is borne out by the abundance of Palmyrene inscriptions found at Spasinou Charax near the Persian Gulf.[85] Under the Parthian dynasty, trade relations with Rome seem to have been relaxed – cordial, even – with Parthian merchants also acting as middlemen.[86] However the rise to power of the Sasanians saw a cooling of relations between Rome and Persia. Firstly, the Palmyrenes were no longer in a position to act as 'neutral' middlemen. Secondly, the city of Dura Europos, which served as the station where the caravans would leave the river and head overland towards Palmyra, was permanently lost to the Persians, who controlled the Euphrates down to the Persian Gulf, in 256, cutting off access to India via that route.[87]

[83] Schnädelbach 2010, Assad and Ruprechtsberger 1987. Diocletian's Camp: e.g., Gawlikowski 1987; Churches: Schnädelbach 2010, 47, Gawlikowski 1997, 211; Cemetery: Assad and Ruprechtsberger 1987, 137-46; Shops: Assad and Stepniowski 1989, 222. See also Shahid 1995 (Vol. 2, pt 2), 172.
[84] Procopius, *Buildings* 2.11.10-12.
[85] Raschke 1978, n.781; Bin Seray 1996, 18; Healey 1996.
[86] Raschke 1978, 642, Young 2001, 194-200.
[87] See Whitehouse and Williamson 1973, esp. 29-43, for trade goods and fortifications dated to the early Sasanian period designed to protect trade in the Persian Gulf. For the link between Dura Europos and Palmyra, see, e.g., Rostovtzeff 1932 92-119, esp. 105; Dirven 1996, 39-41, 43.

Luxury oriental goods came from two principal sources: India and China. Palmyra had been well-placed to control trade from both of these, making use of the Persian Gulf-Euphrates connection for trade from India, and any of the so-called Silk Routes that came from China via Central Asia.[88] With Palmyra out of the equation by the 4th century, new alternatives for acquiring goods had emerged.

Both the Arabian Peninsula and the Red Sea provided a conduit for goods from India. Recent archaeological work on both the Egyptian and Arabian shores of the Red Sea is shedding important light on the Late Roman phases of ports and entrepots and links between them. The Egyptian ports linked up with Alexandria which provided a connection to the wider Mediterranean.[89] On the Arabian side, Aila in particular was important, with a customs point located on the island of Iotabe nearby; from there goods could be transported across the Negev to the Mediterranean ports on the Levantine coast.

Similarly, routes through Mesopotamia into northern Syria rose in prominence as an alternative terminus for trade from China. The Romans could make trade arrangements with the nomadic peoples of central Asia, thus bypassing Persian involvement in the acquisition of luxury oriental goods. A series of embassies by Turks to Constantinople after 568 probably involved negotiations regarding the silk trade.[90]

The increased military build-up along the Mesopotamian frontier indirectly provided infrastructure that helped trade as well. Roads and bridges were built and maintained, and strings of forts between the cities could provide protection for caravans. Tensions between Persia and Rome meant that trade in the region was well-regulated, as freely roaming merchants might easily act as spies gathering intelligence.

[88] Beckwith 2009 contends that there was not just one Silk Road, but many silk routes, and that the precise location of these varied over time.
[89] See Mundell Mango 1996, 151-2.
[90] Menander Protector, Fr. 10.1-5. Blockley 1985, 110-127. Iron is also mentioned as a commodity. Pigulevskaia 1969, 168. Further references in Raschke 1978, n. 359.

Several textual sources make known locations that served as entrepots. Ammianus Marcellinus describes an international trade fair at Batnae taking place annually in September.[91] A law of 408/9 restricts cross-border trading to three locations: Nisibis, Callinicum and Artaxata in Armenia.[92] Artaxata, being much further north than the other two, belongs to a different system of circulation taking in the Black Sea and eastern Asia Minor; the other two cities, however, channel trade into Roman territory via northern Syria.

The passage in Ammianus states that the goods traded at the fair included items from India and China, arriving by land and by sea (*quae Indi mittunt et Seres, aliaque plurima vehi terra marique consueta*). Batnae (modern Suruç) is very much landlocked – the goods that came by sea most likely were transported up the Euphrates and then overland. Batnae is located west of the Euphrates from Zeugma, and southwest of Edessa (see Map 5.3.3). The Peutinger Map shows Batnae as being on the road connecting Nisibis and Zeugma via Resaina, but not being at the junction of multiple roads, and without direct connection to Edessa. However, the map is at this point rather garbled: none of the cities of the Euphrates south of Zeugma, let alone the great river itself, are properly marked. It would probably be unwise to speculate on real connections based on the incomplete information presented in the map. The Antonine Itinerary, for example, lists Batnae (various spellings) as a station between Zeugma and Edessa, and there is nothing in the topography to suggest that Batnae was not accessible from Edessa.[93] However, the connection from Batnae to Zeugma is clear, and from there access to the Euphrates and Antioch via Cyrrhus is straightforward.

[91] Amm. Marc. 16.3.3.
[92] *CJ* IV.64.4.
[93] Batnae is mentioned by Procopius as being one day away from Edessa. In a slightly comic episode, the Persian army gets lost between Batnae and Edessa and goes around in circles (Wars II.xii.31).

Unlike Batnae, the cities mentioned in *CJ* IV.64.4 as approved entrepots for international trade seem to be part of separate systems of circulation. Artaxata was part of a northern system that likely linked directly with the Black Sea and with Constantinople. Nisibis was located outside the limits of Roman territory. It is far removed from the Euphrates and also from the Tigris; it is therefore likely that it was a terminus for overland trade, probably arriving via Central Asia.[94] Callinicum (modern Raqqa) is located within Roman territory, on the left bank of the Euphrates. From here there are many access routes to the interior of Syria. One possible route follows the course of the Euphrates north via, e.g., Dibsi Faraj, and then overland directly to Chalcis. There are some possible Late Roman remains the along the road leading from Palmyra to the Euphrates via Resafa, skirting Jebel Bishri. This route was was incorporated into the *Strata Diocletiana*.[95] However, I would propose that the routes across the desert towards Chalcis – via Androna (Andarin) – are equally viable, and more probable for the 6th century, given the paucity of evidence for settlement in the vicinity of Palmyra, which contrasts with the situation around Androna. Although Callinicum is not listed as a *terminus viae* in the Antonine Itinerary, the site of Seriane is given as a nodal point; routes passing through Seriane which continue into Palestine might have forked with one path heading east towards the river.

It is impossible to say whether the status of Nisibis, Callinicum and Artaxata as sole international entrepots on the Persian frontier persisted, although the inclusion of the law in the Codex Justinianus and the absence of any laws repealing or modifying it suggest its continued validity into the 6th century. The law applies only to Roman subjects, and refers to trading in Persian territory with Persian subjects. It also implies reciprocity

[94] The city is located on the Jaghjagh river, which is a tributary of the Khabur, itself a tributary of the Euphrates. The river is used for irrigation, but the extent to which it might be used for water transport is questionable, as many of the tributaries of the Khabur are dry part of the year.
[95] Lönnqvist 2005, 1078-9. The identification as Late Roman forts is based entirely on satellite imagery and comparisons with known sites.

– that Persian subjects were under similar restrictions. However, it does not constrain the flow of oriental goods into Roman territory, as there are a variety of mechanisms, whether transferring the merchandise to Roman merchants at these entrepots, or middlemen of neither Roman nor Persian nationality taking goods back and forth across the border. Places like Callinicum and Nisibis could be considered classic examples of what Karl Polanyi termed 'ports of trade', where political neutrality was maintained by mutual agreement.[96] Despite their apparent status as places determined by law where international trade was permitted (and presumably where international customs duties were collected), would have been but one level of market in a multi-tiered hierarchy, or multi-part system.

It is attractive to view the purpose of the overland trade routes across Syria as funnelling goods towards Antioch from where they could be shipped to the major centres of consumption at Rome and Constantinople. Certainly the elder Pliny has contributed to this view of the Romans as victims of their love of luxury, clamouring for expensive exotica and contributing nothing in exchange apart from cheap glass and making up the deficit in cash.[97] While this has been soundly challenged by archaeology, the extent to which the Romans themselves might have acted as middlemen in various trade systems, as opposed to relying on neighbouring peoples, has not been explored. It is likely that until the 270s Palmyra served as a nodal point, linking together the two main strands of trade – the southern incense trade with the northern silk trade – before channelling the goods onwards towards the Mediterranean, probably via Antioch.[98]

Certainly the demand for luxury oriental goods did not disappear after the 3rd century; if anything, a new, powerful and wealthy customer emerged in the form of the

[96] Polanyi 1963, 38.
[97] Pliny, Natural History VI.101.
[98] The *tetarte*, the 25% government tax on goods from Palmyra was collected at Antioch, as recorded in an inscription (Inv. X.29); Young 2001, 193.

Christian church, where incense, unguents, and silks played a crucial role in the liturgy and sacraments. Eivind Seland has also conducted an interesting study based on the Liber Pontificalis of the church as a consumer of long-distance trade items. The object of his study has been donations of incense and oil described in the life of Sylvester (d. 335), Bishop of Rome under Constantine. This study focuses on churches in Rome, contributing to the idea that the major urban centres of the Mediterranean were the primary consumers of luxury goods, but such patterns of patronage and use of liturgical paraphernalia were equally valid for the churches of the east.[99]

Fairs and Markets

However, this fixation on major consumption centres should not be allowed to overshadow the extent to which active trade in goods was going on in the provinces. We know from historical sources of many markets and fairs taking place in the cities and villages of the Late Roman Near East. In addition to the fair at Batnae mentioned above and the international trading going on at Nisibis, Callinicum and Artaxata, Luuk de Ligt has found references to 13 periodic fairs taking place in the provinces of Oriens.[100] His survey only takes into account fairs specifically mentioned in historical sources and does not include places where commercial activity is attested archaeologically. For example, although the sources do not directly refer to trading going on at the pilgrimage complex of St Simeon the Elder, the three major sources for his life all refer to multitudes of people from far-flung nations descending on Qala'at Sim'an and the villages nearby, and areas identified as shops and bazaars have been found in the village of Deir Sim'an at the foot

[99] Seland 2011.
[100] See de Ligt 1993, 70-5, Appendix II.5, 255-6 (see also the reference to Aegae in Cilicia, 255).

of the hill and lining the ceremonial walkway up to the shrine (see Figs 5.3.1-3). Traffic would have been especially high around the saint's feast day on September 26.[101]

Of the periodic fairs listed by de Ligt, the markets of Batnae and Imma stand out. Both are rural fairs, held at least a day's journey from the nearest city. While a religious (pagan) component is associated with the Batnae fair, no religious feast is ascribed to the fair at Imma. As described above, Batnae is located near the junction of the Euphrates and the roads linking Edessa and Nisibis with Zeugma and the Syrian heartland (and, eventually, Antioch). Imma is similarly located at the junction of multiple routes, near where the Antioch-Chalcis highway intersects the road to Cyrrhus.[102]

Trade in Pottery

Because most of the long-distance goods are perishable (i.e., textiles and spices) it is difficult to say, based on archaeological evidence, to what extent they circulated in the regional economy of the Levant and Syria in particular. Pottery, for example, can to some extent be used as a proxy for the circulation of goods. Amphorae, as cargo containers, are the most obvious example; likewise, fine-ware pottery can be used for assessing larger-scale trading networks. Produced at various locations around the eastern and southern Mediterranean, such as Tunisia (African Red Slip Ware [ARS]), the east coast of Turkey (Late Roman C/Phocaean Red Slip Ware), Egypt and Cyprus, products of these workshops are then found at sites throughout Syria, including at Zeugma and at Dehes in the interior of the Limestone Massif. The mechanisms for the transportation of these fine wares have been debated; it is assumed that they enter Syria at Antioch.[103] Apamea and Epiphania (Hama) are easily accessible by the Orontes, accounting perhaps for the high presence of imported fine wares found there. From Antioch or the locations on the

[101] See especially Theodoret, *Life of St. Simeon Stylites*, 11; *PUAAES* II.B, 266, Sodini 2001, 253.
[102] See Tchalenko 1958, pls XXXVI-VIII
[103] Kenrick 2009, 267. For discussion on the mechanism of ARS distribution, see, e.g., Wickham 1988.

Orontes they would then have to be transported overland to find spots in the interior (Dehes, Androna, Resafa) and on the Euphrates (Zeugma, Halabiyya), as well as the Khabur, where there is also a locally produced imitation ARS, and imitation ARS in Brittle Ware.[104] The presence of imported fine wares far inland can be seen as a testimony to a fully functioning trade infrastructure and road network. However, the transportation of pottery is challenging: it is bulky and fragile. This was the conclusion drawn by Philip Kenrick of the 7th-century assemblage at Zeugma, that the fine-ware pottery found only made up a small percentage of the overall pottery (mainly of local production) and did not necessarily represent the full extent of trade at Zeugma during the period.[105]

The bulk of household pottery tends to be of local manufacture and of limited export value and is best for reconstructing local patterns of trade. Vokaer found that cooking wares were produced to a similar standard at a number of workshops, and were found at sites throughout northern Syria, at sites along the Euphrates, along the Orontes but also at sites along major roads such as Androna, Aleppo (Beroea) and Dehes in the Syrian Limestone Massif.[106]

While we do not know precisely where each workshop was located, Vokaer's research demonstrates which cities were linked together via trading networks. Workshop 4, which is predominantly found at Apamea, might well have been located near that city. It could then be distributed northwards via the north-south highway through the Limestone Massif, explaining its presence at Dehes, and distributed eastwards along the Antioch-Chalcis-Euphrates highway. Pottery made from Fabric 1 was more common on sites along the Euphrates, suggesting a production site 'east of Aleppo'. Pottery from this workshop was then distributed along the Euphrates and its tributaries, but also found its

[104] Schneider 1995, and imitation ARS in Brittle Ware, Vokaer n.17.
[105] Kenrick 2009, 272.
[106] Vokaer 2009, 135.

way to Androna and back west to Dehes. A map of the distribution of Brittle Ware across Syria in the 4th-7th centuries (Map 5.3.4), including sites where the material has not been subjected to petrographic analysis that would identify its workshop, confirms the importance of both waterways and the main highways in the distribution of the product. Vokaer's work demonstrates that northern Syria formed an integrated system for the circulation of goods. The presence of both fine wares from outside the region and local cooking wares indicates that they were engaged in an economic system with both regional and interregional aspects.

The primary source of northern Syria's wealth was not, however, long distance trade, but agriculture.

Transport of Agricultural Produce

The Syrian Limestone Massif also provides a unique snapshot of land use in the Late Roman period, as the otherwise marginal land was first used for agriculture in the 1st century CE, and gradually ceased to be farmed in the 7th through 10th centuries, with neither previous cultures nor the Arabs making use of the area.[107] The Late Roman buildings were not even robbed of their stone, and their shells still stand against the stark landscape.

The region of the Syrian Limestone Massif covers some 5,600 square kilometres, and is characterised by having very little topsoil covering the limestone bedrock. It is conducive to the cultivation of olives, which initially led George Tchalenko to postulate that the area was given over to a monoculture of olive growing and pressing; however, this idea has subsequently been challenged.[108] In fact, there is sufficient variation in the

107 See Decker 2007, 235-6, for a summary of assessments as to the decline of the region.

108 Tchalenko 1958, 74; contra: Tate 1992; Foss 1995, 217; Decker 2001, 71.

soil cover to allow cereal and fruit to be grown, especially in the southern zone, on the Jebel Zawiye. Chris Wickham observes that most farmers were likely to be agriculturally self-sufficient, engaging in mixed agriculture for their own use in addition to growing olives for export, as dependence on buying food for personal consumption was 'not something that the Roman economy, even at its most elaborate, could normally sustain.'[109] The Massif consists of southern and northern limestone outcroppings, with the Dana plain separating the two. The northern area can be subdivided into six or seven further jebels, with the valleys in between serving as access routes.[110]

There are over 700 villages that have been identified in the area. The settlement pattern is distinctive in that there are no proper cities in the limestone massif itself or even a prominent town; the nearest ones are located outside the region itself: Antioch to the west, Apamea to the southwest, Cyrrhus to the north, etc. This has led scholars to regard the Syrian Limestone Massif as an agricultural hinterland providing food and produce for the non-productive residents of those cities.[111] The unusually high number of olive presses does contribute to the idea that the region produced olive oil for interregional export, both for sale and as part of the governmental *annona*.[112] If the olive oil was indeed destined for an interregional market or for distribution in the capital, then there must have been some authority combining the three principal elements: the olive oil, the transport amphorae, and the sea-going ships, for none of the three originated in the same place.[113] However, the same authority need not have played a role in how the olive oil reached this point of combination. The road network of the area must have played an important role in how these settlements could have participated in such a large-scale enterprise.

109 Wickham 2005, 445. Tchalenko (1958, 73) notes that different forms of agriculture were practised, but maintains that the regions were dependent on their neighbours for an exchange of produce.

110 Tchalenko 1958, Pl. XXV.

111 See Foss 1995, 221.

112 Decker 2001, 73.

113 Kilns for amphora production have been discovered in Cyprus and on the coast between Cilicia and Antioch, but none in the Massif itself. Conversely, excavations in the Limestone Massif reveal low quantities of LR1 sherds. Decker 2001, 76-7; Wickham 2005, 446.

One should furthermore not assume that the intended markets for the produce of the Limestone Massif lay exclusively in the cities. For example, the region was in a key position to provide supplies for the troops along the Euphrates frontier, via the road to Chalcis. Also, the orations of Libanius indicate that the villages had vigorous economic interaction amongst themselves, and that a threat of boycott of the Antiochene markets by the rural peasantry marked a very real threat to the city and was an economically viable form of protest for the peasants themselves.[114]

What, then, of the internal circulation of the region? Over the past few decades, archaeologists have turned to geographers and sociologists for a theoretical framework from which to approach ancient cities, their populations, and the interactions of both with wider regions in a variety of cultural and economic contexts. In his 1980 article, 'The City Region in Roman Palestine', Ian Hopkins applied Central Place Theory to understand the relationship between urban centres and their agricultural hinterlands. According to this theory, a central prominent settlement, such as a city, would be surrounded in concentric circles by a hierarchy of settlements of diminishing population and significance.[115] Using the port city of Jaffa on the Palestinian coast as his urban centre, he found that the settlements radiating from this point decreased in size at steady distances from the centre.

Also, by modern analogy he determined that a distance of 10 to 15 miles (up to 24km) represents the distance which a peasant might cover on foot to town and back in one day. [116] Agnes Choi applies this maxim to the Roman Galilee, and concludes that most of the villages in the Lower Galilee would be within a day's walking distance of

[114] Libanius, *Or*. 50.31, 34-5; see also A.F. Norman's discussion on p. 58.
115 Hopkins 1980, 19.
116 Hopkins (1980, 24) bases the figure on pre-industrial East Anglia.

either Tiberias or Sepphoris, allowing peasants to participate personally in the bi-weekly markets.[117]

However, applying either Central Place Theory or the 15-mile rule to the Limestone Massif produces less satisfying results. In imitation of Hopkins' maps, simply overlaying circles with 15-mile radii on a map of the Limestone Massif quickly demonstrates two things (see Fig. 5.3.4). First, there is no discernible hierarchy of settlement, with the few larger villages having no immediately apparent relationship to the cities based on distance from the centre. Second, most of the villages fall outside the circles, being therefore more than a day's walk from any of the nearest cities. Even adding circles around what appear to be larger settlements in the centre of the Massif area, such as the villages of Brad and el-Bara and assuming that these places served as entrepots, does not bring goods any closer to major centres of consumption. Assuming, therefore, that the average peasant would not choose to spend more than a day travelling, we must look for some other routes along which goods were transported.[118]

The problem with the way Hopkins applies Central Place Theory is that it does not take into account topography. The Limestone Massif has a complicated topography. It is clear from the map that settlements follow the contours of the mountains, dependent on the fertility of the soil and the suitability of the terrain. Accessibility is also defined by the terrain; the mountains and valleys constrain movement. The factor under consideration therefore should not be one of distance (15 miles) but of time (a day's travel). While it is possible to draw up 'catchment areas' on a map of settlements within a 15 mile radius of major urban centres, this is not an accurate reflection of the routes

117 Choi 2005, 12.

118 Libanius, in *Or*. 50.25-26, describes a dire plight for peasants who are unable to complete the journey home before nightfall 'So night overtakes these poor wretches on their way home, and what remedy is there for their plight, and where can it come from, for no purse secures them entry into an inn – how can it, when they have none? – and criminals make travel by night dangerous, and there is nothing to feed either their asses or themselves?'

taken to get to the cities, or of the terrain, both of which would impact how far one could travel in one day. A much more fruitful approach, therefore, would be to examine the relationship of settlements to the road system, and whether this yields evidence for a hierarchy and different levels of local markets serving as intermediaries for produce to the cities, rather than peasants making their own way to urban markets as suggested by Choi.

What becomes clear when overlaying a map of the roads around, through and across the Limestone Massif on the map of settlements is that there is a clear hierarchy, not of settlements, but of road types (Fig. 5.3.5).[119] Lowest on the hierarchy are the unpaved tracks and paths that connect the settlements higher in the hills that are less accessible due to topography. Next are the routes through the Massif area: highways, linking major cities, that follow the path of least resistance through the mountains.[120] Finally, there are the highways that skirt the region and connect the cities on each side of the Massif by following the flat terrain around it. The Orontes River Valley would also serve as an important conduit. As we move up the hierarchy, the speed, ease and comfort with which travel can take place increases, therefore, the roads higher up must be more

[119] Tchalenko's map (Pl. XXXVIII), adapted for Fig. 5.3.5, made certain assumptions about the relevance of certain settlements to the circulation pattern of the Limestone Massif. His map used arrows to show directionality and points of convergence and also highlighted certain settlements along the main roads. I have eliminated these from my map because, while in some instances it is clear that Tchalenko has based his assessment on the natural access routes created by the terrain and also on the size of some of the villages, there is not enough independent evidence available to substantiate his assumptions. For example, many of the settlements on the map are unnamed, and do not appear in discussions in either of Tchalenko's own survey or of the Princeton Expedition. Simply being positioned on the road is not enough to assume prominence of a settlement. Furthermore, his attempts to establish directionality may be misleading, for he may illustrate arrows converging on a point from all directions, whereas in practice only three of these may have been routes for goods entering the village, and the fourth was used to transport them out to the next market.

[120] One runs east-west and connects Antioch with Chalcis and the interior. The other runs north-south and connects Apamea and Cyrrhus. These two roads, which follow the course of valleys in between the limestone hills, intersect at the Dana plain, roughly in the centre of the Massif (see Tchalenko 1958, Pl. XXXVI). There are two inscriptions associated with the Antioch-Chalcis road, one mentioning Marcus Aurelius, and the second a boundary stone of 588/9 (*PUAAES* No. 74 and No. 75, p. 92). The road was repeatedly noted as being in excellent condition by the Princeton expedition, and is still visible in places today. The north-south route has fared less well, and its course is mostly a matter of speculation, based on the terrain and the course of the modern road, as well as medieval caravanserais (Tchalenko 1958, 85).

desirable for transport. One might therefore assume that the aim of those transporting produce from settlements in the hills would be to reach one of the highways as quickly as possible.

One could then make the assumption that settlements along one of these highways must necessarily be higher on the settlement hierarchy than settlements in the hills. This, however, would be overly simplistic. The settlements identified as being of key centrality, both in the Jebel Siman and the Jebel Zawiye, are not located on the main road. They are shown by Tchalenko as being at the junction of pathways, but in the case of Brad, the settlement is located on a ridge above the road, and el-Bara is blocked from the highway running to the west of it by an outcropping rising to an elevation of 700 m (see Map 5.3.5 and Fig. 5.3.6).

It would seem logical that the aim of every step would be to bring the product closer to the end consumer, i.e., the urban centres. However, due to the terrain and the unknown relationships between settlements, this might not necessarily be the case. For example, villages such as Deir Sim'an or Baudeh would likely fall under the administrative sphere of Brad, but would this necessarily require that goods entered Brad first, or would the merchants in Deir Sim'an and Baudeh prefer to take advantage of their proximity to the good road and take their goods directly to Antioch or another city? This seems far more expedient, and therefore far more likely to have been the case.

It should be noted that it is clear both from historical and archaeological sources that over the course of the period different forms of land holding were in fact employed in the region. Most probably belonged to wealthy independent farmers, as suggested by the elaboration of private dwellings and patterns of patronage throughout the region. However, the Domains of Hormisdas were an imperial holding, while a number of large potential villas suggest that there were some wealthier single landowners, perhaps absentee, with holdings over a larger area. Libanius notes that the city of Antioch owned

several estates (χωρία) and beasts of burden (mules, asses, camels), the income from which belonged directly to the city.[121] Monasteries also acted as major landholders and economic agents.[122] A concentration of wealth and manpower would have a different set of implications for the ability to transport produce; for example, imperial or civic estates might have animals and people to spare to send to markets, or have the money to hire camels or donkeys and their drivers, possibly circumventing the entrepots and trading networks that private farmers participated in. [123]

It is clear that the various roads through the Limestone Massif are the key to understanding the circulation of goods within the area and to the surrounding urban centres. The fact that much of the building can be dated to the 4th century and beyond attests to the wealth of the region and to a thriving circulation of goods and people in the 4th through 7th centuries.

5.4 Pilgrim Roads to Jerusalem

The Roman highways of Palestine are mainly superimposed on pre-Roman predecessors. Jerusalem was at the centre of that older network because of the role the city played as the capital of the ancient kingdom and its importance as a religious centre. While the archaeological remains of this archaic network are less durable than the Roman, traffic to and from Jerusalem is detailed in descriptions of military campaigns and individual travel from the Bronze Age to the 1st century CE.[124] The local and interregional network of paved, 'engineered' roads and highways is a product of the Roman period. Furthermore,

[121] Libanius, *Or*. 50.5.
[122] Peña et al. 1983, 55.
[123] See Adams 2007, 102-4, for comparative pricing of animal hire and ownership based on papyri from Roman Egypt.
[124] Fischer et al. 1996, 8-20.

the inception of this road system is clearly connected with Roman military activity and the need to consolidate imperial power in the region by facilitating the rapid movement of administrative officials and, in times of crisis, troops. The dates on the existing milestones can often be connected with historically known military campaigns.

The earliest dated milestone dates to 69 CE; the road network began to be formally paved under Vespasian and Titus at this time, in response to the First Jewish revolt.[125] As a consequence, the *legio X Fretensis* was stationed at Jerusalem in 70 CE and Jerusalem then became the military headquarters of the province and a nodal point of the network for Palestine. Avi-Yonah attributes the bulk of the development of the roads to Hadrian and the need to connect troops stationed in different parts of the province to quell unrest during and after the Bar Kokhba revolt (132-135 CE).[126] Israel Roll, however, suggests that the road network was at its peak under the Severans, when it 'became an integral regional traffic system', with a system of secondary roads built to connect various coloniae and other settlements.[127]

One trend in travel that belongs distinctly to the Late Antique period rather than to the Roman period is Christian pilgrimage. Although a few individuals are known to have travelled to Palestine to view the sites mentioned in Scripture, it was hardly the widespread phenomenon that it became starting in the 4th century.[128] Jerusalem in the 2nd and 3rd centuries derived most of its status from the presence of the *legio X Fretensis*; much of the construction work in the city during this period can be attributed to the legion, and the roads to the city were kept in good repair for the army. However, around 290 the legion was transferred to Aila, and Jerusalem lost nearly all of its administrative

[125] The milestone was found at Afula, about 100 km north of Jerusalem, and was probably a marker on the road between Caesarea Maritima and Scythopolis. Isaac and Roll 1976, 16.
[126] Avi-Yonah 1950, 60.
[127] In Tsafrir, Di Segni, and Green 1994, 21; Roll 2005, 750.
[128] The most famous example is Melito, Bishop of Sardis, c.150. Eusebius, *Church History* 4.26.14. See also Wilkinson 1990, 44.

significance. Even the leader of the Christian population there held no special honours; he was subordinate to the Bishop of Caesarea Maritima, which was the provincial capital. Jerusalem's relative unimportance in the 2nd and 3rd centuries only serves to make the 4th through 6th centuries more remarkable by contrast.

Jerusalem's fortunes were completely transformed by its reinvention as the pilgrim shrine par excellence of the Holy Land. This resurgence is abundantly evident along the roads that led to the Holy City in the construction of churches, minor pilgrim shrines, and monasteries, all of which testify not only to the development of Christian Palestine, but also indirectly to the volume of the pilgrim traffic. Churches and monasteries not only served local populations, but were also custodians of holy sites and provided crucial charity and hospitality to travellers, whether it be food, water, temporary shelter or even overnight accommodation. The presence of monasteries along a road connecting two important pilgrim destinations can serve as an indicator of the volume of traffic that particular road experienced.

This is due in part to the monastic paradox: monks were meant to have abandoned the world for a life of spiritual isolation; however, they were also compelled by Scripture to provide charity and hospitality. Moreover, monasteries stood to benefit from pilgrims, particularly in the form of donations or through the sale of pilgrim souvenirs. It is therefore likely that monasteries situated on the road were actively involved in pilgrim hospitality or they would have selected a more remote location. The chains of monasteries founded along the roads from Jaffa to Jerusalem and from Jerusalem to Jericho therefore indicate that these routes were in active use during Late Antiquity for reasons entirely different from those for which they were initially constructed.

For my analysis I shall rely on the surveys conducted of the Jaffa-Jerusalem road by Fischer, Isaac and Roll (1996), and of the separate studies of the Jerusalem-Jericho road by Beauvery (1954) and Hirschfeld (1990). The authors of the first publication have

wisely chosen to chronicle the history of the route not solely by the datable physical remains of the road and the milestones along it, but by the chronology of settlements found on or immediately near the road. They record a sharp increase in the number of settlements in the Byzantine period (4th-7th centuries): 89 settlements (including monasteries), 5 military installations, 17 other – 111 in total.[129] This is compared with 53 for the Roman period. See Fig. 5.4.1 for comparison with other periods. From among these settlements the network used by the pilgrims emerges, particularly through the examination of monasteries capable of providing the trifecta of pilgrim hospitality: shelter, water and ritual.

Jaffa-Jerusalem

The road connecting the port city of Jaffa with Jerusalem was originally constructed in the first century CE, as part of the efforts to consolidate the Roman presence in Palestine, although some road-building may have taken place in the Herodian period.[130] Due to the terrain (the road passes through six separate natural 'zones') and the 800 m climb between the coastal plain and Jerusalem, the road forks at Diospolis (Lydda) and there are two routes to Jerusalem (Map 5.4.1). It should be noted that both of these roads have steep ascents – Beit Horon even has steps – which makes passage by wheeled vehicles difficult if not impossible.[131] This would not have been an obstacle to pilgrims, however, who tended to travel on foot or with pack animals.

As is the case elsewhere, the modern road now covers the Roman road, which preserves its course but obscures the construction. Earlier explorers, especially Conder

[129] Fischer et al. 1996, 332. In most cases the sites are not excavated, so the precise identification of the nature of the settlement not always possible, nor is the complete span of occupation, as the dating derives from surface pottery, stylistic analysis, etc.
[130] Fischer et al. 1996, 14-16, 328.
[131] Fischer et al. 1996, 77, 79; Robinson 1841 (vol. 3), 59, 61; see also Kloner 1996.

and Kitchener in *The Surveys of Western Palestine* (1881-83) managed to record the course of the Roman road before the modern road was built. In some areas, particularly the coastal plain, very little of the physical road remains, due either to natural erosion and sedimentation, or to the theft of the stone.[132] In other areas, especially in places where the modern road deviates from the ancient one, stretches of the Roman construction are well preserved. The best-preserved stretch is found near Khirbet Kafr Rut, between Modi'in and Beit Horon, which is preserved to a length of 1,600 m, and includes massive kerbstones and flat pavers. Kerbstones are visible in many places along the road, and even the paving remains in some cases. On average, the road seems to have been between 6 and 8 m wide (although at Rujum Abu Hashabe, east of Beit Horon, it is only 2.20 m), with high kerbs, sometimes built directly onto the bedrock, other times with an embankment and the kerbstones partly serving as a retaining wall (see Fig. 5.4.2). The paving stones at Khirbet Kafr Rut are 60 × 40 cm; at Giv'at Ze'ev the slabs used are 80-90 cm by 120-130 cm.[133]

From a combination of literary descriptions and observations made by previous travellers and archaeologists, four Christian monasteries have been identified between Jaffa and Jerusalem (Map 5.4.1).

