SHIPBUILDING AND TRADE IN THE EASTERN MEDITERRANEAN DURING THE 7TH CENTURY: POSSIBLE EFFECTS OF THE MUSLIM INVASION

Matthew Harpster

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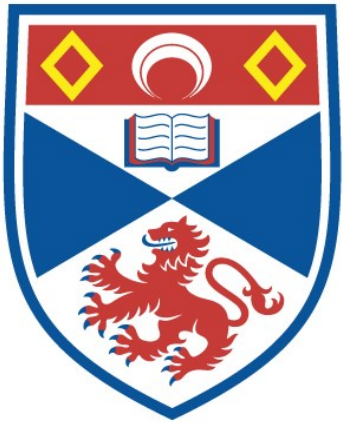

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Submitted for the completion of
the M.Phil Thesis, March 1997

Matthew Harpster

I, Matthew Harpster, hereby certify that this thesis, which is approximately 37,180 words in length, has been written by me, that it is a record of work carried out by me and that it has not been submitted in any previous application for a higher degree.

Date:

I was admitted as a research student in October, 1994, and as a candidate for the degree of M.Phil. in October, 1994; the higher study for which this is a record was carried out in the University of St. Andrews between September, 1995, and March, 1997.

Date:

I hereby certify that the candidate has fulfilled the conditions of the Resolution and Regulations appropriate to the degree of M.Phil. in the University of St. Andrews, and that the candidate is qualified to submit this thesis in application for that degree.

Date:

DATE:

Abstract:

This thesis examines the change in shipbuilding techniques from the mortice and tenon method common in antiquity, to the frame first method, specifically when the former method disappeared, in the 7th century AD. It approaches this change, which is documented in the archaeological record, from a historical point of view, creating a context around the archaeological material, a context which was previously missing. As it does so, it arrives at the conclusion that the Muslim invasion brought a new economic and political atmosphere to the eastern Mediterranean which, in contrast to the Byzantine Empire, was conducive to an expansion in independent mercantilism and a change in shipbuilding techniques.

Acknowledgments:

There are numerous people, I'm sure more than I will remember here, that encouraged, cajoled, pushed, and persuaded me during the completion of this thesis.

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Lastly, I must thank my parents. This thesis caused me, at times, more suffering than I ever thought a pile of paper ever could, but my parents, despite leagues of ocean, did whatever they could to ease it. I love you, and thank you.

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Introduction

The historical period from the end of the reign of the Byzantine Emperor Maurice in 602 to the reign of the caliph 'Abd al-Malik at the end of the 7th century AD is one that is rife with military, economic, and political change. The Byzantine Empire in the mid 6th century was prosperous, and it was at the receiving end of many trade routes from India and China in the east, and Gaul, Italy, and Spain in the west. Its navy controlled the majority of the Mediterranean from the Palestinian coast westwards to Italy, it had a peace treaty established with the Persians in the east, and the Imperial gold bezant was the only accepted form of gold currency from Spain to India. Its territory encompassed political and economic holds on Spain, Italy, and most of the south coast of Europe, the entire southern shore of the Mediterranean and most of Egypt and the Red Sea, and trade agreements with Arabia, India, China, Persia, lands surrounding the Black Sea, and even as far away as Britain. But upon the usurpation of the Emperor Maurice in 602 by Phocas, the Byzantine Empire witnessed the first of many disruptive events that would be indicative of the century to come. In October of 610, Phocas had been dethroned and killed by Heraclius, while the eastern borders were already under threat from the Persian invaders. By 615, the Persians were in Chalcedon across the Bosporan strait, attempting to lay siege to the walls of Constantinople. In the Spring of 618, control of Egypt was lost to the Sassanid invaders, and it was not until 622, and the march of the Byzantine army to the Persian capital of Ctestiphon, that any land was regained. From that date, it still required another eight years for the Persians to complete a total retreat from captured territory.

Economically, the Byzantine treasury was nearly empty, and there was increasing religious strife between the Monothelite emperor in Byzantium, and the Monophysites in Syria, Palestine, and Egypt. Coastal cities in these areas were shrinking in size, retreating from the coasts, and losing population due to disease and bankruptcy. To compound these problems, just six years after the Persian withdrawal from Byzantine territory, scarcely enough time for the Byzantine administration to implement its policies over reconquered territory, the expanding Muslim Empire fought the Byzantine army at Yarmuk in 636. By 641, Heraclius had gone mad in the capital, and

the Muslims had gained territory from Antioch in Asia Minor, to nearly Carthage in Africa.

The Byzantine navy, which had so recently defeated the Avars and the Persians on the sea, lost to the smaller Muslim force at Phoenix in 655, and by 672, the walls of Constantinople were again under attack, this time for the next six years. Byzantine political and military control in Syria, Palestine, Egypt, Africa, and Spain by the early 8th century, were permanently lost, and along with that land, went most of the resources and luxury items imported and sold in Constantinople. By 693, the reign of caliph 'Abd al-Malik, the Muslim capital was in Damascus, most resources and imports were channeled to Medina and Mecca in Arabia, and the sanctity of the Imperial gold bezant was being challenged by a Muslim *dinar*.

But within all of the warring, one thing remained constant, and that was the Byzantine Empire's reliance upon the Mediterranean Sea. In a tradition that descended from the Greek defeats of Darius and Xerxes in the Aegean, and Augustus' seizure of Antony, Cleopatra, Actium, and the Roman Empire with the navy in 31 BC, Rome, and eventually Byzantium continued to use the sea for military and economic purposes. *Triremes* and *quinqiremes* were replaced by smaller and faster *biremes* and *dromons*, and the great grain carriers from Egypt to Rome were replaced with smaller and more efficient cargo ships. By the 7th century AD, and for centuries to come until the advent of the locomotive and the railroad, the sea was the most efficient and most widely used method of transportation, and thus the most valuable resource to an empire.

In many ways, Byzantium and other societies that surrounded the Mediterranean realized that it was an integral part of their culture, and for many, it was depended on for their livelihood. So it should be said, that while a study of a Mediterranean culture, or Byzantium in particular, cannot exclude their involvement with the sea, a study of seafaring practices in the Mediterranean, including shipbuilding, should not exclude the culture in which it develops. Nothing within a society operates in a vacuum. Relationships based on social, economic, and environmental resources inevitably develop between various aspects of a society, and these aspects may become dependent on those resources for continued operation or development. Merchant shipping and shipbuilding in the 7th century eastern Mediterranean, which this thesis will focus on, are just such examples.

Shipbuilding was an industry that created a specialized, custom product for a consumer, and as such, was dependent on the consumer for profit and stability. Like other industries, it relied on the consumer to create a demand for its product, for without a demand, there was no one to purchase the product. This demand however, was based on the financial status of the consumer. The industry had to place a price on its labour and its product, and so, if the consumer was unable to pay, no product would be created. It follows then, that demand is based on money or an equivalent system of payment, and that while a demand requires money to become viable, money does not necessarily create a specific demand. In this thesis, a distinction will be made between a demand and a need. A need for a product such as a ship may always be present within a society, but it requires money to create a demand that a shipbuilder will acknowledge. Money simply allows the consumer to demand the fulfillment of their needs. Finally, the consumer needs shipbuilders to address their demands. Without a shipbuilder, the consumer is incapable of having a ship built, and money and demands will be useless.[1]

Merchant shipbuilding then, requires the presence of a consumer, or in this case a merchant shipper, who demands the creation of a ship to fit their needs. As a ship is a specialized item, there will never be a surplus of the product, just increases and decreases in the level of demand, which is directly related to the number of merchants with viable demands on the market. With a lower number of merchants, or possible merchants competing to ship or trade goods, the shipbuilding industry operates at a lower level. When there is a higher number of merchants, the opposite would occur.

Thus, it should be recognized that shipbuilding in the Mediterranean cannot be extracted and examined independent of other factors in the culture where the industry is based. As merchant shipbuilding is most directly affected by merchant shippers or shipowners, their demands and numbers, it follows that a study of merchants during this period would shed light on the shipbuilding industry during the same period of time.

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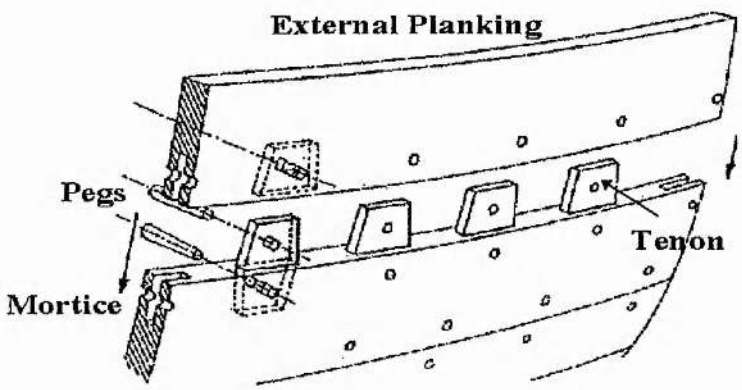
[1] In the modern world, a fourth factor such as the availability of natural resources and raw goods would apply to industrial production and development. However, in the 7th century AD, wood was essentially the only product required for shipbuilding, and so far there is little evidence that suggests that there was ever a lack of this item. See Parker, 1992:26. On the other hand, an artificial shortage was produced by the Byzantine Empire against Muslim Egypt during the last years of the 7th century. See Lewis, 1951:89, and Lewis and Runyan, 1985:44.

But first, it should be recognized that the shipbuilding practice in the Mediterranean during this period of time, the mortice and tenon construction technique, or shell first method, is unlike the ship construction methods common today. In the first stage of construction, a keel and stem and stern posts are laid, but instead of placing key frames amidships and at the bow and stern to aid the shape and run of the external planking, individual slots are carved out of the keel, along the line of the upcoming garboard plank. While in earlier centuries, notably the first 200 years AD, these individual slots, called mortices, were very numerous and extremely well cut throughout the ship's hull and keel, by the 7th century, a degradation in their quantity and quality had occurred.



Into these mortices, along the keel and in the external planking, blocks of wood the same width but approximately twice the depth of the mortice, called tenons, were placed. These tenons, similar to the mortices, show a very refined and skillful construction in the first four centuries AD, and fit very tightly into the mortices. Again, through the progression from the 4th to the 7th centuries, there is a visible degradation in the size and quality of these tenons also. As these tenons were placed in the mortices along the keel, corresponding mortices were cut into the garboard plank that would receive the other half of the exposed tenon. After all of the tenons were aligned with mortices in the garboard plank, the plank was hammered into place until the keel and the garboard edge met. Once there, usually one hole at either end of the tenon, although instances of two have been found[2], were drilled from one side of the garboard plank, through the tenon inside the mortice, and to the other side. Wooden pegs that would fulfill the role of a key in a carpentry joint, were then hammered through each hole to lock the entire joint. Occasionally, a nail may be hammered into the peg to expand it within the hole, and in other instances, tow or pitch was used to

[2] See Parker, 1992, #326.

plug any gaps. Ultimately, once the ship became waterborne, the wood in the hull and in the joints themselves would expand, and create a watertight seam.

This process was repeated in a parallel fashion, building on one side and then the other to achieve symmetry, along each plank of the hull. Mortices would be cut, tenons were placed, planks were forced together, and pegs would then lock each joint. It has been theorized, from the reconstruction of the Kyrenia wreck from the 4th century BC, that this method could be repeated until the external planking reached the sheer height or the level of decking, before any internal frames were placed.

Arguments have developed however, over the construction methods on ships from late 4th century AD and afterwards. It is postulated by Steffy and others that the early use of these mortice and tenon joints was to provide a great deal of longitudinal strength within the hull itself, negating the need for large internal framing. From the late 4th century onwards, as revealed by the Yassıada A and B wrecks and others from this period, the mortices and tenons visibly degrade in size, quality, and number throughout the ship's hull, decreasing the amount of internal strength they provide. By the 7th century, this degradation resulted in mortice and tenon joints that were irregularly spaced throughout the planking, had no pegs to secure the tenons in the mortice, and provided no longitudinal strength to the hull. In response to this degradation after the 4th century, the framing increases in size from that period forward, to compensate for the loss of integral strength. By the early 7th century, as the mortices and tenons had degraded, the internal framing had increased proportionately (Steffy, 1994:80-83), and what was essentially a composite construction technique was in use (Bass *et al.*,1982:82-83).

The composite construction technique, during this period of time, is one in which the older shipbuilding technique, the mortice and tenon method, is still prevalent through the construction of the ship, although a more efficient method, the frame first construction technique, is also in use. In the 7th century, there are only two excavated ships that retain enough of the hull to examine their building technique, and in all three, this composite method is in use. The Saint Gervais B ship, from the first quarter of the 7th century, is actually built in the frame first technique, although it still retains mortice and tenon joints at the fore and aft ends of the planking (Parker, 1992:372). The Yassıada A ship from c.626, similar to Saint Gervais B, also retains mortice and tenon joints at the ends of the vessel and widely spaced throughout the hull, but in this

case, the framing was added after various stages of exterior hull construction below the 16th strake, not before (Parker, 1992:454), and above that strake, no mortice and tenon joints were apparently added (Bass *et al.*, 1982:76). Finally, Pantano Longarini was built in a method very similar to Yassıada A, but there is still some debate over the dating of the ship itself (Parker, 1992:303).

So far, no reliably dated ships from the 8th or 9th century have been recovered that retain enough of their hull to determine possible construction techniques during these two centuries.[3] From the 10th century however, two ships, Agay and Plane C, both excavated off the coast of France, were clearly constructed in the frame first, or skeleton method, where the internal framing is constructed first and the hull is then built around it (Parker, 1992, #8, #821). Dating from c.1026, the Serçe Limani ship has been excavated and studied, and it is clear that it was not only built in the frame first technique, but that it was done so based on linear ratios approximating the Roman foot.

As a result of these and other finds, and the clear shift from the mortice and tenon technique to the frame first technique between the 7th and the 10th centuries, theories have developed as to why the mortice and tenon method disappeared. As the technique is clearly labour intensive, time consuming, and very skilled, it is also very expensive, and many theories examine the possibility that shipbuilders attempted to refine or economize their techniques. As these attempts apparently occurred from the 4th to the 7th centuries, it is felt that the natural progression by the 10th century would be to eventually eliminate the mortice and tenon technique altogether, as it is the process that demands the most skill and requires the largest amount of resources. This theory however, is based primarily on two presumptions. The first is the apparent conservatism or inability of shipbuilders to change their techniques quickly (Unger, 1980:24-25). Along those same lines is the belief that shipbuilders, when beginning to implement these changes in the 4th century or so, were for some reason, unable to eliminate immediately the technique altogether, and it required 200 to 300 years for it to disappear. Unger supports this paradoxical belief, when he writes that shipbuilders in the Classical and Medieval Mediterranean, without a theory or science of

[3] The Institute of Nautical Archaeology at Texas A&M has recently begun to examine a wreck from the 9th century AD along the coast of Turkey, but details have yet to be published.

shipbuilding, could not predict the outcome of their design changes.[4] But if shipbuilders were indeed as conservative, and protective of their techniques as presumed, then their knowledge of the science of shipbuilding is based not on books, but on generations of experience handed down. It seems more likely that shipbuilders in the Classical and early Medieval Mediterranean, if at some point they made a conscious decision to change their techniques, could have implemented these changes fairly rapidly, and it would be reflected in the archaeological record.

But instead of an expected change in the 4th century, the technique remained in use, in a degraded form nonetheless, until some point between the 7th and the 10th century, and we are left with two of many questions. The first is, why did the mortice and tenon technique remain in use from the 4th to the 7th century, or for that matter, why was it in use at all? At present, and most likely for a very long time to come, there is no clear idea why the technique developed and prospered, why it was in use for so long, or even if it was the only technique in use for seagoing ships at the time.[5] Simply enough, there is not enough information, and the answer remains unknown.

The second question then, is why or when did the technique disappear? Initially, it would seem that a detailed examination of the archaeological record would provide an answer. Parker's catalogue, *Ancient Shipwrecks of the Mediterranean & Roman Provinces* was published in 1992, and with it, came the ability to determine when the technique was in use, and when it had apparently disappeared. That, unto itself, is fairly simple. The technique was prevalent in three wrecks from the 7th century, but not in the 10th, therefore, at some point in that period of time, it can be said that the method disappeared or was phased out of use. But, difficulties arise when attempting to determine why the technique disappeared.

In the past, the development of various theories that concern the shift from the shell first to the frame first method tended to focus on the archaeological data alone, and paralleled attempts to categorize and subdivide the variations in shipbuilding technique in the Classical Mediterranean. One of the earliest recent attempts could be seen in Basch's introductory essay in the first issue of the *International Journal of Nautical Archaeology*. A similar attempt is evident in the chapter headings of Bass'

[4] See Unger, 1980:25. It seems similar to arguing that when the Romans built the Pantheon, and its concrete dome was created, they were simply guessing that it would work.

History of Seafaring, also in 1972. As the number of known wrecks with surviving hull remains increased through the 1980's, more attempts to classify specific techniques appeared. Laures' essay in 1983 uses a classification method based on the angle made by the garboard with the keel[6], and he follows his work in 1984 with his four stages of development in construction.[7] Steffy elaborates on Laures' work with garboard to keel angles and other aspects of ship construction in 1987, in an essay that reveals the multitude of problems related to classifying ships based on their construction methods alone. He goes on to suggest a necessary set of categories for ancient Mediterranean ship recording and publication that should be established for all scholars in the field (Steffy, 1987:319). Lehmann's essay in 1988 is good example of the complexity involved in categorization of Roman period boats, even when examining just 10 flat bottomed boats from Switzerland (Lehmann, 1991:24).

Finally, the publication of Parker's catalogue brought to light a growing problem in the interpretation of shipbuilding procedures in the classical Mediterranean. A catalogue of over 1200 wreck sites had now been produced, but of those sites, only 189 had any hull preservation, 37 of those preserved some part of the side planking, and only 33 retained a mast step (Parker, 1992:26).[8] By the end of that year, there was suddenly a problem, as there were many examples of numerous variations within the basic mortice and tenon technique, but interpreting those methods through an archaeological perspective was no longer adequate. From the archaeological standpoint, determining what had happened was a matter of examining the evidence, for a ship's hull can reveal how it was built, the order in which it was constructed, and even where repairs were made, but it still cannot tell us why.

In Steffy's *Wooden Ship Building and the Interpretation of Shipwrecks* from 1994, we find him taking a wider approach that examines more than just the archaeological record.[9] He feels the emphasis was placed on the need for completed vessels, not the method of construction, and that shipbuilders were obliged to create

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[5] See Parker, 1992, #106, 171, 293, 441, 451, 531, 1206, 1248, and 1249 for examples of freshwater or seagoing ships either primarily built with or repaired with stitching techniques.

[6] IJNA 12.3

[7] IJNA 13.4

[8] Dr. Martin has added that these numbers may be further reduced by determining which sites had quality surveys and excavation techniques, and which did not.

[9] Lehmann may have predicted the upcoming problem in 1988 (page 25), concerning the limited amount of information available from a shipwreck alone, when she wrote that considerable variations in construction may be due to geographical, temporal, or personal factors.

ships quickly and cheaply to fulfill their needs. He goes on to say that shipbuilders of each generation built vessels that best utilized, among other things, controlling parameters of the period. As an example he mentions the economics and politics of 7th century Byzantium dictating to builders the quickest and cheapest methods to build a ship (Steffy, 1994:85). In 1994 again, McCann and Freed also interpret their ship's construction off Skerki's Bank, what limited material there is, as being the result of a wider variety of factors, such as political and economic (McCann *et al.*, 1994:51).

In recent years then, a shift has occurred to determine not just what happened, how a ship was built, but also why it was built in a certain way, and clearly, that is something the archaeological record alone cannot tell us. This thesis will attempt to determine not necessarily why ships in the 7th century were built in a certain way, but specifically, why the mortice and tenon method apparently disappeared after the 7th century, and if the Muslim invasion and a change in the local merchants' vitality led to that loss. But to determine why, or partially why, requires an examination not just of shipwrecks, but of merchants and the culture outside the shipbuilding sphere during a specific period of time, in this case, the 7th century AD.

Notes on the Sources:

A number of original sources were consulted during the creation of this thesis. The largest is the Aphrodito Papyri, the extant majority of which is published in the British Museum's catalogue, *Greek Papyri in the British Museum*, volume IV, edited by Harold Idris Bell, which was first published in 1910 and again in 1973. This cache of documents was discovered in 1901, while digging a well in modern Kûm Ashqûh, which was known in antiquity as Aphrodito (Fahmy, 1966:5). The first account of the find appeared in 1902, and facsimiles of three letters were published in 1905, in "Arabic Palaeography", by Moritz in *Zeitschrift fûr Assyriologie und Verwandte Gebiete*, volume XX (Fahmy, 1966:5). After that, Becker's *Papyri Schott-Reinhardt* in 1906 published the Arabic letters from Qurra ibn Sharîk to the Basilyus, Sâhib Ashqûh contained in the Heidelberg and Strasbourg collections, in addition to five of the Greek-Arabic papyri sent to various areas around Aphrodito itself (Fahmy, 1966:5). Becker went on to publish some of the collection in the British Museum in 1907, followed by an article by Bell in 1908, "The Aphrodito Papyri" in *The Journal of Hellenic Studies* volume XXVIII, and in 1910, the complete study of the British Museum's collection was published.

The Papyri are divided up into two distinct divisions, letters sent from Qurra ibn Sharîk to the Basilyus, Sâhib Ashqûh, and accounts of materials and workmen sent from Aphrodito to the Muslim naval arsenals, and occasionally to aid construction projects in Egypt, Palestine, and Syria, although these are rare. Almost two hundred papyri of the collection in the British Museum are in Greek, while the remaining forty are in Coptic, the local language in Egypt. This collection is unique in that it consists entirely of material from one village, and encompasses approximately a twenty year period from the very end of the 7th century AD, papyrus #1412 is from c.699, to the early 8th, as the majority date to 709 - 710.

Aly Mohamed Fahmy, whose work, *Muslim Naval Organisation in the Eastern Mediterranean* was an invaluable source during this research, relied heavily, and rightly, on the Aphrodito Papyri in determining the naval organization of the early caliphate. Fahmy gleaned a great deal a valuable information from the papyri and from extant, and previously untapped Arabic sources concerning the early caliphate, to reveal information concerning the characteristics of ships, their names, materials used,

workmen needed, and prices and wages. In addition, he provides translations of many of the papyri that concern the Muslim fleets and their ships, and which in this case was the basis for the translation of papyrus #1369, found in Appendix II.

Other Greek sources included Saints' Lives and texts of their Miracles. The *Vita of St. John the Almsgiver*, the patriarch of Alexandria, is available in English in the third section of *Three Byzantine Saints*, translated and written by Elizabeth Dawes and Norman Baynes in 1948. The text of the original Greek is available in two sources, both of which were consulted in the creation of Dawes' and Baynes' translation. The first is "Une Vie Inédite de Saint Jean L'Aumonier", by Hippolytus Delehaye and published in the journal, *Analecta Bollandiana*, volume XLV from 1927. The second is "Leontios' von Neapolis Leben des Heiligen Johannes des Barmherzigen Erzbishofs von Alexandrien", by Heinrich Gelzer in 1893, and published in the series, *Sammlung ausgewählter kirchen - und dogmengeschichtlicher Quellenschriften*, part V in volume I of the series. The most current translation of the *Miracles of St. Artemios*, which is valuable for both its preceding commentary, and the English translation running line by line on facing pages with the original Greek, was published by Virgil Crisafulli and John Nesbitt in 1997. This translation of a text which was compiled in the second half of the 7th century, provided many details not currently available elsewhere in English, and the corresponding Greek facilitated a much closer reading and analysis of the original text. As a result, while the translations of *Three Byzantine Saints* and *The Miracles of St. Artemios* were invaluable for determining the events of each passage, the original Greek was still required and consulted, as specific details of the ships themselves were lacking in the English text.

Saints' Lives and their Miracles were also invaluable in creating the three maps of their voyages in the first chapter, and an excellent analysis and examination of all the Saints mentioned in this thesis, and many more, can be found in Dorothy Abrahamse's Ph.D. thesis, published in 1983, which was rigorously consulted during research.

Theophanes' *Chronographia*, compiled by the early 9th century, encompasses the period from the late 3rd century to 813, and continues the work begun by Theophanes' fellow monk, George the Synkellos, whose work began with Adam and ended with the year 284 (Turtledove, 1982:xi). As Theophanes was not a historian

but actually a chronicler, his work does not attempt to determine the underlying causes of events, but merely to reiterate them, partially because of his own

unfamiliarity, and that of his prospective audience. As a result, his work is extremely straightforward, and as the sources for Theophanes' text encompassing the period from 602-813 have all disappeared, it is extremely valuable for this research (Turtledove, 1982:xiv). The primary English text is that published by Harry Turtledove, *The Chronicle of Theophanes* from 1982, which prints not only Theophanes' incorrect dates for each passage, but also the corrected ones, and Theophanes' running accounts of the rulers of the major empires in the eastern Mediterranean. Turtledove's text also prints the corresponding page numbers to *Theophanis Chronographia* by Carolus De Boor, which contains the original Greek text. De Boor's text, printed in 1980, was consulted primarily for the same reason that the original Greek of the Vitae and Miracles were examined, in this case, the specific types of ships needed to be determined.

The last Greek text examined is that of John of Antioch, and the passage that relates to Heraclius' voyage from Africa to Constantinople in 610, to overthrow the current emperor Phocas. Similar to the earlier uses of the original texts, this was consulted, along with the corresponding passage in Theophanes' *Chronographia*, to determine what type of ships Heraclius sailed in. This work can be found in "Joannis Antiocheni", in the series *Scriptorum Graecorum Bibliotheca*: *Fragmenta Historicorum Graecorum*, volume V from 1870, pages 27-38.

The Pilgrimage of Arculfus, compiled by Bede, was also consulted during this research, as it relates to seafaring and indirectly with trade in the eastern Mediterranean. There are currently two contemporary sources for this text, in addition to the original, still in Medieval Latin. The source used for this thesis is the translation available in *The Palestine Pilgrims Text Society*, volume III, from 1895. This is the translation by the Rev. James Rose MacPherson, which contains a brief history of the text, Bishop Arculf, and the transmission of his story. It is also a more complete text than that found in the other contemporary source, that of Thomas Wright's collection, *Early Travels in Palestine*, from 1848. This work was valuable as it dates from c.680, a period in which other sources of this nature are lacking, and clearly describes the Bishop's voyages by ship throughout the eastern Mediterranean.

Other texts and passages, such as that relating to Theodore the shipowner, or the Avar invasion of Constantinople, were found in translation in various articles, and can

be found within the text or in the Bibliography, under "Translations of Ancient Sources".

Similar to archaic Greek texts such as the *Iliad* or the *Odyssey*, Arabic sources of history and geography, such as *The Origins of the Islamic State* (*Kitâb Futûh al Buldân*), *An Introduction* [*to History*] (*Muqaddimah*), and *The Best Divisions for Knowledge of the Regions* (*Ahsan al Taqasim fi Ma'rifat al Aqalim*), were consistently compiled from oral history and written well after the events they record. The result is that while dedicated authors may have been able to compile a narrative based on the oral transmission of earlier information, early historic texts that fail to question their sources may also be felt to have an inherent weakness. Like the *Iliad* or the *Odyssey*, it is this basis of oral transmission that may result in a corruption of the factual telling of historical events, and what may be eventually be passed on to be written down is no longer history, but simply a story with historical characters, almost a myth. But it should be noted that unlike the earlier Greek tradition of poetry or lyricism, this Arabic tradition does not have a basis in entertainment, but religion. It was a pious custom among Muslims, that when they met, one would ask for news or a part of their tradition, *hadîth*, and the other would relate an anecdote of Muhammed (Hitti, 1966:2). The value and authenticity of the news reported would be based on the continuity of the chain of speakers, and the accuracy of each reporter (Hitti, 1966:3). Additionally, as not all of Arabia's inhabitants were located in trading cities such as Mecca or Medina, but were also travelling in raiding parties or caravans, there was also a great deal of value in memory and accurate reporting, as there may not be any other way to efficiently communicate over long distances. In some ways a drawback, this devotion to accuracy resulted in later writers of historiography using very little analysis or criticism, as a deviation from the accepted past was almost sacrilegious (Hitti, 1966:3). Throughout al Balâdhuri's work, *The Origins of the Islamic State*, as it is from the older school of Arabic historical tradition unlike the two later works, there are numerous instances of "...it was reported to me by...on the authority of...as related to..." and so on, similar to using footnotes and page references in academic work today.

The result of this is that while an early Arabic text such as *The Origins of the Islamic State* was based on earlier oral tradition handed down from one speaker to the

next, their content, despite being written centuries after the events, can be considered accurate.

Origins of the Islamic State, written by Ahmad ibn-Yahya ibn Jâbir al-Balâdhuri or simply al Balâdhuri, is the earliest Arabic work and author consulted in this research, and it was first written in the 9th century, to be translated into English by Philip K. Hitti in 1966. *Origins* is apparently the synopsis by al-Balâdhuri of a larger work of his, now lost, and throughout it he remains dedicated to reporting the sources of all his information, to his credit, while unfortunately also eliminating any opinions or criticism (Hitti, 1966:7). The work spans the period of time from c.622, and Muhammed's pilgrimage from Mecca to Medina, to the terms made with Nubia c.860, in al-Balâdhuri's lifetime. Due to the nature of the text however, in this work and others, there can be found many contradictions when it comes to the dates of events, or the details of the of the events themselves. The conquest of Damascus for example, either took place in the year AH 14, by al-Wâkidi, or the year AH 15, by the date on the statement of capitulation (Hitti, 1966:189). There is more confusion over the poll tax instituted by the Muslim conquerors, who will pay who, how much, and so on, but yet it doesn't detract from the quality and accuracy of the work as a whole. Admittedly, the varying dates for the conquests of cities, which the text was primarily used for, can cause difficulty, but the dates rarely vary by more than a year or two, and considering that the Muslim calendar year is shorter than the Judeo-Christian year, problems encountered tend to become minimal when translating from the Muslim system to our own.

Additionally, when al-Balâdhuri's text was used for details concerning the cities themselves, these were characteristics that were not in contention within the text, or they already had support through other accredited, contemporary research.

The Arabic geographical treatise, *Ahsan al-Taqâsîm fî Ma'rifat al-Aqâlîm* (The Best Divisions for Knowledge of the Regions) by al-Muqaddasî, was written in the 10th century, and later copied onto two manuscripts, MS. Sprenger 5 from the late 15th century, and Aya Sofia no. 2971 *bis*, from the mid 13th century (Collins, 1994:xiii). It is from these two manuscripts, primarily the former, that Michael Jan de Goeje completed his text in 1877, in volume III of *Bibliotheca Geographorum Arabicorum*. From that work, and examinations of the two earlier manuscripts, Basil Collins and Muhammad Hamid al Tai produced the current publication of al-Muqaddasî's work,

from which this research was carried out. Al-Muqaddasî was born in the early 10th century, and he became part of a new school of Islamic geographers who examined their surroundings from the point of view of what was Islamic territory, and what was not (Collins *et al.*, 1994:xx). Personally, he felt that earlier works fell short of producing the information needed by kings and commoners alike, and he hoped to remedy those deficiencies, thus ensuring the survival of his own name (Collins *et al.*, 1994:xxii). The work is unlike al-Balâdhuri's, as it does not focus on historical events, but geographical regions within Islamic territory, providing local geographic and architectural information about the cities al-Muqaddasî visits, and personal anecdotes along the lines of Herodotus. Within this research, it was utilized for the information it provided about various cities along the Syria-Palestine coast that the Muslims encountered during their conquest, and for information concerning the annual flooding of the Nile delta in Egypt.

Ibn Khaldûn's work, *Muqaddimah* from 1377, is similar to al-Balâdhuri's in that it too, is essentially the introduction to a larger work of his, *Kitâb al 'Ibar*, or simply, *History*. But unlike al-Balâdhuri's work, it is not just a chronicle of events, but an attempt to determine patterns and changes in man's political and social organization (Dawood, 1987:ix). As it was originally compiled as a set of academic lectures to be read aloud, Franz Rosenthal's original translation of the work, published in 1958, contains all of ibn Khaldûn's repetitions and definitions, meant to illustrate and elucidate specific points for the listener. But the more recent publication of the work, edited and compiled by N.J. Dawood in 1978, eliminated many of these repetitions, resulting in a more direct presentation of ibn Khaldûn's arguments concerning man's dependence on his physical environment. As it is an actual attempt at a philosophy of history rather than an accurate reporting of events, and considering the length of time between the *Muqaddimah*'s compilation and the events it records, it may be said that it is not as accurate a source for events in the early caliphate as the *Origins of the Islamic State*. But, as in this research it was used primarily for the causes and reasons behind the events it records, as opposed to the dates or specifics of the events themselves, it is still a valid source of information.

In addition to textual data in or near the period, valuable information was also gleaned from what initially appears to be an unlikely source, dated Byzantine lead

seals. These seals, at least those concentrated on in this thesis, are the creation of administrative or Church officials, such as Patriarchs, Bishops, Metropolitans, *commerciarioi*, or others who wished to authorize correspondence, packages, or materials to be sent to Constantinople or other cities. The seal itself was created by placing a lead blank between the inscribed tangs of a pair of iron pincers, or a boulloterion, and striking the two halves together to mold the seal within them. In the case of dated seals, those that could be assigned a specific year or period of time, the result was a record in lead of the official's name, their position, any titles possessed, when the seal was produced, and where it was sent from. The inscribed surface of the seal only has one face, and may reveal the portrait of a Saint, in the case of those sent by the Church, or usually, the portrait of the Emperor, when examining seals of *commerciarioi*.

There are several catalogues that can be referenced, the five volume yet unfinished *Corpus* of V.Laurent from 1965, and the massive two volume, five part collection by G.Zacos and A.Vegerly, *Dated Byzantine Lead Seals* individually examining over 4300 seals. Volume I of *Dated Byzantine Lead Seals*, published in 1972, encompasses the first four parts of the series, examining dated seals from c.500 to 900 AD, and contains the majority of the seals mentioned in this text. Volume II from 1982 focuses on surviving Patriarchal seals, and unfortunately, only approximately three seals from this volume relate to this research. In addition to these vast catalogues, N. Oikonomides has produced two smaller, more manageable works. His *Byzantine Lead Seals* is a straightforward introduction to sigillography, the seals themselves, with a wide variety of examples published in 1985, and *A Collection of Dated Byzantine Lead Seals* from 1986 contains advice on dating and typology, and a valuable catalogue of more recently indexed seals. Most recent is the ongoing publication of a series from Dumbarton Oaks, *A Catalogue of Byzantine Seals at Dumbarton Oaks and in the Fogg Museum of Art*, of which two volumes are presently available. Volume I, published in 1991, examines seals from Italy, North of the Balkans and the Black Sea, and Volume II from 1994 proceeds to the South of the Balkans, the Islands in the Aegean, and the South of Asia Minor.

The specific reasons why certain seals, such as those of *commerciarioi*, were valuable to this research are elaborated in the text, but initially, what should be emphasized here how seals of the Church or of Byzantine officials, were examined in

light of the Muslim invasion. As each seal was a record of a communication, or a transportation of goods, between the sender and another city, the assumption has been made that either the official who sent the seal, or someone representing that official and has the right to use the seal, was at a certain place at a certain time, thus revealing the presence of Byzantine or Church administration. For example, seal number 35 in Oikonomides' *Dated Byzantine Lead Seals* is that of Peter, the Archbishop of Thessalonica, and dates from the middle of the 8th century. From this, the assumption could be made that the Archbishop Peter sent something that this seal was attached to, from Thessalonica to another city, possibly Constantinople, at some time in the mid 8th century. While Thessalonica in the mid 8th century was not being threatened, and was not occupied by the Muslims, this action on behalf of the Archbishop is fairly common, for there is no reason to expect that there would not be an official Byzantine presence in the city. On the other hand, when there are extant Byzantine seals, both religious and secular, from cities that were either alongside the Byzantine-Muslim border, or within Muslim territory far after the initial invasion, it seems that there may have been official Byzantine activity in areas where none was previously expected.

Chapter I

The Persian Invasion and Byzantine Merchants from 600 to 632

Unlike the popularity of the Emperor Maurice in the year 600, which had been steadily declining as his parsimonious habits continued, it seemed that the general attitude in the Byzantine Empire towards independent shippers and shipowners, the *naukleroi* (ναυκληροι), was beginning to improve. In previous centuries, the attitude towards profit through independent mercantilism was antagonistic, for to this period, the Byzantine city carried on the habits of its Roman predecessors, and thus was the home of imperial officials and landed proprietors, the conservative aristocracy (Lopez, 1976:347). It was this aristocracy that, as they brought both their income and their mentality to government organization, simply continued a certain amount of prejudice against the mercantile middle class (Lopez, 1976:347). While in previous centuries this prejudice resulted in little or no widespread acknowledgment of the activities of the *naukleroi*, during the first quarter of the 7th century, administrative and literary changes began to appear.