For the first three, descriptions of the Byzantine remains are virtually non-existent, but their presence is known. Approaching Jerusalem from the west, the first is a monastery at Mevo Modi'in, on the road between Lydda (Diospolis) and Beit-Horon (about 25 km from Jaffa and about 35 km from Jerusalem), where salvage excavations were conducted in the 1960s that revealed 'a Byzantine monastery of about a quarter of an acre including a church, chambers, a wine-press and cisterns. The monastery had a cloister surrounded by a wall on three sides. Mosaics, inscriptions and sarcophagi appear

[132] Fischer et al. 1996, 67-68.
[133] Fischer et al. 1996, Khirbet Kafr Rut: 73, Rujum Abu Hashabe: 79, Giv'at Ze'ev: 81.

to have been found as well.' However, none of the results have been published in any detail. The site is presumably loosely linked with the nearby Old Testament site of Modi'in, regarded as the place of origin of the Maccabees, and a minor focus of pilgrimage in Late Antiquity.[134]

The site of Motza (Kolonia), a mere 7 km from Jerusalem, has been identified by the surveyors as the site of the village of Emmaus mentioned in Luke 24:13 when Christ appears to the two disciples. However, because in antiquity this reference was taken to indicate the city of Emmaus/Nikopolis, the site of Emmaus/Kolonia did not become a pilgrimage site associated with that New Testament event. However, the topography of that site, in the shaded, well-watered valley before the final ascent to the Jerusalem plateau, made it an ideal place for settlement, and for travellers to take rest.[135] The ruins of a Byzantine monastery were found under the remains of a Crusader monastery.

The third monastery is known to us only through Procopius: the surveyors identified Mons Gaudii (7 km NW of Jerusalem) as the likely place of the monastery of St. Samuel mentioned as having had a well built by Justinian.[136] This is based primarily on the probable transfer of the name of that monastery to the present Arabic toponym, Nabi Samwil, as well as the association of that site with St. Samuel in medieval pilgrim accounts. This spot is significant as it is where the first glimpse of Jerusalem can be had on this road.[137]

The final monastery is located 2.5 km west of old Jerusalem at Giv'at Ram. It is thought to have been the *gerokomeion* – or home for the elderly – founded by the Empress Eudokia on her first trip to Jerusalem in 438. This site continued to have importance

[134] Fischer et al. 1996, 216-7.
[135] Fischer et al. 1996, 222.
[136] Procopius, *Buildings*, 9.15.
[137] Fischer et al. 1996, 229-34.

throughout antiquity and is listed as one of the places where the victims of the Persian attack on the city in 614 were buried.[138]

Jerusalem-Jericho

The importance of Jericho to pilgrims was two-fold. First, there was its biblical significance as the site of Joshua's victory and the famous tumbling of the walls (Joshua 6:1-27). Second, it was the largest settlement near the crossing of the Jordan Valley into Transjordan, which had in previous eras also been the key to its importance, but in the Christian period had the additional attraction of being associated with the site of Christ's baptism (Matthew 3:13-17, Mark 1:9-11, Luke 3:21-22, John 1:29-33).

The road was likely originally constructed under Vespasian. The one milestone recovered from the route is undated.[139] Herod, in the early 1st century, had a winter palace at Jericho. Josephus writes that, at the time of the First Jewish Revolt, in 69 CE, 'Vespasian, with a view to investing Jerusalem on all sides, now established camps at Jericho and at Adida, placing in each a garrison composed jointly of Romans and auxiliaries.'[140]After the *legio X Fretensis* was stationed at Jerusalem, the Jericho road would have remained a key supply route from Transjordan, which was more fertile and where much of the grain supply for Palestine came from.[141] Beauvery argues that the road dates from this period (rather than the reign of Hadrian as had previously been suggested) based both on the historical context and 'la technique relativement simple' of the cuts revealed.[142]

[138] A brief description, summarising the short Hebrew excavation report (published in *BIES* 15 [1949] 19-24) can be found in 'Jerusalem – The Byzantine Period,' *NEAEHL*, 784. No plan or final report is available. For the attack of 614, see Antiochus Strategos (Conybeare 1910, 515).
[139] Beauvery 1957, 84; Thomsen 1917, 78, No. 279.
[140] Josephus, *The Jewish Wars*, 4.486.
[141] Bartlett 1982, 124; this remained the case in Late Antiquity as well for the monks of the arid Judean Desert (Hirschfeld 1992, 82–85).
[142] Beauvery 1957, 101.

After the annexation of the Nabatean kingdom in 106 the road served as a conduit to the eastern frontier with Persia. However, after 289 and the transfer of the legion, the road lost much of its military *raison d'être*.

Yitzhar Hirschfeld, in his research into the monasteries of the Judean desert, noted four minor sites (what he calls 'memorial church monasteries') along the Jerusalem-Jericho road and beyond, to the Jordan river (Map 5.4.2). These small religious complexes appear to have been strategically placed along this major pilgrimage route (Map 5.4.2). The four sites – St. Peter's Church (Qasr Ali), St. Adam's Church (Khan Saliba), Galgala (Khirbet en-Nitla), and St. John the Baptist (Qasr al-Yahud) – are all identified as monasteries. The distance between them is approximately ten kilometres – which corresponds well with the distance someone travelling on foot could expect to cover in a few hours; if we examine the staging posts of the imperial *cursus publicus,* we see that the more frequent stops, the *mutationes*, are an average of 10 km apart as well.[143]

One of the better-preserved examples of these small pilgrim monasteries is St. Peter's Church, located on the Roman road about 6 km outside of Jerusalem (Fig. 5.4.3), and founded in 459 by the empress Eudokia.[144] It does not appear to have separate facilities for guests, as its proximity to Jerusalem, only a few hours' walk away, makes it an illogical place for overnight lodgings. It would, however, make an ideal watering hole. The complex consists of a church, living quarters for the monks and what may be a tower. For travellers, the most important part of the site would be the massive cistern. This cistern, solidly built and larger, in fact, than the church (the cistern measures 33 × 15 m; the church only 29 × 15 m), must have provided the water necessary for desert travellers. St. Peter's also marks the turnoff from the main road towards the shrine devoted to St. Gabriel, a local saint, located a few kilometres north.

[143] Wilkinson 2002, 20.
[144] Cyril of Scythopolis, 53,10-12; Hirschfeld 1990, 19-20.

The circumstances of St. Peter's founding and its location support the idea that its primary purpose was to serve the peregrinating public.[145] The site does not appear to have any inherent holiness, dedicated in a rather general sense to Peter the Apostle. Beauvery identified the site as a Roman way station – a *mutatio* of the *cursus publicus*.[146] However, his attribution failed to take into account the earlier suggestion that the main building was in fact a church, and could thus be identified with the St. Peter's church mentioned in the Life of Euthymius. The archaeological evidence does not give much weight one way or the other – although the finds from the 'church' – 'marble fragments and Byzantine sherds' suggest both a costly décor and later date more plausible for a church than an ordinary rest stop.[147] Beauvery's identification is based on the site's location – specifically its distance from Jerusalem, where one might expect to find a *mutatio*. This is itself significant, demonstrating how the landscape, whether secular or sacred, had to be broken down into manageable increments.

Moving eastwards, the next site is the so-called Church of St. Adam at Khan Saliba, which lies c. 12 km from the site of the Church of St. Peter's and c. 16 km from Jericho. The site was partially excavated by J. Prignaud. Excavations uncovered several rooms with mosaic pavements, and an inscription mentioning 'the presbyter and hegumen Paul,' confirming the site's monastic status.[148] A rock-cut, partially subterranean cistern was also found within the monastery compound; natural springs in the area mean that water is never lacking (Fig. 5.4.4).[149] Benches lining a small courtyard at the entrance to

[145] Hirschfeld 1992, 56.
[146] Beauvery 1957, 75.
[147] Hirschfeld 1984, 81.
[148] The inscription, written on a single line above the border of the geometric motif of the pavement, reads:
ἐπὶ τοῦ θεοφ[ιλεστάτου] πρεσβ[υτέρου] κ[αι] ἡγουμ[ένου] Παύλου ἐγένετο τὸ ἔργον. It has been dated on stylistic grounds to the sixth century, as the inverted 'S' abbreviation markers are said to be typical of that period (Prignaud 1963, 251).
[149] Prignaud 1963, 253 n. 21.

a small chapel could have provided respite for pilgrims.[150] It is unclear whether the western part of the complex had cells for monks or additional guest accommodation: possibly both. The complex has been dated, based on the styles of the mosaics, to the 6th century. [151]

The next site is Galgala/Khirbet en-Nitla, identified with Gilgal of the Book of Joshua. The site was partially excavated in 1950 by D. Baramki, who identified the structures found as a church consisting of several phases, beginning with a basilical church in the fourth or fifth century, and finally abandoned in the ninth century. However, Hirschfeld disagrees with Baramki's findings, identifying the structure instead as a monastery (possibly including a church). Moreover, earlier explorers identified a reservoir within the site.[152] The location is also significant, as it is situated 3 km east of Jericho, 'just north of the dirt road to the traditional site of Christ's baptism.'[153]

The final memorial church monastery identified by Hirschfeld is situated less than half a kilometre from the site of the baptism – its dedication to John the Baptist is therefore not surprising. This monastery was another imperial foundation, established by Anastasius and endowed from the imperial treasury. The monastery remained in use throughout the middle ages and was rebuilt in the late 19th century. The early complex appears to have consisted of a walled monastery, a church built over a chapel, and a large reservoir, possibly fed by an aqueduct from a spring near Jericho.[154]

[150] See Fig. 11, Locus 2. Prignaud 1963, 246.
[151] Milik identifies the remains at Khan Saliba with St. Adam's Church mentioned in an eighth to tenth century pilgrim itinerary (Epiphanius). The monastery is a convenient turn off for the monastery of Choziba (c. 3 km away), which is mentioned in Epiphanius' itinerary, and an active monastery since the 5th century (Milik 1960, 587-91).
[152] Hirschfeld 1990, 51.
[153] Baramki 1955, 50-2.
[154] Hirschfeld 1990, 35-6.

As we have seen by these examples, a pilgrim could expect to make his way, stage by stage from Jerusalem to the baptism site at the Jordan River secure in the knowledge that, through some higher power, water and shade would be available at regular intervals.

Chapter 6 – The Shifting Routes of Southern Palestine and Transjordan in Late Antiquity: A regional study of military, commercial, and pilgrim traffic

The case studies presented in Chapter 5 have attempted to demonstrate the condition of the Roman road system in response to the various political, economic, and social phenomena of Late Antiquity. The area of Southern Palestine and Transjordan offers an opportunity to bring these different strands together and examine their interplay in a single, relatively cohesive, region. Below I shall consider the various forces of an administrative, military, economic, and religious nature, and how they impacted the communications networks in the region during Late Antiquity.

The area under consideration covers roughly the ancient provinces of Palaestina Tertia and Arabia (see Map 6.1 for place names). At the end of the 3rd century, under Diocletian, the provincial boundaries of Arabia and Palaestina Salutaris (renamed Tertia) were redrawn.[1] The city of Gaza itself actually lies within the bounds of Palaestina Prima. These regions are primarily characterised by desert steppe, with the exception of the very coastal areas. For this reason it is often considered a marginal area, as it is largely inhospitable to habitation, especially sedentary agriculturalism. However, due to this very marginality the area's archaeological remains are well-preserved, and these remains indicate that this area was extensively settled and even farmed in the 4th to 7th centuries. In this respect, it repeats the trend of much of the Late Roman Near East, which suggests vast population expansion and encroachment onto previously marginal areas – the

[1] See Sipilä 2009, Chapter 6, on the dating and extent of this territorial redistribution. See Sipilä 2007 on further reorganisations in the mid-4th century.

villages of the limestone massif of Syria examined in Chapter 5.3 provide a useful comparison.

The area covered by the fluctuating boundaries of Palaestina Tertia and Arabia can be roughly divided into three geographic zones. Firstly, there is the coastal plain, which affords smooth passage in a north-south direction and an unbroken line of communication between Alexandria and Antioch at the very least. Although the coastal plain is bordered by mountains in the north, around Gaza it is quite flat. Secondly, to the east lies the Negev Desert, an arid steppe with low hills and frequent wadis that might have facilitated movement. The terrain is rocky, although the western part is sandier and can contain dunes, extending into the Sinai Peninsula as well, although the central Peninsula is famous for its high mountains among which the famous monastery lies nestled. The Negev is bounded on the east by the Wadi ʻAraba – the Rift Valley. The third zone constitutes the ash-Shara ridge that rises up out of the Wadi ʻAraba to elevations of 900-1510 m asl. The ridge levels out to form the Transjordanian highlands, characterised by rocky plateaus intercut with wadis.

The type of terrain determines what sort of archaeological road remains can be found. If the terrain is rocky, as opposed to sandy or boggy, paving is rarely necessary, only in the case of sand fields, and even then only if the road is intended for wheeled traffic.[2] At the other extreme, boulder fields impede movement. These could either be circumvented entirely, or the boulders could be cleared from the desired path. The gravel plains and mudflats (*sabkhas*) provide an ideal road surface that would not require any further intervention.[3] There is very little need for built road structures, except in places of ascent or descent, or at wadi crossings. Indeed, very few sections of paved road have been

[2] Smith 2005a 182, 186.
[3] Smith 2005a 182.

found in the region, although other indicators of roads, such as surface clearing, milestones and roadside structures have been found (see Fig. 6.1).

Of interest for this study is the development of the main north-south routes of communication, and those leading east-west. The ancient north-south arteries include the road along the Mediterranean coast (sometimes known as the *Via Maris*), and the route from Aqaba through the Transjordan highlands to the east of the Rift Valley, attested since the Iron Age and known as the King's Highway.[4] The main access from the Transjordanian highlands to the Mediterranean coast ran in a north-westerly direction between the Nabataean capital at Petra and Gaza on the coast across the Wadi 'Araba and the Negev desert.[5] A further pattern of circulation includes the southern Negev and the Sinai Peninsula, which in Late Antiquity was an important *locus sanctus* for pilgrimage (see Map 6.2).

Historical Background

A brief historical background will aid in understanding some of the changes that took place in the road system. Southern Palestine and Transjordan formed the heartland of the Nabataean kingdom which experienced its heyday between the 3rd century BCE and the 1st century CE. The Nabataeans were instrumental in the caravan traffic through which exotic goods from the Far East and the Arabian Peninsula reached the Mediterranean world. The Nabataean kingdom – and its lucrative trade – was annexed by Trajan in 106 CE.

The Nabataeans employed the ancient route known as the King's Highway which ran from Egypt to Damascus and beyond via Aila and the Transjordanian plateau. The

[4] See Dorsey 1991, Mattingly 1996. See Borstad 2008 on whether the 2nd century *Via Nova* follows the course of the King's Highway.
[5] Frank 1934, Glueck 1934, Alt 1935, Negev 1966, Cohen 1982, Roll 2007.

main east-west artery from Petra to Gaza channelled trade from the Arabian Peninsula to the Mediterranean shores. The structures – forts, caravanserais, road stations – along this so-called Incense Road span dates from the 3rd century BCE through the 2nd and 3rd centuries CE. It is commonly assumed that the Nabataean caravan route would have been unpaved, and that any paved sections of road are of Roman construction. Assigning a precise terminus for the end of the Nabataean period and the beginning of the Roman is impossible, as Roman involvement in the area began even before the formal annexation of the kingdom by Trajan in 106 CE. This ambiguity is reflected in the pottery sequencing: Nabataean/Roman, Late Roman/Byzantine, Byzantine/Umayyad. However, three distinct phases of development can be discerned taking place in the 2nd-3rd centuries, the early to mid-4th century, and the 5th-7th centuries.

There is a popular dichotomy that the Nabataeans were nomadic and focused on commerce, while the Romans were sedentary and militaristic. This has led to the assumption, for example, that paved stretches of road must be Roman, and that fortified desert structures must be 'caravanserais' if dated to the Nabataean period and 'forts' if dated to the Roman/Byzantine period. This is, of course, an oversimplification. There is little immediate change in the material culture between the Nabataeans and the Romans (especially since these terms reflect the political structure, not the ethnicity of the inhabitants of the region!). Furthermore, one must not overlook the fact that fortified desert structures could serve many functions at once, in any period.

The Nabataeans did build chains of desert structures to provide both security and accommodation for the caravans and after the 3rd century BCE began forming permanent settlements at, e.g., Oboda, Elusa, and Nessana. These structures make it possible to trace a very clear route of the Nabataean Petra-Gaza road leading from Petra to Moyet 'Awad, to Oboda, Elusa and then to Gaza.

However, recent archaeological study of the Nabataean/Roman settlements of the Negev has demonstrated clear evidence of a period of decline and even abandonment in the mid-3rd century CE.[6] This is probably a result of the combination of the general political instability of the 3rd century crisis, epidemics, and possibly also the effects of the bulk of luxury caravan traffic passing through Palmyra rather than Petra for much of the 2nd and early 3rd centuries. Although the incense and luxury trade was revived after the fall of Palmyra, the routes appear to have omitted Petra.[7] Furthermore, the Egyptian Red Sea ports played an important role in channelling commerce from India to the Mediterranean via Alexandria.

This decline apparently includes the Nabataean Petra-Gaza route, as the sites that have been excavated between Moyet ʻAwad and Oboda do not appear to have material from after the 3rd century, despite the renaissance of the Negev region in the 4th century after Diocletian's reforms.

Situation in the 4th to 6th centuries

The real moment of transition comes with Diocletian. Diocletian redrew the provincial boundaries, resulting in the creation of the province of Palaestina Tertia from the former Palaestina Salutaris and parts of the province of Arabia, including Phaino (Wadi Faynan) and southern Transjordan.[8] There was an extensive military build-up, with fortresses built along the *Via Nova* and along the Wadi ʻAraba. Three legions were stationed at intervals of 100-150 km at Bostra, Udruh and Aila, with a fourth at Lejjun (Map 6.2). Fortresses were built along the entire length of the road, which came to serve as a military supply

[6] Erickson-Gini 2007, 97.
[7] Shahid 2009, 24; Fiema 2001, 117.
[8] Sipilä 2009, 149.

artery. The string of fortifications was continued to the north, in the form of the *Strata Diocletiana*, which ran from Bostra to the Euphrates.

West of the Wadi ʻAraba, the key advance was the development of the north-south axis connecting Jerusalem and Aila. At the end of the 3rd century, the Jerusalem legion, *legio X Fretensis*, was transferred to Aila. Milestones dating to the reigns of Diocletian and Constantine have been found, for example, at Yahel.[9] This route was still being described as an important highway (*via regia*) in the late 7th century.[10] In the 4th century the international customs point was transferred from Leuke Kome (mentioned in the 2nd century *Periplus Maris Erythraei*) to Iotabe, close to Aila.[11] This commercial role further enhanced the importance of the roads to Aila, and Jerusalem's increased importance as a pilgrim destination and ecclesiastical centre made it an important terminus for the road as well. It is also significant that a paved road from Petra, dated by Ben David to the late 3rd/early 4th century, runs south of the city to connect with this road to Aila, unlike the earlier Petra-Gaza road that made use of descents to the Wadi ʻAraba north of the city.[12]

There was sustained military activity throughout the region into the early 5th century. New forts were being built into the late 4th century, but there do not appear to be any new forts after the first half of the 5th century. Total abandonment of forts and watchtowers apparently took place by the mid to late 6th century, with some settlement still detected, particularly in forts overlooking key caravan routes. This can be attributed to a number of factors, including the concentration of military activity with Persia on the Mesopotamian frontier to the north, and the increasing reliance on *foederati* – local tribes

[9] Roll and Avner 2008.
[10] Adomnan, *On the Holy Places* 2.7.2.
[11] Jones 1964, 827, Theophanes AM 5990.
[12] Ben David 2007.

– to police and defend the Palestinian *limes.*[13] Despite gradual military withdrawal, the region continued to thrive on trade and pilgrimage even after the Arab conquests.

Settlements of the Negev

Like much of the Levant in the Late Antique period, the Negev and Transjordan experienced a population expansion based on the agricultural development of previously marginal areas.[14] The settlements that emerged were densely populated villages of around 500 to 3,500 inhabitants.[15] The settlements of the Negev were nearly all founded on the sites of early Nabataean caravanserais. The exception may be the village of Saudanon (Saadi), which appears to be Late Antique in origin.[16] Because the settlements were originally stopping points on the Nabataean caravan routes, there is a pre-existing pattern to their distribution that is not dependant, as in the case of most settlements, on the availability of water sources and terrain. Instead it is primarily shaped by connectivity, principally connecting the Nabataean heartlands, centred on Petra, with the Mediterranean coast. The importance of the routes takes such precedence in the siting of these settlements, that many of them in fact have a very poor water supply of their own, with Mampsis (Kurnub) and Sobata having no permanent water sources.[17] Elusa, likewise, though ideally positioned as a stop for caravan traffic as the first inland station from the Mediterranean coast, is built in an area unconducive to permanent settlement with sand dunes that hinder both building construction and water collection.[18] Nevertheless, their primary economic base was agricultural produce: wine, grain, fruit are the crops mentioned in the Nessana Papyri.

[13] Fisher 2011, 120, Fisher 2004.
[14] Bar 2004, 6.
[15] Shereshevski 1991, 200-214, esp. Table 19. Elusa, the only *polis* in the region, had an estimated population of 10,500.
[16] Shereshevski 1991, 90.
[17] Most of the sites relied on wells and cisterns for their water; Mampsis and Sobata had no deep wells. Shereshevski 1991, 190.
[18] Mayerson 1963, 170.

In the 4th century, the settlements began to recover after the 3rd century slump. Among the first to experience a resurgence are naturally those connected with the new military installations – the main settlements in the early 4th century are Mampsis and Oboda, with Nessana only showing signs of revitalising in the late 4th century.[19] Mampsis prospered in the 2nd century CE due to its proximity to the paved road at the Scorpions Ascent and was a centre of horse breeding.[20] As Benjamin Isaac has observed, there is no mention of garrisons or military presence at the villages of the western Negev (Nessana, Sobata, etc.) in documents such as the *Notitia Dignitatum* of c. 400 that could be related to the build-up under Diocletian. However, the Beersheva Edicts of the 5th/6th century do indicate a military presence by the later date, and the Nessana papyri attest to the presence of a garrison there by 505.[21] This indicates that the settlements regained some strategic importance, probably as a result of on-going trade – the revival of the incense and other luxury trade – as well as the agricultural production that might have been part of military supply.[22]

The political stability and increased administrative presence encouraged population expansion and agricultural development; it also aided the spread of Christianity. Extensive church building took place with several churches in each village: a sign of prosperity. Elusa had a theatre that was renovated in 454/6.[23] The settlements are sometimes called 'towns' to emphasise their urban characteristics such as a profusion of churches and public buildings: Irfan Shahid coined the grandiose term 'Heptapolis' to describe them.[24] In reality these settlements lack any official administrative status to

[19] Erickson-Gini 2010, 73-4; Colt 1962, 16.
[20] Shereshevski 1991, 21; Roll dates Mampsis' heyday and the importance of the Scorpions Ascent to the Tetrarchic period: Roll 2007, 126.
[21] See Chapter 2; Kraemer 1958, 5-6, 19-24.
[22] Isaac 1995, 140-144, Fig. 3.
[23] Shereshevski 1991, 88, Negev 1981, 124.
[24] Shahid 2009, 24.

permit that designation.[25] Elusa held the status of *polis*, but Nessana was designated as a *komê*.[26]

The Routes

Petra-Gaza road

The Petra-Gaza road has been the subject of a great deal of scrutiny. At the crux of the debate is whether the route should be identified as exclusively Nabataean, or whether it formed part of the military system of the province under the Romans (Fig. 6.2). Fritz Frank thought that the pottery collected from the surface of the structures strung along the road suggested a Roman, post-annexation, date. Nelson Glueck, on the other hand, based on his studies of Nabataean pottery east of the ‘Araba, argued for a Nabataean date. Albrecht Alt arrived at a similar conclusion to Frank based on a stylistic analysis of the architecture and a survey of historical sources.[27]

Once excavations at the sites along the route began, a more fixed chronology could be established. Excavations at Oboda, which indicated a decline in the 3rd and 4th century. and the absence of ‘Byzantine’ pottery, i.e., of the 4th century and later, along the route led Avraham Negev to the conclusion that the Petra-Oboda-Elusa-Gaza road did not exist during Diocletian’s reign, and was abandoned after 106, as none of the sites along it were inhabited.[28]

Cohen on the other hand, argues for continued use of the road. The presence of Roman milestones and artefacts does not have to be regarded as a dilemma. Cohen focused his investigation on the area between Moyet ‘Awad and Oboda. Based on excavation it has been determined that Moyet ‘Awad was a Nabataean caravanserai that

[25] Shereskevski 1991, 216, citing Y. Dan, The City in Eretz-Israel During the Late Roman and Byzantine Periods (Hebrew), Jerusalem 1984.
[26] κώμη Νεσσάνοις ὁρίου πόλεως Ελούσης (P.Colt 16).
[27] See note 5 above. Isaac 2006, 215.
[28] A. Negev 1966, 96-97.

continued to be occupied until end of the 3rd century. Another road-stop, Mesad Neqarot, was a Nabataean way-station replaced by a Roman tower in the 2nd century. The caravanserai at Oboda suggests continuous occupation from the Nabataean period into the early 4th century.[29]

However, while Roman military presence after 106 can be detected, it becomes difficult to identify consistent militarisation belonging to the period of Diocletian's reforms and beyond along the Petra-Gaza road. Instead, the north-south line through the Wadi 'Araba became more pronounced, while the desert structures between Moyet 'Awad and Oboda remained abandoned. Smith interprets this as consistent with Diocletian's programme of administrative overhaul: 'a conservative, imperial agenda that supported the consolidation of resources and the development of more centralised administrative centers.'[30] As a result of this conservatism and the focused investment of resources in military installations along the north-south route, we may be presented with an archaeological bias for the first half of the 4th century. Despite this deviation northwards from the earlier transverse route, the Negev and the Wadi 'Araba were still very much connected with Gaza, as can be seen not only from trade links, but also from cultural and artistic influences, for example, in the mosaics of the 5th century Petra Church.[31]

Given the vitality and economic integration of the Negev settlements into a network of commerce and exchange – settlements that were lynch-pins in the Nabataean/Roman road network – it seems likely that parts of the Petra-Gaza network

[29] Cohen 1982, 243-246.
[30] Smith 2010, 112.
[31] Leah Di Segni observed the use of the era of Gaza in inscriptions found in the Negev as well as in the Nessana papyri, often used in lieu of or in conjunction with the era of Arabia, which would have been more relevant. Di Segni concludes that this use of the Gazan era is not a relic of a previous administrative reality, but reflects an economic and cultural relationship between the regions. Di Segni 2004, esp. 54-5. The mosaics in the Petra Church were influenced by the Gaza school. Waliscewski 2001.

were revitalised in the 4th century and beyond and that the eastern node of this traffic was probably Aila rather than Petra. This is supported to a certain extent by the ceramic finds from the excavations of residential houses at ez-Zantur in Petra, which yielded numerous types of imported fine wares of Mediterranean origin for the early period (including Arretine ware and other Italian products, as well as Eastern Sigillata A), but hardly any for the Late Roman period, apart from a few sherds of African Red Slip ware. These sherds do extend in date to the final destruction of the second Late Roman phase (probably an earthquake in 419), but the absence of the diversity of the earlier period is striking.[32] This situation is echoed at the other prominent Late Antique sites of Petra, the Petra Church and the monastery of Jabal Harun, where Mediterranean imported wares are rare. At Jabal Harun a handful of sigillata sherds (mainly African Red Slip, some Cypriot Red Slip) were found; the dates for these based on the Hayes typology are fairly late, mainly 6th and 7th centuries, which does give a tantalising hint at continued contact with Mediterranean entrepots.[33] A single sherd of a LR4 Gaza amphora was recovered, and as well as two sherds of Aila/Aqaba-type amphorae.[34] Overall, however, the pottery assemblages from all three sites have an affinity with finds from sites along the *limes* (e.g., Lejjun and Udruh), around Jerusalem and the Galilee, and Aila.[35] Parker suggests that the Late Roman sigillata wares found in Aila arrived at the port city overland from Gaza.[36]

The Wadi 'Araba road (Aila-Jerusalem)

Even with the revised dates for the stations between Moyet 'Awad in the Wadi 'Araba and Oboda in the Negev gleaned from excavations by Cohen, there does not seem to be

[32] Schneider 1996, 139-40.
[33] Gerber 2008, 286.
[34] Gerber 2008, 294.
[35] Fellmann Brogli 1996, 238-9.
[36] Parker 2006, 228.

archaeological evidence linking the eastern Negev and Petra via the old Nabataean/Roman Petra-Gaza road in the 4th-7th centuries. Despite the dates extending well into the 3rd century and therefore after the annexation of the territory, there is no evidence of new construction of fortifications along this particular axis during Diocletian's reign. At Oboda there is evidence of military construction dating to the reign of Diocletian. Although the Petra-Gaza route lacks military construction that would be necessary to safeguard a crucial supply line, suggesting that the route was not of military/administrative importance, the route remained in use, particularly for the transport of agricultural produce, as will be seen below.

On the contrary, there is a marked increase in the proliferation of forts and stations along the north-south axis that runs along the Wadi 'Araba from Aila and then turns north-west at Mampsis and eventually leads to Jerusalem. This can be quite concretely linked to a system of Diocletianic fortifications.

Earlier scholars entertained some scepticism about the existence of a north-south route through the Wadi 'Araba (e.g., Rothenberg 1971), but subsequent archaeological discoveries have confirmed the presence of not just one road, but several routes running both north-south and transversely east-west across the Rift Valley.[37] The principal north-south route is part of an extended highway connecting Aila and Jerusalem. Its inauguration as an imperial highway can probably be attributed to the transfer of the *legio X Fretensis* to Aila probably in the 290s; a Tetrarchic date is further confirmed by milestones found near the fortress of Yotvata.[38]

This particular highway is mentioned in Eusebius' *Onomasticon*; and its survival as a highway into the 7th century is attested by the pilgrim account of Arculf, dated to the

[37] See, e.g., Isaac 2006, Smith 2010, Ben David 2007, Roll 2007.
[38] Roll and Avner 2008.

670s.[39] Surveys and excavations have revealed several fortresses with late 3rd-/early 4th-century occupation, including Yotvata, Gharandal, Bir Madkhur, Mezad Hazeva and Qasr et-Tlah, which can convincingly be linked with the military distribution during the Tetrarchy.[40] However, many of these forts, although they may have previous occupation dating to the Nabataean and Roman periods (1st and 2nd centuries CE), if resettled in the late 3rd/early 4th century may only have been occupied for a short period of time and evidence of settlement may not extend into the 5th century. However, this is not necessarily cause for concern about the vitality of the road networks, as all in all this is consistent with the general trend of reduced military presence in the later centuries. The trouble therefore lies in identifying structures belonging to the 5th century and beyond.

The evidence in the cities (e.g., Aila and Petra) and more populous settlements is clear such as those of the western Negev discussed above. The countryside is problematic. However, the South Araba Archaeological Survey and the Bir Madkhur survey have identified numerous sites in the Wadi 'Araba with evidence of 5th-7th century occupation, sometimes continuing into the Islamic period. These sites consist of farmhouses and 'villages'; they are less overtly militaristic and may have been overlooked by earlier surveys. However they testify that the region was far from abandoned in Late Antiquity.[41]

Bir Madkhur is a Late Roman fort that lies at the bottom of one of the descents from Petra. It has a Nabataean predecessor, and is located at a cross-road. On the one hand it can be regarded as the eastern-most station on the Petra-Gaza road. On the other hand its occupation in the 3rd/4th centuries indicates its importance for the north-south route as well. In that period the site boasted a *quadriburgium* fort, and a second, ancillary structure that was revealed to contain a number of rooms and also a bath. This was

[39] Eusebius, *Onomasticon* 8 ('Asasan Thamar'); Adomnan, *On the Holy Places* 2.7.2.
[40] Smith 2010, 30-51.
[41] Smith 2010, 56-91.

tentatively identified as a caravanserai, but actually it is similar to official *mansiones* found throughout the empire, e.g., at Lejjun.[42] New forts were constructed and occupied and then reoccupied at various times in the 4th and 5th centuries. Be'er Sheva (Birosaba) was an important military camp – it eventually served as an administrative headquarters and residence of the *dux Palaestinae*, which is why it is an important terminus for the main road.[43]

Darb Ghaza – the Sinai route

A third route connects the Mediterranean and the Red Sea, the so-called Darb Ghaza or Gaza Road. This route crosses the southern Negev, where the terrain is flat and 'monotonous'. The desert crossing begins near Nessana; the coast is accessed via Elusa. The route is described as ancient, actually made up of several parallel paths.[44] Apart from what may be a roughly-hewn milestone, the route shows no consolidation into a Roman imperial road. Its use from the 4th century on, however, is attested in the form of graffiti with Greek inscriptions and crosses, which can be attributed to Christian pilgrims en route to Mt Sinai.[45] This route might partly represent the *Haila-Ad Dianam-Rasa-Gypsaria-Lysa-Oboda-Elusa* itinerary on the Peutinger Map, which has been demonstrated not to be the route through the Wadi 'Araba.[46] In addition to serving pilgrims, the route might also have been a trade route connecting the port at Aila with the settlements of the western Negev and the Mediterranean coast, by-passing the Wadi 'Araba route. This was also the route used by Arabian tribes trading within the Roman Empire.[47]

[42] Crawford 1987, 385-398.
[43] Sipilä 2009, 201, Fabian 1995, 240.
[44] Meshel 2000, 99.
[45] Meshel 2000, 110.
[46] See, e.g., Isaac 2006, 219.
[47] Isaac 1995, 131.