One familiar tale from the reign of Heraclius but recorded later, is that of the business partners Theodore, the shipmaster, and Abraham, the Jewish moneylender. As divine intervention aided their mercantile pursuits when no one else would, Theodore and his wife, after a successful trip to Britain, became monastic, and Abraham and his family proclaimed their faith in Jesus (Nelson *et al.*, 1944:293).[1]

Referring to an event following the Avar assault of Thessalonica in 585, the *Miracles of St. Demetrius* explains how the saint appeared to a *naukleros* sailing to Byzantium with a load of grain, only to have him alter his route at Chios to bring the grain to the starving population at Thessalonica (Abrahamse, 1967:271). During another of many Avar sieges of the city, this time c.618, the text again refers to the appearance of more grain ships and their owners[2] in the harbour (Abrahamse, 1967:272). Finally, the sixth miracle in the second book, which can only be generally dated to the 7th century, explains that the African Bishop Cyprianus, thankful to St.

[1] This story went on to be the basis for the character Shylock.

[2] "ναυκληρους", see Abrahamse, 1967, page 272*n*.24.

Demetrius for his release from the Slavs, persuaded a shipowner[3] to take his ship filled with marble slabs at Byzantium to Thessalonica, to redecorate the shine of the saint (Abrahamse, 1967:273).

Theodore of Sykeon, while visiting Byzantium during the reign of the Emperor Maurice in the late 6th century, apparently cured a *naukleros* visiting the city (Abrahamse, 1967:270). The *Miracles of St. Artemios* reveal that while staying in Constantinople, he cured a trader named Euporos from Chios, two sailors, Theoteknos the shipbuilder, and George from Rhodes, a *naukleros* (Crisafulli, *et al.*,1997:85, 87, 103, 153, 185). The *Life of St. John the Almsgiver*, the Cypriot Patriarch of Alexandria, referring to events from 610 to 619, narrates the story of a *naukleros*[4] who through the loss of almost two ships and their cargo, finds success in reaching Britain only by employing money and a ship of the Church (Dawes *et al.*, 1948:216). So blessed was this "swift sailer", carrying 20,000 bushels of corn, that it reportedly reached Britain from Alexandria in only 20 days (Dawes, *et al.*, 1948:217).

In addition to the numerous references to *naukleroi* throughout hagiographic texts, other terms also appear that seem to refer to merchants or mercantile activity. One of the shipments of grain that Thessalonica received through saintly intervention was under the charge of an ἀνὴρ πιστὸς or ἀνὴρ πιστικὸς (Abrahamse, 1967:271), literally, a "man faithful to...", in this case the Count of Abydus. Another instance is the trader from Chios healed by St. Artemios in Byzantium, the trader described as πραγματευτής (Crisafulli *et al.*,1997:84), or "one engaged in business...".

Also, for every voyage in which a *naukleros* was clearly involved, there are numerous voyages that a *naukleros* may have taken part in. A disciple of St. Symeon the Stylite the Younger, reportedly took a trip from the port of Antioch, Seleucia, to Pamphylia at some time in the late 6th century (Abrahamse, 1967:274). During the same period of time, St. Nicholas Sionites in Myra apparently made two trips to Jerusalem on board ships from Egypt, Ascalon, and Rhodes, and the text alludes to the activity of the ports of Kekova, Andriake, Tristomon, and Phoinikon, all near Myra along the Lycian coast (Abrahamse, 1967:275). While at present, it may not be clear if *naukleroi* were described as engaged in these voyages, it is highly likely that any saints

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[3] "ναυκληρω" see Abrahamse, 1967, page 273*n*.26.

[4] See Abrahamse, 1967, page 269.

or bishops wishing to travel made the same arrangements as any other passenger, and booked passage on merchant vessels.

Official activity sanctioned by the church and the state is also common in the texts. Between the years 675 and 676, Thessalonica received a fleet of ships carrying 60,000 measures of wheat from the emperor in Byzantium, and the city also sent their own ships south to Phthiotis for additional foodstuffs (Abrahamse, 1967:272). The *Life of St. John the Almsgiver* expounds on many instances of the church's mercantile activity. In addition to the ship given to the *naukleros* to sail to Britain, the text also refers to two of the church's ships returning from Sicily with grain to feed the immigrants from the Persian invasion in the Levant (Dawes *et al.*, 1948:223), the loss of the cargo of the entire fleet in the Adriatic, estimated at approximately 130,000 artabas (Dawes *et al.*, 1948:240), and the voyage of St. John the Almsgiver from Alexandria, to Rhodes, then to Cyprus in 616-617 (Dawes *et al.*, 1948:255).

Indeed, for referring to Map I, which relates to nearly just the hagiographic sources alone, shipping activity, whether it was of the *naukleroi*, imperial, or church fleets, seems to be fairly active.

But what brought about this apparent rise in activity, or shift in public attitudes towards the *naukleroi*? If there is a single, direct reason, it is difficult to find. However, a combination of a variety of events and trends may shed some light.

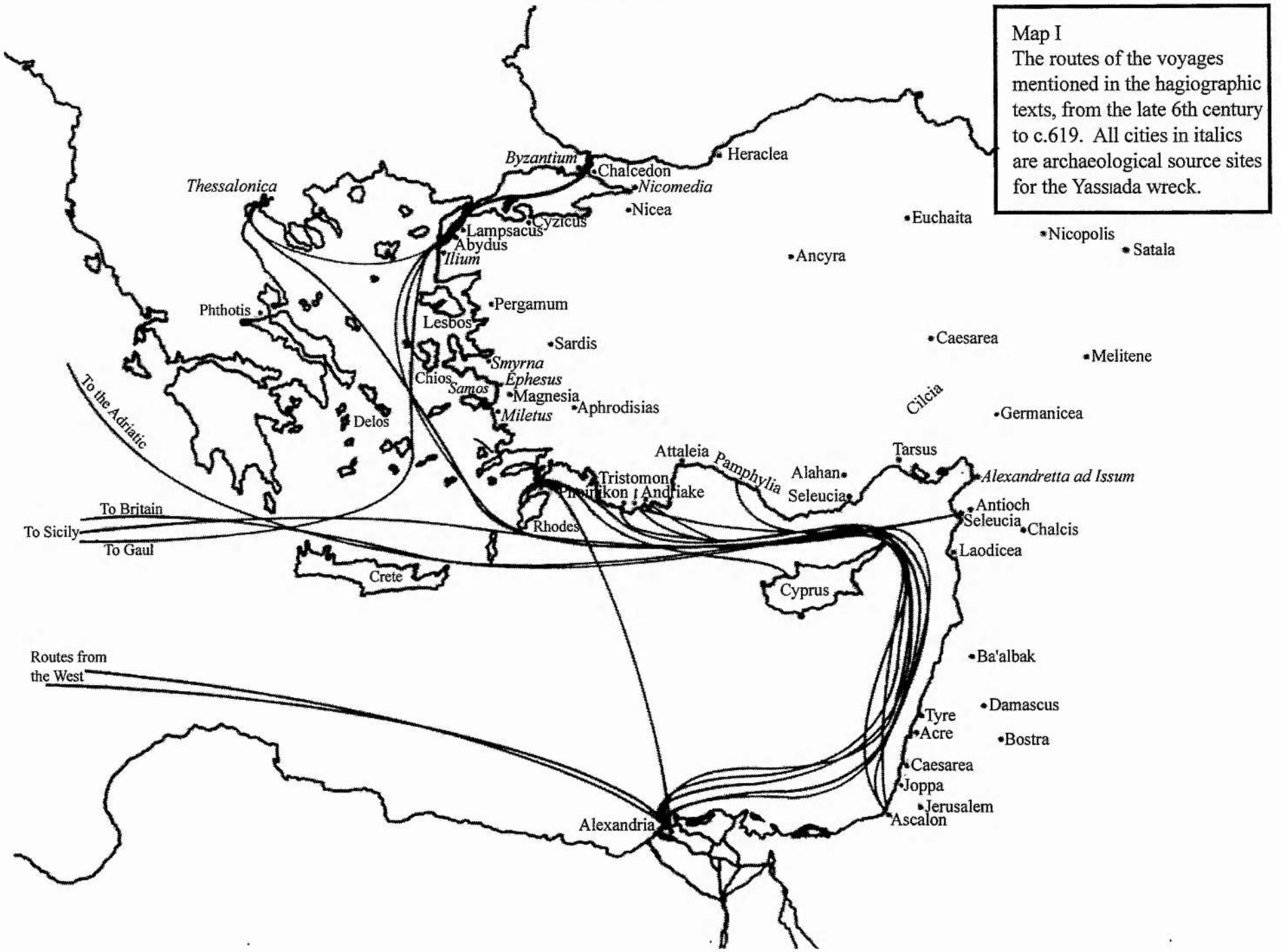
Beginning in the reign of Justinian from 527-565, nationalistic pride began to play a greater role in swaying the policies of the Byzantine emperors, and was one of the motivating factors behind Justinian's attempted reconquest of Italy from the Vandals. Unfortunately, the reconquest was not a complete success, and the Italian countryside was left ravaged and destroyed (Tierney *et al.*, 1983:76). However, funding both 30 years of war on the western frontier, and negotiating peace with the Persians on the eastern borders, drained the imperial treasury of a great deal of its resources (Rubin, 1986). In addition to the great loss of manpower incurred by the war, bubonic plague, which may have been initially contracted in Egypt in 542 (Procopius, II.22; McNeill, 1989:109), quickly spread through the Mediterranean basin, and periodically raged until c.750 (McNeill, 1989:109). This plague, as Procopius describes it, did not just spread over the whole world (II.22), but in the city of Constantinople alone, it was seemingly killing 5,000-10,000 people a day (II.23). While it is highly likely that these figures are an exaggeration or a copyist's mistake, it should still be noted that the

disease may have caused enough disorder to leave many of the dead unburied for days (II.23). Justinian's successors then, were left to attempt to stabilize and revitalize the depleted treasury, and watch as their manpower was consistently cut down by the plague.

Justin II, from 565-578, was a competent ruler, and in order to strengthen his position in the eyes of the army and the senate, who would proclaim him emperor, he paid Justinian's debts from his own resources. While he managed some economic rehabilitation, he refused to pay tributes to the Persians, which only resulted in another wave of invasion from the East (Stratos, 1968:6). During his reign then, the eastern provinces were not just struck with Persian raids, but with the recurring plague also.

Unfortunately, the economic rehabilitation established by Justin II was wasted on the less than thrifty Tiberius Constantine, from 578-582, who at one time spent 120,000 gold pieces on his consular celebrations alone (Stratos, 1968:6). By the time of the Emperor Maurice, from 582-602, the treasury was empty (Stratos, 1968:6). Hence, despite Maurice's attempts to minimize the fragmenting nature of the Byzantine Empire (Stratos, 1968:8), caused by the losses of manpower to disease and war, and the increasingly independent and provincial nature of the outlying territories, a degradation in land based transportation between economic centers began (Lopez, 1959:70). Lopez mentions the nearly complete disappearance of the postal service throughout the empire as an example of this (1959:70), but perhaps a better example can be found in the text of the *Life of St. Theodore of Sykeon* from the late 6th century. The saint's mother and grandmother operated an inn, and St. Theodore had built his own monastery not far away. While both the inn and the monastery were located along the pilgrim's road from Constantinople to Jerusalem, and there are instances of contact with military and government personnel, merchants are hardly ever mentioned as visiting either (Abrahamse, 1967:276). Thus as this land based trade, communication, and migration broke down, the recurring need for contact with other economic centers was filled by the independent shipowners, the *naukleroi*.

So it seems, from a preliminary impression of Map I, which traces nearly all the routes mentioned in the hagiographic sources, and archaeological source sites for the Yassıada wreck, that seaborne commerce and independent mercantile activity was relatively active through the first few decades of the 7th century. Initially, it seems that the activities of the *naukleroi* and the Imperial and Church fleets were fairly


Map I
The routes of the voyages mentioned in the hagiographic texts, from the late 6th century to c.619. All cities in italics are archaeological source sites for the Yassiada wreck.
Byzantium
Chalcedon
Heraclea
Nicomedia
Nicea
Thessalonica
Cyzicus
Lampsacus
Abydus
Ilium
Euchaita
Nicopolis
Satala
Ancyra
Phthotis
Pergamum
Lesbos
Sardis
Caesarea
Melitene
Smyrna
Chios
Ephesus
Samos
Magnesia
Miletus
Aphrodisias
Cilcia
Germanicea
To the Adriatic
Delos
Attaleia
Pamphylia
Tarsus
Alahan
Alexandretta ad Issum
Tristomon
Phoinikon
Andriake
Seleucia
Antioch
To Britain
To Sicily
To Gaul
Rhodes
Seleucia
Chalcis
Laodicea
Crete
Cyprus
Routes from the West
Ba'albak
Damascus
Tyre
Acre
Bostra
Caesarea
Joppa
Jerusalem
Ascalon
Alexandria

regular and possibly occurring even throughout the Sassanid occupation, but that impression is somewhat incorrect. The latest dates for voyages that occurred before the Muslim invasion, in the hagiographic sources, are the appearance of the *naukleroi* in the harbour of Thessalonica c.618, the voyage of St. John the Almsgiver in 617, from Alexandria to Rhodes, then to Cyprus, and the voyage of the Church's ships from Alexandria approximately a year before that. The only recorded voyages that occurred after the Muslim invasion are those of emigrating monks and clergy from Alexandria to Rhodes and Cyprus (Butler, 1978:358, 366), the capture of Cypriot ships on the way to Constantinople (ibn A'tham, 1969:119), and the route taken by the Bishop Arculf from Joppa to Alexandria, to Cyprus, then to Constantinople, and to Sicily c.680 (MacPherson, 1895). Could one come to the conclusion then, from the hagiographic sources, that the Persian invasion, and the economic and social disruption apparently caused, brought about this apparent drop in seagoing activity?

The Persian invasion began when Maurice's commander in Mesopotamia, Narses, opposed the usurper Phocas' rule, and asked the Persian King Chosroes II for military aid against the new emperor (Foss, 1975:722). Chosroes accepted, mobilized his armies, and by the first year of Heraclius' reign, Mesopotamia had been reoccupied, northern Syria was subdued, and the cities of Satala and Nicopolis in western Armenia were taken, leaving the route north to Asia Minor open. The Persian general Shahin led forces into Cappadocia, and reconquered land that had been lost three centuries earlier. Cappadocian Caesarea was taken by the Persians in 611, and despite the Roman siege in 612, by that summer, the Persian army was able to force its way out and burn the city as it went. Heraclius attempted to redouble his efforts at the Persian Gates and Antioch in 613, but he was beaten back again, and the Persians were able to flood into Asia Minor. With the Roman armies confined in the Taurus mountains, the Persian army was split into two divisions. One headed south to victory at Damascus and Jerusalem in 615-616, and Egypt in 617, and the other kept moving onwards to take Tarsus, Cilicia, and Melitene (Foss, 1975:723). The northern division advanced to Chalcedon in 615, apparently destroying the countryside as they went (Foss, 1975:743), and laid the city under siege for a year until it capitulated. While the Persian army was forced to retreat a year later, it had occupied the countryside and possibly forced the Imperial mint at Cyzicus to close (Foss, 1975:743). Off the coast of Asia Minor, Cyprus was captured in 617, but a peaceful settlement was agreed to

there between St. John the Almsgiver and the Persian general Aspagourios (Foss, 1975:724). The Persian forces had routed the Romans out of southwestern Asia Minor, and may have made their way west down the Maeander valley to Magnesia, Aydin, Ephesus, and possibly Aphrodisias (Foss, 1975:743). A temporary Roman mint established at Seleucia from 616-617, alludes to the development of the center of Roman resistance in the southeast. Its closure and movement to another temporary site at Isauria in the mountains far inland from 618-619 however, shows that the Romans were unable to hold this position in the south and had little control over Asia Minor for the next 5 years (Foss, 1975:744). In central Anatolia, the regions around Germanicea and Alisar were occupied by 617, and remained that way until the end of the war. The mint at Nicomedia closed in 619, to reopen for only a year in 626-627, with Cyzicus. While Ancyra was razed in the east in 620, Rhodes off the west coast was captured in 622-623 and its inhabitants were enslaved (Foss, 1975:744).

Heraclius began his campaigns in the Spring of 622, and fought back. With his refurbished navy, he already had control of the coastal cities, and the second Persian occupation of Chalcedon in 626-627 was a failure. As in the first occupation, the Sassanid troops never managed to cross the Bosporus, and only the Avars were able to attack the walls of Constantinople. After the Persians' final defeats on their own territory by 627-628, plans were drawn up for a complete Persian retreat from occupied lands, and by 630, the last Persian troops crossed the Euphrates on their way home (Foss, 1975:744).

However, as successful as Heraclius' defeat of the Sassanid army was, there were still repercussions. These attacks were representative of a defiling of what the inhabitants of the Byzantine Empire saw as sanctified territory, and was the penultimate event in a series dating from the early reign of Maurice in 584. The Roman Empire in the east rested on and believed in their divine right to exist (Alexander, 1962:339). After the separation from the Roman Empire in the west, Constantinople, while occasionally aiding the West militarily, would otherwise sequester itself based on a high religious morality, and saw its success as evidence of its religious glory. According to one account, even after the Avars and Slavs in 584 apparently "*...captured the cities* [in Greece and Thrace], *and took numerous forts, and devastated and burnt, and reduced the people to slavery, and made themselves masters of the whole country...and led captives to slay and burn.*" (Charanis,


Map II.
The progress of the Persian invasion and the dates that cities were captured or destroyed.
Heraclea
Byzantium
Chalcedon in 615/626
Nicomedia closed in 619
Thessalonica
Nicea
Cyzicus closed in 615
Lampsacus
Abydus
Ilium
Euchaita
Nicopolis in 611
Ancyra in 620
Satala in 611
Phthiotis
Pergamum
Lesbos
Sardis
Caesarea in 611
Melitene
Smyrna
Chios
Ephesus
Magnesia
Samos
Miletus
Aphrodisias
Delos
Cilicia
Germanicea
Attaleia
Pamphylia
Tarsus
Alahan
Alexandretta ad Issum
Tristomon
Philinikon
Andrikè
Rhodes in 622
Seleucia in 618
Antioch in 613
Seleucia
Chalcis
Laodicea
Crete
Cyprus in 617
Ba'albak
Damascus in 615-616
Tyre
Acre
Bostra
Caesarea
Joppa
Jerusalem in 615-616
Ascalon
Alexandria in 617

1946b:82), there was still belief in the fortitude of the Roman Empire in the east. However, these threats at Byzantium's borders continued, and with the Persian attacks and temporary success, introspection and doubt in their faith began to appear. A witness of the Avar assault on Byzantium in 619 wrote: "*There was a time when things were going well for us and there was no warfare to terrify us; but the summit of prosperity, as they say, was changed through our carelessness and tripped us up, for we were not able to maintain our prosperity unsullied. So there came upon us many just and different stings from God to reprove us...to stop our sinfulness.*" (Cameron, 1979:49). The narrative goes on to say that the Avars had devastated everything around the city, and the style and language reveal an almost apologetic tone to God throughout the narrative. Chroniclers from the 7th century reported Chosroes' success as subduing the entire earth (Palmer, 1993:18). A 9th century manuscript, that of Dionysus of Tel-Mahre, is a history of the period 582-842, and asks: "*Was there any region which rose up against him* [Chosroes] *without him devastating and destroying it, killing the men, and taking the women and children captive*?" (Palmer, 1993:85, 125). Dionysus also wrote that the Persian general Shahwaraz[5], when he broke through the walls to Jerusalem, slaughtered 90,000 Christians (Palmer, 1993:128). Undoubtedly there is a certain amount of poetic license involved in this and other texts, but the slaughter may have certainly occurred, and if the report of Jews aiding the Persians contains a mix of truth and prejudice, it would explain the expulsion and massacre of Jews that followed the war (Butler, 1978:134).

But were the effects of the Persian invasion as devastating as reported? Is there any basis to this doubt in the fortitude of Byzantium and its territories, and ultimately, can this apparent devastation be linked to a possible drop in mercantile and economic activity?

In Asia Minor, from the Aegean coast to the eastern border of Armenia and the Lycian coast, the hyperbole evident in the literary sources has some basis in the archaeological record. While it should be considered that religious fervour may play a role in exaggerating Persian malignancy and destructiveness recorded in the sources,

[5] Also known as Khorheam, Chorawazaih, Sharawazaih, Shahrbarz, and Shahrbaraz. A corruption of 'Shah-Waraz', the 'King's wild boar'. See Butler, 1978, page 59.

for many of the chroniclers and historiographers were monastic[6], there is evidence from throughout Asia Minor which may be attributed to the destructive activities of the Sassanid invasion.

Treasure hoards found at Lampsacus along the Dardanelles reveal a threat during the reign of Heraclius (Foss, 1975:730), as does a second hoard found at Aydin from 615 (Foss, 1975:731). Coin hoards from c.613 were found at Euchaita, one day east of a road from Pontus to Ancyra, possibly buried just previous to the Persians' march through the area to Chalcedon (Foss, 1975:731), and a coin hoard found on the island of Lesbos might be attributed to the attack on Pergamum, on the nearby coast (Foss, 1975:732).

During the late Roman period, the city of Sardis near the Aegean coast was a flourishing center of trade and industry. It was the home of the imperial arms factory, and it produced a variety of textile and glass wares for local use and export trade (Foss, 1976:14, 15). There was constant upkeep of the city's baths and the nearby gymnasium, and industrial activity such as the recycling of marble from the abandoned Temple of Artemis for the production of lime continued well into this period (Foss, 1976:50). In the first third of the 7th century however, this prosperity quickly ends. Evidence from the western quarter of the city shows traces of violent destruction, burning and abandonment, and a coin hoard found at the Temple of Artemis can be dated to 615, a possible date of a Persian attack (Foss, 1976:53). The remains of the gymnasium contain evidence of burning, an iron sword found in the House of Bronzes can be dated to this period, as can other coin hoards from around the site, to approximately 615-616 (Foss, 1976:53, 54). Just as important as the apparent attack on the city, is the lack of rebuilding that occurred afterwards. The gymnasium was untouched for the next 40 years (Foss, 1975:738), and the city only managed to recover at a much smaller scale physically and economically by 660, nearly 30 years after the Persian retreat (Foss, 1975:737; 1976:55-56).

In the thriving city of Ephesus south of Sardis, the main street, the *embolos*, was lined with monuments, statuary, and from the reign of Justinian, luxury housing (Foss, 1975:738). However, once again, there is more evidence of destruction in the city that

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[6] Dionysus of Tel-Mahre was a Jacobite Patriarch in the 9th century (Palmer, 1993:85), and the narrator of the Avar invasion was either Byzantine Orthodox or became so soon afterwards. The Persians, on the other hand, were predominantly Zoroastrian.

may be associated with the advancing Persians. The buildings along the *embolos* were burned and ruined, an excavated coin hoard was buried c.614 (Foss, 1975:739), and after this time, the occupation of the city shrank to areas near the harbour. By the 8th century, the luxury housing had been used as foundations for a long storehouse outside the city walls (Foss, 1975:739).

About 50km north of ancient Seleucia[7] along the Lycian coast, the early Christian monastery at Alahan also exhibits a discontinuity in its coinage and building construction about this time. Of the 113 coins recovered from the site, there is a fairly clear continuity from the 3rd or 4th century through the end of the 6th century, when they stop. The latest coin dated previous to the Persian invasion is attributed to Maurice, from 586/7 (Gough, 1985:68). After that date only ten more coins were recovered, the next chronologically is a folles of Constans II, from 655/6, and nothing apparently follows until an anonymous folles from the 11th century (Gough, 1985:68). Evidence from the sequence of building construction however, shows an abandonment of the site rather than a destruction of it. While the Bapistry and the East Church are both structurally complete, they are both only partially decorated (Gough, 1985:149). The same is true of the Colonnaded Walk between the two buildings, where the grading of the floor at the eastern end is unfinished (Gough, 1985:149). The destruction that has been found may be the result of a minor earthquake, as only the weakest parts of buildings, such as arcading, apparently fell (Gough, 1985:150). While over half of the late Roman tableware can be attributed to the 7th century, it is difficult to date it precisely, and they may have been in use before the abandonment, presumably in the first third of the century. Additionally, of the African Red Slip ware on the site, which demonstrates local and overseas trade, only one piece has been precisely dated to the second half of the 7th century, and no piece of ware has been dated after that time (Gough, 1985:38).[8] Similar to Sardis, while the site was reoccupied, little prosperity came of it. The construction process that did continue during the second habitation was seemingly done without any intention to continue the previous architectural style, and it contained no masonry skills whatsoever (Gough, 1985:150).

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[7] Modern Silifke.

It certainly seems possible, considering the monastery's proximity to Seleucia, that as the Roman army retreated from the temporary mint there in 616-617, an abandonment of the monastery followed. The site is very close to a main road leading from Seleucia through the Taurus mountains to Isauria, and farther west to the Maeander valley near the Aegean coast (Talbert, 1985:160). While the Persians may have used this road to gain access to the Aegean coast, they may have avoided any direct attacks on the monastery due to an initial 300m ascent up a cliff to the front door (Gough, 1985:10).

On the other hand, it must be noted that in contrast to some of the texts and their descriptions, there is a wide variety of evidence which does not support the destructive activities of the Persian invaders in Asia Minor.

The northern coast along the Black Sea apparently avoided any attacks and flourished during the following century, as did the cities of Nicaea and Smyrna (Foss, 1975:743). Despite the Persian capture of Chalcedon in 615, the mint at Nicomedia, just down the coast, continued to operate until 619, when it temporarily closed until 625 (Foss, 1975:729). The city of Attaleia along the coast of Pamphylia, with its protected harbour and access to a road to Constantinople, was apparently left untouched during the entire Persian campaign (Foss, 1996:3, 4).

Numerous cities along the Lycian coast, such as Lebissos, Xanthus, and Patara, bear no direct evidence of a Persian attack.[9] The region of Aperlae, containing Aperlae itself, Apollonia, and Kekova, and the area of Cyaneae and Tristomon have evidence only of an abandonment of the area, again with no evidence of a threat or direct attack.[10] Myra and Andriake bear a similar pattern. While there is archaeological evidence that supports the apparent shrinkage of the city of Myra and the port of Andriake, the remains do not suggest violent destruction (Foss, 1994:32).[11] Additionally, inland, the church of St. Nicholas apparently survived and prospered

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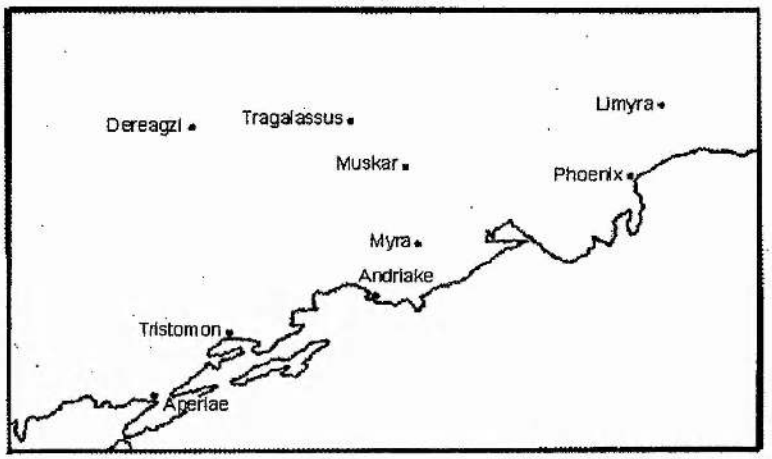
[8] Red Slip piece #9, and this is discounting all local monastic ware.

[9] See Foss, 1994, pages 8-16, where he discusses the fate of these cities during this period, but does not provide any direct evidence that can link their apparent destruction to the Persian invasion.

[10] See Foss, 1994, pages 16-22.

[11] Foss incorrectly states on page 30 that this region of Myra "disappears from history" after the reign of Justinian and reappears in 790. Significantly, three Byzantine lead seals in the catalogue compiled by Zacos and Veglery can be dated to this apparent disappearance. Two 7th century seals are of Bishops of the region, one named Anastasios, and the third is of

throughout this period, and the fortress of Dereagzi may have been built during this time along with others at nearby Muskar and Tragalassus



(Foss, 1994:31, 33, 36). Overall, in Myra, and most likely reflected through the Lycian region, there is a clear withdrawal of the population from the coasts, and possibly to an occupation of the interior land and the mountains (Foss, 1994:37). Foss' implication seems to be that this withdrawal and abandonment may have been due to a Persian threat or attack during their campaigns (Foss, 1994:50). But instead of a military threat, considering the region's dependence on the trade generated with Syria, Palestine, and Egypt (Foss, 1994:1), and the subsequent takeover of those areas by the Persians c.615, perhaps the region degraded and the inhabitants left simply due to the loss of revenue after that date.

Finally, it should be noted that hagiographic sources strongly suggest that cities, both large and small, in Asia Minor, continued to be inhabited during the 7th and 8th centuries (Abrahamse, 1967:331). There are no references to abandoned cities in Asia Minor from the texts, and nearly all of the cities were still in existence, apparently through the 9th century (Abrahamse, 1967:332).

When the progress of the Persian campaign is traced through Syria, Palestine, and Egypt, similar trends of survival can be seen. While some texts describe Chosroes' success in Syria as "*He laid many cities to waste, and took a vast number of captives...*" (Palmer, 1993:16), Sebeos reports that "*...the entire country of Palestine willingly submitted to the king of kings*" (Schick, 1995:22), with no mention of destruction. From the writings of Eutychius, it seems that the Christians in the cities of al-Ramla, Tiberius, Tyre, and Damascus may not have suffered as greatly as

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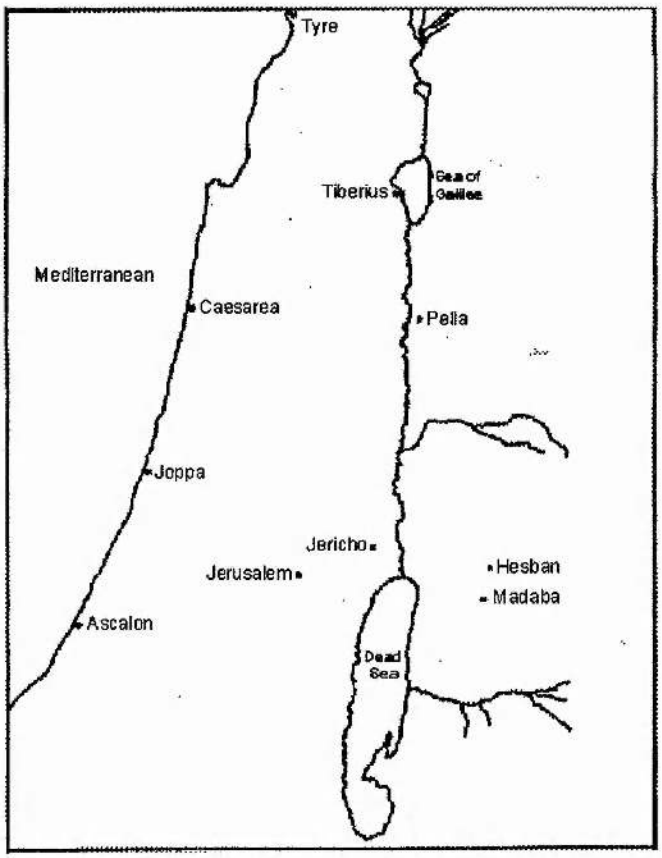
Theophilos, a Metropolitan of Myra from the 8th century. The significance of these positions can be determined from the Glossary. See Zacos *et al.*, 1972, seals #1220, 1657, and 2941.

expected, as they were able to aid the Patriarch Modestus in the repair of Jerusalem after the Perisan attack (Schick, 1995:22).



Archaeological evidence from Caesarea does not support the expected destruction in 614 in any way, and it seems to have survived throughout the occupation period (Schick, 1995:23). When the city was finally captured by the Muslims c.639, apparently 300 markets, all in good shape, were found within it (Hitti, 1966:217), gold and silver was plundered from it (Palmer, 1993:166), and estimates of captured prisoners ranged from 4000 to 7000 people (Hitti, 1966:218; Palmer, 1993:165). The city of Ba'albak, when captured by the Muslim forces, apparently contained churches and houses inside the city walls, and outside, mills and cattle pastures (Hitti, 1966:198). The city of Damascus was captured by Shahwaraz in 615-616, but he apparently left the city in peace as he received a payment of tribute (Palmer, 1993:128). Finally, recent claims that destruction in Jericho, Pella, Madaba, Hesban, Albia, and Magen are the result of the Persian attack are weak and not substantial, they could easily be the result of an earthquake in 633 (Schick, 1995:24).

Just as noteworthy, the Persian forces had left the coastal areas in peace until after their capture of Jerusalem in 615-616, and even then, they did not lead the attack. Jews allied with the Persians lead the sieges on Acre and Tyre on the coast (Schick, 1995:27)[12], and in neither attack were Persian forces directly involved. In the attack

[12] It certainly seems noteworthy that Damascus, which survived the Persian raids, and Tyre, which successfully repelled the Jewish revolt, were also major centers of trade, and most likely remained prosperous through this period. Tyre was, along with Beirut, also the center of

on Jerusalem however, the point at which the Jews allied themselves with the Persians, there is no question of Persian involvement, or the destruction and plunder that resulted.

Initially, the city attempted to surrender peacefully. But not all of the inhabitants agreed to this plan, and as internal violence broke out, the Persians took advantage of the situation and laid the city under siege for twenty days, followed by three more days of plunder. While archaeological evidence still leaves some questions unanswered as to the full extent of the damage (Schick, 1995:34), there is abundant literary evidence describing the devastation that occurred. Numerous churches and monasteries were burned and destroyed, and the remains of the True Cross were subsequently taken back to Persia. The churches of the Holy Sepulchre and Holy Zion were destroyed, and an explanation of the massacre that occurred describes the dead as "*...lying cloven asunder from head to breast; others lay with fissures from shoulder to belly; some lay transfixed with the sword and cut in bits like grass; some lay cut in twain.*" (Schick, 1995:38). Clearly, while other cities may have been ignored or undamaged, Jerusalem suffered and seemed to be a focus of the Persian attack in Syria and Palestine.

In Egypt, similar episodes occurred. Alexandria, as the largest and most important city in Egypt, received the brunt of the Persian attacks beginning in 617. The Persians advanced along the Delta of the Nile to reach the city, and once there, managed to get a few inside the city through the seaward gate by disguising themselves as fishermen and blending in with the returning fleet. Those few inside then opened the city gates to let the rest of the forces in (Butler, 1978:77). For the three years after Alexandria was taken, the Persians slowly gained territory up the Nile (Stratos, 1964:114), and remained in place until c.629. However, territory not within the immediate area of Alexandria experienced not devastation and plunder, but apparently, merely political occupation. Just nine miles west of Alexandria, the monastery and library of Ennaton was not touched (Butler, 1978:51*n*.2, 74), and similarly, northeast of Alexandria on the coast, the monastery of Dair Kibrîûs was also unharmed (Butler, 1978:75). The Persians would not massacre the inhabitants of a city that surrendered peacefully (Butler, 1978:76), and as such, areas farther up the Nile were more or less left intact. There is, in fact, no record of any resistance except

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government silk production, and it would be interesting to determine the fate of Beirut

from Alexandria, and even in that case, many of the buildings that could have been destroyed, remained in place (Butler, 1978:78, 90).

It seems then, that while parts of Asia Minor bear evidence of a violent attack and prolonged plundering, the majority of the territory occupied during the invasion may have experienced an initial shock, then a restoration of their daily lives. Maritime activity however, relies on more than just the survival of coastal cities, their inhabitants, and their revenue. In the areas specific to this study, the coasts of Asia Minor, Syria, Palestine, and Egypt, their trade and vitality was also dependent upon the arrival and processing of goods from India and the Orient. However, during the first third of the 7th century, whether it was due directly to the Persian invasion or not, the majority of the coastal cities in these areas were undergoing shrinkage and demographic loss.[13]

Antioch on the Orontes experienced an earthquake in 526 and burning by the Persians during an earlier occupation in 540, and from that time onwards, there seems to be a general abandonment of the city (Kennedy, 1985:153). The towns of Daphne to the south, and Seleucia in Pieria, both reliant on Antioch, also experienced a decline in activity (Kennedy, 1985:154). The port city of Laodicea saw little recovery after an earthquake in the late 6th century, and no activity was recorded at its ports upon its capture by the Muslims in the 7th century (Kennedy, 1985:156). Additionally, the city was apparently captured by the Muslim general abu 'Ubaidah when the city gates were opened to let the inhabitants' cattle graze nearby (Hitti, 1966:203). When the Muslims laid the city of Qinnasrin[14] under siege, they reportedly took sheep and cattle as booty instead of luxury items or money (Hitti, 1966:224). In the mid 6th century, it was reported that the port of Caesarea was nearly empty, and Kennedy argues that while it may have been able to resist the Persian seige, the city proper was decaying (Kennedy, 1985:147).