Via Nova Traiana

Finally, let us look at the route connecting the Red Sea with the interior of Syria. The change in altitude between the Wadi ‘Araba and the Transjordanian highlands means that, apart from a few mountain passes, this route belongs to a different system of circulation than the Wadi ‘Araba route and the routes to the Mediterranean. Although as the King’s Highway it had been part of the Nabataean caravan routes from the first millennium BCE, the construction of a magisterial artery that eventually led from Bostra in the north all the way down to Aila was the first major road development to take place immediately after the annexation in 106. This road came to be known as the *Via Nova Traiana*.[48]

The history of the *Via Nova* is extremely well documented by the milestones that dot its course.[49] Its construction was begun after the annexation of the Nabataean kingdom in 106; it was laid down quite quickly and completed between 111 and 114. It connected the provincial capital of Arabia at Bostra with the legionary camp at Aila. Bostra was also a legionary garrison, home to the *legio III Cyrenaica* from the 2nd century possibly up to the Arab conquest.

No comprehensive study of the entire length of the *Via Nova* exists. There have been numerous individual surveys that have taken in short stretches of the highway.[50] Despite the evidence mainly coming from disparate surveys, the approximate route of nearly the entire length of the road is known thanks to the milestones that have been studied, similarity in construction technique identified along various sections, and by correlation of known sites with sites marked on the Peutinger Table.[51] The road starts in

[48] See Borstad 2008, who argues that the route of the paved *Via Nova* differed from the route of the King’s Highway.
[49] Thomsen 1917 is the standard reference, although a handful of new discoveries supplement this.
[50] Starting with Brünnow and von Domaszewski (1909) in the late 19th century, Butler for the Princeton expedition in the early 20th century (*PUAES* I-III). In more recent work, David Graf has surveyed the southern section of the road between Petra and Aila (Graf 1995), while David Kennedy has worked on areas to the north-east of Amman (Kennedy 1997). See also Fiema 1993; MacDonald et al. 1982, 1988; Bauzou 1998.
[51] Graf 1995, 244; Bowersock 1970, 239.

Bostra and leads south to Amman/Philadelphia, there the road may diverge, with one road veering east and south towards the legionary camp at Udruh, and the other towards the west and south, terminating in Petra, the *metropolis*, and extending from there to Aila.

In many places the paving is preserved – whether the road was paved along its entire length is unknown; it is possible that it was just a cleared track in places. Where built, the road was c. 5.5 m wide with kerbstones and a central ridge.[52]

These surveys of the *Via Nova* are often done as part of larger investigations of the military installations of the Arabian *limes*, and thus consider the road primarily in its military aspect, and during its earlier period. The later phases of the road are very difficult to gauge and discuss, due in part to the discontinuation of the practice of erecting datable milestones, and the frequent absence of any datable material in the fill of the road itself. David Graf observes of the highway in the region between Petra and Aila:

> The archaeological investigation of this route indicates the Trajanic road maintained its official character into the Byzantine period, although by that time alternative routes had developed to accommodate the growth and expansion of settlements as far east as the fringe of the eastern desert. [53]

The growth in number and size of settlements of various types in the Levant is well-attested for the 4th through 6th centuries. That the road system kept up with these developments is evident from the number of secondary roads that lead from major cities along the principal highways. Graf notes from his survey that 'spurs from the Trajanic road are clear at Petra, Basta, Sadaqa, Qana and Humayma.'[54] All of these appear to have been significant settlements, with Sadaqa (Zadagatta) and Humayma (Hauarra) represented on the Peutinger Map as significant points for road-users.

[52] Graf 1997, 244.
[53] Graf 1995, 264-5.
[54] Graf 1995, 244.

However, it appears clear that the changes in military disposition had an impact on the vitality of the *Via Nova* itself. The lines of Tetrarchic forts and the presence of milestones dated to the reign of Julian (361-3) show that it was part of an integrated system of defence.[55] By the mid-6th century, only a few of the forts show signs of occupation, some of which may not even be indicative of an appointed garrison.[56] The continued prosperity of sites that lie at a remove from the main course of the *Via Nova*, at the expense of sites directly on it, confirms this image of fragmentation.

Zbigniew Fiema has surveyed one of the best-preserved sections of the Roman highway at Tuwaneh in south-eastern Jordan. Tuwaneh may correspond to Thornia on the Peutinger Map, suggesting that it served as a rest stop along the public highway. Fiema's survey attempts to contextualise the road within the changes that took place in the settlement of Tuwaneh over the centuries between the Nabataean and Byzantine periods. He has therefore taken into account the later developments of the road and how that reflects the development of the settlement. He concludes that the settlement shows an increase in activity and affluence during the first centuries CE (connected doubtless with Nabataean trade activity), followed by continued affluence and construction work around the building of the Trajanic road (including the construction of watchtowers and stations). The 4th and 5th centuries were characterised by 'unparallelled expansion into marginal lands and intensive agricultural production', followed by a noticeable decline in activity in the 5th through 7th centuries. This is evidenced by the drop in ceramic material, which according to Fiema represents the region-wide trend towards 'a gradual decline in urbanism, growing isolation of settlement clusters, the abandonment of military infrastructure, and a gradual disappearance of interregional means of communication'.

[55] Thomsen 1917, Nos 126-7.
[56] Parker 1986, 152-3.

This isolation is reflected in the condition of the Trajanic road at the site during the period. Fiema arrives at the conclusion that the road was no longer consistently maintained along its entire length in the 6th and 7th centuries. Thus, the road no longer served as a continuous conduit, but was maintained only over short distances leading to and from larger settlements or remaining military installations.[57]

A similar pattern is evident among the settlements in the region of Wadi al-Hasa to the north of Tuwaneh. The survey team explored 8 Roman miles of the *Via Nova* from a bridge crossing the Wadi al-Hasa. The road was easy to follow: the surface was made up of field stones with clear, raised kerbs on both sides. Occasional embankments and cuttings were observed, including a few steps carved into the bedrock. The road was 3 m wide, except on the plateau where it had been widened to 6 m. (Fig. 6.3) [58]

Sites 435, 394, 398, 384, 406, 409, 411, and 413 (Figs 6.4-5) are all locations of milestones in the Wadi al-Hasa. Because most of these are still in situ, they could be regarded as 'Byzantine' sites as well, as they were still visible and could be used as road markers.[59] 'Late Roman Period' (i.e., 2nd–mid-4th century) pottery was recovered throughout the survey area, and buildings used to monitor traffic on the road, such as towers and forts (e.g., Rujm al Faridiyyeh, a square fort located at the 58th mile from Petra).[60] However, no sherds of the Byzantine period (i.e., 4th-7th century) were found along the *Via Nova Traiana*. [61] The site groupings with Byzantine material are found at some distance from the road suggesting that the road and the installations that previously

[57] Fiema 1993, 550.
[58] MacDonald, Rollefson, and Roller 1982: 128, 452, pl. 31.
[59] MacDonald et al. 1986, 224-6. The latest milestone is Tetrarchic in date. Thomsen 1917, no. 134b
[60] MacDonald et al. 1982, 129.
[61] MacDonald et al. 1982, 246.

served it were no longer in use; instead a road further west (Site 26) that ran between the Wadi ‘Afra and the Wadi La’ban was being used.[62]

The bridge discovered by the survey team spanning the Wadi al-Hasa may provide a clue to the decline of the *Via Nova*. Engineering works such as bridges require maintenance. This may well have been the responsibility of whoever occupied the forts such as Rujm al Faridiyyeh. No evidence of occupation from the 5th century onward has been found at these forts once military personnel had withdrawn and been redeployed. If, in the absence of this ‘central authority’, repairs were not kept up on the Wadi al-Hasa bridge, and if the bridge had subsequently become unstable or collapsed, this could have led to seeking an alternative route for crossing the Wadi al-Hasa and the fragmentation of the *Via Nova* network.

Further evidence of the fragmentation of the *Via Nova* as a commercial highway is evident in the northern parts of Arabia. Apart from its northern terminus, the only city of the Decapolis that the *Via Nova* passes through is Philadelphia (Amman), although a secondary branch (with milestones of Caracalla) does appear to go to Gerasa, with evidence of Byzantine building along this spur to suggest it was in use.[63] Bauzou argues that the rise of Umm al-Jimal in the 5th and 6th centuries (and the lack of Byzantine remains at Thantia, a road station directly on the *Via Nova*) suggests an eastward shift in commercial circulation.[64] He further argues that the *Via Nova* could have declined in popularity precisely because of its paved surface, as camels and other beasts of burden took over once more from wheeled traffic, especially after the emperor Leo discontinued

[62] MacDonald et al. 1988, 295.
[63] Bauzou 1998, 130.
[64] Bauzou 1998, 253. Bauzou adopts Kennedy’s view that Thantia of the Peutinger Map should be equated with the site of Thugrat al-Jubb, rather than with Umm al-Jimal itself. Kennedy 1982, 142-54. Parker 1986, 26.

the *cursus vehicularis* that relied on ox carts.[65] Camels in particular prefer softer surfaces for walking on, and the hard paving of the 2nd century Roman highways might have been avoided for this reason.

Traces of a second north-south road c. 20 km to the east of the *Via Nova* but following its approximate course, have led scholars to believe that a second military supply line existed in Provincia Arabia, tending to the needs of the *limes*, corresponding to the *Strata Diocletiana* in Syria. This road has in particular been linked with the row of Roman/Byzantine fortresses that connect the region around Amman with the legionary camp of Udruh near Petra in the south. The legionary camp at Lejjun, home to the *Legio IV Martia* does not lie on the *Via Nova*, but 10 km east of it, and so would have to be integrated into the larger communications network. This connection is further reinforced by the fact that the milestones that mark the road have mostly been found near these forts.[66] However, David Graf argues that the gaps in milestones and the irregular spacing of the alleged forts in the *limes* argue against it being a continuous conduit for troops and goods from Amman to Udruh, serving a frontier that served as one functional unit against nomadic desert raiders.[67] The apparent breakdown of the *Via Nova* as a military communications line belies the vitality of its *capita viae* during Late Antiquity. Aila (through Iotabe) assumed the role of official customs point for Red Sea trade, along with Clysma. The city not only served as a nodal point for the distribution of long-distance trade items, it collected the duty of 12.5% on this lucrative trade.[68] Bostra, too, experienced a 'boom' in construction in the 5th and 6th centuries with the construction of porticos (488), a cathedral and episcopal palace (512/13).[69] A series of inscriptions dated

[65] See Chapter 3.
[66] Graf 1997, 272.
[67] Graf 1997, 281.
[68] Jones 1964, 826-7, Mayerson 1992, 1-4.
[69] *PUAAES* III.A., Nos 560-1, 557.

to 539-41 records unspecified civic building projects under the mixed auspices of the emperor Justinian, the archbishop of Bostra, and a *doukikos* named Zenon, among others.[70] The evidence from the archaeology, however, shows that the trade did not flow along the *Via Nova*, and this expansion in wealth and construction did not extend to infrastructure improvements along this highway.

Commercial Traffic

Luxury and Red Sea trade

In considering the communication networks of southern Palestine and Transjordan it is crucial to look south and east as well as west. The study of trade around the Red Sea and Indian Ocean in Late Antiquity is a field that is constantly gaining momentum, and recent archaeological work in the Arabian Peninsula is also revealing new information about exchange and communications.[71] Recent archaeological work around the Red Sea indicates the vitality of the international trade taking place in the 4th through 6th centuries and that Aila and Clysma were fully integrated into this circulation.[72] Clysma is more accessible for Egypt and Alexandrian markets whereas we have seen that the highways established in the 4th century integrated Aila with both Transjordan and the Mediterranean.

As mentioned above, there is archaeological evidence to suggest that there was a decline in Nabataean-controlled eastern trade at the end of the 3rd century. The suppression of Palmyra after 272 may have revitalised the southern trade routes. The transferring of the customs port to Iotabe near Aila confirms that Aila was an important point of entry for Red Sea trade.[73] We know from documents such as the *Liber*

[70] *IGLS* 9128-9137. One of the inscriptions mentions a *mesopyrgos* – a defensive wall. Mundell Mango 2011.
[71] Decker 2009, 248-9; Fiema 2001, 120-1.
[72] See Chapter 4, note 3.
[73] However, the actual location of Iotabe remains unknown. Mayerson 1992 and 1995.

Pontificalis (mid-4th century) that the church was a major consumer of aromatics and textiles and gems of eastern origin, and that Jerusalem, in addition to Rome, Constantinople and Alexandria, would be a major centre of consumption.[74]

The region is not without its own products for export. I will discuss agricultural produce below; however, the region also possesses considerable mineral wealth. The geological stratification along the Dead Sea Transform exposes many mineral deposits. In fact, in his survey of the Wadi 'Araba, Smith reinterprets many sites previously thought to be connected with trade as involved in industry, specifically metal production.[75] By far the most impressive in the region is the imperial copper mine at Wadi Faynan. The mine, which was active in the 4th and 5th centuries, lies in the hills between the *Via Nova* and the Wadi 'Araba. The survey carried out there records no mention of a paved road connecting the mine to either of these arteries; in fact, the steep slopes of the wadi make it likely that the ore was sent out – and supplies brought in – using camels and mules or donkeys.[76]

Agricultural produce

In Late Antiquity, Gaza attained international fame particularly as the point of origin of a highly desired wine.[77] Analysis has identified the amphorae used to transport this wine, and production sites for the amphorae have been found along the Mediterranean coast between Gaza and Ascalon.[78] While numerous studies have been carried out about the distribution of these amphorae at sites beyond the Levantine coast, and about the wine trade and circulation of goods at an interregional level, relatively little work has been

[74] Seland 2011; Tomber 2007, 226.
[75] Smith 2010, 110-1.
[76] Mattingly et al. 2007, 344-5.
[77] Gregory of Tours, *History of the Franks* 7.29, although the wine's popularity may have had less to do with its quality than with its association with the Holy Land.
[78] This type is most commonly known as Late Roman (LR) 4. See Riley 1975, 30-31, Dixneuf 2005, 54-5, Mayerson 1992.

done on linking the port of Gaza from which this wine derived its name, and with the production sites of both the wine and the amphorae, and circulation of both within Gaza's agricultural hinterland, specifically the Negev.[79]

The coastal plain of Gaza and the desert of the Negev represent two very different microregions. The coastal plain was naturally more conducive to agriculture in general. The 4th century text *Expositio totius mundi et gentium* praises the wine of Palestine, and in Late Antiquity Gaza wine, with its special connotation as a product of the Holy Land, was of especial renown. It is likely that much of the wine was being produced in the immediate vicinity of the coast, as is clear from a site excavated near Ascalon, an apparent 'industrial' estate given over entirely to the production not only of wine but also of the distinctive transport vessels.[80] However, it is also likely, given the extent to which the Negev was cultivated beyond its own subsistence level, that that region played a part in producing wine for international export.

The Negev desert is classified as a semi- to hyper-arid climate. The population up to the mid-20th century consisted of nomadic or semi-nomadic Bedouin who engaged in limited agricultural practice that is often cited as analogous to that of the Byzantine period (late 3rd-7th centuries). In this period the agriculturally marginal landscape of the Negev was extensively cultivated, using terracing and other means to improve irrigation. Elusa was famous for its terraces in the 5th century.[81] There has been considerable debate over whether the climate in the Late Antique period was cooler and more humid than it is now. The evidence is inconclusive and no consensus has been reached; however, the archaeological discoveries do not appear to reflect a sudden climatic shift, making it

[79] See, e.g., Dixneuf 2005, Kingsley 2001 and 2002, Mundell Mango 2011.
[80] Israel 1995, 119-32, Hirschfeld 1997, 46. Archaeological survey of Gaza and its hinterland has otherwise remained limited, Kingsley 2002, 67. See Saliou, ed., 2005 for recent work in the area.
[81] Unwin 1991, 149-50; Goor 1966, 57.

unlikely that climate is a factor in the population expansion in the Late Antique period and its subsequent abandonment. It is doubtful that the climate in that period was very different from current conditions – agriculture, therefore, would have been a challenging enterprise requiring extensive human intervention.[82] Mayerson argues that agricultural installations ('stone heaps') found in the vicinity of Nessana are specifically related to viticulture: the stone heaps support and protect the vines, which are watered by hand from cisterns.[83] The number of wine-presses discovered in the area, while representing a small proportion of the overall number found in Palestine, nevertheless indicates that wine production was taking place on a large scale for such an inhospitable region.[84] In particular, wine presses are found near the settlements, and probably reflect communal usage by different farmers in the area, all bringing their grapes back to the village to be treaded and pressed.[85]

This is not to suggest that the Negev was cultivated solely to produce cash crops of grapes and wine for international export. The Nessana Papyri indicate that grain was the main product of the area. However, Michael Decker has calculated that a small farm in the Negev (Michael's Farm near Sobata) would barely produce enough grain to feed a family of six, but the same farm if given over to a wine monoculture, would produce a surplus, 1992 litres to the estimated annual consumption of 598; the surplus 1394 litres could then be sold and grain purchased.[86] As Gaza remained the nearest Mediterranean port and the fame of the wine suggests that it was being produced in an area larger than the immediate hinterland of the city, this points to the Negev.

[82] For discussion on the climate of the Negev, see Shereshevski 1991, 14-17; Foss 1995, 224; Woolley and Lawrence 1936, 36.
[83] Mayerson 1962, 254. Similar stone heaps were found associated with 'Byzantine' sites in the Wadi al-Hasa region. MacDonald et al. 1988, 242.
[84] Kingsley 2002, 67-9, esp. Figs 102-3.
[85] Shereshevski 1991, 82.
[86] Decker 2009, 116, 122, 210.

Gaza of course need not have been the sole market for any surplus wine produced in the Negev; some of it may have been destined for the military outposts along the Arabian frontier (for example the legion based at Udruh), although Roman troops diminished in number as the *foederati* were increasingly employed to safeguard the southern territories over the course of the 6th century. The *Legio X Fretensis* was garrisoned in Aila until the 530s at least.[87] Kingsley estimates that to meet the rations of the *annona militaris* for the two legions stationed in Palaestina Tertia (at Udruh and Aila) would have required 22,000 full amphorae of wine per year.[88] Since grain was included in the *annona* as well as wine, military consumption could account for a sizeable percentage of the region's agricultural produce.

Also, wine produced in the Negev may have been transported to the Red Sea ports at Aila and Clysma. The hinterland of Aila was not farmed to any extent that would have supported the city let alone provided a surplus for exports.[89] A 6th century amphora type manufactured at Aila has been found at sites around the Red Sea.[90] It is possible that the amphorae were carrying wine produced in southern Palestine and the Negev. While some LR4 – Gaza – amphorae have been found at Berenike, none have been found so far in India, whereas quantities of Aila amphorae have been found on the subcontinent.

As mentioned above, Elusa, Oboda, and the other settlements of the western Negev are mostly Nabataean foundations with their origins as part of the network of caravanserais and watering points that connected Gaza with Petra from the 3rd century BCE to the 2nd century CE. Despite the shift by the army to routes of higher military status, the pre-existing routes did not cease to function. The wine, once pressed and

[87] Parker 2000, 393.
[88] Kingsley 2002, 61.
[89] Parker 2006, 223.
[90] Parker 1998, 389.

allowed to ferment in the wineries of these important villages, could be transported to Gaza and to its Mediterranean port at Maiuma along these routes. For example, Map 6.3 shows the route from Petra to Gaza as proceeding first to Oboda, then to Elusa, and via Birsama (Beershema, where a 6th century wine press has recently been uncovered) to Gaza.[91] Sobata is not shown as lying directly on this route, but at a distance of around 10 km to the south-west. However, Sobata appears connected to the road by natural valleys and wadis. Nessana is shown on a secondary route connecting to Gaza either via Elusa or by proceeding north towards the *Via Maris* and then following the coast to Gaza.[92] We must remember that these roads were mostly unpaved in the Nabataean period anyway; connectivity is explicated by the thriving economies of these various settlements, although greater security was to be had on the roads with military outposts. The road that joins Elusa and Nessana was also the main point of entry into the Sinai desert; it is the route followed both by the Piacenza pilgrim and his retinue, as well as merchants and envoys to the Bedouin mentioned in the *Narrationes of Nilus the Ascetic* (dated to the late 3rd /early 5th century), when travelling between Pharan in the Sinai Peninsula, and Palestine.[93] Erickson-Gini argues that Elusa served as a 'gateway city' from which the produce of the Negev, 'a network of small producers and eventually production surpluses were exported.'[94]

Finally, a word on the method of transport is needed. At what point in the process were the distinctive Gaza/Ascalon amphora and its contents combined? Wine experts suggest that to maintain the quality of the wine this should take place as early as possible in the production process; that clay vessels are preferable for storage; and that 'moving'

[91] Dolinka 2007, 115.
[92] Barrington Atlas, Map 70.
[93] Piacenza Pilgrim 35 (Wilkinson 2002, 145). For Nilus, see Mayerson 1963, 163.
[94] Erickson-Gini 2010, 198.

the wine, i.e., decanting and repouring it, should be avoided.[95] However, the kiln sites known to date do not appear in the Negev itself, although a few are situated inland of Gaza and the coast.[96] A picturesque mosaic from Kissufim appears to show a camel laden with Gaza type amphorae, however, given the logistics of transport, it is more likely that the wine was transported in some kind of soft, organic packaging such as a wineskin, since amphorae, or any clay jars, being both heavy and breakable, are less than ideal for land transport.[97] This would also make sense if the wine was exported from Aila as well as from Gaza – the wine could then be transported in organic containers that would permit larger loads, and then be 'bottled' prior to being loaded onto a ship.[98]

Pilgrim Traffic

The fourth century brings with it a phenomenon that introduces a significant alteration to the circulation of traffic in the region, namely pilgrimage to the holy sites on Sinai described in the book of Exodus (Chapters 19-40). Whereas previously the main routes would follow the coast, circumventing the mountainous interior entirely, suddenly volumes of pilgrims desired specifically to make their way to view the setting for the events in Exodus. As early as 384, Egeria records her journey to Mount Sinai and describes a community of monks prepared to receive visitors. A century later, in the 570s, the Piacenza pilgrim makes a similar journey, describing with palpable relief his arrival at the port of Clysma on the Red Sea having safely completed his desert crossing.

[95] Dayagi-Mendels 1999, 30.
[96] See Israel 1995, fig. 1.
[97] Israel 1995, fig. 10. The mosaic is far from accurate in detail and it may be that some other vessel is represented, such as small clay jars for transporting perfume or other luxury items.
[98] See Ward 2007, 163, and excavation of 7th century pottery kilns at Aqaba making, *inter alia*, amphorae. Melkawi et al. 1994, 460-3.

Increased pilgrim traffic required an investment in infrastructure, especially to support travel through such an inhospitable landscape: there was danger both from the difficult terrain and from bandits and hostile nomadic tribes.

All across Sinai and the southern Negev we find sites with Byzantine phases geared towards pilgrim travel. For example, the oasis of Pharan (Firan) is mentioned by both Egeria and the Piacenza pilgrim. Egeria describes it as a village, notes that it is 35 miles from the Mount and that she rested there for two days.[99] The Piacenza pilgrim, however, describes it as a city with fortified walls and a bishop.[100] This expansion and increased prominence could be the result of the influx of pilgrim traffic and elevated religious profile of the area. Recent excavations have revealed extensive remains of the 5th-7th centuries, including seven churches. One of these, the church of Ss Cosmas and Damian may have served as a healing shrine with facilities for incubation.[101]

Egeria's route to Mount Sinai, via Pelusium and Pharan is potentially more comfortable – it takes better advantage of the coastal route. Mayerson argues that this would have been the route favoured by most pilgrims.[102] However, the more arduous the journey, the greater the spiritual rewards.

The Piacenza pilgrim takes a different route to Egeria through the desert. He departs for Egypt via Pharan, but takes an easterly route to Mount Sinai. The last place the Piacenza pilgrim and his companions stay before entering the desert and sleeping out of doors is 'the guest-house (*xenodochium*) of St. George' described as 'a fort … which provides something of a refuge for passers-by and gives food for hermits.' On a promontory outside the ancient village of Sobata, 20 km southwest of Elusa, lies a ruined

[99] Egeria 6.1 (Wilkinson 2002, 114).
[100] Piacenza Pilgrim 40 (Wilkinson 2002, 147).
[101] Grossmann 2007.
[102] Mayerson 1963, 170.

complex that consists of fortified walls, monks' cells and a chapel (Fig. 6.6). An inscription on one of the arches contains a prayer addressed to 'Lord, God of St. George.'[103] Both the site's excavator, Y. Baumgarten, and Pau Figueras, who has studied the inscriptions, believe the site can be confidently identified with the *xenodochium* of St. George mentioned by the Piacenza pilgrim.[104] The inscriptions give a glimpse into the types of people using the facility. Inscription No.1 – really more of a graffito than a formal inscription – was written by a man named Paulos who was clearly not a monk as he includes his wife and at least one daughter in his prayer, and was also a man of some wealth, as he also offers a prayer for nine of his servants. It is not clear whether any or all of these were attending Paulos on this journey – it was customary also to remember those not present in graffiti, as the Piacenza pilgrim did for his parents at Cana.[105] The second inscription (another prayer although this one does not specifically invoke St. George) was painted by a certain Ouaelos, possibly a local, as this is a Nabataean name. The third graffito consists only of the name Zenon, which, like Paulos, could be any Greek speaker, local or foreign.[106] The second inscription also contains a date – 577/8 – which makes it a close contemporary of the Piacenza pilgrim's own desert crossing which took place around 570.

Nessana lies some 10 km west of Sobata, and it clearly derived importance from lying on the verge of the desert crossing. Continuously settled from the 3rd century BCE, in the 4th century a fort was established on a promontory, which housed a troop of camel cavalry. Later the fort was converted to a monastery; it and the other monasteries in the village could have catered to pilgrims. The town also had several inns, one of which, it is

[103] '+ΚΕ ὁ ΘΣ τοῦ ἁγίου Γεοργιου ἐλεήσον.' Figueras 2007, 513-4.
[104] Figueras 2007, 511.
[105] Piacenza Pilgrim 4 (Wilkinson 2002, 131).
[106] Figueras 2007, 516. The inscription by Paulos partially preserves the name of his native village ('Chosyf (?)'), but Figueras does not offer any suggestions as to where this might be, or the linguistic affiliation of the word.

known from a papyrus document, had 96 beds.[107] Even after the Arab conquest Nessana continued to be instrumental in pilgrim traffic, as is borne out by two papyri from the Arab governor of the province, dated to 683 and 684, requesting that the village provide guides to accompany visitors to the holy mountain.[108]

The different threads of travel and transport examined above must be woven together to understand the different networks of communication and exchange that existed. The primary highways served to link important military and administrative posts, such as the legionary garrisons at Aila, Bostra, and Udruh. This defensive network was a necessary precondition both for trade and for agriculture, especially given the dispersed and decentralised nature of desert farming.[109] The soldiers protected the pilgrims, who in turn presumably offered up prayers on their protectors' behalf, and the soldiers were fed from crops grown by the farmers, and the empire obtained revenue from the customs on trade. The symbiotic interdependence of these different strands ensured that the communications networks continued to function, yet remained flexible in the face of changing circumstances.

[107] P. Colt 31. Kraemer 1958, 96.
[108] P. Colt 72, 73.
[109] Shereshevski 1991, 222.

Chapter 7 – Conclusions

The purpose of this study has been to investigate the travel infrastructure that existed in the Late Antique Levant, and how it enabled people to travel around the region for a variety of official, professional or personal reasons. It is not a study of the road network as a whole, or even a survey of archaeologically attested infrastructure developments. Instead, the purpose has been to turn from the general to the specific, to look at micro regions and known events to determine their impact on the wider picture.

Chapter 2 examined the impetus for travel: the motivations to set out on a journey, the mechanisms that facilitated or constrained travel for different groups of people. Four primary sets of road users were identified: the military; representatives of the imperial administration; merchants involved in long-distance trade or the more local circulation of agricultural produce; and pilgrims and clerics. The latter two constitute a significant group: the sudden rise of popularity of the phenomenon of Christian pilgrimage after the 4th century necessitated the construction of a whole new infrastructure reflected in architecture, literature, and ritual.

Chapter 2 also discussed road conditions and road maintenance, looking at methods of construction, and solutions to topographical challenges. Changing patterns of patronage and responsibility for infrastructure maintenance emerged, particularly by bishops and the church. Overall responsibility for road maintenance at the government level was held by the *comes Orientis*, whose office financed numerous repair projects.

Modes of land transport were assessed by analysing the capacities and speeds of the most common pack and draught animals. While animals such as horses,

donkeys, and even camels are capable of high speeds, their preferred walking speed is more or less equivalent to that of human beings. The evidence for the use of wheeled vehicles in the Near East is limited, challenging the long-held cultural and chronological dichotomy of the wheel-using Romans being supplanted by the camel-riding Arabs.

Chapter 3, 'Travel Through an Incremental Landscape' addresses the conception of space and distance held by people in Late Antiquity. This pertains not only to how they described geographical space both in writing (geography and chrorography) and in two dimensional representations (cartography), but also at how they measured distance and broke it up into manageable increments for travel. In units of measurement and rates of travel, the latter is often reflected in the former, with long distances expressed in days of travel rather than miles. The concept of a hodological world view, whereby travellers broke down travel into a series of linear progressions between point A and B was facilitated by the existence of milestones serving as markers of distance and direction along imperial highways. This chapter also detailed how the concept of an incremental landscape was applied in practice, e.g., through the staging posts of the *cursus publicus* and set itineraries for pilgrimage.

Chapter 4 examines the use of water routes in Late Antiquity. The first part of the chapter focuses on travel by sea, while the second half addresses travel by river. It is often assumed that the benefits of speed to be had from transport by water must have made it preferable to transport by land. Various factors, such as ship construction, seasonal weather patterns, navigation and hazards, determined whether this really was the case. Technological changes during Late Antiquity, such as the preference for lateen sails and smaller, hull-first constructed ships, impacted the sailing and carrying capacity, and in turn affected the economy. The risks inherent in sea travel may have

made it less attractive as a form of transport for goods and passengers, despite the benefits of speed compared to land travel.

River transport is a subject that has been studied relatively little, and especially the role of the Tigris, Euphrates and Orontes rivers in transportation during Late Antiquity. Due to a lack of direct sources from the period, it is fruitful to examine ethnographic comparanda from both earlier and later periods to understand local customs that were probably common practice throughout history.

Chapter 5 was devoted to a series of case studies examining in detail the specific evidence for networks and connections that were in existence in the Late Antique Levant. The four case studies looked variously at the connections between the Levant and the imperial capital at Constantinople, military routes to the Mesopotamian frontier, trade and caravan routes through Greater Syria, and pilgrim roads leading to Jerusalem. These case studies attest to the vitality of the road network and how infrastructure was being deliberately maintained in response to specific needs.

These various strands were brought together in a final regional study (Chapter 6) focusing on southern Palestine and Transjordan. Changes in the routes through this region over time reflect military and commercial concerns, as well as the interest of pilgrims in the holy sites of the area.

As has been demonstrated, the many upheavals of the centuries of Late Antiquity had the scope to impact travel and communications in many ways. Therefore, it is important not to make blanket statements of ‘decline’ and instead examine the specific pressures brought to bear on the road system in each region. By doing so it becomes apparent that, while in some cases military withdrawal can have a negative impact on the road network (as in the case of the *Via Nova Traiana*) other concerns such as trade or religion can revitalise routes that had been neglected,

resulting in renewed investment in travel infrastructure (as in the case of the Negev or Jerusalem and its environs).

It is to be hoped that future research will continue to make connections between different regions, and different types of infrastructure, rather than focusing exclusively on the army, or on trade, or even on pilgrimage. A more synthesising approach would allow for greater understanding of the various phenomena that shaped Late Antiquity, and their place in the history of the region as a whole.

Bibliography

Primary Sources

The Digest of Justinian. 1998. In: A. WATSON, ed., Rev. English language ed.. edn. Philadelphia: University of Pennsylvania Press.

Expositio totius mundi et gentium. 1966. In: J. ROUGÉ, ed., Paris: Éditions du Cerf.

The Rhodian Sea Law. 1909. In: W. ASHBURNER, ed., Oxford: Clarendon Press.

Notitia Dignitatum: accedunt notitia urbis Constantinopolitanae et Laterculi provinciarum. 1876. In: O. SEECK, ed., Berolini: Weidmann.

AGATHIAS, 1975. *The Histories.* Berlin: W. de Gruyter.

AMMIANUS MARCELLINUS, 1935-40. *Res Gestae*. In: J.C. ROLFE, ed., *Ammianus Marcellinus.* Cambridge, Mass: Harvard University Press.

ANTIOCHUS STRATEGOS, 1910. The Capture of Jerusalem by the Persians in 614 AD. In: F.C. CONYBEARE, ed., *English Historical Review.* London: Longmans, Green and Co., pp. 502-517.

BORDEAUX ITINERARY, 1999. *Egeria's travels.* Warminster: Aris and Phillips.

CASSIODORUS, 2004. *Institutions of Divine and Secular Learning; and, On the soul.* Liverpool: Liverpool University Press.

CODEX JUSTINIANUS, 2010. In: F.H., BLUME, *Annotated Justinian Code*. http://uwacadweb.uwyo.edu/blume&justinian/default.asp

CODEX THEODOSIANUS, 1952. In: C. PHARR, ed.,. *The Theodosian Code and Novels, and the Sirmondian Constitutions.* Princeton: Princeton University Press.

CORIPPUS, 1976. *In laudem Iustini Augusti minoris*. In: A. CAMERON, ed., London: Athlone Press.

COSMAS INDICOPLEUSTES, 1968-1973. In: W. WOLSKA-CONUS, ed., *Cosmas Indicopleustès Topographie chrétienne.* Paris: Éditions du Cerf.

COSMAS INDICOPLEUSTES, 1897. In: J.W. MCCRINDLE, ed., *The Christian Topography of Cosmas, An Egyptian Monk.* London: Hakluyt Society.

CYRIL OF SCYTHOPOLIS, 1991. *Lives of the Monks of Palestine.* Kalamazoo, MI: Cistercian Publications.

DAMASKIOS, 1999. *The Philosophical History.* Athens: Apamea Cultural Association.

DORAN, R., ed., 1992. *The Lives of Simeon Stylites.* Kalamazoo, MI: Cistercian Publications.

EGERIA, 1929. *Itinerarium Egeriae*. In: W. HERAEUS , ed., *Silviae vel potius Aetheriae peregrinatio ad loca sancta (Itinerarium Egeriae).* Heidelberg: Carl Winter's universitätsbuchhandlung.

EGERIA, 1999. In: J. WILKINSON, ed., *Egeria's Travels.* Warminster: Aris and Phillips.

EUSEBIUS, 1905. *Church History, Life of Constantine the Great, and Oration in Praise of Constantine*. In: H. WACE, ed., New York: C. Scribners.

EUSEBIUS OF CAESAREA, 2005. *Onomasticon*. In: R.S. NOTLEY and Z. SAFRAI, eds, Leiden: Brill.

EUSEBIUS OF CAESAREA, 2003. *Onomasticon*. In: G.S.P. FREEMAN-GRENVILLE, R.L. CHAPMAN and J.E. TAYLOR, eds, *The Onomasticon: Palestine in the Fourth Century A.D.* Jerusalem: Carta.

EVAGRIUS SCHOLASTICUS, 2000. *Historia Ecclesiastica*. In: M. WHITBY, ed., *The Ecclesiastical History of Evagrius Scholasticus.* Liverpool: Liverpool University Press.

GERONTIUS, 1962. *Vita s. Melaniae*. In: D. GORCE, ed., *Vie de Sainte Mélanie: texte grec.* Paris: Éditions du Cerf.

HESIOD, 1978. *Works and Days*. In: M. WEST, ed., Oxford: Clarendon Press.

JEROME, 1949. *Epistolae*. In: J. LABOURT, ed., *Lettres.* Paris: Belles Lettres.

JOHN LYDUS, 1983. *De magistratibus*. In: A.C. BANDY, ed., *On Powers, or, The magistracies of the Roman state.* Philadelphia: American Philosophical Society.

JOHN MALALAS, 1986. *The Chronicle of John Malalas*. In: E. JEFFREYS, M. JEFFREYS and R. SCOTT, eds, Sydney: Australian Association for Byzantine Studies.

JOHN RUFUS, 2008. *Life of Peter the Iberian*. In: C.B. HORN and R.R. PHENIX, eds, *John Rufus: The Lives of Peter the Iberian, Theodosius of Jerusalem, and the Monk Romanus.* Leiden: Brill.

JOSEPHUS, 1997. *The Jewish War*. In: H.S.J. THACKERAY, ed., Cambridge, Mass.: Harvard University Press.

JULIAN, 1923. In: W. WRIGHT, ed., *The Works of the Emperor Julian.* Cambridge, Mass.: Harvard University Press.

LIBANIUS, 1992. In: A.F. NORMAN, ed., *Autobiography and Selected Letters.* Cambridge, Mass.: Harvard University Press.

LIBANIUS, 1977. In: A.F. NORMAN, ed., *Selected works.* Cambridge, Mass: Harvard University Press.

MARK THE DEACON, 1913. *Vita Porphyrii*. In: G.F. HILL, ed., *The Life of Porphyry, Bishop of Gaza.* Oxford: Oxford : Clarendon Press.

MAURICE, 1984. *Strategikon.* In: G.T. DENNIS, ed., *Maurice's Strategikon: Handbook of Byzantine Military Strategy.* Philadelphia: University of Pennsylvania Press.

MENANDER PROTECTOR, 1985. In: R.C. BLOCKLEY, ed., *The History of Menander the Guardsman.* Liverpool: F. Cairns.

NICHOLAS OF SION. In: ŠEVCENKO, I. and ŠEVCENKO, N.P., eds, 1984. *The Life of Saint Nicholas of Sion.* Brookline, Mass: Hellenic College Press.

PIACENZA PILGRIM, 1889. In: J. GILDEMEISTER, ed., *Antonini Placentini itinerarium*. Berlin: H. Reuther.

PLINY THE YOUNGER, ed., 1990. *Correspondence with Trajan from Bithynia.* Warminster: Aris & Phillips.

PROCOPIUS, 1971. *Buildings*. In: H.B. DEWING, ed., Cambridge, Mass.: Harvard University Press.

PSEUDO-JOSHUA THE STYLITE, 2000. *The Chronicle of Pseudo-Joshua the Stylite*. In: J.W. WATT, ed., Liverpool: Liverpool University Press.

PTOLEMY, 1994. *Ptolemy's Geographia: Books I & II.* Accessed via http://ota.ahds.ac.uk/headers/2422.xml:.

SARGON II, 1987. In: PARPOLA, S., ed,. *The Correspondence of Sargon II. Part I, Letters from Assyria and the West.* Helsinki: Helsinki University Press.

SARGON II, 1990. In: LANFRANCHI, G.B. and PARPOLA, S., eds. *The Correspondence of Sargon II. Part II, Letters from the northern and northeastern provinces.* Helsinki: Helsinki University Press.

STEPHEN OF BYZANTIUM, 2006-2011. *Stephani Byzantii Ethnica*. In: M. BILLERBECK, B. WYSS, J.F. GAERTNER and C. ZUBLER, eds, Berolini et Novi Eboraci: Walter de Gruyter.

STRABO, ed., 1932. *The Geography of Strabo.* Cambridge, Mass.: Harvard University Press.

SYNESIUS, 1926. In: A. FITZGERALD, ed., *The Letters of Synesius of Cyrene.* Oxford: Oxford University Press.

THEODORET OF CYRRHUS, 1892. *Historia Ecclesiastica*. In: B. JACKSON, ed., *The Ecclesiastical History, Dialogues, and Letters of Theodoret*. Buffalo, NY: Christian Literature Publishing Co.

THEOPHANES THE CONFESSOR, 1997. *Chronographia*. In: C. MANGO and R. SCOTT, eds, *The Chronicle of Theophanes Confessor: Byzantine and Near Eastern History, A.D. 284-813.* Oxford: Clarendon Press.

VEGETIUS, 1996. *De re militarii*. In: N.P. MILNER, ed., *Vegetius: Epitome of Military Science.* Rev. 2nd ed.. edn. Liverpool: Liverpool University Press.

VEGETIUS, 2004. *Epitoma rei militaris*. In: M.D. REEVE, ed., Oxford: Oxford Medieval Texts.

ZACHARIAS, 2010. *The Chronicle of Pseudo-Zachariah Rhetor*. In: G. GREATREX, R.R. PHENIX, C.B. HORN, S.P. BROCK and W. WITAKOWSKI, eds, *The Chronicle of Pseudo-Zachariah Rhetor: Church and War in Late Antiquity.* Liverpool: Liverpool University Press.

ZOSIMUS, 2000. *Historia nova*. In: F. PASCHOUD, ed., *Histoire nouvelle.* Paris: Les Belles Lettres.

Secondary Sources

AHARONI, Y., 1954. 'The Roman Road to Aila (Elath)'. *Israel Exploration Journal,* 4(1), pp. 9-16.

AKKERMANS, P. and SCHWARTZ, G.M., 2003. *The Archaeology of Syria: From Complex Hunter-Gatherers to Early Urban Societies (c. 16,000-300 BC).* Cambridge: Cambridge University Press.

ALGAZE, G., 1989. 'A New Frontier: First Results of the Tigris-Euphrates Archaeological Reconnaissance Project,1988'. *Journal of Near Eastern Studies,* 48(4), pp. 241-281.

ALGAZE, G., BREUNINGER, R. and KNUDSTAD, J., 1994. 'The Tigris-Euphrates archaeological reconnaissance project: final report of the Birecik and Carchemish Dam survey areas'. *Anatolica,* , pp. 1-96.

ALGAZE, G., BREUNINGER, R., LIGHTFOOT, C.S. and ROSENBERG, M., 1991. 'The Tigris-Euphrates archaeological reconnaissance project: a preliminary report of the 1989-1990 seasons'. *Anatolica,* , pp. 75-235.

ALT, A., 1935. 'Aus der ‘Araba II-IV'. *Zeitschrift des Deutschen Palästina-Vereins,* 58, pp. 1-78.

ANDO, C., 2000. *Imperial Ideology and Provincial Loyalty in the Roman Empire.* Berkeley: The University of California Press.

ARNAUD, P., 2011. 'Ancient sailing-routes and trade patterns: the impact of human factors'. In: D. ROBINSON and A. WILSON, eds, *Maritime Archaeology and Ancient Trade in the Mediterranean.* Oxford: Oxford Centre for Maritime Archaeology, pp. 61-80.

ARNAUD, P., 1988. 'Observations sur l'original du fragment de carte du pseudo-bouclier de Doura-Europos'. *Revue des études anciennes,* 90(1-2), pp. 151-161.

ASSAD, K. and RUPRECHTSBERGER, E.M., 1987. 'Aspekte der Spätantike von Palmyra'. In: K. ASSAD and E.M. RUPRECHTSBERGER, eds, *Palmyra: Geschichte, Kunst und Kultur der syrischen Oasenstadt: einführende Beiträge und Katalog zur Ausstellung.* Linz: Druck- und Verlagsanstalt Gutenberg, pp. 137-149.

ASSAD, K. and RUPRECHTSBERGER, E.M., eds, 1987. *Palmyra: Geschichte, Kunst und Kultur der syrischen Oasenstadt: einführende Beiträge und Katalog zur Ausstellung.* Linz: Druck- und Verlagsanstalt Gutenberg.

ASSAD, K. and STEPNIOWSKI, F.M., 1989. 'The Umayyad Suq in Palmyra'. *Damaszener Mitteilungen,* 4, pp. 205-223.

AVI-YONAH, M., 1950. 'The Development of the Roman Road System in Palestine'. *Israel Exploration Journal,* I, pp. 54-60.

BAEDEKER, K., 1898. *Palestine and Syria: Handbook for Travellers.* 3rd ed., revised.. edn. Leipzig: Karl Baedeker.

BAKIRTZIS, C., 1995. 'The Role of Cyprus in the Grain Supply of Constantinople in the Early Christian Period'. In: V. KARAGEORGHIS, ed., *Proceedings of the International Symposium Cyprus and the Sea.* Nicosia: University of Cyprus, pp. 247-254.

BALTY, J., 1995. *Mosaïques antiques du Proche-Orient: chronologie, iconographie, interprétation.* Paris: Belles Lettres.

BALTY, J., 1977. *Mosaïques antiques de Syrie.* Brussels: Centre belge de recherches archéologiques à Apamée de Syrie.

BALTY, J., 1981. *Guide d'Apamée.* Brussels: Centre belge de recherches archéologiques à Apamée de Syrie.

BAR, D., 2004. 'Population, Settlement and Economy in Late Roman and Byzantine Palestine (70-641 AD)'. *Bulletin of the School of Oriental and African Studies, University of London,* 67(3), pp. 307-320.

BARAG, D., 1973. 'The Borders of Syria-Palaestina on an Inscription from the Raphia Area'. *Israel Exploration Journal,* 23(1), pp. 50-52.

BARAMKI, D., 1955. *Excavations at New Testament Jericho and Khirbet en-Nitla.* New Haven: Yale University Press.

BARTL, K. and HAUSER, S.R., eds, 1996. *Continuity and change in Northern Mesopotamia from the Hellenistic to the early Islamic period : proceedings of a colloquium held at the Seminar für Vorderasiatische Altertumskunde, Freie Universität Berlin, 6th-9th April, 1994.* Berlin: Dietrich Reimer Verlag.

BARTLETT, J.R., 1982. *Jericho.* Guildford: Lutterworth Press.

BARTOSIEWICZ, L., 1995. 'Camel remains from Hungary'. In: H. BUITENHUIS and H.-. UERPMANN, eds, *Archaeozoology of the Near East II: proceedings of the second international symposium on the archaeozoology of southwestern Asia and adjacent areas.* Leiden: Backhuys, .

BARTOSIEWICZ, L. and DIRJEC, J., 2001. Camels in antiquity: Roman Period finds from Slovenia'. *Antiquity*, 75, pp. 279-285.

BARTOSIEWICZ, L., VAN NEER, W. and LENTACKER, A., 1997. *Draught Cattle: Their Osteological Identification and History.* Tervuren, Belgique: Musée royal de l'Afrique centrale.

BASCH, L., 1991. 'La felouque des Kellia. Un navire de mer à voile latine en Égypte au VII siècle de notre ère'. *Neptunia,* 183, pp. 3-12.

BASS, G.F., 2012. 'A Brief History of Nautical Archaeology in Turkey'. In: N. GÜNSENIN, ed., *Between Continents: Proceedings of the Twelfth Symposium on Boat and Ship Archaeology, Istanbul 2009.* Istanbul: Ege Yayınları, .

BASS, G.F., 1982. 'The Pottery'. In: G.F. BASS and F.J. VAN DOORNINCK, eds, *Yassı Ada: Volume I: A Seventh-Century Byzantine Shipwreck.* College Station: Texas A&M University Press, pp. 155-188.

BASS, G.F. and VAN DOORNINCK, F.J., eds, 1982. *Yassı Ada: Volume I: A Seventh-Century Byzantine Shipwreck.* College Station: Texas A&M University Press.

BAUZOU, T., 1998. 'La *Via Nova*: introduction', 'Les vestiges de la Via Nova éntre Busra et 'Amman', 'La Branche de Mafraq (site de al-Fudain)', 'La valeur des milles romains sur la *Via Nova*: étude métrologique', 'Le système des tors associées à la *Via Nova*', 'Le segment septentrional de la *Via Nova* et le Table de Peutinger', 'Les bornes milliaires de la *Via Nova*: évolution du Ile au IVe siècle', 'Les inscriptions relevées sur les bornes milliaires du secteur septentrional de la Via Nova' and 'Histoire et évolution du secteur septentrional de la Via Nova: essai de synthèse historique'. In: J.-. HUMBERT, ed., *Fouilles de Khirbet es-Samra en Jordanie.* Turnhout: Brepols, pp. 105-255.

BAUZOU, T., 1988. 'Les voies romaines entre Damas et Amman'. In: P.-. GATIER, B. HELLY and J.-. REYCOQUAIS, eds, *Géographie historique au ProcheOrient (Syrie, Phénicie, Arabie, grecques, romaines, byzantines). Actes de la Table Ronde de Valbonne, 16-18 septembre 1985.* Paris: pp. 293-300.

BAUZOU, T., 1986. 'Les voies de communication dans le Hauran à l'époque romaine'. In: J.-. DENTZER, ed., *Hauran I: recherches archéologiques sur la Syrie du Sud à l'époque hellénistique et romaine.* Paris: P. Geuthner, pp. 137-167.

BEAN, G.E. and MITFORD, T.B., 1970. *Journeys in rough Cilicia, 1964-1968* . Wien: Böhlau.

BEAUVERY, R., 1957. ‘La route romaine de Jérusalem à Jericho’. *Revue Biblique,* 64, pp. 72-101.

BECKWITH, C.I., 2009. *Empires of the Silk Road: a history of central Eurasia from the Bronze Age to the present* . Princeton, N.J.: Princeton University Press.

BELL, G.L., 1907. *The Desert and the Sown.* London: W. Heinemann.

BELL, G.L. and MUNDELL MANGO, M., 1982. *The Churches and Monasteries of the Ṭurʿ Abdin.* London: Pindar Press.

BEN-DAVID, C., 2007. 'The Paved Road from Petra to the 'Arabah - Commercial Nabatean or Military Roman?'. In: A. LEWIN and P. PELLEGRINI, eds, *The Late Roman Army in the Near East from Diocletian to the Arab Conquest: Proceedings of a colloquium held at Potenza, Acerenza and Matera, Italy (May 2005).* Oxford: Archaeopress, pp. 101-110.

BERGER, P.C., 1981. *The Insignia of the Notitia Dignitatum.* New York: Garland.

BIN SERAY, H., 1996. 'Spasinou Charax and Its Commercial Relations'. *ARAM,* 8, pp. 15-23.

BORSTAD, K., 2008. 'History from Geography: The Initial Route of the Via Nova Traiana in Jordan'. *Levant,* 40(1), pp. 55-70.

BRADBURY, S., 2004. 'Libanius' Letters as Evidence for Travel and Epistolary Networks'. In: L. ELLIS and F. KIDNER, eds, *Travel, Communication, and Geography in Late Antiquity: Sacred and Profane.* Aldershot: Ashgate, pp. 73-80.

BRAUND, D., 1996. 'River frontiers in the environmental psychology of the Roman world'. In: D.L. KENNEDY, ed., *The Roman Army in the East.* Ann Arbor, MI: Journal of Roman Archaeology, pp. 43-48.

BROWNING, R.C., BAKER, E.A., HERRON, J.A. and KRAM, R., 2006. ‘Effects of obesity and sex on the energetic cost and preferred speed of walking’. *Journal of Applied Physiology,* 2, pp. 390-398.

BRÜNNOW, R. and VON DOMASZEWSKI, A., 1909. *Die Provincia Arabia : auf Grund zweier in den Jahren 1897 und 1898 unternommenen Reisen und der Berichte früherer Reisender.* Strassburg: Strassburg : Trübner.

BULLIET, R.W., 1975. *The Camel and the Wheel.* Cambridge, Mass: Harvard University Press.

BURY, J.B., 1923. *History of the later Roman empire from the death of Theodosius I to the death of Justinian (A.D. 395 to A.D. 565)* . London: Macmillan.

CAMPBELL, I.C., 1995. 'The Lateen Sail in World History'. *Journal of World History,* 6(1), pp. 1-23.

CANTINEAU, J. and ET AL., eds, 1930-. *Inventaire des inscriptions de Palmyre.* Beyrouth: Beyrouth : Impr. catholique.

CASSON, L., 1994. *Travel in the Ancient World.* Baltimore: Johns Hopkins University Press.

CASSON, L., 1971. *Ships and Seamanship in the Ancient World.* Princeton: Princeton University Press.

CASSON, L., 1966. 'The Lateen Sail in the Ancient World'. *Mariner's Mirror,* 52(2), pp. 199-200.

CASTRO, F., FONSECA, N., VACAS, T. and CICILIOT, F., 2008. 'A Quantitative Look at Mediterranean Lateen- and Square-Rigged Ships (Part 1)'. *International Journal of Nautical Archaeology,* 37(2), pp. 347-359.

CHESNEY, F.R., 1868. *Narrative of the Euphrates expedition: carried on by order of the British government during the years 1835, 1836, and 1837.* London: Longmans, Green, and Co.

CHEVALLIER, R., 1976. *Roman Roads.* London: Batsford.

CHOI, A., 2005. The Traveling Peasant and Urban-Rural Relations in Roman Galilee. In: P. HARLAND, ed., *Travel and Religion in Antiquity.* Canadian Society of Biblical Studies Seminar, pp. 1-32.

COHEN, R., 1982. New Light on the Date of the Petra-Gaza Road. *The Biblical Archaeologist,* 45(4), pp. 240-247.

COHEN, R., 1993. 'A Byzantine Church and Its Mosaic Floors at Kissufim'. In: Y. TSAFRIR, ed., *Ancient Churches Revealed.* Jerusalem: Israel Exploration Society, pp. 277-282.

COLT, H.D., 1962. *Excavations at Nessana, Vol. I.* Princeton: Princeton University Press.

COMFORT, A., 2009. *Roads on the frontier between Rome and Persia: Euphratesia, Osrhoene and Mesopotamia from AD 363 to 602.* PhD Thesis: University of Exeter.

COMFORT, A., ABADIE-REYNAL, C. and ERGEÇ, R., 2000. 'Crossing the Euphrates in Antiquity: Zeugma Seen from Space'. *Anatolian Studies,* 50, pp. 99-126.

CONDER, C.R., 1883. *The Survey of Western Palestine: Memoirs of the Topography, Orography, Hydrography and Archaeology.* London: Committee of the Palestine Exploration Fund.

COOPER, J.E. and DECKER, M., 2012. *Life and Society in Byzantine Cappadocia.* Basingstoke: Palgrave Macmillan.

CRAWFORD, P., 1987. 'A Building in the West Vicus of al-Lejjun'. In: S.T. PARKER, ed., *The Roman Frontier in Central Jordan: interim report on the Limes Arabicus Project, 1980-1985.* Oxford: British Archaeological Reports, pp. 385-398.

CROKE, B. and CROW, J., 1983. 'Procopius and Dara'. *The Journal of Roman Studies,* 73, pp. 143-159.

CROKE, B. and CROW, J., 1983. 'Procopius and Dara'. *Journal of Roman Studies,* 73, pp. 143-159.

CROW, J. and FRENCH, D., 1980. 'New research on the Euphrates frontier in Turkey'. In: W.S. HANSON and L. KEPPIE, eds, *Roman Frontier Studies 1979: papers presented to the 12th International Congress of Roman Frontier Studies.* Oxford: British Archaeological Reports, pp. 903-912.

CSEPREGI, I., forthcoming. 'Christian ways of handling ‘pagan’ cult places. The case of Aegae'. In: S. CHANDRASEKARAN, A. KOUREMENOS and M. WHITING, eds, *Continuity and Destruction in Alexander’s East – The Transformation of Monumental Space from the Hellenistic Period to Late Antiquity.*. Oxford: Archaeopress, .

CULHAM, P., 1987. 'Roman Roads, Greek Terms: Translation, Transliteration and Transfer'. *Glotta,* 65(1), pp. 161-170.

CUMONT, F., 1925. 'Fragment de bouclier portant une liste d'étapes'. *Syria,* 6, pp. 1-15.

DĄBROWA, E., 1997. The Rivers in the defensive system of Roman Syria (from Augustus to Septimius Severus). In: W. GROENMAN-VAN WAATERINGE, B.L. VAN BEEK, W.J.H. WILLEMS and S.L. WYNIA, eds, *Roman Frontier Studies 1995. Proceedings of the XVlth International Congress of Roman Studies.* Oxford: Oxbow, pp. 109-111.

DAUPHIN, C., 1993. ‘Dora-Dor: A Station for Pilgrims in the Byzantine Period on Their Way to Jerusalem’. In: Y. TSAFRIR, ed., *Ancient Churches Revealed.* Jerusalem: Israel Exploration Society, pp. 90-97.

DAYAGI-MENDELES, M., 1999. *Drink and be merry: wine and beer in ancient times.* Jerusalem: The Israel Museum.

DE LIGT, L., 1993. *Fairs and Markets in the Roman Empire: economic and social aspects of periodic trade in a pre-industrial society.* Amsterdam: JC Gieben.

DE MIRANDA, A., 2007. *Water Architecture in the Lands of Syria: The Water-Wheels.* Roma: "L'Erma" di Bretschneider.

DECKER, M., 2009. *Tilling the Hateful Earth: agricultural production and trade in the late antique East.* Oxford: Oxford University Press.

DECKER, M., 2007a. 'Water to Wine: Trade and Technology'. In: L. LAVAN, E. ZANINI and A. SARANTIS, eds, *Technology in transition: A.D. 300-650.* Leiden: Brill, pp. 65-92.

DECKER, M., 2007b. Frontier Settlement and Economy in the Byzantine East. *Dumbarton Oaks Papers*, 61, pp. 217-267.

DENNIS, G.T., ed., 1985. *Three Byzantine Military Treatises.* Washington, D.C.: Dumbarton Oaks Research Library and Collection.

DI PAOLA, L., 1999. *Viaggi, trasporti e istituzioni: studi sul cursus publicus.* Messina: DiScAM.

DIETZ, M., 2005. *Wandering Monks, Virgins, and Pilgrims: Ascetic Travel in the Mediterranean World, A.D. 300/800.* University Park, Pa.: Pennsylvania State University Press.

DILLEMANN, L., 1962. *Haute Mésopotamie orientale et pays adjacents: contribution a la géographie historique de la région, du Ve s. avant l'ére chrétienne au VIe s. de cette ére* . Paris: P. Geuthner.

DILLEMANN, L. and JANVIER, Y., 1997. *La Cosmographie du Ravennate.* Bruxelles: Société d'études latines.

DILLER, A., 1975. *The Textual Tradition of Strabo's Geography: With Appendix, The Manuscripts of Eustathius' Commentary on Dionysius Periegetes.* Amsterdam: A. M. Hakkert.

DIRVEN, L., 1996. 'The Nature of the Trade between Palmyra and Dura-Europos'. *ARAM*, 8, pp. 39-54.

DIXNEUF, D., 2005. 'Production et circulation des biens à Gaza durant l'Antiquité Tardive: le témoignage des amphores'. In: C. SALIOU, ed., *Gaza dans l'Antiquité Tardive: archéologie, rhétorique et histoire: actes du colloque international de Poitiers, 6-7 mai 2004* . Salerno: Helios, pp. 51-74.

DODGEON, M.H. and LIEU, S.N.C., 1991. *The Roman Eastern frontier and the Persian Wars (AD 226-363): a documentary history.* London: Routledge.

DOLINKA, B.J., 2007. 'Be'er Shema - Birsama of the *Notitia Dignitatum*: A Prolegomenon to the 2006 Excavations'. In: A. LEWIN and P. PELLEGRINI, eds, *The Late Roman Army in the Near East from Diocletian to the Arab Conquest: Proceedings of a colloquium held at Potenza, Acerenza and Matera, Italy (May 2005).* Oxford: Archaeopress, pp. 111-118.

DONCEEL-VOÛTE, P., 1988. *Les pavements des églises byzantines de Syrie et du Liban: Décor, archéologie et liturgie.* Louvain-La-Neuve: Département d'archéologie et d'histoire de l'art.

DORSEY, D.A., 1991. *The Roads and Highways of Ancient Israel* . Baltimore: Johns Hopkins University Press.

DRAKE, H.A., ed., 2006. *Violence in Late Antiquity: Perceptions and Practices.* Aldershot: Ashgate.

DREXHAGE, R., 1988. *Untersuchungen zum römischen Osthandel* . Bonn: R. Habelt.

DUECK, D., 2000. *Strabo of Amasia: A Greek Man of Letters in Augustan Rome.* London: Routlege.

DUNCAN-JONES, R., 1990. *Structure and Scale in the Roman Economy.* Cambridge: Cambridge University Press.

ELTER, R. and HASSOUNE, A., 2005. 'Le monastère de saint Hilarion: les vestiges archéologiques du site de Umm el-'Amr'. In: C. SALIOU, ed., *Gaza dans l'Antiquité Tardive: archéologie, rhétorique et histoire : actes du colloque international de Poitiers, 6-7 mai 2004* . Salerno: Helios, pp. 13-40.

ELTON, H., 2013. 'Zeugma's Military History in Light of the Rescue Excavations'. In: W. AYLWARD, ed., *Excavations at Zeugma.* Los Altos, CA: The Packard Humanities Institute, pp. 375-380.

ELTON, H., 1996. *Warfare in Roman Europe, AD 350-425.* Oxford: Clarendon Press.

ERICKSON-GINI, T., 2010. *Nabataean settlement and self-organized economy in the Central Negev: crisis and renewal.* Oxford: Archaeopress.

ERICKSON-GINI, T., 2007. 'The Nabataean-Roman Negev in the Third Century CE'. In: A. LEWIN and P. PELLEGRINI, eds, *The Late Roman Army in the Near East from Diocletian to the Arab Conquest: Proceedings of a colloquium held at Potenza, Acerenza and Matera, Italy (May 2005).* Oxford: Archaeopress, pp. 91-100.

FABIAN, P., 1995. 'The late-Roman military camp at Beer Sheba: a new discovery. In: J.H. HUMPHREY, ed., *The Roman and Byzantine Near East: some recent archaeological research.* pp. 235-240.

FEDDEN, R., 1946. *Syria: an historical appreciation* . London: Hale.

FEISSEL, D., 2010. 'Un fragment palestinien de la constitution d'Anastase sur l'administration militaire du diocèse d'Orient'. *Zeitschrift für Papyrologie und Epigraphik,* 173, pp. 125-129.

FEISSEL, D., 2006. *Chroniques d'épigraphie byzantine : 1987-2004.* Paris: Paris : Association des amis du Centre d'histoire et civilisation de Byzance.

FELLMANN BROGLI, R., 1996. 'Die Keramik aus den spät-römischen Bauten'. *Petra, Ez Zantur I. Ergebnisse der Schweizerisch-Liechtensteinischen Ausgrabungen 1988-1992.* Mainz: Philipp von Zabern, pp. 219-282.

FIEMA, Z.T., 1993. 'Tuwaneh and the *Via Nova Traiana* in Southern Jordan: a short note on the 1992 season'. *Annual of the Department of Antiquities of Jordan,* 37, pp. 549-550.

FIEMA, Z.T., 2001. 'Byzantine Petra - A Reassessment'. In: T.S. BURNS and J.W. EADIE, eds, *Urban Centers and Rural Contexts in Late Antiquity.* East Lansing: Michigan State University Press, pp. 111-131.

FIGUERAS, P., 2007. ‘The location of *xenodochium Sancti Georgii* in the light of two inscriptions in Mizpe Shivta’. *ARAM,* 19, pp. 509-526.

FISCHER, M., 1989. ‘An Early Byzantine Settlement at Kh. Zikrin’, *Actes du Xie congres international d’archeologie chretienne, Vol. II* 1989, pp. 1787-1807.

FISCHER, M., ISAAC, B.H. and ROLL, I., 1996. *Roman Roads in Judaea II: the Jaffa-Jerusalem Roads* . Oxford: Tempus Reparatum.

FISHER, G., 2011. *Between Empires: Arabs, Romans, and Sasanians in late antiquity.* Oxford: Oxford University Press.

FISHER, G., 2004. 'A New Perspective on Rome's Desert Frontier'. *Bulletin of the American Schools of Oriental Research,* (336), pp. 49-60.

FLUSIN, B., ed., 1992. *Saint Anastase le Perse et l'histoire de la Palestine au début du VIIe siècle.* Paris: Editions du CNRS.

FOSS, C., 1997. 'Syria in Transition, AD 550-750: an archaeological approach'. *Dumbarton Oaks Papers,* 51, pp. 189-269.

FOSS, C., 1995. 'The Near Eastern Countryside in Late Antiquity: a review article'. In: J.H. HUMPHREY, ed., *The Roman and Byzantine Near East: some recent archaeological research.* Ann Arbor, MI: Journal of Roman Archaeology, pp. 213-234.