The city of Ascalon, which played a major role in the voyages of St.Nicholas Sionites in the late 6th century, is unmentioned during the Persian invasion. The fall of other cities in Lycia mentioned in the saint's voyages, such as Tristomon, Kekova, and Andriake, came c.617, after the Persian subjugation of the coast from Syria to Egypt.

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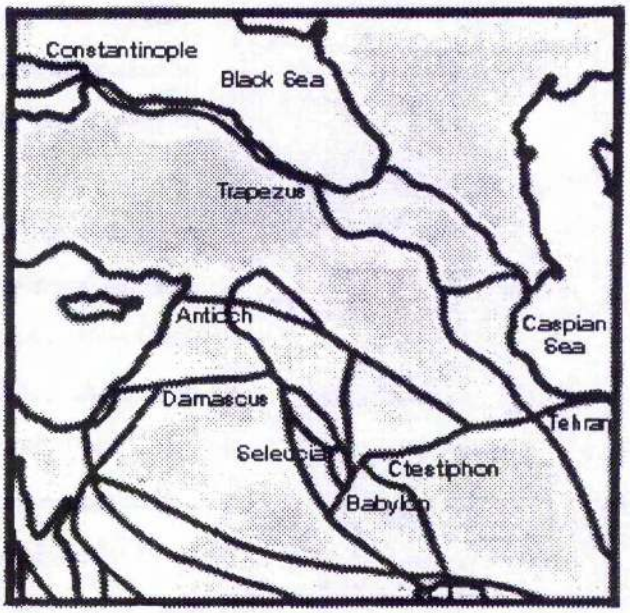
during the period.

[13] Alexandria is a clear exception to this.

[14] Also known as Chalcis.

Some of this degradation can be blamed on the earthquakes in the region during the 6th century, and the rash of bubonic plague which periodically cycled through the region (McNeill, 1989:109). This plague, which was apparently spread by ship[15], would have had drastic effects in coastal cities when encountering a populace with almost no resistance to it, and one quarter to one third of the population in affected areas may have been lost (McNeill, 1989:103). But in addition to these natural disasters, there may be another explanation as to the degradation that cities in Syria and Palestine experienced.



Beginning during the reign of Justinian, efforts were made to secure and dominate the trade routes running from India and the Orient (Lewis, 1951:33). These attempts came about as a result of the fruitful position of Sassanid Persia, which encompassed nearly all of the land routes running from the East. These land routes passed through Seleucia and Ctestiphon in Persia (Charlesworth, 1924:101), and progressed westwards to cities on the Syrian-Palestine coast, the south coast of Asia Minor, or along a northern route through Nicopolis, Trapezus, Chalcedon, and finally to Constantinople (Charlesworth, 1924:82-86). The clear result of this geography was that goods and trade vital to Byzantium, most importantly silk, could be easily regulated or stopped by Persia through economic and physical means.

The first Byzantine attempts to reorganize their trade began in the mid to late 6th century, when the establishment of trade routes bypassing Persia to the north through the Turkish Khazar state, and sea routes to the south via the Red Sea, Ceylon, and the East Indies opened up, with partially successful results (Lewis, 1951:33-34). In 552, Justinian also smuggled silkworms into the Byzantine Empire, in an attempt to begin

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[15] "And this disease always took its start from the coast, and from there went up to the interior.", Procopius II.22. Also see McNeill, 1989, pages 109-113 for disease transmission and black rats.

local production (Lewis, 1951:34). His attempts to begin this new industry however, were probably frustrated by the labour intensive harvesting in the Spring, and the lack of an adequate number of mulberry trees on which the worms feed (Oikonomides, 1986:42). It is also clear that local attempts did not supplement the supplies from the East, for a late 6th century law placed the ceiling price on one pound of imported raw silk at 15 nomismata, and only imperial officials, the *commerciarioi*, were authorized to buy and sell this, or any imported goods along the Byzantine border (Lopez, 1945:13; Oikonomides, 1986:34). As a result, through the late 6th and early 7th century, while the cities of Tyre and Beirut, as the homes of government silk production, prospered[16], other private silk manufacturers lost their resources and livelihood (Lewis, 1951:42). To compound the loss of the silk trade, cities such as Antioch, Caesarea, and Laodicea, which had previously been at the western ends of these routes from the Orient, lost even more business as it was shunted to routes in the north and south.

When the Persians encountered cities in Syria and Palestine that were either directly or indirectly associated with the former trade routes from India and the Orient, they most likely found them battered from earthquakes in the late 6th century, depopulated from recurring plague, and additionally, economically unstable and reliant on local agriculture. What should also be taken into account is that in addition to a possible religious motivation[17], there is the supposition that the Persians were attempting to regain control of the commerce that used to flow through their territory by occupying the receiving ends of the new trade routes in the west (Stratos, 1964:124). If this is so, then for the 10 to 15 years that cities such as Tyre, Beirut, and most importantly Alexandria were under Sassanid government, it is likely that no large scale maritime trade was occurring in these cities, as it simply reverted back to the Persian capital at Ctestiphon, and never moved onwards to Constantinople.

This lack of, or reduced amount of activity is somewhat reflected in the hagiographic texts.[i] Discounting the voyage to Thessalonica from Constantinople

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[16] The activity of Tyre is also attested by the six lead seals from the city from the late 6th to early 7th century. See Zacos *et al.*, 1972, #130bis.1-6.

[17] The Monophysites throughout Egypt, Syria, and Palestine were opposed by the Byzantine Orthodoxy. See Frend, 1972, page 336 onwards, for an explanation of the favorable treatment of the Monophysites by the Persians during the invasion. Also see Hardy, 1952, page 135, for the dichotomy between the Byzantine Orthodoxy in the Nile delta, and the Monophysites in the rest of Egypt.

c.618, as it does not involve area captured by the Persians, or later by the Muslims, there are only two instances that can be reliably dated as occuring during the Persian occupation.

Both of the events occurs in the text of the *Life of St. John the Almsgiver*, written by Leontius, Bishop of Neapolis on Cyprus, which was to act as a supplement to the biography of the Saint written by both Sophronius and John Moschus (Dawes *et al.*, 1948:195). The first occurs in Chapter 13 of the Supplement, and concerns the immigrations of many of the homeless and fugitives from the Persian invasion along the Palestinian coast.

Apparently, the previous Nile flood was not sufficiently high, and there was a scarcity of food throughout the country (Dawes *et al.*, 1948:221). Even after the saint had managed to gather all the food together that he could, found that the multitude within the city of Alexandria were still starving, and refused a donation of 200,000 bushels of corn under the pretext of holy intervention, two of the Church's ships[ii] appeared in the harbour with approximately 40,000 bushels of corn from Sicily (Dawes *et al.*, 1948:223). But while the events of the story may simply be illustrating the saint's faith, what is more revealing is that the events occurred at all.

The Persian capture of Jerusalem occurred in either 614 or 615 (Stratos, 1968:109), and after the fall of the city, the great immigrations to Egypt mentioned in the text of St. John's life began (Stratos, 1968:112). At some point between that date and the opening months of 617, when the Persians began their attack on Egypt, St. John sent the two ships to Sicily for grain to feed the immigrants.

However, unlike travel in the Mediterranean in the modern period, when local merchants, imperial galleys, or grain ships embarked on a voyage during antiquity and the Medieval period, they were subject to the currents and wind patterns throughout the Mediterranean basin. This routine travel in the summer, for the winter was unpredictable, was governed by the numerous high protected shores and ports along the northern coasts of the Mediterranean, the dangerous shores along the African coast, the prevailing winds from the north and northwest, and the general counterclockwise currents throughout the sea.[18] As a result, in sailing craft with either

[18] For a full discussion of this, see Pryor, 1988, page 12, and Gardiner, 1995, page 206.

square or lanteen rigs, both the direction and the speed of travel could be highly dependent on the weather conditions.

While the prevailing winds were strong enough to carry a ship from Rome to Alexandria in ten days, the counterclockwise opposing currents could make travel against the winds possible[19], and resulted in common trunk routes from Alexandria northeast along the Palestinian coast to Asia Minor, and onwards to the Aegean, Italy, or Sicily (Pryor, 1988:15). In other words, the predominant direction of travel from southern shores was rarely a direct route.

These trunk routes were taken into account when creating the maps of the voyages mentioned in the hagiographic sources. Unless a route was more or less clearly mentioned, like that of St. John from Rhodes to Cyprus, or the Bishop Arculf, the assumption was made that the ships were coasting along the shores of the Mediterranean. In the case of the two ships sent by St. John to Sicily for grain, it can be seen that if they were in fact coasting along this route, they would have had to, at some point, make port on Persian occupied territory. While Seleucia was still in Byzantine hands until 617, as it was operating as a temporary mint for the military, and Cyprus was not captured also until 617, once the two ships had rounded the northeast corner past Antioch, they were in friendly waters. However, the port city of Caesarea was the headquarters of the Persian general Shahwaraz by 615 (Butler, 1978:59), and Antioch had been captured at least two years earlier. While the cities of Acre and Tyre were still apparently prosperous, as they warranted an attack by the rebelling Jews after the fall of Jerusalem, they too were clearly within Persian occupied territory. Ultimately, what is found is that while the Persians occupied the Palestinian and Syrian coast, there seems to be little resistance on their part to what small amounts of non military, and non Persian traffic coasted offshore.

The second event occurs in Chapter 44 of the Supplement, when St. John set out for Byzantium seeking either refuge or assistance during the seige on Alexandria (Foss, 1975:724). When the ship he was traveling on arrived at Rhodes however, he received a divine vision to go instead to Cyprus (Dawes *et al.*1948:255), where he found himself acting as an arbitrator for a peaceful settlement between the Persian

[19] These currents were apparently so strong in the southeast corner of the Mediterranean, that when the Bishop Arculf traveled from Joppa to Alexandria, against their flow, it took him 40 days. See MacPherson, 1895.

general Aspagourios and the inhabitants of the capital city, Constantia (Foss, 1975:724). Again, while it is not the narrative of the story that concerns this discussion, it is the events within it.

What should be noticed immediately is not just that this voyage took place, but also the route. The type of ship that the Saint and Nicetas traveled on from Alexandria is called only a *ploion*, and nothing more specific.[20] While it may be a merchant craft, similar to the ship of the *naukleros* in Chapter 10 of the Supplement, it may also be a ship of the Church, similar to those sent to the Adriatic.[21] Nevertheless, upon reaching Rhodes, it is also remarkable that the saint managed passage to Cyprus, and apparently arrived without incident.[22] Again, a situation similar to that encountered in the first example is evident. While a Byzantine ship is coasting along, and in this case, definitely making port in Persian territory, there are no reports of any malignant activity. If any incident had occurred, it would have been exaggerated in the Life of the Saint if only to enhance the violent nature of the Persian invaders.

The Persians did not necessarily shun the coasts or naval activity, as is clear from their attacks on Cyprus c.617, and Rhodes c.622, but yet, despite their control of major coastal areas in Syria, Palestine, and especially Alexandria, there never seems to be a major naval aspect to their invasion. During both occupations of Chalcedon in 616 and 626, all naval activity across the strait to Constantinople was done by the Avars, who were ineffective in their *monoxyla*.[23] The city of Lampsacus and the island of Lesbos both have treasure hoards from this period, but it should be remembered that these are hidden in the hopes of recovering them, which implies that Lampsacus and Lesbos off the coast may have been relatively safe areas by 620-621. Attaleia, which is west of Seleucia, lacks evidence of any Persian attacks (Foss, 1975:745; 1996:6), and Smyrna, which was surrounded by threatened cities like Pergamum, Sardis, and Ephesus, was apparently untouched (Foss, 1975:745). Finally, it should be

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20 *Ploion* is just a general term for a ship, and see Delehaye, page 68, lines 1-3, and Gelzer, page 91, lines 12 and 17, which have the Greek text that concern this passage.

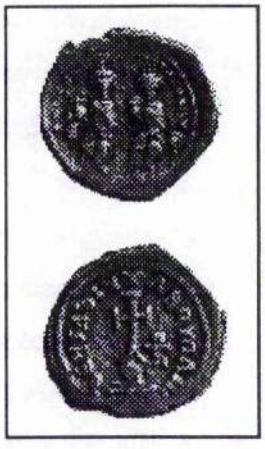
21 Ships of the *naukleros*, see Delehaye, page 31, lines 1-4, and 13-16. Ships of the Church (which lost their cargo in the Adriatic), see Delehaye, page 57, lines 10-15. Both refer to the ships as *ploia*.

22 Divine intervention though, was not resulting in an uneventful trip, as the ship encountered a storm and violent winds on the way to Rhodes.

23 There is an incident in the *Miracles of St. Demetrius* of Thessalonica in which a group of shipowners, upon encountering the city being attacked by the Avars in their *monoxyla*, manage to construct ad hoc weapons and fight them off. See Abrahamse, 1967, page 272.

noted that of all the cities along the Asia Minor coast that Foss feels were threatened or attacked by the Persians, only Ephesus has archaeological evidence that supports the apparent destruction that occurred.[24]

One possible reason for the lack of Persian naval activity would have been the presence of the Byzantine navy on the sea. While Heraclius reportedly traveled to Constantinople with a contingent of castellated ships[25], at some point during the Persian invasion, he melted down the gifts, gold, and silver of the church to mint new silver hexagrams, possibly in an attempt to help fund the rebuilding of the army and the navy.[26] Theophanes indirectly writes that the reestablishment of this navy began in 622 (Turtledove, 1982:13), but Stratos disagrees with Theophanes' date, arguing that the loan was provided by Sergius, the Patriarch of Constantinople, and Theophanes' date does not provide adequate time for the preparation of the military (1968:127). Stratos' argument is based on the first minting of the new hexagrams by the Emperor, which shows Heraclius seated on the throne with his son, both wearing long robes and holding an orb. On the reverse is the same orb on three steps, surrounded by the Latin inscription: **Deus Adjuta Romanis**, [God Help the Romans] (Stratos, 1968:127). These coins however, were first minted in 615 (Grierson, 1968:17), not 619-620 as Stratos believes, and thus, by 616, the Byzantine navy could have been equipped and reasserting its presence in the Aegean.[27]



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[24] There are literary accounts of the capture of Chalcedon and Rhodes. See Palmer, 1993, pages 18, 125, and 133. It should also be noted that Foss goes on to say in 1979 that the destruction in Ephesus may be due to an earthquake, see Foss, 1979, page 103. Also see his discussion of Miletus and Smyrna in "Archaeology and the 'Twenty Cities' of Byzantine Asia", 1977.

[25] See DeBoor, page 298, line 2, and *Scriptorum Graecorum Bibliotheca* volume V, *Fragmenta Historicorum Graecorum* page 38, passage 4. These passages, discussion, and translations can be found in Appendix IV.

[26] Stratos (1968) asserts on page 126 that the Patriarch Sergius understood the needs of the Emperor, and provided the gift from the Church to help restore pride through a rebuilt military. Lewis (1951), asserts the same belief on page 51, that Heraclius used the money to help rebuild the army and the navy, but for neither Stratos' nor Lewis' argument is there primary evidence to support their belief. It may be noted that it was not until after this time that the Byzantine military began to wage successful terrestrial campaigns, and that the Persian threat along the Asia Minor coast receded, but the actual use of the gift from the Church is still speculative.

[27] Stratos does not provide any argument as to why the years 619-620 were chosen. Additionally, Grierson reasserts his date of 615 in *Byzantine Coins*, 1983, one page 103. Grierson does mention the date of 621 as the year of the Church's gift to Heraclius in *Byzantine Coins*, but that may be due to the use of Theophanes as a source. Also see W.Wroth, *Imperial*

If so, then the lack of Persian activity along the Aegean coast after apparently attacking Ephesus, their inability to cross the Bosporus while in Chalcedon, and the ineffectiveness of the Avar *monoxyla* may be explained by the reappearance of a Byzantine military presence on the sea.[iii]

The security of the Byzantine navy in the Aegean would have also reinstated a certain amount of confidence on the part of the *naukleroi*, and their shipping activities. This is not to say that mercantile activity would have returned to normal, but that shipping, whether on the part of the Imperial family, the Church, or the independent merchant could have continued. One example of this continuation of mercantile activity during the Persian invasion may be the Yassıada ship which sank c.626 off the coast of southwest Turkey. On Map I, all of the cities in italics are source sites for the archaeological evidence recovered from the wreck, and the line south of Samos is the last proposed route of the ship. What must be taken into consideration is that while dateable copper coins from the mints at Byzantium, Nicomedia, Thessalonica, Cyzicus, Alexandretta ad Issum, and possibly others were recovered, the total number is only 54 coins. Fagerlie rightly points out that from such a small representation of the total number of possible coins on board, an accurate indication of the size or nature of the ship's ventures cannot be determined (Bass *et al.*, 1982:147). But in a more general sense, while it may be inaccurate to attempt to place the ship at a certain site during a certain year, it can be seen that for the approximate 25 years that the ship was in service (Bass *et al.*, 1982:312, 318), it operated throughout the Aegean. Additionally, it must be considered that when the ship was built, it was built for its owner to act in a mercantile capacity, and to this extent, the availability and possibility of trade must have been evident. In other words, why would a trading ship that may have cost in excess of 300 solidi to build be commissioned (Bass *et al.*, 1972:140), if it was not able to carry out its duties, and return the investment? While presently, there is some debate over the final character of the ship when it sank[28], nearly the same year that the Persians occupied Chalcedon for the second time, it certainly seems more than likely that it was operating throughout the Aegean while the Persians were in Asia Minor. If

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Byzantine Coins, 1966, page 195, and M.Hendy, *Studies in the Byzantine Monetary Economy*, 1985, pages 494-495.