FRANK, F., 1934. 'Aus der ‘Araba I'. *Zeitschrift des Deutschen Palästina-Vereins,* 57, pp. 191-280.

FRENCH, D.H., 1993. 'A Road Problem: Roman or Byzantine?'. *Istanbuler Mitteilungen,* 43, pp. 445-454.

FRENCH, D.H., 1983. ‘New research on the Euphrates frontier, supplementary notes 1 and 2’. In: S. MITCHELL and J.A. ARVITES, eds, *Armies and frontiers in Roman and Byzantine Anatolia.* Oxford: British Archaeological Reports, pp. 71-101.

FRENCH, D.H., 1981-8. *Roman Roads and Milestones of Asia Minor.* Oxford: B.A.R.

FRENCH, D.H., 1974. 'A Study of Roman Roads in Anatolia: Principles and Methods'. *Anatolian Studies,* 24, pp. 143-149.

FROST, H., 1995. 'Harbours and Proto-Harbours; Early Levantine Engineering'. In: V. KARAGEORGHIS, ed., *Proceedings of the International Symposium Cyprus and the Sea.* Nicosia: University of Cyprus, pp. 1-22.

GARRETT, R., 1914. *Topography and Itinerary.* New York: Century.

GAWLIKOWSKI, M., 1997. 'Palmyra: Excavations 1997'. *Polish Archaeology in the Mediterranean,* 9, pp. 197-211.

GAWLIKOWSKI, M., 1987. 'Polnische Ausgrabungen in Palmyra: Das Diokletianslager'. In: K. ASSAD and E.M. RUPRECHTSBERGER, eds, *Palmyra:*

Geschichte, Kunst und Kultur der syrischen Oasenstadt: einführende Beiträge und Katalog zur Ausstellung. Linz: Druck- und Verlagsanstalt Gutenberg, pp. 249-253.

GENERAL STAFF OF THE BRITISH FORCES IN IRAQ, 1923. *Military Report on Mesopotamia (Iraq), Area 6: Western Kurdistan.* Great Britain: The War Office.

GERBER, Y., 2008. 'The Byzantine and Early Islamic Pottery from Jabal Harun'. In: Z.T. FIEMA and J. FRÖSÉN, eds, *Petra - The Mountain of Aaron: the Finnish Archaeological Project in Jordan. Vol. 1, The church and the chapel.* Helsinki: Societas Scientiarum Fennica, pp. 287-330.

GERTWAGEN, R., 1988. 'The Venetian port of Candia, Crete (1299–1363): Construction and maintenance'. *Mediterranean Historical Review,* 3(1), pp. 141-158.

GEUS, K., 2012. 'A Day's Journey in Herododus' *Histories*'. In: K. GEUS and M. THIERING, eds, *Common Sense Geography and Mental Modelling: Opening The Stage.* Berlin: Max Planck Institute for the History of Science, pp. 110-118.

GEUS, K. and THIERING, M., eds, 2012. *Common Sense Geography and Mental Modelling: Opening The Stage.* Berlin: Max Planck Institute for the History of Science.

GEYER, B. and MONCHAMBERT, J., 2003. *La basse vallée de l'Euphrate syrien du Néolithique à l'avènement de l'islam: géographie, archéologie et histoire.* Beyrouth: Institut Français d'Archéologie du Proche-Orient.

GLUECK, N., 1934. 'Exploration in Eastern Palestine and the Negeb'. *Bulletin of the American Schools of Oriental Research,* 55, pp. 3-21.

GOODCHILD, R.G., 1949. 'The Coast Road of Phoenicia and its Roman Milestones'. *Berytus,* 9, pp. 91-127.

GOOR, A., 1966. 'The History of the Grape-Vine in the Holy Land'. *Economic Botany,* 20(1), pp. 46-64.

GORCE, D., 1925. *Les voyages, l'hospitalite, et le port des lettres dans le monde chretien des iv. et v. siecles.* Paris: Librairie Auguste Picard.

GOUGH, M., 1952. 'Anazarbus'. *Anatolian Studies,* 2, pp. 85-150.

GRAF, D.F., 1997. 'Camels, Roads, and Wheels in Late Antiquity'. *Electrum,* 1, pp. 43-49.

GRAF, D.F., 1997. 'The *Via Militaris* in Arabia'. *Dumbarton Oaks Papers,* 51, pp. 271-281.

GRAF, D.F., 1995. 'Milestones with Uninscribed Painted Latin Texts'. *Studies in the History and Archaeology of Jordan,* 5, pp. 417-425.

GRAF, D.F., 1995. 'The Via Nova Traiana in Arabia Petraea'. In: J.H. HUMPHREY, ed., *The Roman and Byzantine Near East: some recent archaeological research.* Ann Arbor, MI: Journal of Roman Archaeology, pp. 241-265.

GRAHAM, S., 2006. Networks, Agent-Based Models and the Antonine Itineraries: lmplications for Roman Archaeology. *Journal of Mediterranean Archaeology,* 19(1), pp. 45-64.

GROSSMANN, P., 2007. 'Late Antique Christian Incubation Centres in Egypt'. In: H. BRANDENBURG, S. HEID and C. MARKSCHIES, eds, *Salute e guarigione nella tarda antichità: atti della giornata tematica dei Seminari di archeologia cristiana (Roma - 20 maggio 2004).* Vatican: Pontificio istituto di archeologia cristiana, pp. 125-140.

GSCHWIND, M., 2009. 'Every square structure a Roman fort? Recent research in Qreiye-ʿAyyash and its alleged bridgehead fort Tall Ar-Rum on the Euphrates'. In: Á. MORILLO, N. HANEL and E. MARTÍN, eds, *Limes XX : International Congress of Roman Frontier Studies, León (Spain), September 2006;* Madrid: Consejo Superior de Investigaciones Científicas: Instituto Histórico Hoffmeyer: Instituto de Arqueología de Mérida: Ediciones Polifemo, pp. 1593-1604.

GÜNSENIN, N., ed., 2012. *Between Continents: Proceedings of the Twelfth Symposium on Boat and Ship Archaeology, Istanbul 2009.* Istanbul: Ege Yayınları.

HALDON, J.F., 1999. *Warfare, State and Society in the Byzantine World, 565-1204* . London: UCL Press.

HALL, L.J., 2004. *Roman Berytus: Beirut in Late Antiquity.* London: Routledge.

HANDLEY, M.A., 2011. *Dying on foreign shores : travel and mobility in the late-antique West.* Portsmouth, R.I.: Portsmouth, R.I. : Journal of Roman Archaeology.

HANNAH, R., 2009. *Time in antiquity.* London: Routledge.

HANSON, W.S. and KEPPIE, L., eds, 1980. *Roman Frontier Studies 1979: papers presented to the 12th International Congress of Roman Frontier Studies.* Oxford: British Archaeological Reports.

HARPER, R.P., 1977. 'Two Excavations on the Euphrates Frontier 1968-1974: Pağnik Öreni (Eastern Turkey) 1968-1971, and Dibsi Faraj (Northern Syria) 1972-1974'. In: D. HAUPT and H.G. HORN, eds, *Studien zu den Militärgrenzen Roms, II : Vorträge des 10. Internationalen Limeskongresses in der Germania Inferior.* Köln: R. Habelt, pp. 453-460.

HARPER, R.P. and WILKINSON, T.J., 1975. 'Excavations at Dibsi Faraj, Northern Syria, 1972-1974: A Preliminary Note on the Site and Its Monuments with an Appendix'. *Dumbarton Oaks Papers,* 29, pp. 319-338.

HAUPT, D. and HORN, H.G., eds, 1977. *Studien zu den Militärgrenzen Roms, II : Vorträge des 10. Internationalen Limeskongresses in der Germania Inferior.* Köln: R. Habelt.

HEALEY, J.F., 1996. 'Palmyra and the Arabian Gulf Trade'. *ARAM,* 8, pp. 33-37.

HEATHER, P., 1994. 'New men for new Constantines? Creating an imperial elite in the eastern Mediterranean'. In: P. MAGDALINO, ed., *New Constantines: The Rhythm of Imperial Renewal in Byzantium, 4th-13th Centuries.* Aldershot: Variorum, .

HELLENKEMPER, H., 1977. 'Der Limes am nordsyrischen Euphrat. Bericht zu einer archäologischen Landesaufnahme'. In: D. HAUPT and H.G. HORN, eds, *Studien zu den Militärgrenzen Roms, II : Vorträge des 10. Internationalen Limeskongresses in der Germania Inferior.* Köln: R. Habelt, pp. 487-500.

HENDY, M., 1985. *Studies in the Byzantine Monetary Economy, c. 300-1450* . Cambridge: Cambridge University Press.

HILD, F., 1990. *Kilikien und Isaurien* . Wien: Verlag der Österreichischen Akademie der Wissenschaften.

HIRSCHFELD, Y., 1990. 'List of the Byzantine monasteries in the Judean Desert'. In: G.C. BOTTINI, L. DI SEGNI, AND E. ALLIATA, ed., *Christian Archaeology in the Holy Land: New Discoveries.* Jerusalem: Franciscan Printing Press, pp. 1-89.

HIRSCHFELD, Y., 1997. 'Farms and Villages in Byzantine Palestine' . *Dumbarton Oaks Papers,* 51, pp. 33-71.

HIRSCHFELD, Y., 1992. *The Judean Desert Monasteries in the Byzantine Period* . New Haven: Yale University Press.

HÖCKMANN, O., 1993. 'Late Roman Rhine vessels from Mainz, Germany'. *International Journal of Nautical Archaeology,* 22(2), pp. 125-135.

HODGES, R. and WHITEHOUSE, D., 1983. *Mohammed, Charlemagne, and the Origins of Europe: Archaeology and the Pirenne Thesis.* London: Duckworth.

HOHLFELDER, R.L., 1997. 'Building harbours in the early Byzantine era: the persistence of Roman technology'. *Byzantinische Forschungen,* 24, pp. 367-380.

HOHLFELDER, R.L., 1995. 'Ancient Paphos Beneath the Sea: A survey of the submerged structures'. In: V. KARAGEORGHIS, ed., *Proceedings of the International Symposium Cyprus and the Sea.* Nicosia: University of Cyprus, pp. 191-130.

HOHLFELDER, R.L., 2000. 'Anastasius I, Mud, and Foraminifera: Conflicting Views of Caesarea Maritima's Harbor in Late Antiquity'. *Bulletin of the American Schools of Oriental Research,* (317), pp. 41-62.

HOHLFELDER, R.L., 1988. 'Procopius, De Aedificiis, 1.11.18–20: Caesarea Maritima and the Building of Harbours in Late Antiquity'. *Mediterranean Historical Review,* 3(1), pp. 54-62.

HOHLFELDER, R.L., 1985. 'Byzantine Coin Finds from the Sea: A Glimpse of Caesarea Maritima's Later History'. In: A. RABAN, ed., *Harbour Archaeology: Proceedings of the First International Workshop on Ancient Mediterranean Harbours, Caesarea Maritima, 24-28.6.83.* Oxford: British Archaeological Reports, pp. 179-184.

HOPKINS, I., 1980. 'The City Region in Roman Palestine'. *Palestine Exploration Quarterly,* 112, pp. 19-32.

HORDEN, P., 2005. 'Mediterranean excuses: Historical writing on the mediterranean since Braudel'. *History and Anthropology,* 16(1), pp. 25-30.

HORDEN, P. and PURCELL, N., 2000. *The Corrupting Sea: a study of Mediterranean history* . Oxford: Blackwell.

HOWARD-JOHNSTON, J., 2000. 'The Education and Expertise of Procopius'. *Antiquité Tardive,* 8, pp. 19-30.

HOYLE, F., 1962. *Astronomy.* London: Crescent Books.

HUMPHREY, J.H., 1986. *Roman Circuses: Arenas for Chariot Racing.* Berkeley: University of California Press.

HUNT, E.D., 1982. *Holy Land pilgrimage in the later Roman Empire, AD 312-460* . Oxford: Oxford University Press.

ISAAC, B.H., 2006. 'Roman Organization in the Arabah in the Fourth Century AD'. In: P. BIENKOWSKI and K. GALOR, eds, *Crossing the Rift : resources, settlements patterns, and interaction in the Wadi Arabah.* Oxford: Oxbow, pp. 215-221.

ISAAC, B.H., 1995. 'The Army in the Late Roman East: The Persian Wars and the Defence of the Byzantine Provinces'. In: A. CAMERON, L. CONRAD and G. KING, eds, *The Byzantine and Early Islamic Near East III. States, Resources and Armies. Papers of the Third Workshop on Late Antiquity and Early Islam.* Princeton: Darwin Press, pp. 125-155.

ISAAC, B.H., 1990 [1992]. *The Limits of Empire: the Roman Army in the East* . Oxford: Clarendon Press.

ISAAC, B.H. and ROLL, I., 1976. 'A Milestone of A.D. 69 from Judaea: The Elder Trajan and Vespasian'. *The Journal of Roman Studies,* 66, pp. 15-19.

ISAKSEN, L., 2008. 'The application of network analysis to ancient transport geography: A case study of Roman Baetica'. *Digital Medievalist.* http://www.digitalmedievalist.org/journal/4/isaksen/

ISRAEL, Y., 1995. 'The Economy of the Gaza-Ashkelon Region in the Byzantine Period in the Light of the Archaeological Survey and Excavations of the"Third Mile Estate" near Ashkelon' (Hebrew). *Michmanim,* 8, pp. 119-132.

ISSAWI, C.P., 1988. *The Fertile Crescent, 1800-1914: a documentary economic history.* Oxford: Oxford University Press.

IVANISEVIC, V., 8 May 2013. *'Caricin Grad - Justiniana Prima? New research on the topography of an early Byzantine metropolis'.* Oxford University: Late Antique and Byzantine Studies Seminar.

JANNI, P., 1984. *La mappa e il periplo: Cartografia antica e spazio odologico.* Roma: Bretschneider.

JEFFREYS, E., ed., 2008. *The Oxford Handbook of Byzantine studies* . Oxford: Oxford University Press.

JONES, A.H.M., 1964. *The Later Roman Empire, 284-602: a Social, Economic and Administrative Survey.* Oxford: Blackwell.

JONES, A.H.M., 1960. 'Church Finance in the 5th and 6th Centuries'. *The Journal of Theological Studies,* XI(1), pp. 84-94.

KAHANOV, Y., 2004. 'The Late Antique shipwrecks of Tantura Lagoon'. In: S.A. KINGSLEY, ed., *Barbarian seas: Late Rome to Islam.* London: Periplus, pp. 96-101.

KATZEV, M., 1990. 'An Analysis of the Experimental Voyages of KYRENlA II'. In: H.E. TZALAS, ed., *Tropis II: Proceedings of the second international symposium on ship construction in antiquity, Delhi 1987.* Athens: Hellenic Institute for the Preservation of Nautical Tradition, pp. 245-256.

KAZHDAN, A.P. and TALBOT, A., eds, 1991. *The Oxford Dictionary of Byzantium* . Oxford: Oxford University Press.

KEMPTON, T.J., 2007-last update, 'Nutrition, diet, feed and feeding the racing camel' [Homepage of Stance Equine], [Online]. Available: http://www.stanceequine.co.uk/mediaroom_detail.php?Nutrition-of-the-racing-camel-69 [07/09, 2013].

KENNEDY, D.L., 1997. 'Roman Roads and Routes in North-East Jordan'. *Levant,* 29, pp. 71-94.

KENNEDY, D.L., 1982. *Archaeological Explorations on the Roman Frontier in North-East Jordan: the Roman and Byzantine Military Installations and Road Network on the Ground and From the Air.* Oxford: B.A.R.

KENNEDY, H., 1985. 'From Polis to Madina: urban change in late antique and early Islamic Syria'. *Past and Present,* (106), pp. 3-27.

KENNEDY, D.L., ed., 1998. *The Twin Towns of Zeugma on the Euphrates: rescue work and historical studies.* Portsmouth, RI: Journal of Roman Archaeology.

KENRICK, P., 2009. 'On the Silk Route: imported and regional pottery at Zeugma'. In: M. MUNDELL MANGO, ed., *Byzantine Trade, 4th-12th Centuries.* Aldershot: Ashgate, pp. 263-272.

KILLICK, A.C., 1986. 'Udruh and the Southern Frontier'. In: P. FREEMAN and D.L. KENNEDY, eds, *The Defence of the Roman and Byzantine East: proceedings of a colloquium held at the University of Sheffield in April 1986* . Oxford: B.A.R, pp. 431-446.

KINGSLEY, S.A., ed., 2004a. *Barbarian seas: Late Rome to Islam.* London: Periplus.

KINGSLEY, S.A., 2004b. *Shipwreck Archaeology of the Holy Land: Processes and Parameters.* London: Duckworth.

KINGSLEY, S.A., 2002. *A Sixth-Century AD Shipwreck off the Camel Coast, Israel: Dor D and Holy Land Wine Trade.* Oxford: Archaeopress.

KINGSLEY, S., 2001. '"Decline" in the ports of Palestine in late antiquity'. In: L. LAVAN and W. BOWDEN, eds, *Recent research in late-antique urbanism.* Portsmouth, RI: pp. 69-87.

KINGSLEY, S. and DECKER, M., eds, 2001. *Economy and exchange in the East Mediterranean during Late Antiquity : proceedings of a conference at Somerville College, Oxford, 29th May, 1999.* Oxford: Oxbow.

KINGSLEY, S.A. and RAVEH, K., 1996. *The Ancient Harbour and Anchorage at Dor, Israel: results of the underwater surveys, 1976-1991.* Oxford: British Archaelogical Reports.

KLONER, A., 1996. 'Stepped Roads in Roman Palestine'. *ARAM,* 8, pp. 111-137.

KOCABAŞ, U., 2012. 'Byzantine Shipwrecks at Yenikapı'. In: N. GÜNSENIN, ed., *Between Continents: Proceedings of the Twelfth Symposium on Boat and Ship Archaeology, Istanbul 2009.* Istanbul: Ege Yayınları, pp. 107-114.

KOLB, A., 2012. 'Transport and Communication in the Roman State: The cursus publicus'. In: C. ADAMS and R. LAURENCE, eds, *Travel and Geography in the Roman Empire.* London: Routledge, pp. 95-105.

KOLB, A., 2000. *Transport und Nachrichtentransfer im römischen Reich.* Berlin: Akademie Verlag.

KÖTTING, B., 1950. *Peregrinatio Religiosa: Wallfahrten in der Antike und das Pilgerwesen in der alten Kirche.* Münster: Regensberg.

KRAEMER, C.J., 1958. *Excavations at Nessana, Vol. III: Nonliterary Papyri.* Princeton: Princeton University Press.

KROLL, H., 2012. 'Animals in the Byzantine Empire: an overview of the archaeozoological evidence'. Archeologia Medievale, 39, pp. 93-121.

KUBBA, S.A.A., 2011. *The Iraqi Marshlands and the Marsh Arabs: the Ma'dan, their culture and the environment.* Reading, UK: Ithaca Press.

KUBITSCHEK, W., 1928. *Grundriss der antiken Zeitrechnung.* München: Beck.

LAMBROU-PHILLIPSON, C., 1991. 'Seafaring in the Bronze Age Mediterranean: The Parameters involved in Maritime Travel'. In: R. LAFFINEUR and L. BASCH, eds, *Thalassa: l'Égée préhistorique et la mer: actes de la troisième Rencontre égéenne internationale de l'Université deLiège, Station de recherches sous-marines et océanographiques (StaReSO), Calvi, Corse (23-25 avril 1990).* Liège: Université de Liège, Histoire de l'art et archéologie de la Grèce antique, pp. 11-19.

LASSUS, J., 1935-6. *Inventaire archéologique de la région au nord-est de Hama.* Damascus: Institut français de Damas.

LAVAN, L. and BOWDEN, W., eds, 2003. *Theory and Practice in Late Antique Archaeology.* Leiden: Brill.

LEAKE, J. and HOOKHAM, M., 2011, 25 December 2011. 'Hail, Eddie Stobartus: camels were HGVs of Roman Britain'. *The Sunday Times*.

LEFORT, J., MORRISSON, C. and SODINI, J., eds, 2005. *Les villages dans l'empire byzantin: IVe-XVe siècle.* Paris: Lethielleux.

LENSKI, N., 2007. 'Two Sieges of Amida (AD 359 and 502-503) and the Experience of Combat in the Late Roman Near East'. In: A. LEWIN and P. PELLEGRINI, eds, *The Late Roman Army in the Near East from Diocletian to the Arab Conquest: Proceedings of a colloquium held at Potenza, Acerenza and Matera, Italy (May 2005).* Oxford: Archaeopress, pp. 219-236.

LEONARD, J.R., 1995. 'Evidence for Roman Ports, Harbours and Anchorages in Cyprus'. In: V. KARAGEORGHIS, ed., *Proceedings of the International Symposium Cyprus and the Sea.* Nicosia: University of Cyprus, pp. 228-246.

LEVI, D., 1947. *Antioch Mosaic Pavements.* Princeton: Princeton University Press.

LEWIS, M.J.T., 2001. *Surveying Instruments of Greece and Rome.* Cambridge: Cambridge University Press.

LIEBESCHUETZ, J.H.W.G., 1977. 'The Defences of Syria in the Sixth Century'. In: D. HAUPT and H.G. HORN, eds, *Studien zu den Militärgrenzen Roms, II : Vorträge des 10. Internationalen Limeskongresses in der Germania Inferior.* Köln: R. Habelt, pp. 487-500.

LÖNNQVIST, M., LÖNNQVIST, K., WHITING, M.S., TÖRMÄ, M., NUÑEZ, M. and OKKONEN, J., 2005. 'Tracing New Dimensions in the Roman Military Organization of the Eastern Limes', *International Cooperation to Save the World's Cultural Heritage, Proceedings of the XX International Symposium CIPA 2005* 2005, pp. 1074-1079.

LUTTWAK, E., 2009. *The Grand Strategy of the Byzantine Empire.* Cambridge, Mass.: Harvard University Press.

LUTTWAK, E., 1976. *The Grand Strategy of the Roman Empire From the First Century A.D. to the Third.* Baltimore: Johns Hopkins University Press.

MAAS, M., 2007. 'Strabo and Procopius'. In: A. CAMERON, H. AMIRAV and R.B. TER HAAR ROMENY, eds, *From Rome to Constantinople: studies in honour of Averil Cameron.* Leuven: Peeters, pp. 67-83.

MACDONALD, B., 1992. *The Southern Ghors and Northeast Wadi Arabah Archaeological Survey.* Sheffield: J.R. Collis Publications.

MACDONALD, B., 1988. *The Wadi el Hasa Archaeological Survey, 1979-1983, West-Central Jordan.* Waterloo, Ont., Canada: W. Laurier University Press.

MACDONALD, B., ROLLEFSON, G.O. and ROLLER, D.W., 1982. 'The Wadi el Hasa Survey 1981: A preliminary Report'. *Annual of the Department of Antiquities of Jordan,* 26, pp. 117-131.

MACKAY, T.S. and MACKAY, P.A., 1969. 'Inscriptions from Rough Cilicia East of the Calycadnus'. *Anatolian Studies,* 19, pp. 139-142.

MAGUIRE, H., 1990. 'Garments Pleasing to God: The Significance of Domestic Textile Designs in the Early Byzantine Period'. *Dumbarton Oaks Papers,* 44, pp. 215-224.

MANGO, C., 1997. 'The Pilgrim's Motivation'. In: E. DASSMANN and J. ENGEMANN, eds, *Akten des XII. Internationalen Kongresses für Christliche Archäologie, Bonn 1991.* Münster: Aschendorffsche Verlagsbuchhandlung, pp. 1-9.

MANGO, C., 1986. 'A Late Roman Inn in Eastern Turkey'. *Oxford Journal of Archaeology,* 5(2), pp. 223-231.

MANGO, C. and MUNDELL MANGO, M., 1991. 'Inscriptions de la Mésopotamie du Nord'. *Travaux et Mémoires,* 11, pp. 465-471.

MARRINER, N., MORHANGE, C. and CARAYON, N., 2008. 'Ancient Tyre and its harbours: 5000 years of human-environment interactions'. *Journal of Archaeological Science,* 35, pp. 1281-1310.

MARRINER, N., MORHANGE, C. and DOUMET-SERHAL, C., 2006. 'Geoarchaeology of Sidon's ancient harbours, Phoenicia'. *Journal of Archaeological Science,* 33, pp. 1514-1535.

MATTHEWS, J., 2006. *The Journey of Theophanes: Travel, Business, and Daily Life in the Roman East* . New Haven: Yale University Press.

MATTHEWS, J., 1989. 'Hostages, Philopsophers, Pilgrims, and the Diffusion of Ideas in the Late Roman Mediterranean and Near East'. In: F.M. CLOVER and R.S. HUMPHREYS, eds, *Tradition and Innovation in Late Antiquity.* Madison: University of Wisconsin Press, pp. 29-50.

MATTINGLY, D., NEWSON, P., CREIGHTON, O., TOMBER, R., GRATTAN, J., HUNT, C., GILBERTSON, D., EL-RISHI, H. and PYATT, B., 2007. 'A landscape of imperial power: Roman and Byzantine Phaino'. *Archaeology and desertification: The Wadi Faynan landscape survey, Southern Jordan.Oxford, Oxbow Books, CBRL Levant Series,* 6, pp. 305-348.

MATTINGLY, G.L., 1996. 'The King's Highway, the Desert Highway, and Central Jordan's Kerak Plateau'. *ARAM,* 8(1), pp. 89-99.

MAYERSON, P., 1995. 'A Note on Iotabê and Several Other Islands in the Red Sea'. *Bulletin of the American Schools of Oriental Research,* (298), pp. 33-35.

MAYERSON, P., 1994. *Monks, Martyrs, Soldiers and Saracens: Papers on the Near East in Late Antiquity (1962-1993)* . Jerusalem: Israel Exploration Society.

MAYERSON, P., 1992. 'The Gaza "Wine" Jar (Gazition) and the "Lost" Ashkelon Jar (Askalônion)'. *Israel Exploration Journal,* , pp. 76-80.

MAYERSON, P., 1992. 'The Island of Iotabê in the Byzantine Sources: A Reprise'. *Bulletin of the American Schools of Oriental Research,* (287), pp. 1-4.

MAYERSON, P., 1985. 'The Wine and Vineyards of Gaza in the Byzantine Period'. *Bulletin of the American Schools of Oriental Research,* (257), pp. 75-80.

MAYERSON, P., 1963. 'The Desert of Southern Palestine According to Byzantine Sources'. *Proceedings of the American Philosophical Society,* 107(2), pp. 160-172.

MCCANN, A.M., 2004a. *Deep-Water Shipwrecks off Skerki Bank: The 1997 Survey.* Portsmouth, R.I.: Journal of Roman Archaeology.

MCCANN, A.M., 2004b. 'The Isis shipwreck, Skerki Bank'. In: S.A. KINGSLEY, ed., *Barbarian seas: Late Rome to Islam.* London: Periplus, pp. 54-57.

MCCORMICK, M., 2002. 'Byzantium on the move: imagining a communications history'. In: R.J. MACRIDES, ed., *Travel in the Byzantine World: Papers from the Thirty-fourth Spring Symposium of Byzantine Studies, Birmingham, April 2000.* Aldershot: Ashgate, pp. 3-32.

MCCORMICK, M., 2001. *Origins of the European Economy: Communications and Commerce, A.D. 300-900.* Cambridge: Cambridge University Press.

MELKAWI, A., ‘AMR, K. and WHITCOMB, D.S., 1994. "The excavation of two seventh-century pottery kilns at Aqaba". *Annual of the Department of Antiquities of Jordan,* 38, pp. 447-468.

MEREDITH, H.G., ed., 2011. *Objects in Motion: The Circulation of Religion and Sacred Objects in the Late Antique and Byzantine World.* Oxford: Archaeopress.

MESHEL, Z., 2000. *Sinai: Excavations and Studies.* Oxford: Archaeopress.

MILIK, J.T., 1960. ‘Epigraphie et topographie Palestiniennes’. *Revue Biblique,* 67, pp. 551-591.

MITTENHUBER, F., 2010. 'The Tradition of Texts and Maps in Ptolemy's *Geography*'. In: A. JONES, ed., *Ptolemy in Perspective: Use and Criticism of his Work from Antiquity to the Nineteenth Century.* London: Springer, pp. 95-120.

MORALES MUÑIZ, A., RIQUELME, J.A. and LETTOW-VORBECK, C., 1995. *'Dromedaries in antiquity: Iberia and beyond'.*

MORILLO, Á., HANEL, N. and MARTÍN, E., eds, 2009. *Limes XX*. León, Spain. edn. Madrid: Consejo Superior de Investigaciones Científicas: Instituto Histórico Hoffmeyer: Instituto de Arqueología de Mérida: Ediciones Polifemo.

MOUTERDE, R. and POIDEBARD, A., 1945. *Le limes de Chalcis: organisation de la steppe en haute Syrie romaine : documents aériens et épigraphiques.* Paris: P. Geuthner.

MUNDELL MANGO, M., 2011. 'Byzantine Settlement Expansion in North Central Syria: The Case of Androna/Andarin'. In: A. BORRUT, M. DEBIÉ, A. PAPACONSTANTINOU, D. PIERI and J. SODINI, eds, *Le Proche-orient De Justinien aux Abbassides: peuplement et dynamiques spatiales. Actes du colloque "Continuités de l'Occupation entre les Périodes Byzantine et Abbasside au Proche-Orient, VIIe-IXe Siècles", Paris, 18-20 octobre 2007.* Turnhout: Brepols, pp. 93-122.

MUNDELL MANGO, M., 2011. 'Monumentality versus Economic Vitality: was a balance struck in the late antique city?'. In: A. NIKOLOV, ed., *Proceedings of the 22nd International Congress of Byzantine Studies, Sofia, 22-27 August 2011.* Sofia: Bulgarian Historical Heritage Foundation, pp. 239-262.

MUNDELL MANGO, M., ed., 2009. *Byzantine Trade, 4th-12th Centuries: the Archaeology of Local, Regional and International Exchange: Papers of the thirty-eighth Spring Symposium of Byzantine Studies, St John's College, University of Oxford, March 2004* . Aldershot: Ashgate.

MUNDELL MANGO, M., 2009a. 'Byzantine Trade: Local, Regional, Interregional and International'. In: M. MUNDELL MANGO, ed., *Byzantine trade, 4th-12th centuries: the archaeology of local, regional and international exchange. Papers of the thirty-eighth Spring Symposium of Byzantine Studies, St John's College, University of Oxford, March 2004.* Aldershot: Ashgate, pp. 3-14.

MUNDELL MANGO, M., 2009b. 'Tracking Byzantine silver and copper metalware, 4th-12th centuries'. In: M. MUNDELL MANGO, ed., *Byzantine trade, 4th-12th centuries: the archaeology of local, regional and international exchange. Papers of the thirty-eighth Spring Symposium of Byzantine Studies, St John's College, University of Oxford, March 2004.* Aldershot: Ashgate, pp. 221-238.

MUNDELL MANGO, M., 2008. 'Metalwork'. In: E. JEFFREYS, ed., *The Oxford handbook of Byzantine studies.* Oxford: Oxford University Press, pp. 444-452.

MUNDELL MANGO, M., 2000a. 'Building and Architecture'. In: A. CAMERON, B. WARD-PERKINS and M. WHITBY, eds, *Cambridge Ancient History, Volume XIV: Late Antiquity: Empire and Successors, A.D. 425-600.* Cambridge: Cambridge University Press, pp. 918-971.

MUNDELL MANGO, M., 2000b. 'The Commercial Map of Constantinople'. *Dumbarton Oaks Papers*, (54), pp. 189-207.

MUNDELL MANGO, M., 1996. 'Byzantine Maritime Trade with The East (4th - 7th centuries)'. *ARAM*, 8, pp. 139-163.

MUNDELL MANGO, M., 1992. 'The Purpose and Places of Byzantine Silver Stamping'. In: S.A. BOYD, M.M. MANGO and G. VIKAN, eds, *Ecclesiastical silver plate in sixth-century Byzantium: papers of the symposium held May 16-18, 1986, at the Walters Art Gallery, Baltimore, and Dumbarton Oaks, Washington, D.C., organized by*

Susan A. Boyd, Marlia Mundell Mango, and Gary Vikan. Washington, D.C: Dumbarton Oaks Research Library and Collection, pp. 203-216.

MUNDELL MANGO, M., 1986. *Silver from early Byzantium: the Kaper Koraon and related treasures.* Baltimore: Walters Art Gallery.

MURRAY, W.M., 1995. 'Ancient Sailing Winds in the Eastern Mediterranean: The Case for Cyprus'. In: V. KARAGEORGHIS, ed., *Proceedings of the International Symposium Cyprus and the Sea.* Nicosia: University of Cyprus, pp. 33-44.

NEGEV, A., 1988. *The Architecture of Mampsis, Final Report, vol. 2: The Late Roman and Byzantine Periods.* . Jerusalem: Israel Exploration Society.

NEGEV, A., 1966. 'The Date of the Petra-Gaza Road'. *Palestine Exploration Quarterly,* , pp. 89-98.

NICOLET, C., 1991. *Space, Geography, and Politics in the Early Roman Empire.* Ann Arbor: University of Michigan Press.

OATES, D. and OATES, J., 1990. 'Aspects of Hellenistic and Roman settlement in the Khabur basin'. In: P. MATTHIAE, M.N.V. LOON and H. WEISS, eds, *Resurrecting the Past: A Joint Tribute to Adnan Bounni.* Leiden: Nederlands Historisch-Archaeologisch Instituut te İstanbul, pp. 227-248.

O'CONNOR, C., 1993. *Roman Bridges.* Cambridge: Cambridge University Press.

ÖNAL, M., 2009. *Zeugma Mosaics: a corpus.* Ĭstanbul: A Turĭzm Yayinlari.

ONAL, V., 2013. 'Animal Skeletal Remains Discovered at the Metro and Marmaray Excavations'. In: Z. KIZILTAN and G. BARAN ÇELIK, eds, *Stories from the Hidden Harbor: The Shipwrecks of Yenikapı.* Istanbul: Istanbul Archaeological Museums, .

OUSTERHOUT, R., ed., 1990. *The Blessings of Pilgrimage.* Urbana: University of Illinois Press.

ÖZSAIT KOCABAŞ, I., 2012. 'Hull Characteristics of the Yenikapı 12 Shipwreck'. In: N. GÜNSENIN, ed., *Between Continents: Proceedings of the Twelfth Symposium on Boat and Ship Archaeology, Istanbul 2009.* Istanbul: Ege Yayınları, pp. 115-121.

PAPAIOANNOU, T., 2011. 'A reconstruction of the maritime trade patterns originating from western Asia Minor during Late Antiquity, on the basis of ceramic evidence'. In: D. ROBINSON and A. WILSON, eds, *Maritime Archaeology and Ancient Trade in the Mediterranean.* Oxford: Oxford Centre for Maritime Archaeology, pp. 197-210.

PARAIN, C., 1966. 'The Evolution of Agricultural Technique'. In: M.M. POSTAN, ed., *The Cambridge economic history of Europe. Vol. 1, The agrarian life of the Middle Ages.* pp. 125-179.

PARKER, A.J., 1992. *Ancient Shipwrecks of the Mediterranean & the Roman Provinces.* Oxford: Tempus Reparatum.

PARKER, S.T., 2006. *The Roman Frontier in Central Jordan: final report on the Limes Arabicus Project, 1980-1989* . Washington, D.C.: Dumbarton Oaks Research Library and Collection.

PARKER, S.T., 2000. 'The Roman 'Aqaba Project: The 1997 and 1998 Campaigns'. *Annual of the Department of Antiquities of Jordan,* 44, pp. 373-394.

PARKER, S.T., 1998. 'The Roman 'Aqaba Project: The 1996 Campaign'. *Annual of the Department of Antiquities of Jordan,* 42, pp. 375-394.

PARKER, S.T., 1986. *Romans and Saracens: A History of the Arabian Frontier.* Winona Lake, IN: American Schools of Oriental Research.

PATRICH, J., 2011. *Studies in the Archaeology and History of Caesarea Maritima: Caput Judaeae, Metropolis Palaestinae.* Leiden: Brill.

PEKÁRY, T., 1968. *Untersuchungen zu den römischen Reichsstrassen.* Bonn: R. Habelt.

PEÑA, I., 1983. *Les Cénobites Syriens.* Jerusalem: Franciscan Printing Press.

PHARR, C., ed., 1952. *The Theodosian Code and Novels, and the Sirmondian Constitutions.* Princeton: Princeton University Press.

PICCIRILLO, M., 1993. *The Mosaics of Jordan.* Amman: American Center of Oriental Research.

PICCIRILLO, M. and ALLIATA, E., eds, 1999. *The Madaba Map Centenary, 1897-1997: Travelling through the Byzantine Umayyad Period.* Jerusalem: Studium Biblicum Franciscanum.

PIGIÈRE, F. and HENROTAY, D., 2012. 'Camels in the northern provinces of the Roman Empire'. *Journal of Archaeological Science,* 39(5), pp. 1531-1539.

PIGULEVSKAIA, N., 1969. *Byzanz auf den Wegen nach Indien*. *Berliner byzantinistische Arbeite,* 36.

POIDEBARD, A., 1934. *La trace de Rome dans le désert de Syrie: le limes de Trajan à la conquête arabe: recherches aériennes (1925-1932).* Paris: P. Geuthner.

POIDEBARD, A., 1930. 'Mission archeologique en haute Djezireh (1928)'. *Syria,* 11(1), pp. 33-42.

POIDEBARD, A., 1928. 'Mission archeologique en haute Djezireh (automne 1927)'. *Syria,* 9(3), pp. 216-223.

POLLARD, N., 2000. *Soldiers, cities, and civilians in Roman Syria* . Ann Arbor: University of Michigan Press.

POLZER, M.E., 2008. 'Toggles and Sails in the Ancient World: Rigging Elements Recovered from the Tantura B Shipwreck, Israel'. *International Journal of Nautical Archaeology,* 37(2), pp. 225-252.

POMEY, P., 2006. 'The Kelenderis Ship: A Lateen Sail'. *International Journal of Nautical Archaeology,* 35(2), pp. 326-329.

PRENTICE, W.K., 1908. *Greek and Latin inscriptions.* New York: Century.

PRIGNAUD, J., 1963. 'Une installation monastique Byzantine au Khan Saliba'. *Revue Biblique,* 70, pp. 243-254.

PRYOR, J.H., 2002. 'Types of ships and their performance capabilities'. In: R.J. MACRIDES, ed., *Travel in the Byzantine World: Papers from the Thirty-fourth Spring Symposium of Byzantine Studies, Birmingham, April 2000.* Aldershot: Ashgate, pp. 33-58.

PRYOR, J.H. and JEFFREYS, E., 2006. *The Age of the Dromōn: the Byzantine Navy ca. 500-1204.* Leiden: Brill.

PULAK, C., 21 November 2007. *'The 24 shipwrecks in the Harbour of Theodosius of Constantinople'.* Oxford University: Late Antique and Byzantine Studies Seminar.

RABAN, A., 1995. 'The Heritage of Ancient Harbour Engineering in Cyprus and the Levant'. In: V. KARAGEORGHIS, ed., *Proceedings of the International Symposium Cyprus and the Sea.* Nicosia: University of Cyprus, pp. 139-190.

RABAN, A., ed., 1985. *Harbour Archaeology: Proceedings of the First International Workshop on Ancient Mediterranean Harbours, Caesarea Maritima, 24-28.6.83.* Oxford: British Archaeological Reports.

RAMSAY, W.M., 1903. *Cilicia, Tarsus, and the Great Taurus Pass.* London: Hodder and Stoughton.

RAMSAY, W.M., 1899. *A Historical Commentary on St. Paul's Epistle to the Galatians.* London: Hodder and Stoughton.

RAMSAY, W.M., 1890. *The Historical Geography of Asia Minor.* London: John Murray.

RASCHKE, M., 1978. 'New Studies in Roman Commerce with the East'. *Aufstieg und Niedergang der Römischer Welt,* II(9.2), pp. 604-1378.

RAVEH, K. and KINGSLEY, S.A., 1991. 'The Status of Dor in Late Antiquity: A Maritime Perspective'. *The Biblical Archaeologist,* 54(4), pp. 198-207.

REES, R., 2004. *Diocletian and the Tetrarchy.* Edinburgh: Edinburgh University Press.

REMIJSEN, S., 2007. 'The Postal Service and the Hour as a Unit of Time in Antiquity'. *Historia,* 56(2), pp. 127-140.

RILEY, J.A., 1979. 'The Coarse Pottery from Berenice'. In: LLOYD, J.A., ed., *Excavations at Sidi Khrebish, Benghazi (Berenice)* . Tripoli: Deptartment of Antiquities, Ministry of Teaching and Education, People's Socialist Libyan Arab Jamahiriya, pp. 91-465.

RILEY, J.A., 1975. 'The Pottery from the First Session of Excavation in the Caesarea Hippodrome'. *Bulletin of the American Schools of Oriental Research,* (218), pp. 25-63.

ROBERTS, O.T.P., 2006. 'The Rig of the Kelenderis Ship Reconsidered'. *International Journal of Nautical Archaeology,* 35(2), pp. 330-331.

ROBINSON, E., 1841. *Biblical researches in Palestine, Mount Sinai and Arabia Petræa: a journal of travels in the year 1838* . London: John Murray.

ROGERS, R.W., 1915. *A History of Babylonia and Assyria.* New York: Abingdon Press.

ROLL, I., 2000. 'Roman Milestones in the Vicinity of Aphek-Antipatris'. In: M. KOKHAVI, P. BECK and E. YADIN, eds, *Aphek-Antipatris I: Excavation of Areas A and B: The 1972-1976 Seasons.* Tel Aviv: Tel Aviv University, Sonia and Marco Nadler Institute of Archaeology, pp. 39-41.

ROLL, I., 2005. 'Imperial Roads Across and Trade Routes beyond the Roman Provinces of Judaea-Palaestina and Arabia: The State of Research'. *Tel Aviv: Journal of the Institute of Archaeology of Tel Aviv University,* 32(1), pp. 107-118.

ROLL, I., 1995. 'Roads and Transportation in the Holy Land in the Early Christian and Byzantine Times'. *Akten des XII internationalen Kongresses für christliche Archäologie.* Münster: Jahrbuch für Antike und Christentum, pp. 1166-1170.

ROLL, I., 1983. 'The Roman Road System in Judaea' (in Hebrew). *The Jerusalem Cathedra,* 3, pp. 136-161.

ROLL, I. and AVNER, U., 2008. 'Tetrarchic Milestones Found near Yahel in the Southern Aravah'. *Zeitschrift für Papyrologie und Epigraphik,* 165, pp. 267-286.

ROLL, I. and AYALON, E., 1986. 'Roman Roads in Western Samaria'. *Palestine Exploration Quarterly,* 118, pp. 113-134.

ROSTOVTZEFF, M.I., 1932. *Caravan cities.* Oxford: The Clarendon Press.

ROTH, J., 1998. *The Logistics of the Roman Army at War (264 B.C.-A.D. 235).* Leiden; Boston: Brill.

ROUGÉ, J., 1975. *La marine dans l'Antiquité.* 1. éd.. edn. Paris: Presses universitaires de France.

SADDINGTON, D.B., 2001. 'The Roman naval presence in the East, the *Classis Syriaca* and the Roman approach to the Euphrates.'. *Archäologisches Korrespondenzblatt,* 31, pp. 581-586.

SALONEN, A., 1939. *Die Wasserfahrzeuge in Babylonien nach šumerisch-akkadischen Quellen (mit besonderer Berücksichtigung der 4. Tafel der Serie ḪAR-ra = ḫubullu): eine lexikalische und kulturgeschichtliche Untersuchung.* Helsinki: Societas Orientalis Fennica.

SCHNÄDELBACH, K., 2010. *Topographia Palmyrena.* Damascus.

SCHNEIDER, C., 1996. 'Die Importkeramik'. *Petra, Ez Zantur I. Ergebnisse der Schweizerisch-Liechtensteinischen Ausgrabungen 1988-1992.* Mainz: Philipp von Zabern, pp. 129-150.

SCHNETZ, J., 1942. *Itineraria Romana, vol. II: Ravennatis Anonymi Cosmographia et Guidonis Geographica.* Stuttgart: Teubner.

SEGAL, J.B., 1970. *Edessa: 'the blessed city'.* Oxford: Clarendon Press.

SEGAL, J.B., 1955. 'Mesopotamian Communities from Julian to the Rise of Islam'. *Proceedings of the British Academy,* 41, pp. 109-139.

SELAND, E., 2011. 'Kameler og kamelkaravaner i romersk kunst' *Klassisk Forum,* 2, pp. 45-53.

SELAND, E., 2011. 'The Liber Pontificalis and the Red Sea trade of the early-mid fourth century AD'. In: D.A. AGIUS, J.P. COOPER, A. TRAKADAS and C. ZAZZARO, eds, *Navigated Spaces, Connected Places Proceedings of Red Sea Project V held at the University of Exeter September 2010.* Oxford: Archaeopress, pp. 117-126.

SHAHID, I., 2009. *Byzantium and the Arabs in the Sixth Century.* Washington, D.C: Dumbarton Oaks Research Library and Collection.

SHAHID, I., 1995. *Byzantium and the Arabs in the sixth century.* Washington, D.C: Dumbarton Oaks.

SHERESHEVSKI, J., 1991. *Byzantine Urban Settlements in the Negev Desert.* Beersheva: Ben-Gurion University of the Negev Press.

SIJPESTEIJN, P.J. and WORP, K.A., 1976. 'Documents on Transportation by Ship'. *Zeitschrift für Papyrologie und Epigraphik,* 20, pp. 157-165.

SIPILÄ, J., 2009. *The Reorganisation of Provincial Territories in Light of the Imperial Decision-Making Process: Later Roman Arabia and Tres Palaestinae as Case Studies .* Helsinki: Societas Scientiarum Fennica.

SIPILÄ, J., 2007. 'Fluctuating Provinicial Borders in the Mid-4th Century Arabia and Palestine'. In: A. LEWIN and P. PELLEGRINI, eds, *The Late Roman Army in the Near East from Diocletian to the Arab Conquest: Proceedings of a colloquium held at Potenza, Acerenza and Matera, Italy (May 2005).* Oxford: Archaeopress, pp. 201-210.

SMITH, A.M., 2010. *Wadi Araba in classical and late antiquity: an historical geography.* Oxford: Archaeopress.

SMITH, A.M., 2005a. 'Pathways, Roadways, and Highways: Networks of Communication and Exchange in Wadi Araba'. *Near Eastern Archaeology,* 68(4), pp. 180-189.

SOUTHERN, P., 2006. *The Roman Army: A Social and Institutional History.* Oxford: Oxford University Press.

SPEIDEL, M.P., 1977. 'The Roman Army in Arabia'. *Aufstieg und Niedergang der Römischer Welt,* II(8), pp. 687-730.

STARK, F., 1966. *Rome on the Euphrates: the story of a frontier.* London: Murray.

STROMMENGER, E. and HIRMER, M., 1962. *Fünf Jahrtausende Mesopotamien: die Kunst von den Anfängen um 5000 v. Chr. bis zu Alexander dem Grossen.* Munich: Hirmer.

STROUMSA, R., 2009. *People and Identities in Nessana.* PhD Thesis: Duke University.

SYVÄNNE, I., 2007. 'Water Supply in the Late Roman Army'. In: P.S. JUUTI, T.S. KATKO and H.S. VUORINEN, eds, *Environmental history of water: global views on community water supply and sanitation.* London: IWA Publishing, pp. 69-92.

TALBERT, R.J.A., 2010. *Rome's World: The Peutinger Map Reconsidered.* Cambridge: Cambridge University Press.

TALBERT, R.J.A., ed., 2000. *Barrington Atlas of the Greek and Roman World.* Princeton: Princeton University Press.

TARDIEU, M., 1990. *Les paysages reliques: routes et haltes syriennes d'Isidore à Simplicius.* Louvain: Peeters.

TATE, G., 1992. *Les campagnes de la Syrie du Nord du IIe au VIIe siècle : une exemple d'expansion démographique et économique à la fine de l'antiquité.* Paris: Librarie orientaliste Paul Geuthner.

TCHALENKO, G., 1958. *Villages antiques de la Syrie du Nord; le massif du Bélus à l'époque romaine.* Paris: Librarie orientaliste Paul Geuthner.

THESIGER, W., 1964. *The Marsh Arabs.* London: Longmans.

THOMSEN, P., 1917. 'Die römischen Meilensteine der Provinzen Syria, Arabia und Palaestina'. *Zeitschrift des Deutschen Palästinavereins,* 40, pp. 1-103.

TILLEY, C., 1994. *A Phenomenology of Landscape: Places, Paths and Monuments.* Oxford: Berg.

TOBLER, W., 1993. *'Three Presentations on Geographical Analysis and Modeling'.* 93-1. National Center for Geographic Information and Analysis.

TOMBER, R., 2007. "Bishops and Traders: The Role of Christianity in the Indian Ocean during the Roman Period". In: J. STARKEY, P. STARKEY and T.J. WILKINSON, eds, *Natural resources and cultural connections of the Red Sea.* Oxford: Archaeopress, pp. 219-228.

TOMBER, R., 2008. *Indo-Roman Trade: From Pots to Pepper.* London: Duckworth.

TREADGOLD, W., 1995. *Byzantium and Its Army, 284-1081.* Stanford: Stanford University Press.

TROMBLEY, F.R., 2007. 'The Operational Methods of the Late Roman Army in the Persian War of 572-591'. In: A. LEWIN and P. PELLEGRINI, eds, *The Late Roman Army in the Near East from Diocletian to the Arab Conquest: Proceedings of a colloquium held at Potenza, Acerenza and Matera, Italy (May 2005).* Oxford: Archaeopress, pp. 321-356.

TSAFRIR, Y., 1986. 'The Maps Used by Theodosius: On the Pilgrim Maps of the Holy Land and Jerusalem in the Sixth Century C. E.'. *Dumbarton Oaks Papers,* 40, pp. 129-145.

TSAFRIR, Y., DI SEGNI, L. and GREEN, J., eds, 1994. *Tabula Imperii Romani. Iudaea-Palaestina: Eretz Israel in the Hellenistic, Roman and Byzantine periods: maps and gazetteer* . Jerusalem: Israel Academy of Sciences and Humanities.

UNWIN, P.T.H., 1991. *Wine and the Vine: An Historical Geography of Viticulture and the Wine Trade.* London: Routledge.

URMAN, D., 2004. *Nessana: Excavations and Studies I.* Beer-Sheva: .

VANN, R.L., 1998. 'Some Observations on Byzantine Harbours in Isauria'. *Vizantiĭskiĭ vremennik (Byzantina chronika),* 55(2), pp. 78-85.

VANN, R.L., 1993. 'A Survey of Ancient Harbors in Rough Cilicia: the 1991 Preliminary Survey'. *Araştırma,* , pp. 29-40.

VIKAN, G., 1991. 'Guided by Land and Sea: Pilgrim Art and Pilgrim Travel in Early Byzantium'. *Tesserae: Festschrift für Josef Engemann, Jahrbuch für Antike und Christentum Ergänzungsband,* 18, pp. 74-92.

VOKAER, A., 2009. 'Brittle Ware trade in Syria between the 5th and 8th centuries'. In: M. MUNDELL MANGO, ed., *Byzantine Trade, 4th-12th Centuries.* Aldershot: Ashgate, pp. 121-136.

VRYONIS, S., 1962. 'The Question of the Byzantine Mines'. *Speculum,* 37(1), pp. 1-17.

WAGNER, J., 1983. 'Provincia Osrhoene'. In: S. MITCHELL and J.A. ARVITES, eds, *Armies and frontiers in Roman and Byzantine Anatolia.* Oxford: British Archaeological Reports, pp. 103-129.

WAGNER, J., 1977. 'Legio IIII Scythica in Zeugma am Euphrat'. In: D. HAUPT and H.G. HORN, eds, *Studien zu den Militärgrenzen Roms, II : Vorträge des 10.*

Internationalen Limeskongresses in der Germania Inferior. Köln: R. Habelt, pp. 517-539.

WALISCEWSKI, T., 2001. 'Mosaics'. In: Z.T. FIEMA, C. KANELLOPOULOS, T. WALISCEWSKI and R. SCHICK, eds, *The Petra Church.* Amman: American Center of Oriental Research, pp. 215-270.

WARD, W., 2007. "Aila and Clysma: The Rise of Northern Ports in the Red Sea in Late Antiquity" In: J. STARKEY, P. STARKEY and T.J. WILKINSON, eds, *Natural resources and cultural connections of the Red Sea.* Oxford: Archaeopress, pp. 161-171.

WATSON, G.R., 1969. *The Roman Soldier*. London: Thames & Hudson.

WEBER, E., 1999. 'The Tabula Peutingeriana and the Madaba Map'. In: M. PICCIRILLO and E. ALLIATA, eds, *The Madaba Map Centenary 1897-1997. Travelling through the Byzantine Umayyad Period. Proceedings of the International Conference Held in Amman, 7-9 April 1997.* Jerusalem: Franciscan Printing Press, pp. 41-46.

WEULERSSE, J., 1940. *L'Oronte: étude de fleuve.* Tours: Arrault.

WHITBY, M., 2000. 'The army, c. 420–602'. In: A. CAMERON, B. WARD-PERKINS and M. WHITBY, eds, *Cambridge Ancient History, Volume XIV: Late Antiquity: Empire and Successors, A.D. 425-600.* Cambridge: Cambridge University Press, pp. 288-314.

WHITEHOUSE, D. and WILLIAMSON, A., 1973. 'Sasanian Maritime Trade'. *Iran*, 11, pp. 29-49.

WHITEWRIGHT, J., 2009. *Maritime Technological Change in the Ancient World: The invention of the lateen sail.* PhD Thesis: University of Southampton.

WHITEWRIGHT, J., 2009. 'The Mediterranean Lateen Sail in Late Antiquity'. *International Journal of Nautical Archaeology*, 38(1), pp. 97-104.

WHITING, M., 2013. 'Asceticism and Hospitality as Patronage in the Late Antique Holy Land: The Examples of Paula and Melania the Elder'. In: M.E. MULLETT, M. GRÜNBART, G. FINGAROVA, M. SAVAGE and L. THEIS, eds, *Female Founders in Byzantium and Beyond.* Wien: Boehlau Verlag, pp. 71-81.

WHITTAKER, C.R., 2002. 'Mental Maps: Seeing Like A Roman'. In: P. MCKECHNIE, ed., *Thinking like a Lawyer: Essays on Legal History and General History for John Crook on his Eightieth Birthday.* Leiden: Brill, pp. 81-112.

WICKHAM, C., 2005. *Framing the Early Middle Ages: Europe and the Mediterranean 400-800.* Oxford: Oxford University Press.

WICKHAM, C., 1988. 'Marx, Sherlock Holmes, and Late Roman Commerce'. *Journal of Roman Studies*, 78, pp. 183-193.

WILKINSON, J., 1990. 'Jewish Holy Places and the Origins of Christian Pilgrimage'. In: R. OUSTERHOUT, ed., *The Blessings of Pilgrimage.* Urbana: University of Illinois Press, pp. 41-53.

WILKINSON, J., 2002. *Jerusalem Pilgrims Before the Crusades* . Warminster: Aris & Phillips Ltd.

WILKINSON, J., 1999. *Egeria's Travels* . Warminster: Aris and Phillips.

WILKINSON, T.J., 1997. 'The History of the Lake of Antioch: A Preliminary Note'. In: G.D. YOUNG, M.W. CHAVALAS and R.E. AVERBECK, eds, *Crossing Boundaries and Linking Horizons: studies in honor of Michael C. Astour on his 80th birthday.* Bethesda, MD: CDL Press, pp. 557-576.

WILSON, R.T., 1989. 'The one-humped camel in the world', J.-. TISSERAND, ed. In: *Séminaire sur la digestion, la nutrition et l'alimentation du dromadaire*, 1989 1989, pp. 15-17.

YENER, K.A., 1992. 'Byzantine Silver Mines: An Archaeometallurgy Project in Turkey (with a contribution on the pottery finds by A. Toydemir)'. In: S.A. BOYD, M.M. MANGO and G. VIKAN, eds, *Ecclesiastical silver plate in sixth-century Byzantium: papers of the symposium held May 16-18, 1986, at the Walters Art Gallery, Baltimore, and Dumbarton Oaks, Washington, D.C., organized by Susan A. Boyd, Marlia Mundell Mango, and Gary Vikan.* Washington, D.C: Dumbarton Oaks Research Library and Collection, pp. 155-168.

YOUNG, G.K., 2001. *Rome's eastern trade: international commerce and imperial policy, 31 BC-AD 305.* London: Routledge.

TRAVEL IN THE LATE ANTIQUE LEVANT

A STUDY OF NETWORKS OF COMMUNICATION AND TRAVEL INFRASTRUCTURE IN THE 4TH-7TH CENTURIES

VOLUME II: MAPS & FIGURES



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Lincoln College

Submitted in partial fulfilment of the requirements for Doctor of Philosophy in Archaeology

University of Oxford
Trinity Term 2013

Maps



Map 1.1 Locations mentioned in Chapter 1..

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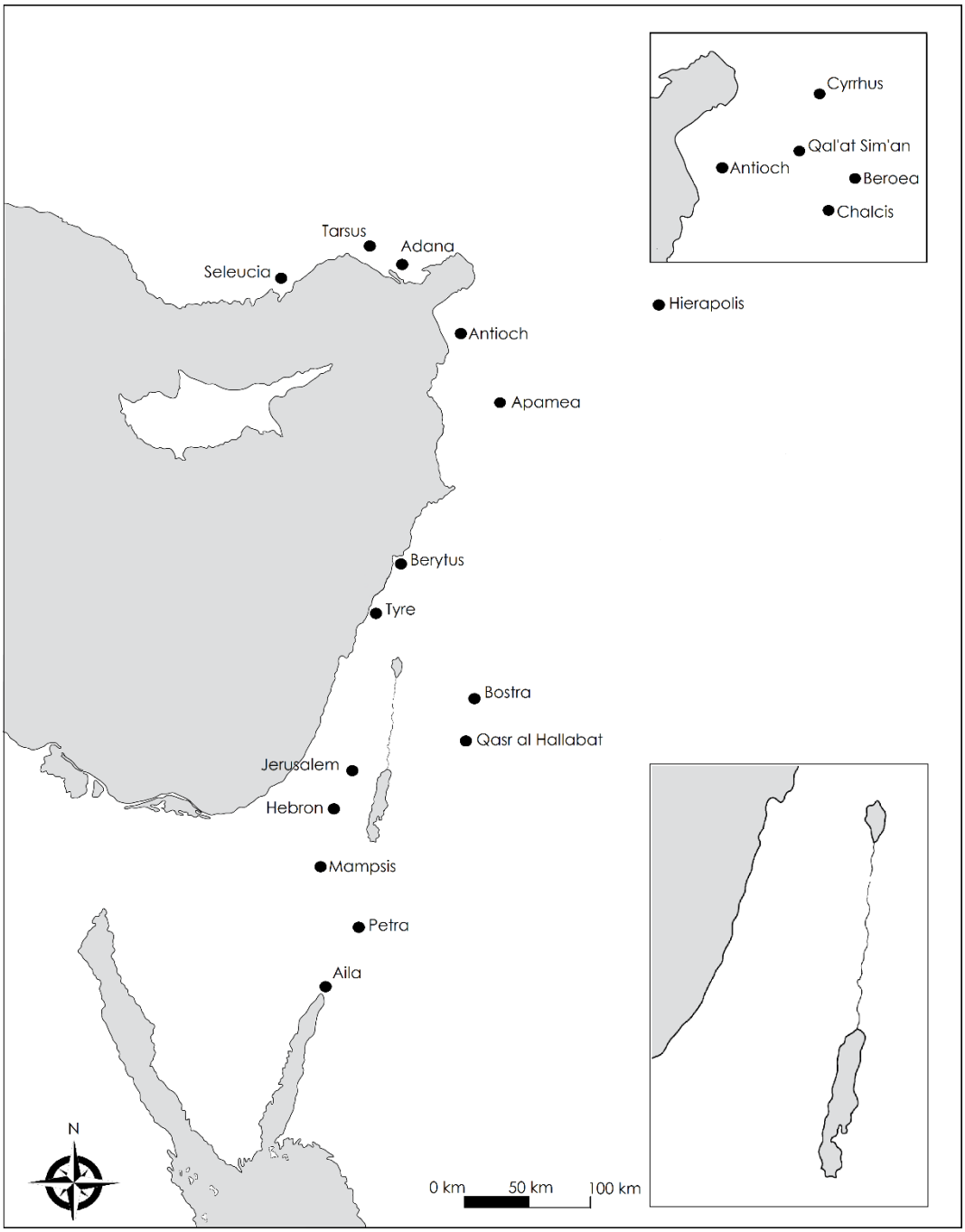
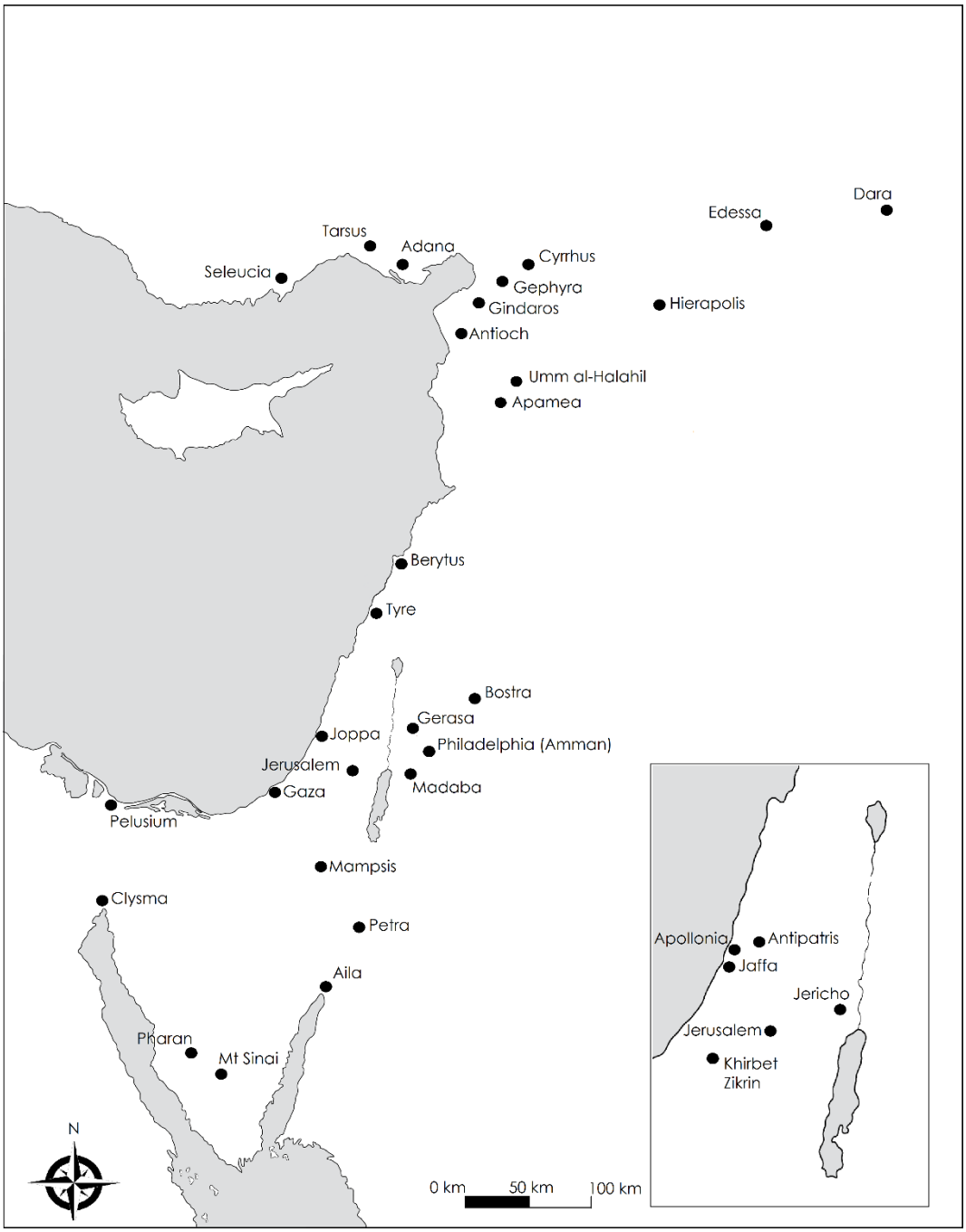
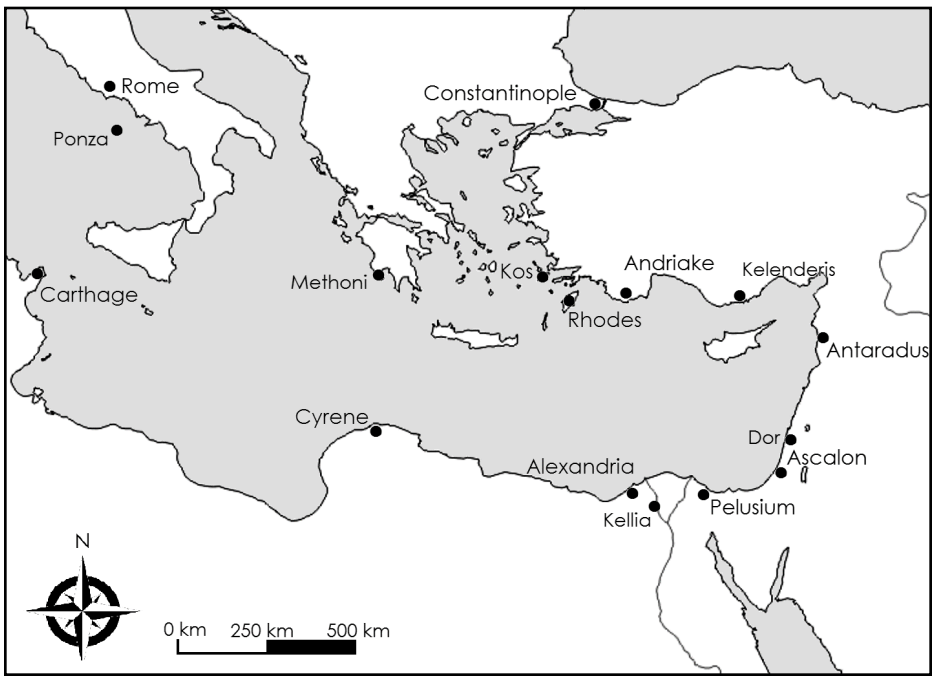
Map 1.2. Main roads of Palestine.
Roll 1995, 1167, Fig. 1.