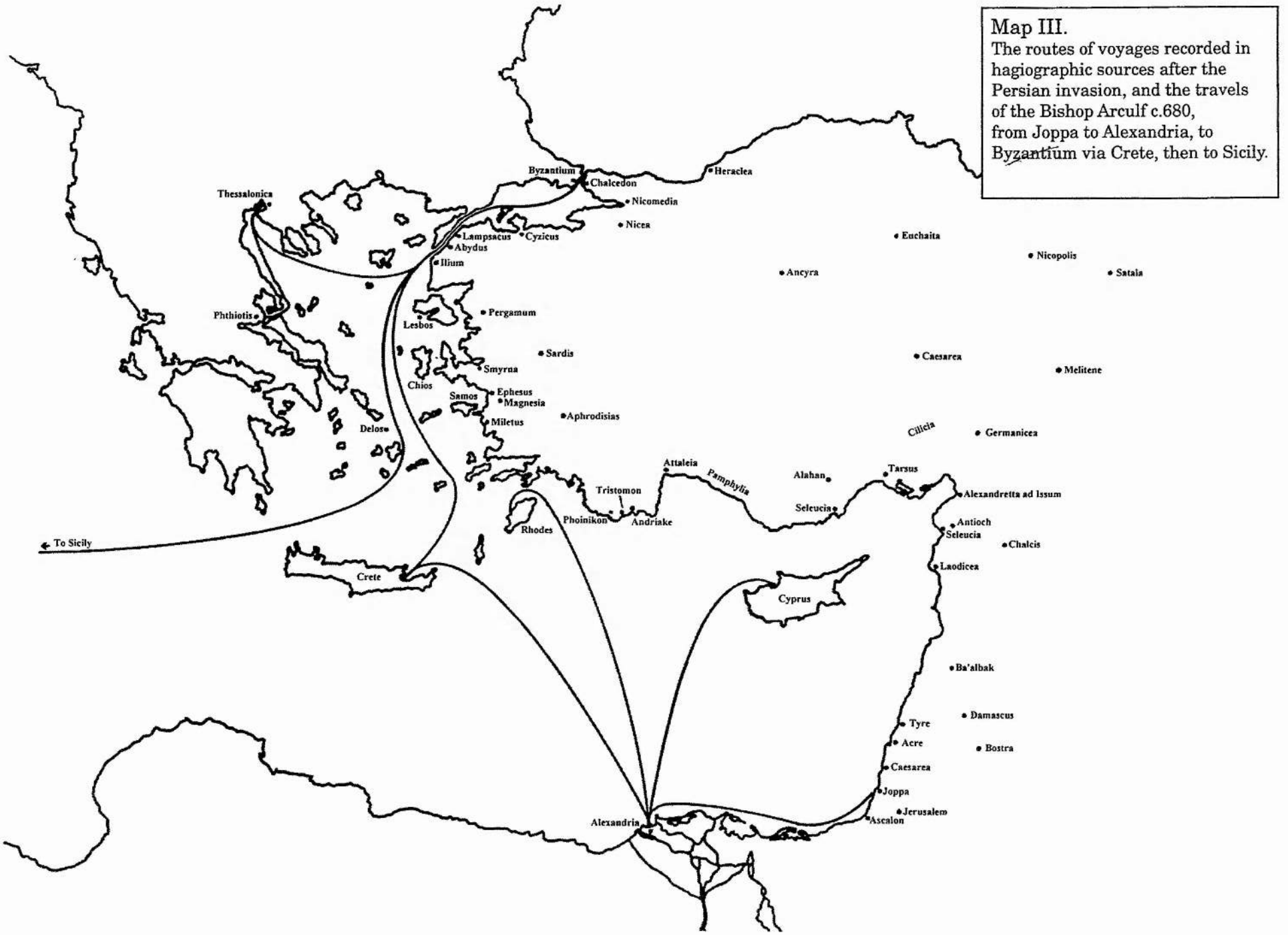
[28] See *Journal of Roman Archaeology*, volume 9 (1996), and P.G van Alfen's article, "New Light on the 7th c. Yassi Ada shipwreck: capacities and standard sizes of LRA1 amphoras." 189-213.

a more substantial chronology of the ship's movements could be determined, it would be invaluable to determining shipping activity during the first quarter of the 7th century.

Is there conclusive evidence that mercantile activity was steady and unaffected throughout the eastern Mediterranean during the Persian occupation of Asia Minor, Syria, and Egypt? No, there is not, and yes, it certainly seems as if the demographic crisis and Persian invasion did cause a drop in mercantile activity, as an examination of Map III makes fairly clear. However, the eastern Mediterranean does not appear to be devoid of activity. The text of St. John the Almsgiver reveals some unexpected coasting along Persian occupied territory, and the re-establishment of the Byzantine navy may account for the lack of Persian activity along the Aegean coast. If anything, by 619-620, the eastern Mediterranean along the Syrian-Palestine coast may have been in Persian hands, and the Aegean may have stabilized under the Byzantine navy, but non military coasting activity may have continued through and between the two areas. It is clear that major ports such as Smyrna, Miletus, Nicomedia, Byzantium, Thessalonica, Cyprus, Caesarea, and Alexandria survived the Persian assaults, and were prosperous after the war, but it is unclear if they operated through the onslaught. Even if mercantile activity did cease altogether, it seems noteworthy that immediately after the Persians were driven back from the coastal areas, a re-establishment of practices began.

The mints at Nicomedia and Cyzicus were reopened for a year from 625-626, and Cyprus was operating as a temporary mint from 626-629 (Foss, 1975:729-730). More importantly, a lead seal minted in Cyprus from 629-631 attests to the presence of Theodore, the *genikos commerciarius* of the island[29], and the *Kitab al-Futuh* by ibn A'tham al Kufi describes the Muslim capture of beautiful female slaves and furnishings of silk being shipped to Constans II from the island c.649.[30] By the time Cyprus was occupied by the Muslims in 655, it was able to pay approximately 7,200 dinars annually, to both the Greeks and the Muslims (Hitti, 1966:236). The Yassiada ship was evidently in use from c.625 until its sinking, and there is even an encounter between the Emperor Heraclius and *Quraysh* merchants in Gaza during this period (Schick, 1995:52). If mercantile activity did continue unhindered through the Persian invasion in the Aegean and eastern Mediterranean, it most likely did so on a much smaller scale

[29] Zacos *et al.*,1972, #132.


Map III.
The routes of voyages recorded in hagiographic sources after the Persian invasion, and the travels of the Bishop Arculf c.680, from Joppa to Alexandria, to Byzantium via Crete, then to Sicily.
Byzantium
Chalcedon
Heraclea
Nicomedia
Nicea
Thessalonica
Lampsacus
Cyzicus
Abydus
Ilium
Euchaita
Nicopolis
Ancyra
Satala
Phthiotis
Lesbos
Pergamum
Sardis
Caesarea
Melitene
Smyrna
Chios
Samos
Ephesus
Magnesia
Aphrodisias
Miletus
Delos
Cilicia
Germanicea
Attaleia
Pamphylia
Alahan
Tarsus
Tristomon
Alexandretta ad Issum
Seleucia
Phoinikon
Andriake
Rhodes
Antioch
Seleucia
Chalcis
To Sicily
Laodicea
Crete
Cyprus
Ba'albak
Damascus
Tyre
Acre
Bostra
Caesarea
Joppa
Jerusalem
Ascalon
Alexandria

than that evident in the hagiographic texts from the earlier decades. On the other hand, if activity did cease for approximately 10-15 years, the amount of time that the Persians occupied coastal areas, then it apparently resumed fairly quickly, and with little difficulty.

Unfortunately, the mercantilism that occurred after the Persian invasion did so in an atmosphere that was highly likely to be similar to that previous to the attack. Just as in previous centuries, the *naukleroi* were not acknowledged for any possible aid during this time of crisis (Lopez, 1976:350), and similarly, the Persian attack only reinforced the closed mentality of the Byzantine state. After repelling numerous attacks from the Germanic tribes in the 4th century, and later the Avars, Slavs, and continual Persian skirmishes, Byzantine foreign policy had developed in line with its religious beliefs, essentially to preserve its holiness and the Christian state (Lewis, 1988:56). This defensive attitude was applied to nearly all walks of life, soldiers, diplomats, priests, monks, scholars, artists, or sailors and merchants, and was reinforced through a great deal of governmental regulation (Lewis, 1988:56). While this regulation supported, and was supported by, a well balanced economy and self sufficient resources (Lewis, 1988:55), it resulted in a governmental structure that tended to discourage independent mercantilism and capitalistic tendencies. Byzantine *naukleroi* and other merchants, both before and after the Persian invasion, were limited in their profits due to governmental regulation of foodstuffs and interest rates (Lewis, 1988:57). Byzantine merchants were unable to trade outside the empire's borders (Lewis , 1988:58), nor were they allowed to export gold or other coined and uncoined precious metals, jewels, essential raw materials and foodstuffs, weapons and blueprints for ships, slaves, quality textiles or silk, and fish sauce (Lopez, 1976:351). Additionally, in the empire's effort to maintain a balanced budget, it taxed the population heavily (Lopez, 1951:232), resulting in a middle class with very little excess capital. The merchants, who rarely rose out of the middle class, were hit the hardest with the tax burden, and what profits they lost to taxation merely discouraged or halted economic expansion on their part (Lopez, 1976:350).

The wealthy classes were influenced in their investments by deep seated prejudice against mercantilism as a way of life, and by the Byzantine state itself, which

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[30] See Appendix I.

encouraged its landowners to preserve its sanctity (Lewis, 1988:56). This elitism was maintained through the 10th century and the creation of the *Book of the Prefect*, possibly written by Leo VI, which actually prohibited the wealthy from visiting markets and producing luxury goods which might create unfair competition for the craft guilds (Lopez, 1976:249). The *Rhodian Sea Law*, which is felt to have been written earlier than the *Book of the Prefect*, possibly the 8th century, contains maritime customs and rules, but the legal activities of merchants are hampered by contradictory regulations within it, which only tend to protect the government itself (Lopez, 1976:351). Commercial investment by the wealthy is rare (Lewis, 1988:57), and there is little evidence that the wealthy participated in trade (Lopez, 1976:349). At best, they seem to have succumbed to the prejudice against mercantilism, and instead invested in land and the Byzantine state itself, maintaining their own agricultural prosperity.

By the year 632 then, seafaring mercantilism may have been at a relative low point. The activity that was occurring before the Persian assault did so in a society that never tended to acknowledge it, or reward its practitioners for their efforts. The *naukleroi* that were active within the Byzantine territory were unable to venture and trade outside it, and were soon playing an almost passive role within the state, merely transporting goods from its trade centers on foreign borders, to Byzantine territory and Constantinople. After the invasion, while the need for the *naukleroi* may have increased due to the loss of some terrestrial routes, the situation was increasingly strained by the shrinking amount of territory they were able to venture in, and by the continual lack of investment and support by the wealthy and the Byzantine state, who were now concentrating on the establishment of the themal system in Asia Minor. Along the coasts of Palestine, Syria, and southern Asia Minor, towns were shrinking and retreating from the coasts due to disease, the after effects of the war, and the lack of economic stability they found there. Egypt was able to recover, as did the large port cities such as Miletus along the Aegean coast, as they were both at the receiving ends of the trade routes from the East, and were still vital to the prosperity of Byzantium. However, despite the totality of the Byzantine victory over the Persians, the Byzantine state still had a great deal of administrative and economic reestablishment to do in Syria, Palestine, and Egypt, which had not been under Byzantine control for nearly 15 years (Whittow, 1996:81). Families and lives had

grown and changed during those years, adapting to the idiosyncrasies of Persian rule, and it would take a great deal of time to successfully integrate the complex and highly structured Byzantine system into an area that was fragmenting spatially and economically. Unfortunately for the Byzantine state, 632 was also the year of Muhammed's death. Unknown to the emperor, he had less than 10 years to reestablish the government, and prepare for the arrival of Islam, and even greater changes in their shipping, shipbuilding, economy, and society.

[I] Dr. Magdalino has rightly pointed out that the reduced number of voyages in the hagiographic sources can be attributed to the smaller number of extant texts occurring after the Persian invasion. Personally, I feel that if a larger number were preserved, a lack of maritime activity would still be reflected, as the subjects of these texts continued to be associated with urban areas until the Iconoclastic constroversy in the early 8th century. As these urban areas were decaying, moving, or the population was retreating inland, I feel an associated shift in the focus of the texts would occur, for they tended to reflect the activities of the city in which they were based. See Abrahamse, 1967, 324-331.

[II] At present, it is unclear what kind of ships these are. Dawes and Baynes insists in the endnotes to chapter 10, on page 266, that these ships and the ship given to the foreign *naukleros* are *dorkons* (δόρκωνες), a term derived from *dorkas* (δορκάς), or gazelle, denoting a fast ship. Dawes and Baynes however, utilized two texts in their translation of the Life of St. John the Almsgiver. The first is "Leontios' von Neapolis Leben des Heiligen Johannes des Barmherzigen Erzbishofs von Alexandrien" by Heinrich Gelzer in 1893, and published in the series, *Sammlung ausgewählter kirchen - und dogmengeschichtlicher Quellenschriften*, in part V of volume I. The second is Hippolytus Delehaye's from 1927, "Une Vie Inédite de Saint Jean L'Aumonier" in *Analecta Bollandiana*, vol 45, and while in Gelzer's text the term *dorkon* does appear, in Delehaye's, *dromon* is prevalent.

Gelzer, chapter 13, page 28, line 1:
...δύο δόρκωνας τῶν τῆς ἐκκλησίας...
...two *dorkons* of the Church...

Delehaye, chapter 27, page 38, line 2:
...δύο δρόμωνας τῶν τῆς ἐκκλησίας πλοίων...
...two *dromons* of the ships of the Church...

A similar discontinuity appears in Gelzer's text of chapter 10 (page 19, lines 6-8), and Delehaye's of chapter 23 (page 31, lines 29-31), where Gelzer again uses the term *dorkon*, and Delehaye uses *dromon* to describe the ship given to the foreign *naukleros*. This discontinuity in chapter 10 is based on which codex of the original Greek the author used as a source. In Gelzer's footnotes to chapter 10, he mentions that the term *dorkon* is from the Codex Parisinus Graecus 1510, while the term *dromon* is used in the Codex Berolinensis Graecus, folio 57. Currently, due to the inaccessability of these documents and material about them, it remains unclear which could be considered the more accurate source.

In other instances that mention ships in general however, the term *ploion* (πλοίων) is used consistently in both Gelzer's and Delehaye's texts. See Gelzer, chapter 10, page 18, lines 7, 8, and 18 to compare with Delehaye's chapter 23, page 31, lines 1, 3, and 15; Gelzer, ch.28, page 60, line 9 to Delehaye, ch.40, page 57, line 10; and Gelzer, ch.44b, page 91, lines 12 and 17 to Delehaye, ch.47, page 68, line 1.

Currently, there is no information about a *dorkon*, only that it is evidently a fast ship. If instead the ships are *dromons*, then it seems that either St. John had these craft in the Church's fleet at Alexandria, or that St. John had access to the resources of the Byzantine fleet stationed in the Nile delta. In the 6th century AD, a *dromon* was commonly known as a single banked craft, but by the 9th century, it had been transformed into a double banked ship, and in either case, it was still commonly a warship (Gardiner, 1995:94). It is remarkable to think that St. John had warships at his disposal, that he was able to give one away to a haggard ship owner, or that they were used to carry 20,000 bushels of grain. Or for that matter, were they still at Alexandria when the Persians overran the city, and did the Persians use them to begin the naval aspect of their campaign? What of the Muslim invasion? One possibility is that there may be an even wider use of the term *dromon* other than referring to a *dromon* itself, a *pamphylion*, or an *ousiakos*, or that both John Moschus and Sophronius were not completely familiar with *dromon* or *dorkon*, merely using the terms to describe fast ships. In any case, it bears investigation.

[III] The Persian occupation of Cyprus in 617 might be due to the loss of land based military support after the fall of Seleucia and the Lycian coast. Once there was no friendly coast within one day's row from Cyprus that a Byzantine *dromon* could land on, the navy was unable to reach the island. It should also be remembered that a peace settlement was agreed to on Cyprus, and perhaps there was no fear for the safety of the island.

The capture of Rhodes on the other hand, is difficult, in that it is not only hard to determine if the nearby coast was occupied by Persian forces, but also that it would seem that the Byzantine navy could have repelled any attack on an island in such a strategic position. There is no mention of a naval egagement over the occupation of Rhodes, only that a general on the island (a Byzantine general perhaps), was taken captive and prisoners were taken back to Persia (Palmer, 1993:18).

Chapter II

The Muslim Invasion and its Culture

The Muslim culture that arrived on the shores of the Mediterranean in 640 was a stark contrast to the Roman and Byzantine society that had previously ruled the sea. As Arabia was bordered on the west by the Mediterranean, the Red Sea, and Egypt, and on the east by the Gulf, the Indian Ocean, India and China, it became a trading crossroads as early as the 1st century AD. As a result of these early contacts with trade from both the East and West, and the lack of natural resources and large scale industry, the Arabs in northern Arabia adapted their lifestyles to carrying and trading goods for both themselves and the bordering states. By the 7th century, while some tribes survived on raiding caravans, other tribes such as the *Quraysh* had become rich merchants whose religious and economic systems revolved around their *haram* in Mecca, where they controlled local and international trade through the area (Kennedy, 1986:25). However, despite an individual tribe's organizational experience, the unified Muslim society in the early 7th century was approximately 10 years old, and had no background in government organization. No instructions had been left by Muhammed to determine his successor, so his father in law, Abu Bakr, was chosen by a council of senior Muslims to lead the tribes of Arabia as caliph (Watterson, 1988:145). Previous to this, tribes had been ruled under the leadership of *shaykhs* for centuries, whose word, in times of emergency, was considered to be law (Bishai, 1968:57). But as different tribes could have different *shaykhs*, and tenuous communications between members, a strong centralized government similar to that in the Byzantine Empire never developed. By the 7th century, the Arabian tribes still followed *shaykhs*, and were based in two social groups in northern Arabia, the *al-hadar* or city dwellers who controlled the trade routes, and the *al-badw* or Bedouins, who were essentially a nomadic group (Bishai, 1968:55). The *Quraysh*, and other *al-hadar* mercantile tribes, because they had little need for governmental organization, instead relied on a system of individual capitalism that focused on various forms of partnerships to maintain cultural stability (Lewis, 1988:31). This system of individual capitalism was concentrated at the *haram*. These sites were often located near an oasis and developed around a shrine which was then declared to be sanctified and neutral

territory by a holy man (Kennedy, 1986:25). In Mecca, this *haram* was the Ka'ba, the building containing the black stone of the god Hubal (Donner, 1981:36). Upon this neutral ground, physical confrontation, especially murder, was forbidden, and peaceful trading and negotiations could occur and thrive in the secure boundaries (Donner, 1981:34). Likewise, the controlling tribe descended from the holy man of a successful *haram*, such as Mecca, was able to expand their influence. As Mecca began to dominate the west Arabian trade routes during the lifetime of the Prophet, the *Quraysh* tribe based in Mecca became a leading trading organization for northeastern Arabia (Kennedy, 1986:27).