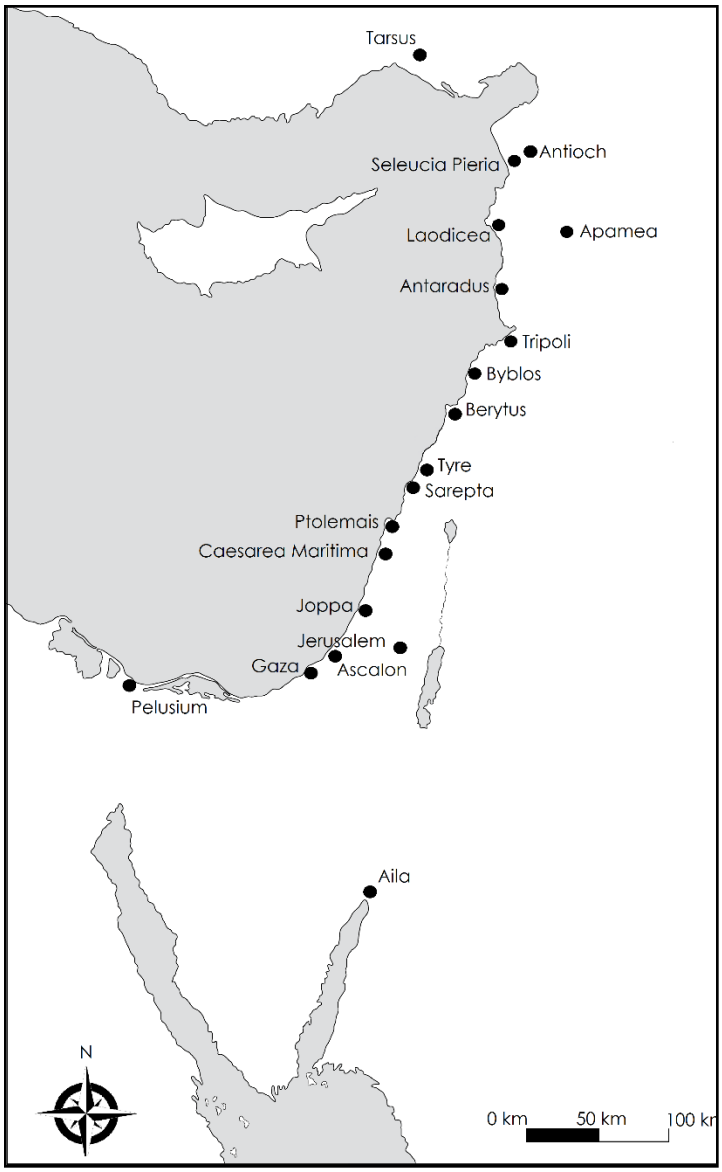
Map 2.1 Locations mentioned in Chapter 2.



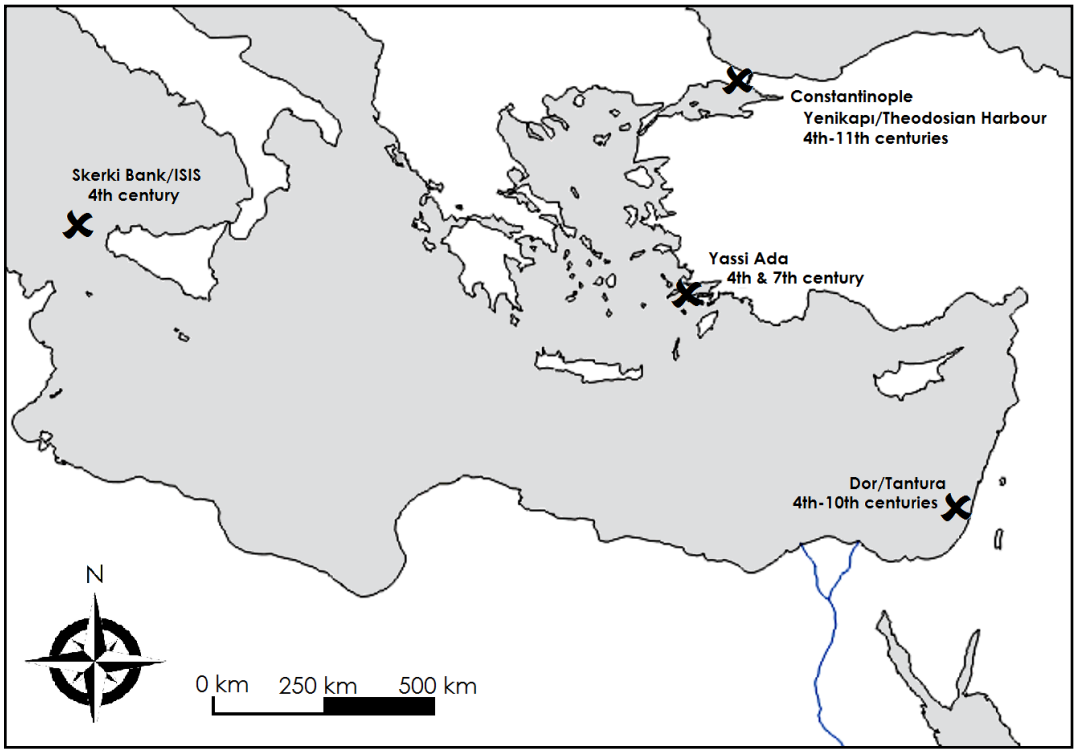
Map 3.1 Locations mentioned in Chapter 3.



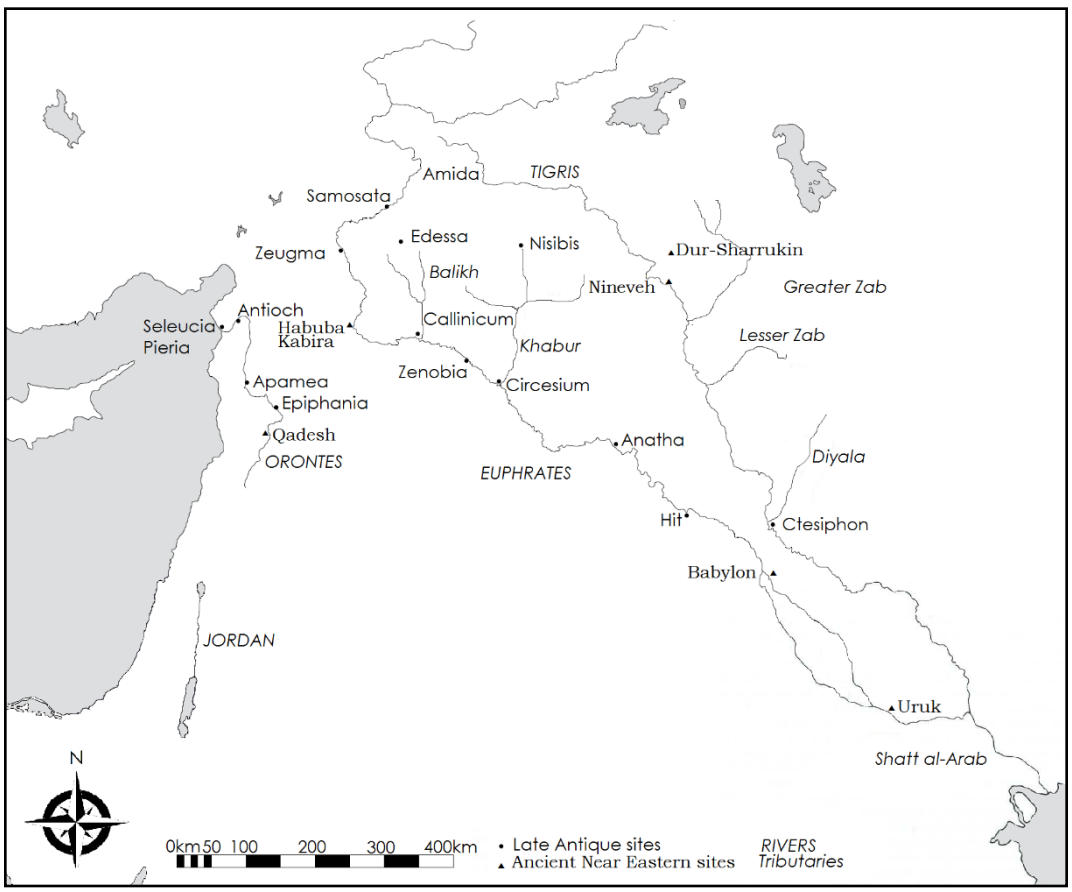
Map 4.1.1 Locations in the Mediterranean mentioned in Chapter 4.1.



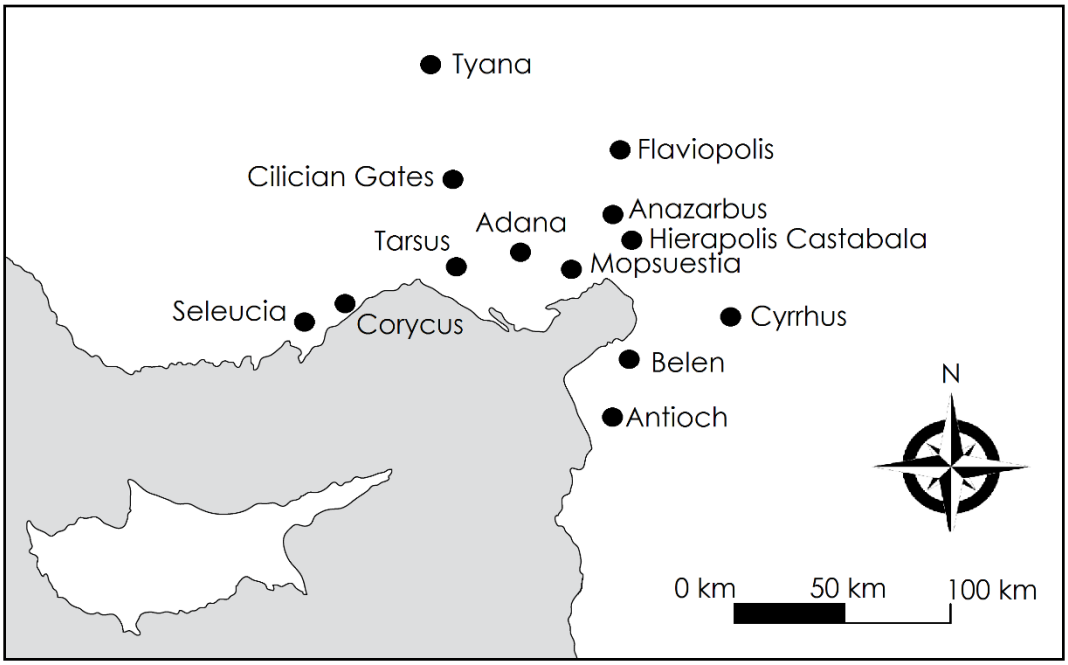
Map 4.1.2 Locations on the Levantine coast mentioned in Chapter 4.1.



Map 4.1.3 Locations of shipwrecks mentioned in Chapter 4.1.



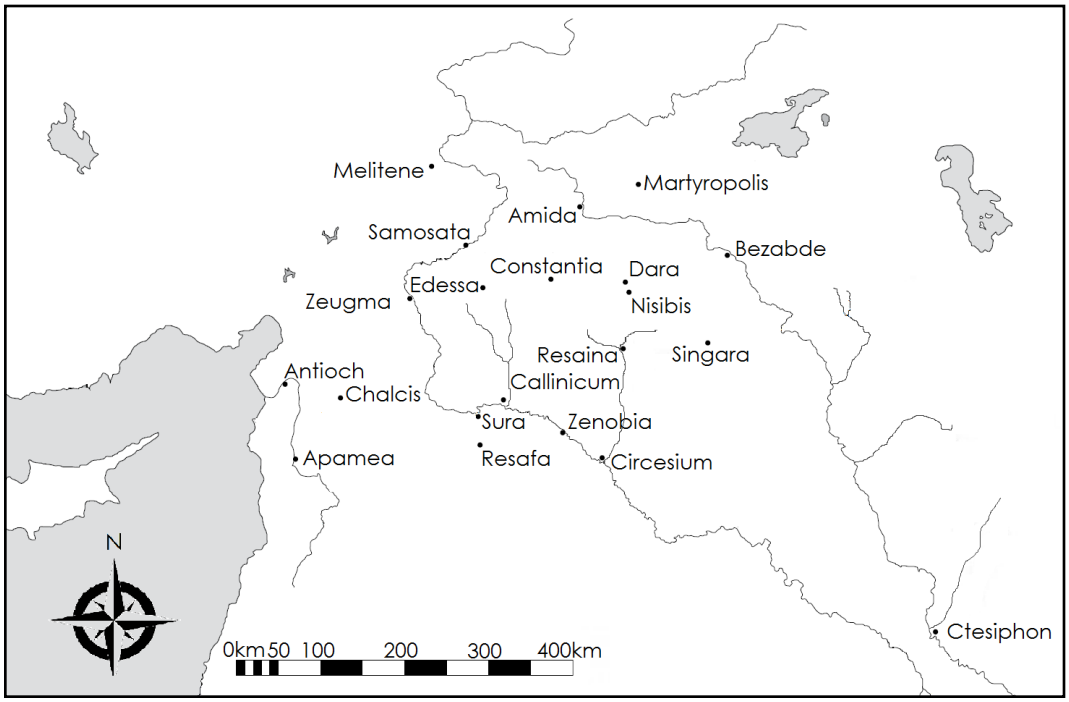
Map 4.2.1 Rivers and places mentioned in Chapter 4.2.



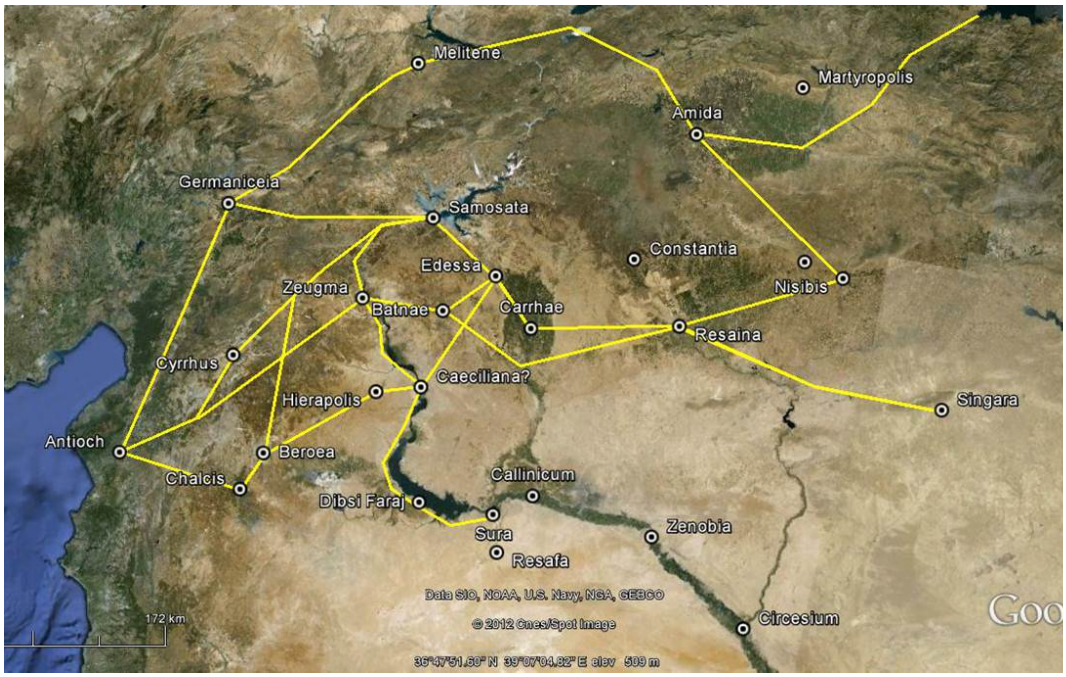
Map 5.1.1 Locations mentioned in Chapter 5.1.



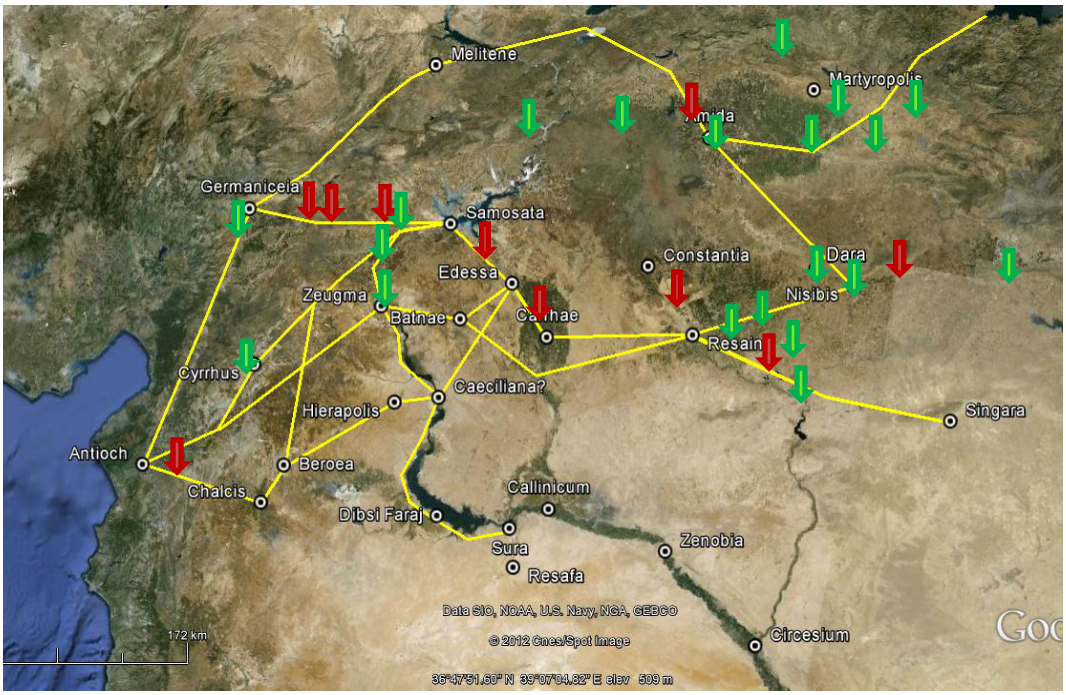
Map 5.1.2 Route from Antioch to Constantinople



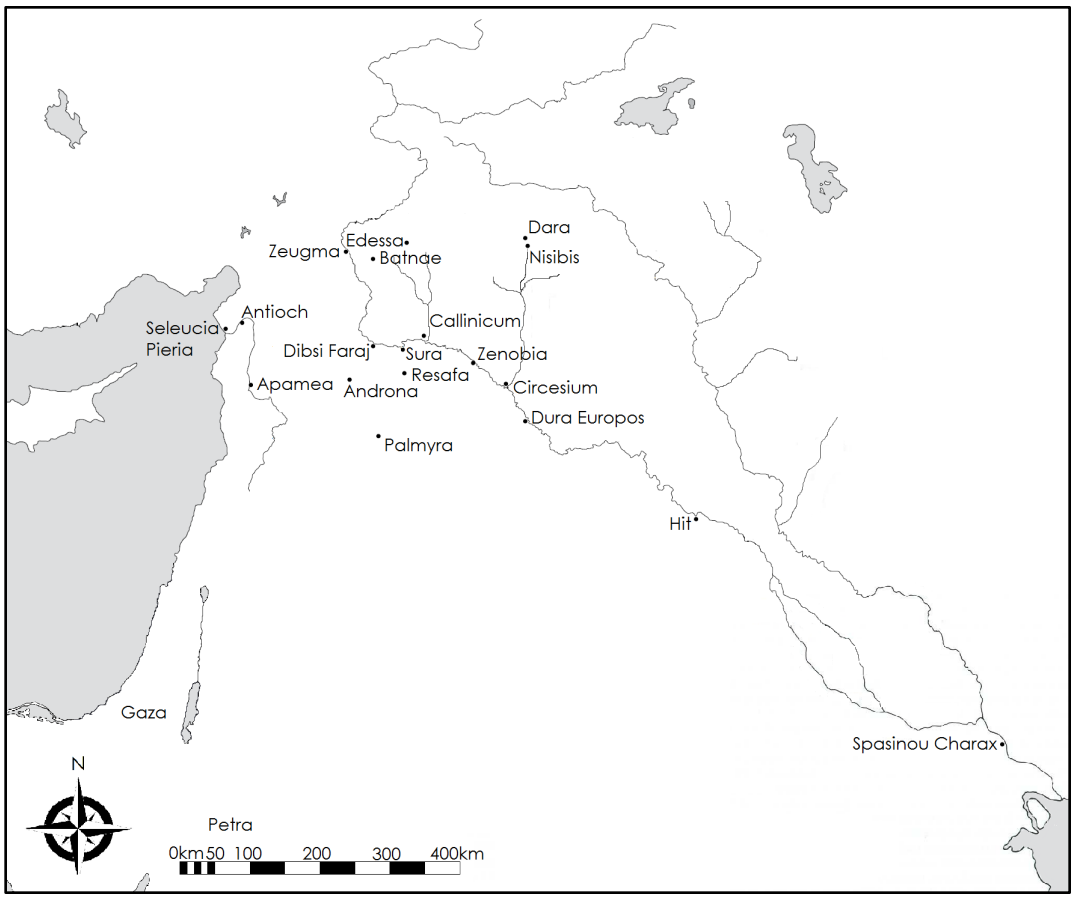
Map 5.2.1 Locations mentioned in Chapter 5.2.



Map 5.2.2 Routes across northern Mesopotamia and Syria mentioned on the Peutinger Map.



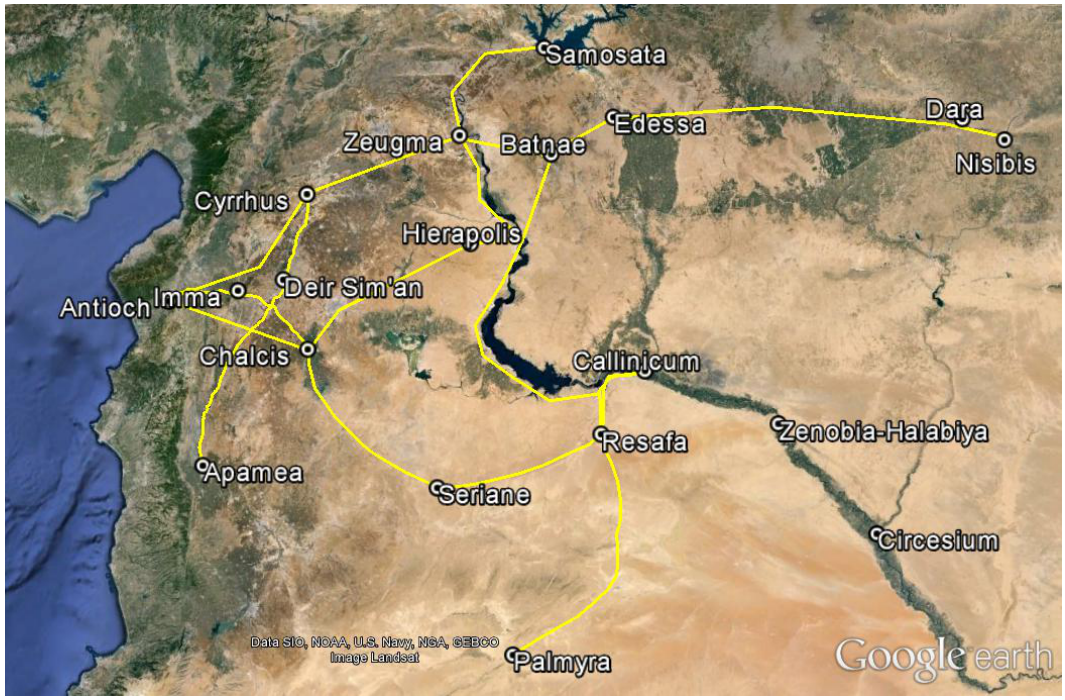
Map 5.2.3 Peutinger Map routes showing extant road remains (red arrows) and bridges (green arrows).



Map 5.3.1 Locations of sites mentioned in Chapter 5.3.



Map 5.3.2 Trade routes to Palmyra from the Persian Gulf.



Map 5.3.3 Trade routes through northern Mesopotamia and Syria.



Map 5.3.4 Map of distribution of Brittle Ware pottery in Syria
Based on Vokaer 2009, Fig. 8.8.



Map 5.3.5 Map showing main roads through the Limestone Massif, and the location of key villages.



Map 5.4.1 Jaffa-Jerusalem road. Flags mark extant road remains.



Map 5.4.2 The road from Jerusalem to the Jordan River through Jericho



Map 6.1 Locations mentioned in Chapter 6.



Map 6.2 Locations and routes mentioned in Chapter 6.

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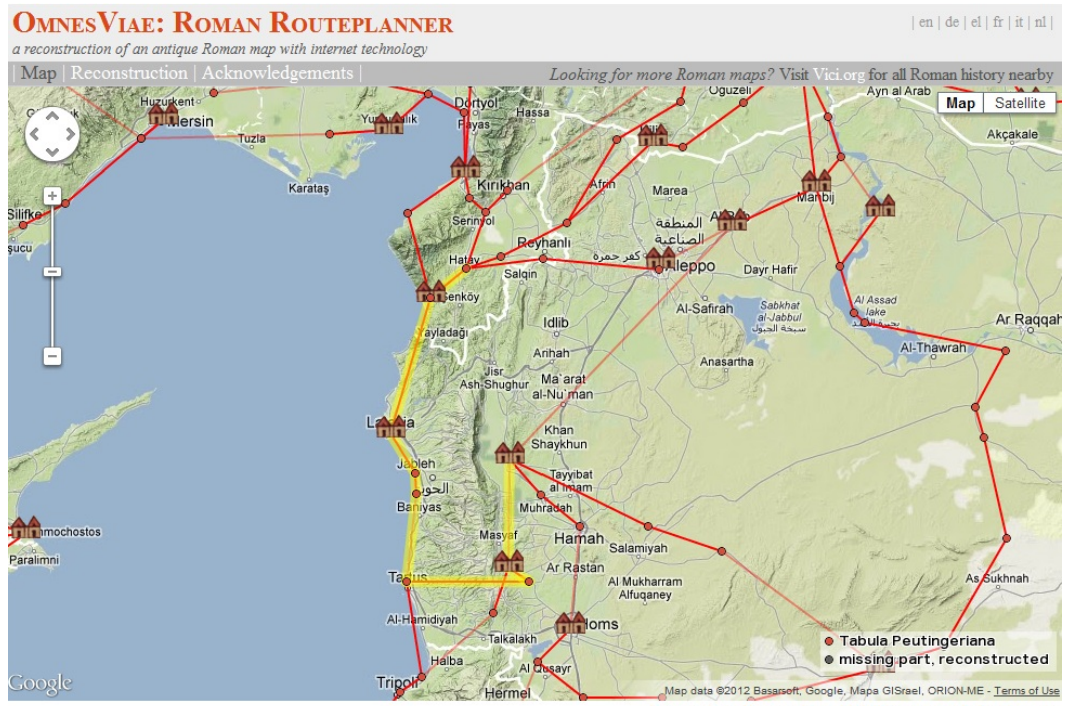
Map 6.3 Routes through the Negev in the Nabataean/Roman period. *Roll 2007,*

Illustrations – Chapter 1



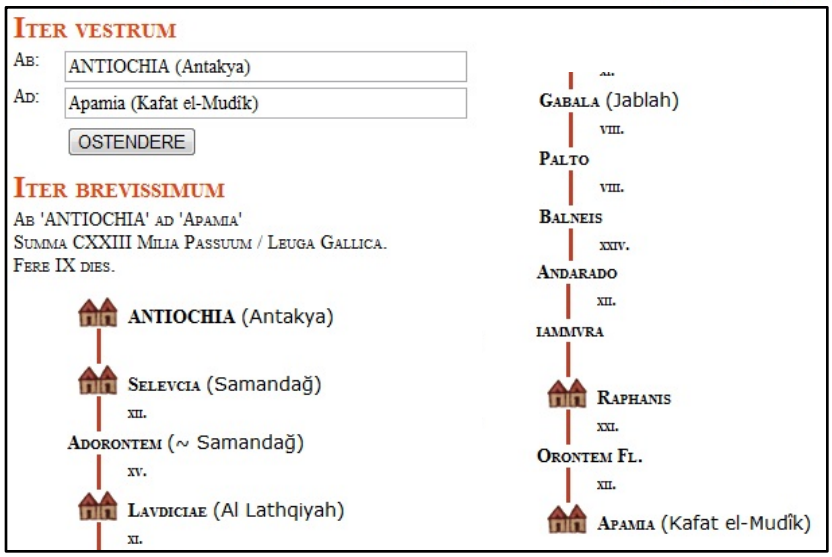


Fig. 1.1 Antioch-Apamea route plotted using *Omnes Viae*



Fig. 1.2 Sections of Peutinger Map (segments 11 and 12) showing Oriens
Based on Miller's 1887 facsimile http://www.hs-augsburg.de/~harsch/Chronologia/Lspost03/Tabula/tab_intr.html

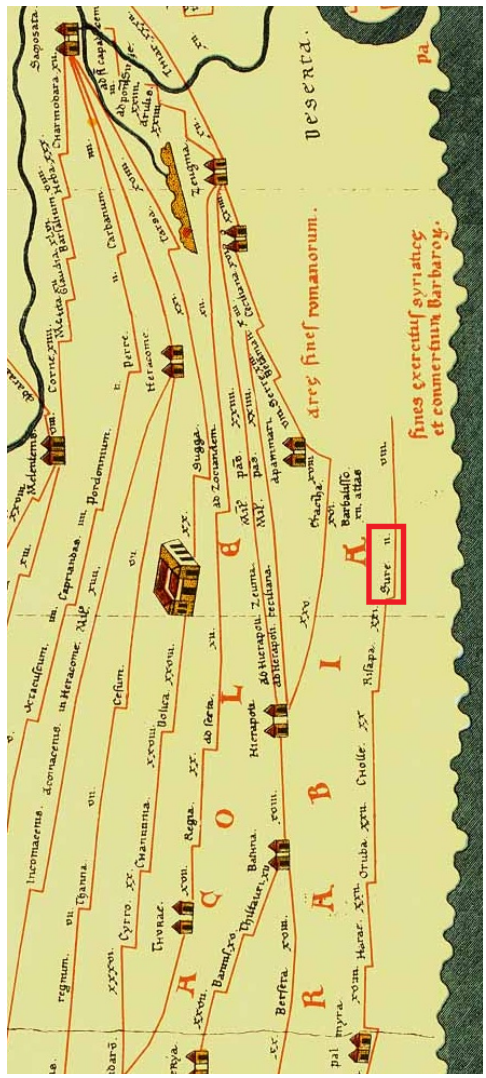


Fig. 1.3 Detail of Fig. 1.1 showing routes to the Euphrates. Sura highlighted.