The varieties of extremism found in the forms of Christianity throughout the Byzantine Empire too, were distinctly different from the unifying aspects of early Islam. Heraclius' adoption of Monothelitism is a clear example of this. Monothelitism arose as an attempt by Heraclius to unite the Jacobite and Melkite orthodox factions of the church over the singular nature of God. After the emperor's success in politically and geographically saving the fragmenting empire from the Persians, he attempted to reunify it under a common religious doctrine (Butler, 1978:137). The Monophysites however, Syrians and Copts, were religiously opposed to Constantinople both before and after Monothelitism, and soon found themselves under oppression to convert. Cyrus, who was appointed by Heraclius to bring together the opposing churches in Egypt, resorted to guile and torture in his attempts. One manuscript reveals the sufferings of Menas, who was burnt by torches then thrown into a bag full of sand and carried away from shore. After three chances to acknowledge the singular nature of God, he was drowned (Butler, 1978:184). The Jews too, who were blamed for the killing of Christians and burning of churches during the Persian invasion, were victims of widespread persecution (Butler, 1978:134). They were banished from Jerusalem, and Heraclius apparently acknowledged the vengeful massacre that followed (Butler, 1978:134).

The caliph 'Umar, who was only the third to rule the unified tribes of Arabia, led the Muslim invaders to victory through Syria in 634, defeated the Byzantine army at Yarmuk in 636 and the rest of Palestine by 638, and Egypt by 641. As he did so, he brought the tolerance of Islam with him, which is reflected in various extant peace treaties with Hims, Jerusalem, Damascus, and other cities (Tritton, 1930:5). These treaties are thought to reflect a document now called the Covenant of 'Umar, which is

seen as an unspecific treaty which could be applied to any conquered city. While rather harsh conditions, such as class and religious segregation, and the intolerance of public displays of Christianity, are visible throughout the document, there are also various statements that promise to protect those who follow its rules (Tritton, 1930:12). *"We will protect you and your lawful (according to our law) property against any one, Muslim or not, who tries to wrong you, as we protect ourselves and our own property; our decisions about it will be the same as those about our own property, and ourselves."* (Tritton, 1930:15). Although the covenant forbids the construction of churches in Muslim occupied territories, previously standing structures would not be taken down. Also, similar to the present day, there were various interpretations of the law, and an opinion attributed to ibn 'Abbas from this period says that if a Christian town peaceably surrendered to the Muslims, a church could be built (Tritton, 1930:37). There seems to be a more widespread agreement that while a church may not be constructed within a Muslim occupied town, it may be built outside one (Tritton, 1930:38), or for that matter, if no Muslims live within a town, churches may be built and festivals may be held (Tritton, 1930:100). Disregarding the various interpretations of the law, what is most significant are the number of surviving churches encountered by the Bishop Arculf during his journey to Palestine in the last 30 years of the 7th century. This Bishop, whose travels were recorded by the abbot Adamnan when the Bishop reached Britain, then translated by MacPherson in the late 19th century, spent 18 months on pilgrimage to Jerusalem, Egypt, Constantinople, and the rest of the eastern Mediterranean (MacPherson, 1895:xi). His written account, which is contained in three brief books, mentions that he visited 19 churches in Palestine, none of which seem to have been damaged during the invasion.

The rules outlined in the covenant do not solely apply to Christians. Jews too, perhaps because they spoke Arabic and a variety of languages, and due to their merchant and trading status, were occasionally seen in a better light than the Christians (Tritton, 1930:94-95).

But this acceptance or indifference towards religious practices extended beyond just the local level. Similar to a notary public today, administrators and religious officials in the Byzantine Empire wishing to communicate or send goods to Constantinople or other cities had to seal the letter or container with a lead seal that reveals not only the sender's position or religious status, such as a *commerciarius* or a

bishop, but their location and the date of delivery. They are primarily a record of a communication or shipment within Byzantium, and secondarily, they reveal the presence of Byzantine government officials, and even Orthodox clergymen, acting in an official status.

Once the Muslims had gained, or at least threatened, areas from Pamphylia and Myra to Armenia I and IV in the northeast after c.655[1], it would be expected that due to yearly raids across the Byzantine-Arab border, Byzantine centers of administration would have retreated or dissolved due to possible military threats. But, Byzantine activity in these areas doesn't disappear, and numerous lead seals from church officials in or along Muslim territory testify to their presence during and long after the initial Muslim conquests. In certain areas, the recovered seals can only be dated to the 7th century, and admittedly, may have been present prior to the Muslim invasion. There is a seal from Anastasius, the Bishop of Myra[2] that dates to this period, as do two seals from different Metropolitans of Tarsus.[3]

However, beginning in Antioch on the Orontes and moving southward, there are a number of seals that date from the late 7th and 8th centuries that should be examined. Antioch was taken by the Muslim forces before the capture of Jerusalem in AD 640 (Hitti, 1966:213), and despite a revolt in Antioch that year, it was quickly subdued and the city remained in Muslim hands. What should be pointed out though, is that there are two surviving seals from the late 7th century, and one from the 8th, that testify to almost continuous official Byzantine religious activity in the city. The earliest seal is from Makarios I, the Patriarch of Antioch, who was in office from c.654 to March 7th, 681.[4] The next is possibly his replacement, George, who was in office from 685 and was replaced by 702.[5] Finally, there is a seal from the church of Antioch generally dating from the 8th century[6], well after its submission to the Muslim occupiers.

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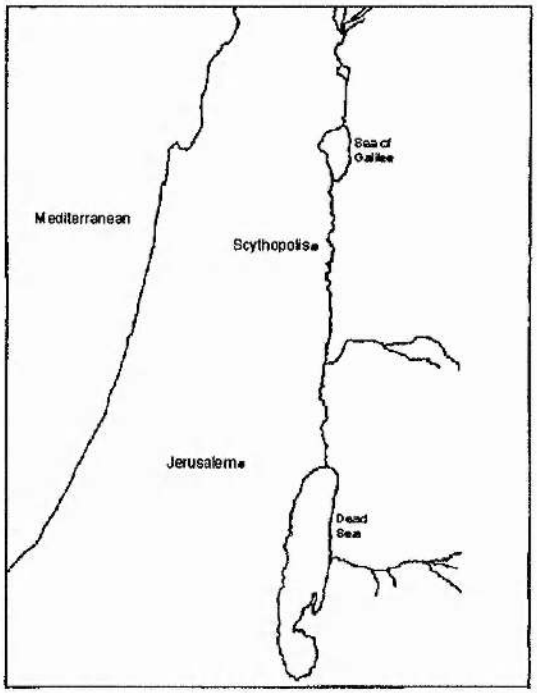
[1] The date of the Battle of the Masts, off the Lycian coast, near Phoenix.
[2] Zacos *et al.*, #2941
[3] Laurent #1537 and #1538
[4] Zacos *et al.*, #56
[5] Oikonomides, 1986*a*, #16. Same as Laurent #1516, and may instead date from the first George in the office, in 649.
[6] Laurent #1513

From the island of Aradus, just 2km southwest off the Syrian coast from Tartus (Conrad, 1992:317), a seal from the Bishop Patherius was stamped at some time from the late 7th to the early 8th century.[7] The nearby coast and the island were reportedly taken by the Muslims approximately 40 to 50 years earlier[8], just previous to the submission of Jerusalem (Conrad, 1992:321). Even farther into Muslim territory is the city of Scythopolis, just south of the Sea of Galilee on the west bank of the Jordan river (Stillwell *et al*, 1976), presumably taken some time between AH 14, the date of the conquest of Damascus c.636 (Hitti, 1966:189), and the conquest of Jerusalem in 638. Once again, there is an extant seal, this time of Christopher the Metropolitan of the city, dating from the late 7th to the 8th century.[9]



The island of Crete, which was the focus of a number of attacks beginning under Mu'awiyah in the mid 7th century, and ending in the early 9th century (Hitti, 1966:376), was also apparently the location of the church of Kisamos in the 8th century, as revealed by a lead seal from that office.[10] The island of Cyprus, which had made peaceful terms with Mu'awiyah c.649 (Hitti, 1966:235), then was recaptured after a violation of the agreement c.655, was also the home of John, the Archbishop of the island in the late 7th century.[11]

While this continuation of religious activity on the part of the Byzantine administration seems odd in the territory of an invading culture, and the motivations of

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[7] Laurent #1535. See also Conrad, 1992, pages 320*n*.8 and 344*n*.86, where he insists that the seal is undated, but does not explain why.

[8] Mysteriously, Theophanes, when recounting the Muslim capture of the island, reports that they burned the town, destroyed the walls, and left "...it uninhabited up to the present." See Turtledove, 1982, page 43. Also see Conrad, 1992, pages 333-336, for his discussion of Theophanes' passage.

[9] Laurent #1570.

[10] Laurent #1596.

the Muslim caliphate are still obscure, it is clear that this activity was occurring. Unfortunately, questions that do arise are not the focus of this thesis, and should be dealt with at a separate time. At present, what is most important is how the presence of these lead seals reveal that the Muslim culture assimilated, and possibly supported and perpetuated, both local and official religious practice.

Additionally, as the Muslims had little internal administration which could replace the departing Roman government, they left remaining Orthodox Greek officials in place, or appointed Monophysite Copts who were already familiar with the past administration, to take their place (Butler, 1978:450). Although this practice was officially outlawed under the covenant, there were many instances of it in Syria and Persia, and predominately in Egypt where the Muslim capital was established at Fustat (Tritton, 1930:18). In fact, during the initial stages of the Muslim occupation in Egypt, a number of the Muslim invaders were on *jihad*, or Holy War, for Islam, and were not expected to own property or settle in one place. It was not until the caliphate of 'Umar II from 717-720 that attempts to stop this practice occurred, as the caliph would not tolerate a *dhimmi*, a non Muslim, holding authority over a Muslim (Tritton, 1930:21). In light of that, conversion to Islam was simple and widely accepted. A man had to testify before any Muslim that "There is no God but Allah, and Muhammed is his Prophet", and the conversion was complete (Watterson, 1988:151). A *dhimmi* who converted to Islam, who was now a *mawla*, was still accepted into government service after 'Umar II, and in 755 there were a recorded 450 conversions in one day (Tritton, 1930:36). While these *mawali* had lower taxes to pay than the *dhimmi*, and in theory were felt to be equals, in reality they were viewed as inferior, and were often denied equality (Watterson, 1988:151). 'Umar II, during his attempts to remove *dhimmi* from government service, is recorded as writing that Jews and Christians should not be accepted as friends, for they want to see Muslims suffer, and will corrupt them (Tritton, 1930:22).

This antagonism was often mutual. The Armenian historian Sebeos, a Monophysite from the 7th century, was opposed to the Muslim advance. He quotes the prophecies of Daniel in relation to the destruction brought by the Islamic invaders: "*'And the fourth beast, terrible, dreadful, his teeth of iron, his claws of bronze; he ate*

[11] Zacos *et al.*,1972, #2974.

and crunched and trampled the rest underfoot.' He is saying that this fourth kingdom, which rises from the south [East] , *is the kingdom of Ishmael* [Muhammed]." (Kaegi, 1969:146). Sebeos and John of Nikiu, another Monophysite from the same period, both vehemently opposed the Muslim invasion on religious grounds, and they wrote that it was successful due to the sins of Christians (Kaegi, 1969:148). John of Nikiu specifically cites divine anger, but places the blame on the Chalcedonian, Monothelite, Orthodoxy (Kaegi, 1969:148). The view of the Coptic Bishop John was not unique, and was reflected even in the writings of a dialogue between Jacob, a recent convert to Byzantine Christianity, and several Jews from 634. This document, called the *Doctrina Jacobi nuper baptizati* again uses Daniel's prophecies from the bible, but places the image of the fourth beast upon the late Roman Empire itself (Kaegi, 1969:141), paralleling the blame attributed by John of Nikiu. The Byzantine Christian author of the Pseudo-Methodius attributes the Muslims' success to the failings of Byzantine Christianity also (Kaegi, 1969:143), and proceeds to describe in lengthy detail the apocalypse to come. The author's faith and loyalty to Byzantium shines through however, when a resurrection of the empire is predicted under a new, powerful emperor (Kaegi, 1969:145).

It should be remembered that these authors are reporting on a second wave of invasion occurring in as many decades. The first was the Persian invasion, and accounts of their brief occupation rival and surpass similar accounts of the Muslim wave twenty years later.[12] Eyewitnesses of the Avar assault on Constantinople reportedly saw that event as evidence of the failings of the Byzantine Empire (Palmer, 1993:xiv). If apocalyptic visions did not result from the destructive Persian attack, it seems likely that a repetition of the events, on a larger scale 15 to 20 years later certainly would.

But whether they were driven by fear of the apocalypse or the reported brutality of the invaders, Greeks apparently fled from Syria and Palestine to safety. A monk, John Moschus, retreated from Palestine to Antioch, then to Alexandria, only to move again in 617 to Rome, fleeing from the oncoming Persian invaders (White, 1936:8). A similar situation is recorded by St. Maximus in Carthage in 641, when he reports immigrations of monks from Syria, Egypt, and Lybia, fleeing the oncoming Muslims.

[12] See Palmer, 1993:16,18 and Foss, 1975. Also see Charanis, 1946*b*:82, for the Avar assault in 584.

(White, 1936:11). However, White goes on to say that once order was reestablished in the Muslim occupied provinces, this retreat almost ceases (White, 1936:12). Significantly, of the 8 churches known at the city of Rihab south of Damscus, it is clear that two were dedicated in 635, after Bostra, the provincial capital, had fallen to the Muslims, and just a year before the Battle at Yarmuk with Heraclius (Schick, 1995:79). The pilgrimage of the Bishop Arculf in the 680's, and the lack of difficulties he encountered, certainly implies that not only was travel, religious or otherwise, quickly reestablished, but that it was fairly common. This apparent absence of religious or secular disruption certainly seems likely on two counts. The first was the Muslim's religious tolerance, for although conquered peoples may have been inhibited from practicing their native religion in public, there was no forcible conversion to Islam placed upon them (Watterson, 1988:148). Secondly, not only does White report that these migrations contained almost no Coptic or Syriac speaking refugees (White, 1936:8), but those that did flee to the West seem to be primarily monks or the clergy. The common lay people, Monophysite or not, apparently retreated to a more fortified town, saw no reason to fight and surrendered peacefully, or even welcomed in the Muslims as possible liberators from the Monothelite emperor in Byzantium. Kennedy cites numerous examples of cities and towns encountered by the Muslims that accepted the Covenant of 'Umar with little resistance (Kennedy, 1985:147), and Hitti's translation of the *Kitâb Futûh al-Buldân* by al-Balâdhuri from the 9th century, mentions the towns of Shaizar[13], Ma'-arrat Hims, and Fâmiyah bowing to the arriving Muslims with tambourines and singers (Hitti, 1966:201). It seems clear that the Muslims did not set out to be destructive, and that in comparison to the previous Sassanian occupation, there was much less religious and economic disruption as a result (Schick, 1995:83).

The Muslim arrival in Syria and Egypt then, due to the religious assimilation and the cooperative nature of the minimal Muslim administration, encountered little resistance from the native population. It is likely, in fact, that the Copts may have welcomed the Muslim takeover as an end to religious persecution under the dominant Byzantine faith (Butler, 1978:451). The occupation may have also signaled the beginning of a better system of stable poll taxes and fluctuating land taxes that varied

[13] Also known as Larissa.

according to the rise of the Nile and the agricultural conditions each year (Butler, 1978:451). In Franz Rosenthal's translation of the *Muqaddimah*, book II.34, we read that the non-Muslim nations were under Muslim control and "*...every craftsman offered them his best services. They employed seagoing nations for their maritime needs. Their own experience of the sea and of navigation grew, and they turned out to be very expert.*" In Egypt, similar to Asia Minor, it is likely that the Byzantine and Greek shipbuilders residing there were removed to prevent possible capture. However, Butler asserts that shipbuilding flourished in Alexandria during the first half of the 7th century, and did not diminish when the Muslims took rule (Butler, 1978:114). It seems clear that the native Copts, who may have been independent of, or better than the Roman craftsmen (Butler, 1978:114), and who did not oppose the new Muslim rule, were the shipbuilders in Egypt who began to teach the incoming Muslims the new industry and techniques (Hourani, 1951:57).

But despite the Muslims' progress on land and previous coasting along the Indian Ocean and Arabian Sea, their inexperience, either real or imagined, became evident upon encountering the seafaring conditions in the Mediterranean. In the *Muqaddimah*, book II.34, we read that while under the control of the caliph 'Umar, no Arab traveled the sea without his knowledge, and because "*..of their Bedouin attitude, the Arabs were at first not skilled in navigation and seafaring, whereas the Byzantines and the European Christians, on account of their experience of the sea...were used to the sea and well trained in navigation.*" Indeed, according to the writer Mas'udi, the waters of the sea itself were felt to be different, for although nails could be used to build ships in the Mediterranean, it was felt that in the Abyssinian Sea the metal would become thinner and weaker (Fahmy, 1966:80).

Rosenthal's *Muqaddimah* tells us that the caliph 'Umar recommended that the Muslims avoid seafaring because he was told that "*The sea is a great creature upon which weak creatures ride - like worms upon a piece of wood.*" (III.34). However, under the control of 'Umar's eventual successor 'Uthman, raids to the Indian coast near Bombay and the mouth of the Indus did occur during 'Umar's reign in 636, against his strict orders (Hourani, 1966:53). Only once did the caliph 'Umar order a seagoing attack, as a reprisal against the Abyssinians in 641 (Hourani, 1951:54). The first raids in the Mediterranean did not occur until eight years later, under the caliph 'Uthman, led by Mu'awiyah against Cyprus.

Significantly, the Muslims, after only 16 years of *jihad* in 650, had captured nearly three times the amount of territory that Persia had fought for just 25 years earlier, in nearly the same amount of time. However, in comparison to their swift terrestrial gains, it seems noteworthy that it required another 15 years from the Muslim advancement on the Mediterranean in 640, to reach the Lycian coast and win a major naval battle there, *Dhat al-Sawari*, the Battle of the Masts, in 655.