Illustrations – Chapter 2

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Fig. 2.1 Line drawing demonstrating the principle of 'successive approximation'
From Lewis 2001, 223, Fig. 11.2

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Fig. 2.2 Line drawing showing section of typical road construction.
Fischer et al. 1996, 75, Fig. 7



Fig. 2.3 Paving of Antioch-Chalcis highway. Note absence of central spine.
Photo M. Whiting



Fig. 2.4 Section of paved road in Wadi ‘Araba.
Smith 2005, 188



Fig. 2.5 Road on slope with revetment wall near Rumkale.
Comfort 2009, 21



Fig. 2.6 Schematic of section through road built on slope.
French 1981, 20, Fig. 2



Fig. 2.7 Combination of switchback road (top) and carved steps (bottom) on ascent to Jabal Harun monastery.
Photos M. Whiting.



Fig. 2.8 Section of carved stepped road on processional way, Qala'at Sim'an
Photo M. Whiting.

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Fig. 2.9 Built steps at Ma'ale Dragot on Jerusalem-Mampsis road
From Kloner 1996, 126, Fig. 11.

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Fig. 2.10 Carved steps at Ma'ale 'Aqrabbim between Mampsis and Hatzeva
From Harel 1959, Pl. 19.B.

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Fig. 2.11 Bridge of Septimius Severus spanning the Kahta, a tributary of the Euphrates
From Butler 2003, 42, Fig. 11.





Fig. 2.12 4th century bridges near Cyrrhus (top) and Aleppo (bottom)
From Livius.org (http://www.livius.org/a/syria/cyrrhus/cyrrhus_bridge1.JPG) and Wikimedia Commons (http://en.wikipedia.org/wiki/File:Afrin,Huri.jpg)

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Fig. 2.13 Proportion of beasts of burden from different region of the Empire. The size of the circles represents the relative significance of beasts of burden overall in various regions.
Kroll 2012, 98, Fig. 6.

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Fig. 2.14 Detail from the nave pavement of the Church of Priest Wa'il (586).
Piccirillo 1993, 243, Fig. 400 and 242, Fig. 396

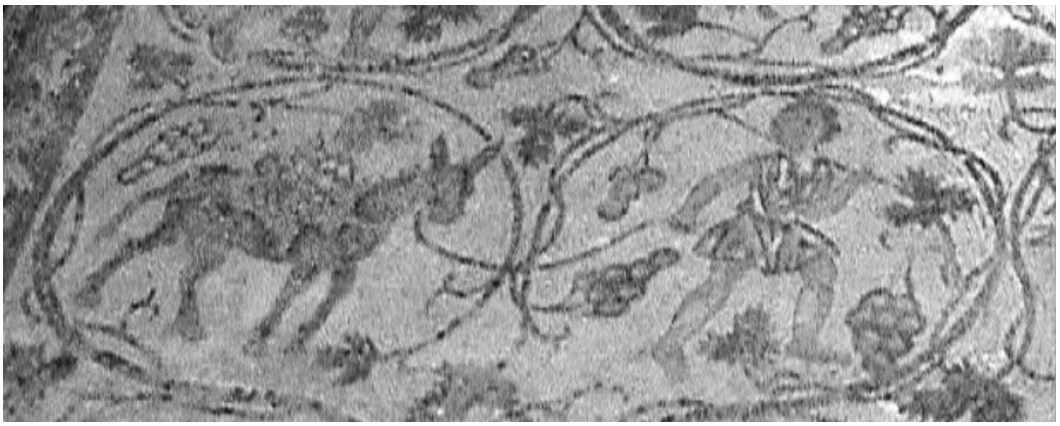

Fig. 2.15 Detail from the nave pavement of the Church of Ss Lot and Procopius showing donkey laden with baskets
Photo: M. Whiting.



Fig. 2.16 Detail from the nave pavement of the Church of St George showing Moukharios the *kamelarios*. Now in the Bostra Museum.
Photo: M. Whiting.



Fig. 2.17 Mosaic from Kissufim showing *kamelarios* leading a camel laden with jars. Now in the Israel Archaeological Museum.
Photo: S. Leatherbury.



Fig. 2.18 Detail from the north aisle of the Petra Church showing a camel laden with a beam or post.
Photo: M. Whiting.



Fig. 2.19 Pilgrim Flask from Abu Mina with ship depicted on reverse. 5th/6th century.
British Museum 1882-0510-51

Illustrations – Chapter 3



Fig. 3.1 Detail of the Madaba Mosaic Map with Jerusalem at centre, the Dead Sea at top right.
Photo: M. Whiting.

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Fig. 3.2 Miniature illustrating territory of *comes per Isauriam*. Note the Cilician Gates marked by the hind quarters of a wolf.
MS Bodley Canon. Misc.378, fol. 114v

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Fig. 3.3 6th/7th century portable clay sundial found at Apollonia (Sozousa). *Tal 2009, Figures 2-4.*

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Fig. 3.4 Common angular measurements for astronomical observing. *http://www.oneminuteastronomer.com/wp-content/uploads/2009/04/angular-measures.jpg*

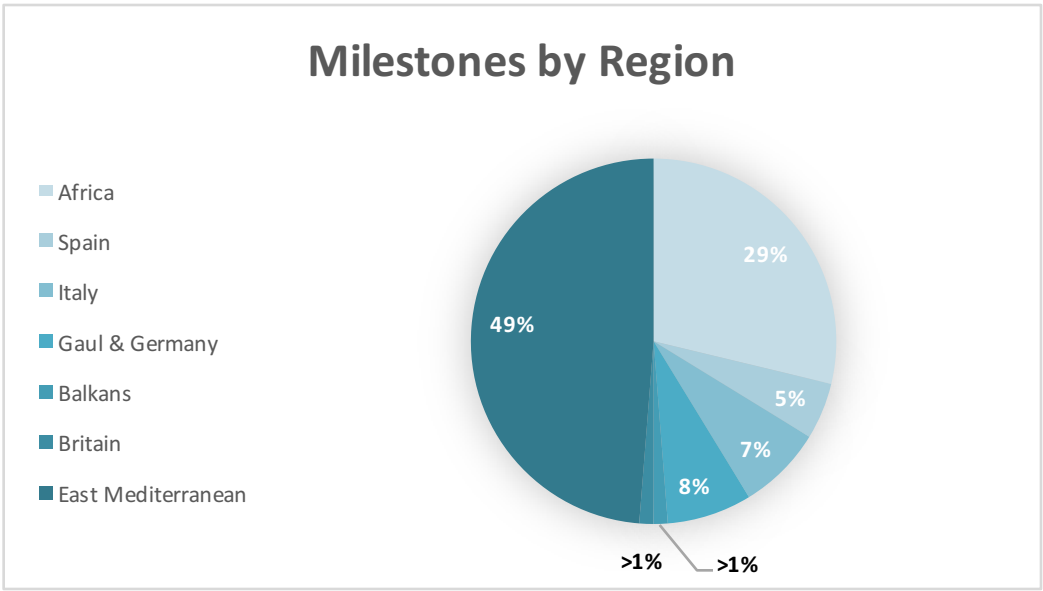

Fig. 3.5 Distribution of 8000 recorded milestones according to region of the Roman Empire. Numbers from Graf 1995, 417.





Fig. 3.6 2nd century milestones from Britain and Syria demonstrating uniformity of shape and design. Left: Milestone of Hadrian (Vindolanda Museum). Right: Milestone of Trajan (Latakia Museum)
Photos: S. Chandrasekaran, O. Nieminen

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Fig. 3.7 Example of milestone inscription, giving name and honorifics of Caracalla and consul Sextus Furnius Julianus, dated to 214. Observe bilingual mile number. (Humbert 1998, No. 061). Currently at the Bosra Museum, Syria.
Photo: O. Nieminen

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D(ominis) [n(ostris)]
Fl(avio) Constan[tino]
P(io) F(elicit) invicto A[ug(usto)]
Et Constantin[o]
Et Constanti[o]
Et Constant-
e
mi(lia passuum) ii

Ἀπὸ Νι-
κοπόλ-
εως
μ(ίλια) β’

Fig. 3.8 Milestone from Emmaus/Nikopolis – Beit Horon road, dated 333-337, with secondary inscription in Greek.
Fischer, Isaac and Roll 1996, 294-5; 431. Pl. 103-4.

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Fig. 3.9 Plan of the Western Vicus building (*mansio*) at Lejjun.
Parker 1986, Fig. 30

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Fig. 3.10 Site layout of Bir Madhkur.
Smith 2010, 40, Fig. 36

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Fig. 3.11 Site plan of Bir Madhkur.
Smith 2010, 41, Fig. 37, from Glueck 1935, 168, Pl. 6

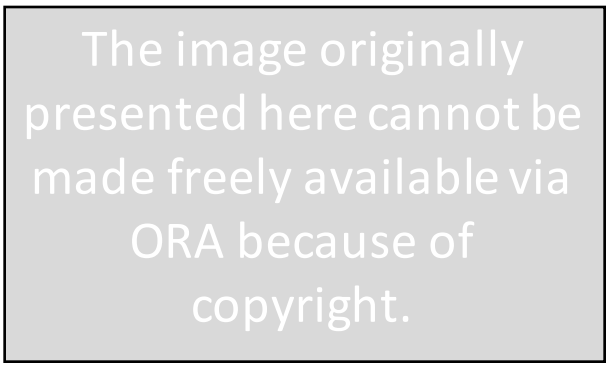

Fig. 3.12 Plan of *mansio* and baths at Chelmsford.
Black 1995, 150, Fig. 31.

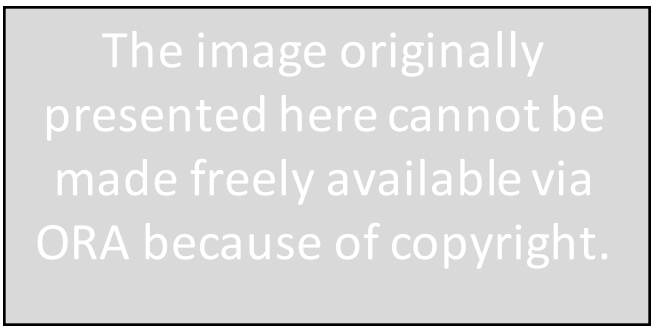

Fig. 3.13 Plan of *mansio* at Godalming.
Black 1995, 151, Fig. 32.

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Fig. 3.14 Umm al-Halahil, Syria. Plan and inscription mentioning *xeneôn*.
From Mundell Mango 2000, Fig. 34.

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Fig. 3.15 Map of Jordan showing concentrations of military forts and roads by region.
Kennedy 2004, 19, Fig. 1.1.

Illustrations – Chapter 4



Fig. 4.1.1 Predominant surface currents from December to February
From Mediterranean Pilot 5 2005, 18



Fig. 4.1.2 Predominant surface currents from June to August
From Mediterranean Pilot 5 2005, 19



Fig. 4.1.3 Wind distribution in January
From Mediterranean Pilot 5 2005, 29

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Fig. 4.1.4 Wind distribution in July
From Mediterranean Pilot 5 2005, 30

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Fig. 4.1.5 Main regional winds of the Mediterranean
From Mediterranean Pilot 5 2005, 31

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Fig. 4.1.6 Diagram of the triangular lateen and quadrilateral settee sail.
Based on Whitewright 2009, 98, Fig. 1



Fig. 4.1.7 Graffiti from Kellia in Egypt showing ships with lateen rigging (left) and square rigging (right).
From Whitewright 2009, 99, Fig. 2, Kingley 2004a, 65



Fig. 4.1.8 Line drawing of Kelenderis mosaic showing lateen-settee rigging.
From Whitewright 2009, 99, Fig. 3



Fig. 4.1.9 Chronological development of mortise-and-tenon joinery from the 1st century CE (A), 4th century (B), and 7th century (C)
From Kingsley 2004, 73

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Fig. 4.1.10 Land visibility from the sea in the eastern Mediterranean
From Manning and Hulin 2005, 277, Fig. 11.1

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Fig. 4.1.11 Reconstruction of the 7th century Yassi Ada ship being built
From Kingsley 2004, 51

Illustrations – Chapter 4.2

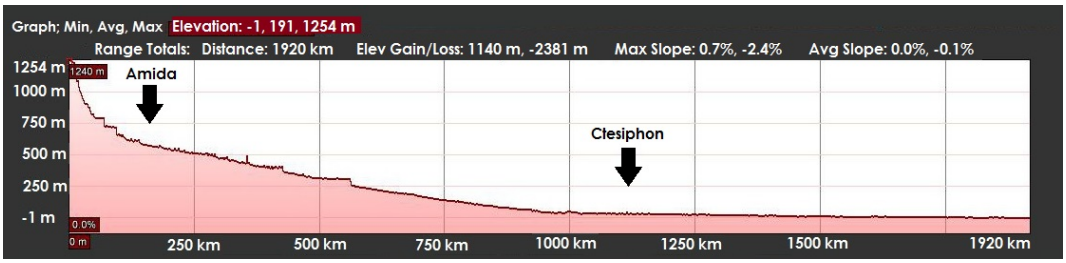

Fig. 4.2.1 Elevation profile of Tigris river.
N.B. Flat areas followed by sudden drops represent modern lakes and dams.



Fig. 4.2.2 Bridge across Tigris at Amida, originally built by Bishop John Sa'oro c. 484
Photo: M. Prins
(http://www.livius.org/a/turkey/diyarbakir/diyarbakir_bridge2.JPG)

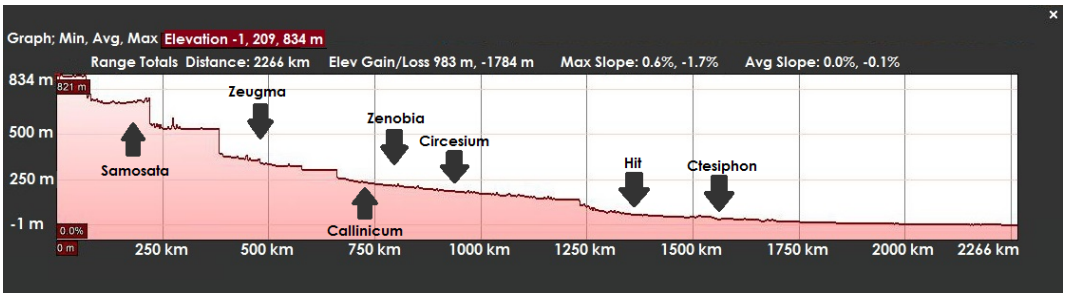

Fig.4.2.3 Elevation profile of Euphrates river.
N.B. Flat areas followed by sudden drops represent modern lakes and dams.



Fig. 4.2.4 Ferry crossing on the Euphrates
Photo: M. Stout Whiting

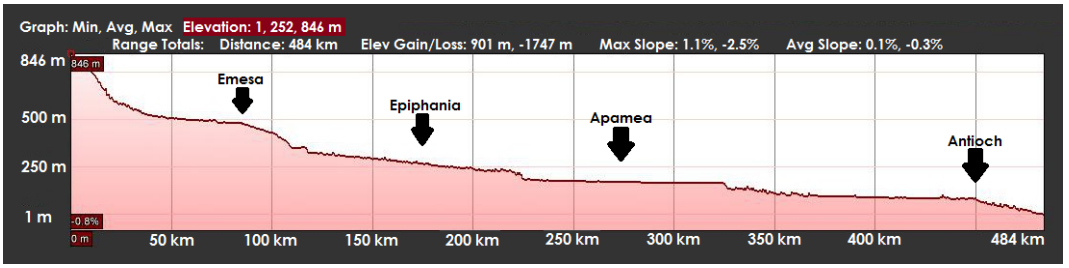

Fig. 4.2.5 Elevation profile of Euphrates river.
N.B. Flat areas followed by sudden drops represent modern lakes and dams.



Fig. 4.2.6 Orontes at Qadesh
Photos: M. Stout Whiting



Fig. 4.2.7 Man piloting a *mashhuf* in the Marshes
Photo: N. Postgate

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Fig. 4.2.8 Artistic reconstruction of boat used on the Khabur c. 5000 BCE based on Tell Mashnaqa clay model.
Akkermans and Schwartz 2003, 168, Fig. 5.7

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Fig. 4.2.9 Cylinder seal of early Sumerian date (3250-2000 BCE)
Strommenger 1962, Pl. 17

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Fig. 4.2.10 Assyrian king prepares to cross a river with his army (note soldiers inflating animal skins) (c. 630 BCE)
Corr. Sarg. Vol. I, Fig. 16

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Fig. 4.2.11 Relief showing *kelek.*
Corr. Sarg.. Vol II., Fig. 2

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Fig. 4.2.12 Line drawing of Assyrian relief showing hauling of large block for use in Sennacherib's palace.
Corr. Sarg. VolI, Fig. 18a.

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Fig. 4.2.13 Assyrian relief showing *quffa*, and fisherman on an inflated skin
Corr. Sarg. Vol. I, Fig. 17b



Fig. 4.2.14 Lithographs showing *quffa*s and swimmers on inflated skins.
Chesney 1868, Pl. LXI, Pl. LXXXVIII

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Fig. 4.2.15 Two men carrying empty *quffas* upstream
Salonen 1939, Pl. XLI

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Fig. 4.2.16 Mosaic showing personification of the Euphrates, Zeugma. 3rd Century AD
Onel 2009, 63.

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Fig. 4.2.17 Mosaic showing personification of the Orontes, Ghallineh (Latakia) 3rd Century AD.
Balty 1977, 15

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Fig. 4.2.18 Personification of the Tigris, Antioch. *Tpq* 1st Century AD
Levi 1947 Ixb.

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Fig. 4.2.20 *Shakhturs* on the Euphrates. *Salonen 1939, Pl.XXXIX*

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Fig. 4.2.21 Two *shakhturs* being used as a ferry *Naval Intelligence Geographic Handbook: Iraq and the Persian Gulf 1944, Fig. 216*



Fig. 4.2.22 Detail of mosaic showing boat with amphorae, Maaret en-Numan *Photo: M. Whiting*

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Fig. 4.2.23 Mosaic from Apamea showing waterfront scene *Balty 1981, Fig. 101.*

Illustrations – Chapter 5



Fig. 5.1.1 Schematic of typical road construction along 'Pilgrim's Road' *French 1981, 20, Fig. 1*



Fig. 5.1.2 South entrance to Cilician Gates. Note sturdy retaining wall. *Ramsay 1903, 23, Fig. 3*



Fig. 5.1.3 Schematic section of road cut into rock. *French 1981, 21, Fig. 3*

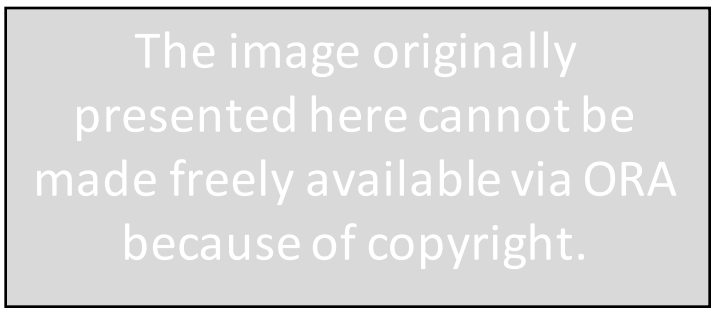

Fig. 5.1.4 Roman road cutting (expanded to accommodate modern road) *Ramsay 1903, 39, Fig. 6*

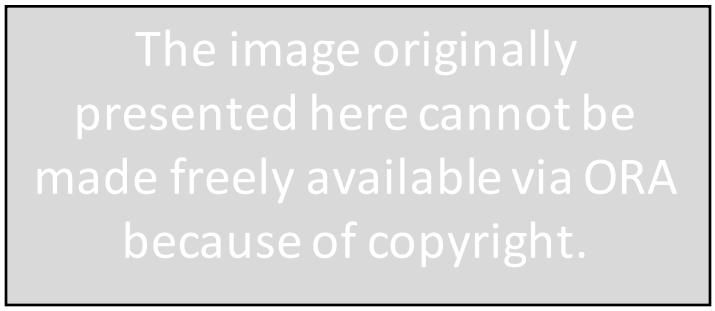

Fig. 5.2.1 'Euphrates Gates' view eastwards. *French 1988, 101, Pl. 7.2b*

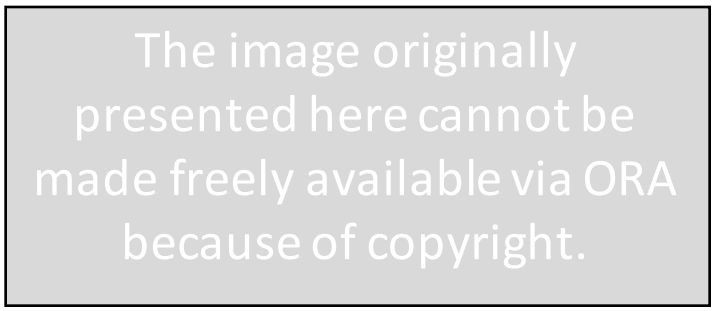

Fig. 5.2.2 Roman ford southeast of Tell Brak. Note roadside revetments marked by upright poles. *Oates and Oates 1990, Pl. 63.*



Fig. 5.2.3 Paved road surface near Amida.
Comfort 2009, 22.

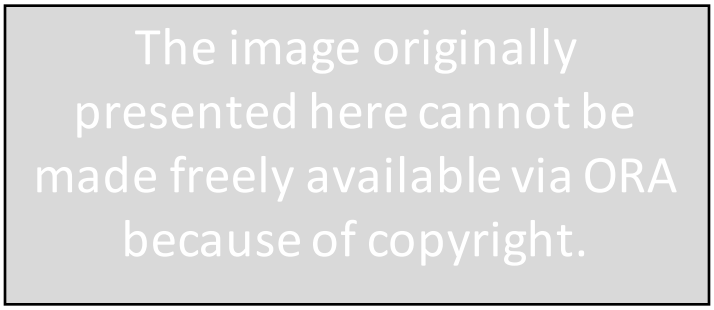

Fig. 5.2.4 Paved Roman road near 'Thallaba'.
Poidebard 1934, Pl. CXXXVIII

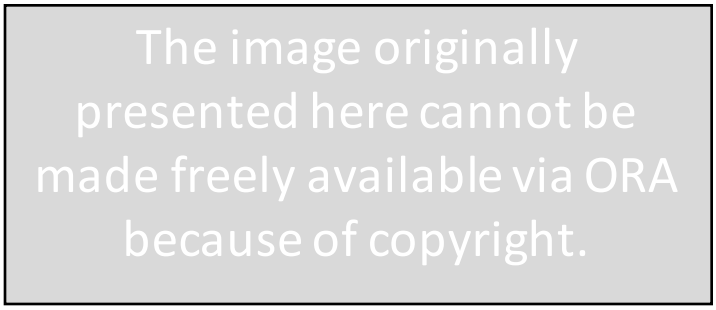

Fig. 5.2.5 Section of road between Singara and Bezabde, east of Demir Qapou
Poidebard 1934, Pl. CLXI, 2.



Fig. 5.3.1
Excavation of shops along processional way at Qal'at Sim'an
Photo: M. Whiting

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Fig. 5.3.2
Reconstruction of shops seen in Fig. ##
Sodini 2009, 1419, Fig. 20

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Fig. 5.3.3
Examples of finds from shops
Based on Sodini 2009, 1416, Fig. 19

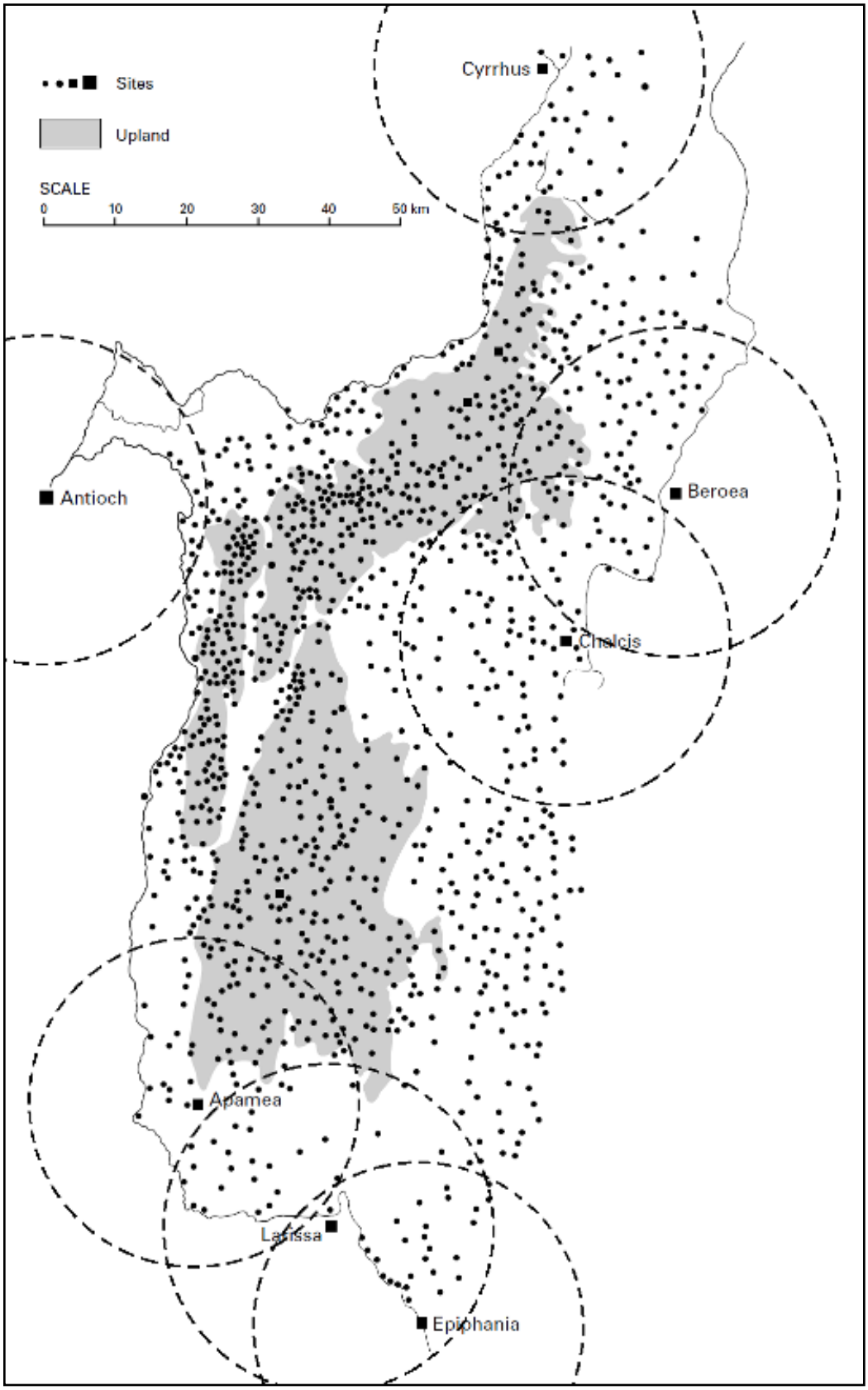

Fig. 5.3.4 Map of Limestone Massif with circles of 15 mi radii centred on surrounding cities.

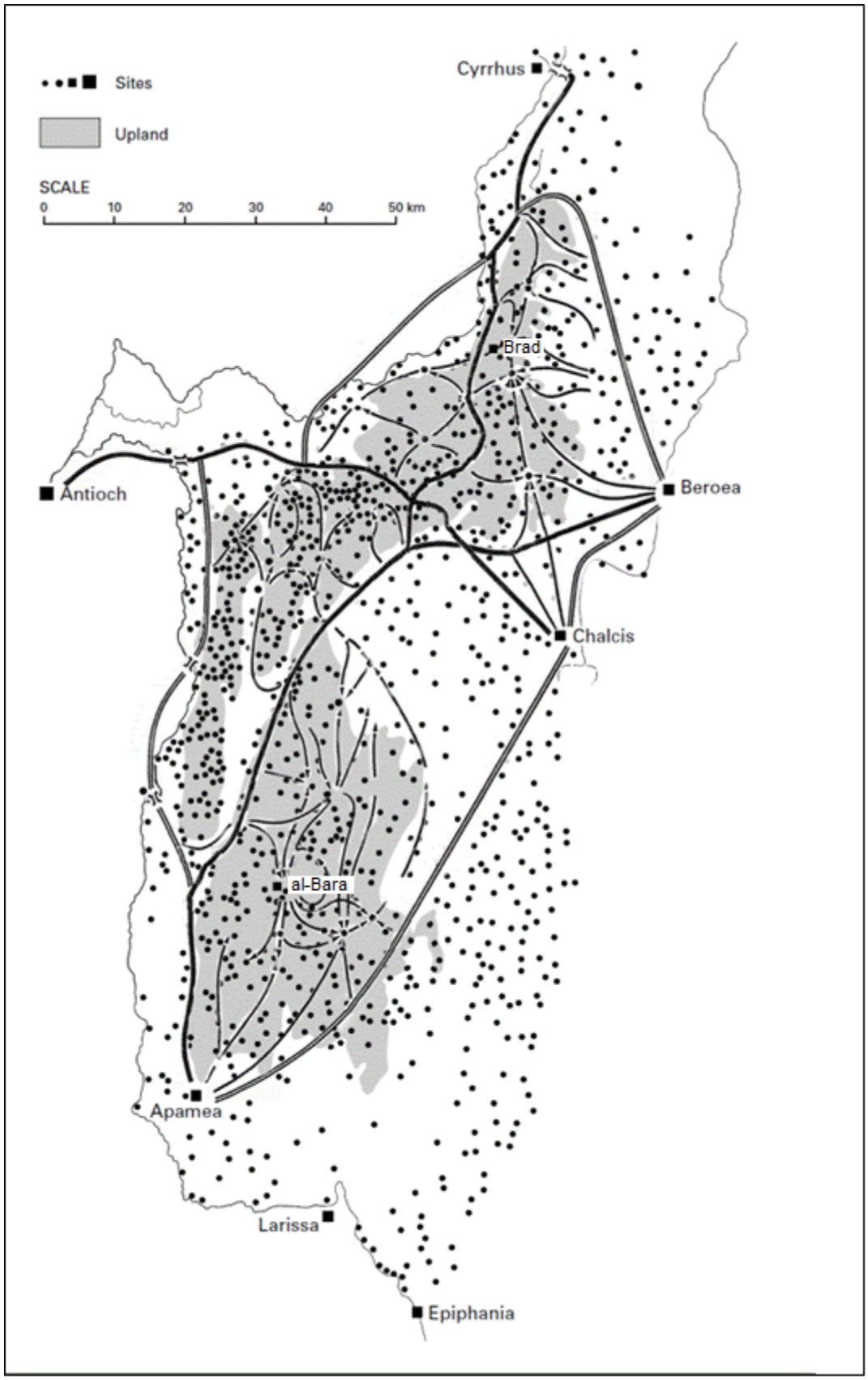

Fig. 5.3.5 Map of Limestone Massif showing hierarchy of roads leading to and from cities and key settlements.



Fig. 5.3.6 El-Bara with hilly outcrop rising to the west. *Photo: M. Whiting*

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Fig. 5.4.1 Number of sites along the Jaffa-Jerusalem roads distributed by time. *Fischer et al. 1996, 434.*

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Fig. 5.4.2 Beit-Horon road, west of Lower Beit-Horon. Section.
Fischer et al. 1996, Fig. 7.

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Fig. 5.4.3 *Plan and reconstruction of St. Peter's in the Judean Desert.*
From Hirschfeld 1990, 20; Hirschfeld 1992, 58.

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Fig. 5.4.4 Plan of St. Adam's Church in the Judean Desert.
Prignaud 1963, Pl. XI.

Illustrations – Chapter 6



Fig. 6.1 Cleared road in Wadi ‘Araba west of Bir Madhkur with milestone *Smith 2010, 80, Fig. 81.*



Fig. 6.2 The Petra-Gaza road in the Wadi ‘Araba *Smith 2005, 187.*



Fig. 6.3 Remains of Roman bridge, Wadi al Hasa *MacDonald, Rollefson, and Roller 1982: 128, 452, pl. 31.*

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Fig. 6.4 Nabatean/Roman, Late Roman, Late Roman/Byzantine, and Parthian settlements in the Wadi al-Hasa
MacDonald 1988, 218, Fig. 57

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Fig 6.5 Byzantine, Byzantine/Umayyad, and Byzantine/Mamluk settlements in the Wadi al-Hasa
MacDonald 1988, 239, Fig. 60

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Fig. 6.6 Fig. 34. Xenodochium of St. George at Mizpe Shivta.
Figueras 2007, Fig. 2,