Literary sources reveal that leading into the 8th century, the arriving Muslim state used local shipbuilders in both Syria and Egypt to supplement their lack of experience in this industry (Khaldun, III.34; Hourani, 1951:57; Hitti, 1966:180). In Egypt, the Muslims employed the Copts to build warships that would match those found in the Byzantine navy, and it has been surmised that the construction of Byzantine *dromons* for the Muslim arsenals was the result (Kreutz, 1976:94). This assumption has been strengthened by papyri found in the cache at Aphrodito[14] which mention the repair of *dromonaria* at the arsenal of Babylon in 709, a requisition for sailors for the *carabi* and *dromonaria* also in 709, and the departure and return of *dromonaria* from Laodicea in 714 (Fahmy, 1966:37, 53, 100). A large portion of these papyri are in the form of letters written to the pagarch of Aphrodito, from Qurra ibn Sharik, the governor of Egypt from 709 to 714 (Fahmy, 1966:6). They predominantly consist of requests for sailors, workmen, and materials to be sent from Aphrodito in upper Egypt, to the arsenals at Alexandria, Babylon in the Nile delta, and the port of Clysma at the western end of the freshwater canal, near the modern town of Suez (Wilson, 1933:2).

The site of Clysma gained importance under the Umayyad caliphate when the canal from Cairo to the Red Sea was reopened to divert the Egyptian corn trade to Medina in Arabia (Hourani, 1955:60). It becomes evident from the papyri that by the early 8th century, Clysma was becoming not only a center of trade between the Red Sea and farther east, but also the location of a naval arsenal for the Muslim fleet (Bell, 1910:XXXIII; Fahmy, 1966:23). The Aphrodito papyri #1387 and #1433 both mention *carabi* at Clysma, ships that were stationed at the arsenal in Babylon for the yearly raid in 715, and that were also felt to be castellated to protect the soldiers aboard (Fahmy, 1966:25, 26, 126). Additionally, papyrus #1386 is a requisition order

[14] Modern Kom Eskhaf, Kum Ishqau (Baedeker, 1914:219), or Kum Ashquh (Fahmy, 1966:5).

that includes provisions for sailors at Clysma, and #1433 is a request for sailors to man the *carabi* at Clysma (Fahmy, 1966:26). These requests for sailors were similar to other requisitions for workmen and goods from the local pagarchs, and were part of a conscription process that supported the Muslim naval fleets (Fahmy, 1966:100, 103). Although it may be unclear why at this period a military fleet was required at Clysma (Fahmy, 1966:60), it seems evident that a fleet was stationed there nonetheless.

But more importantly, the question arises as to how the *dromonaria* and the later Muslim fleet were built, and if the Muslim incursion into the Mediterranean played any role in changing shipbuilding and seafaring practices in the Mediterranean.

From ibn Khaldun's *Muqaddimah* and the actions of caliph Umar in the 7th century AD, it is clear that despite the Muslims' experience in the Arabian Sea and Indian Ocean, they felt that their skills and ships were not prepared for the conditions in the Mediterranean. We could assume that initially then, there was little attempt on their part to impose the method most familiar to them, sewn plank construction, on the Coptic builders in Egypt.

Unlike the composite shell first methods that still prevailed throughout the Mediterranean, the sewn plank method in the Arabian Sea and Indian Ocean is reliant upon stitching the exterior planks edge to edge with coir rope made from coconut husks (Hourani, 1951:92). The stitching is drawn tight over internal coir stringers that also act as caulking, to keep the ship watertight. The most distinct difference between the Mediterranean and the Arabian method is that no nails were used to construct ships in Arabian waters (Hourani, 1951:92), while the use of iron and copper fastenings was accepted practice in the Mediterranean. Tacks were the preferred method of attaching copper and lead sheathing to the exterior of ships to repel *Teredo navalis*, and archaeological evidence reveals that at the Gela site, copper and iron nails were used to affix the exterior planking to the frames as early as the late 6th to early 5th century BC (Parker, 1992:189).

From the 12th century the writer ibn Jubayr explains that "*...No nails are used in the ships of the Red Sea; they are merely stitched together with cords of coco-husk...The planks are perforated with stakes of palm wood and then saturated with mutton fat, castor oil or shark oil; the last is the best.*" (Fahmy, 1966:80). In the 10th century Mas'udi explains that "*...the vessels of the Mediterranean and the West are all*

joined with nails", and that metal fastenings would become weaker in the waters of the Abyssinian Sea (Fahmy, 1966:80).[15]

Therefore, when the Aphrodito papyri #1369, 1399, and 1408 reveal requisition orders for lump iron to be made into nails for shipbuilding purposes at the arsenals in Egypt (Bell, 1910)[16], it seems that as of 710, Muslim techniques apparently had not played a role in the construction of their own fleets. Instead, the Coptic techniques appear to predominate.

However, it is difficult to determine what method of ship construction the Copts may have been using. The first half of the 7th century is a transition period in which the traditional method of edge joining exterior planking with mortice and tenon joints is disappearing, while frame first construction is taking its place. Three ships from this period, Pantano Longarini, Yassıada A, and St. Gervais B, exhibit this transitional phase. Whereas in the 4th century the exterior hull planking and the mortice and tenon joints within it were predominately constructed first, by the 7th century, stronger internal framing made up for the lack of hull integrity contained in the degrading edge joints (Steffy, 1994:84), and a greater number of construction methods were possible. A composite construction method came to light in the investigation of the Yassıada A ship from c.626. The five or six pine bottom planks were built up first, the floors were installed next, planking was continued up to the 10th strake, then larger floor timbers followed (Steffy, 1994:80). Mortice and tenon joints were used between the strakes, but they were found predominately at the ends of the vessel, apparently as planking guides (Steffy, 1994:80). These construction characteristics are apparently repeated in the Pantano Longarini ship (Throckmorton *et al*, 1968:187; Parker, 1992:313). What is crucial in these two ships is that their construction is a few simple steps away from the frame first method, where the floors would be installed before the bottom planking, eliminating the need for edge joining. In the St. Gervais B ship from 600-625, it seems that step was taken. The floors and half frames were fitted to the keel first, and the planking was affixed second. This is evident from some planking that was cut thicker internally to meet the framing, and other examples where internal shims were installed between the planking and framing to fill gaps (Parker, 1992:373).

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[15] A interesting note to this is that the Aini wood that Tim Severin used in building the Sohar, which was available during the 6th and 7th centuries AD, causes nail sickness, and nails will fall out.

The only mortice and tenon joints on St. Gervais B were found irregularly spaced at the ends, and apparently used again as planking guides (Parker, 1992:373).

From investigation of the Athlit Ram, it is clear that the use of mortice and tenon joints in warships was similar to that of merchantmen, so the assumption could be made that warships may have been going through the same transitions during this period. Steffy maintains that on a ship built with mortice and tenon joints, the watertightness of the hull was dependent on the seams, and the construction method did not permit driven caulking (Bass *et al.*, 1982:72). However, it is interesting to note that papyri #1391, 1410, and 1514 concern the recruitment of shipbuilding caulkers for the Muslim naval arsenals (Bell, 1910). Also, on Yassıada A, the artifact #Fe31 has been identified as a caulking iron (Bass *et al.*, 1982:298), which could be interpreted as evidence that either Yassıada A had driven caulking that may have needed repair, or other ships with driven caulking existed that the carpenter on board could repair. Overall, the caulking iron on Yassıada A may reveal that with inadequate mortice and tenon joints, or a lack of joints throughout the exterior planking, caulking may be required to keep the ship watertight, as the edge joining process no longer fulfills that demand. There are two earlier instances of caulking on sea going, mortice and tenon ships, Jaune Garde B from 200-140 BC, and Port Vendres A from c.AD 400 (Parker, 1992:222, 329). In both of these ships however, the caulking was not driven in like oakum after the planks were assembled. On Jaune Garde B, the caulking, presumably tow or pitch, was pasted on each mortice and tenon joint, and on Port Vendres A, tow was used between the seams (Parker, 1992:222, 329).

A conclusion that the Muslim *dromonaria* were built in a composite or frame first method based on the limited evidence of the papyri, the caulking iron, and the construction of Yassıada A, would not be justified as more evidence would be required. Unfortunately, it is unclear if the caulking found on St. Gervais B was driven in like oakum or smeared on like pitch, and it is also unclear what material the caulkers in Egypt were using. If both could be determined, they might shed light on the construction method of the Coptic built *dromonaria*.

Unlike construction techniques, other Muslim practices seem to have taken precedent over Mediterranean traditions. The most noticeable of these are the *cursus*

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[16] See Appendix II.

raids throughout the Mediterranean, occasionally taking place during the winter months (Bell, 1910:#1349). For centuries, the Greek and Roman states avoided sailing during the winter months for good reason, the sea was frequently hit with unpredictable storms, and the wind patterns could be erratic (Kreutz, 1976:97). The new Muslim state however, disregarded the warnings they inevitably heard and set sail anyway (Kreutz, 1976:97), apparently with mixed results. The wintertime raids, such as the taking of Taranto in the 9th century, were unpredictable and unprecedented (Kreutz, 1976:97), and no doubt added to the effectiveness and the speed with which Islam spread through the Mediterranean. Eickhoff observes however, that the Muslim fleet may have lost four ships to storms, to every one they lost in battle (Kreutz, 1976:97*n*). This high ratio may be the result of the Muslims' seafaring inexperience, and it could also be a result of the Mediterranean predilection for sailing during the seven good months of the year (Kreutz, 1976). It has already been established that the Copts were simply building Byzantine *dromons* or *dromonaria* for the Muslim fleet, but these double banked galleys were the result of nearly eleven centuries of tradition built upon fair weather warfare in the Mediterranean. A *dromon*, which may have measured approximately 30.625m long, may have had a length-to-beam ratio as narrow as 8 to 1, resulting in a beam around 3.83m (Gardiner, 1995:105). A ship with these dimensions is built for speed, not for all weather sailing, and as a result Eickhoff's conclusions are not surprising, and most likely correct.

The Prophet Muhammed said that the lives of Muslims must not be risked on expeditions which served no useful purpose (Hourani, 1951:54). In light of this, we could assume that the losses incurred by the Muslim fleets during their wintertime raids must have been outweighed by early gains such as new followers of Islam. As a result, wintertime raids still occurred, and thus the changes that had to result were in the ships themselves. By the reign of Leo VI, the swift, double banked galleys similar to those in the Byzantine navy had been replaced by ships that were reported to be large, heavy, and relatively slow (Kreutz, 1976:95). In comparison to the Byzantines' purpose built navy, the Muslim fleet of the 9th and 10th centuries may seem inadequate, but it is in fact more utilitarian (Kreutz, 1976:96). In light of all weather sailing, it seems much more useful.

Another change in the Mediterranean may be the widespread use of the lanteen sail. This is not to say that its initial introduction into the Mediterranean was

associated with Islamic expansion in 640, for some evidence has been brought forth which depicts lanteen rigged ships from as early as the 2nd century AD (Casson, 1994:118). Sottas has noted that passages in Procopius' *History of the Vandalic War* certainly seem to allude to the use of something other than a square sail in the 6th century (Kreutz, 1976:83), and Fahmy in *Muslim Naval Organization in the Eastern Mediterranean* explains that he is unable to determine if "*...the Muslims introduced or developed it* [the lanteen rig]." (Fahmy, 1966:123*n*).

The traditional square sail in the Mediterranean, similar to the *dromonarion* , was aptly suited to fair weather use and was the result of centuries of practice. During the summer months, the winds through the Mediterranean blew in a predictable northwest to southeast direction, and ships traveling to Crete, Alexandria, or Caesarea from Rome could count on a steady following wind (Casson, 1960:234). During the stormy months of the year however, the square sail lost effectiveness due to its inability to compensate for shifting and gusting winds at various points around the compass. It certainly seems possible that just as the ships themselves became more utilitarian and better suited for all weather sailing, the rig must have followed suit, or even preceded the change.

The lanteen rig may have gained predominance in the Mediterranean at this time for a variety of reasons. Primary was its usefulness in foul weather sailing. During a storm, it took time to stow a square sail and reef it up to the yardarm, but when using a lanteen rig, simply cutting the main sheet of the sail would drop it to the deck, deactivating it completely (Kreutz, 1976:98). Secondly, in the light of the various roles the ships of the Muslim fleet played year round, a flexibility in choosing the ship's course according to wind direction is highly advantageous, and more easily accomplished with a fore and aft rig (Kreutz, 1976:98).

The Muslims' use of heavier, beamier hulls and the lanteen rigs on their ships were most likely a result of the demands placed upon them by sailing in the Mediterranean during the stormy season. But if we can assume that the Copts, if no one else, warned the inexperienced Muslims not to sail during the winter, why did they do so anyway?

References to *cursus* raids occurring in the winter date from 28 AH, or 648-649, under the control of the admiral of Mu'awiyah's fleet, 'Abdallah ibn Qays al-Jasi. These raids occur before large scale trading was active between the Islamic and the

western Mediterranean states such as Venice or Naples, so it would be fair to assume that commerce was not the principle reason for sailing during the winter season. Instead, one explanation may be the location of the naval arsenal at Clysma. While Alexandria, Babylon, and Damietta may have been the primary centers for the fleet, it is clear that *carabi* and *dromonaria* were also stationed at Clysma, at the end of the freshwater canal at the northern tip of the Red Sea.

This canal, named the Khalij Amir al-Mu'minin canal during the Muslim occupation (Fahmy, 1966:23), followed the path of an earlier canal dug by either Sesostris or Necho which ran nearly 126km from the northern tip of the Red Sea, through the Bitter Lakes, to Bubastis (Wilson, 1933:1). This first canal was later deepened by Trajan, and extended approximately 71km from Bubastis to begin just below the Nile delta, nearly at modern Cairo (Wilson, 1933:5). In the 7th century AD, Trajan's canal was found to be silted up and blocked, but under the caliph 'Umar it was reopened to facilitate the corn trade to Medina (Hourani, 1951:60). Hourani asserts that during the Muslim occupation, this canal was only available during high Nile due to the gradual rising of the land in the area (Hourani, 1951:60), and the Aphrodito papyrus #1346 demands that the supplies requested are sent before the water in the canal subsides (Fahmy, 1966:25). Also, this limited availability is evident by the fact that the difference between high and low Nile at Cairo is approximately 16ft, and remains of masonry reveal the Muslim canal to be between 16 to 17ft deep, and 50 yards wide (Baedeker, 1914:LXV, 180).

Additionally, the annual inundation of the Nile begins far upstream in Wadi Halfa during the months of June and July. However, its peak is not reached until August or September, at which point another week or two is required for the flood crest to reach Cairo (Hurst, 1952:238-239; Walker, 1964:464). It is clear from the 10th century *Ahsan al-Taqasim fi Ma'rifat al-Aqalim* by al-Muqaddasi that the annual flooding followed a similar pattern during his lifetime, and even in the 7th century. Al-Muqaddasi explains that the rising of the Nile and flooding of the delta villages such as Damanhur coincides with the Festival, or Exaltation, of the Cross (Muqaddasi:206). This festival was developed by Pope Honorius I around 638 to commemorate the restoration of the true cross to Jerusalem by Heraclius, and was celebrated by the Coptic church for three days, from September 13th to the 15th (Smith *et al.*, 1875:502). Al-Muqaddasi goes on to say that the filling of this canal, which according to his text

ran from 'Ayn Shams[17], would occur at this time along with the rising Nile (Muqaddasi:206). In light of the limited availability of the freshwater canal from the middle of September through the end of October, it should be remembered that the traditional sailing season in the Mediterranean was scheduled to close by November 10th. For galleys however, it would close on September 14th (Gardiner, 1995:210), or just before the time at which the freshwater canal becomes useful.

Herodotus tells us that by boat, the journey along the approximately 126km long canal required four days of travel (Herodotus:II.155-160). However, he neglects to tell us what type of craft he is describing, or which way they are traveling. Assuming seven hours of rest a night, a *trireme* at a pace of 5.9 knots [6.7 miles per hour] for the journey from Clysma to Bubastis (Gardiner, 1995:58), could complete it in around 11 hours, less than a full day of rowing. After the extension built by Trajan to Cairo, the same *trireme* could complete the nearly 197km journey in approximately 18 hours, or traveling all day.

If a similar relationship in speed can be assumed between a double banked *liburnian* and a double banked *dromonarion* (Gardiner, 1995:94), then it would fair to conclude that the Muslim *dromonaria* were capable of sprinting around 7.5 knots, and could easily maintain a pace of approximately 5 knots (Gardiner, 1995:141). By that speed on calm water with seven hours of sleep, a *dromonarion* could reach Cairo in approximately 21 hours, about a day and a third.

Once the canal was full, it was most likely available for approximately a month (Hurst, 1952:238). As a *dromonarion* may have apparently needed it for about a day or so, the Clysma contingent of the *cursus* fleet could have arrived in Cairo by the second week of September, just at the very edge of the stormy season. However, the ships would still have to overcome the flood currents running against them for the entire journey. Previous to the high dam at Aswan, approximately 548 miles upstream from Cairo, over 700 million cubic meters of water passed through the cataract each day during the height of the flood season (Hurst, 1952:241). Even if, for example, downstream at Cairo this amount was reduced by two-thirds, and only 10% of that volume was diverted down the canal, we still arrive at a figure of just over 23.3 million cubic meters of water moving towards Clysma each day. If the canal is estimated at

[17] Ancient Heliopolis NE of Cairo.

197,000 meters [106.18 nautical miles, 122.26 statute miles] long, 45.7 meters wide [50 yards], and 4.87 meters deep [16 feet deep], we find that when full, it would contain 43,844,123 cubic meters of water. If only 10% of the flood current at Cairo is diverted down the canal, then a ship could conceivably travel from Cairo to Clysma in just under two days, in a 2.36 knot [2.7 miles per hour] current. Even if at Cairo the initial amount was reduced by five-sixth, and 10% of that amount was taken, there would be still be .78 knots [.90 miles per hour] of current.

At a speed of 5 knots [5.75 miles per hour], a *dromonarion* would travel approximately 120 nautical miles [138 miles] a day in calm water. However, in the freshwater canal with a 2.36 knot current against it, the *dromonarion*'s progress would be reduced to 63.6 nautical miles [73.2 miles] a day, nearly doubling the rowing time to 40 hours. Even if the *dromonarion* was fighting just a .78 knot current, it would only make 101 nautical miles [116 miles] a day, increasing the rowing time to 25 hours. Therefore we could assume that while the grain carriers to Medina had a relatively easy two day trip downstream to Clysma, when departing, the *dromonarion* crews may have had two to three days of constant rowing ahead of them, just to reach Cairo or Babylon.[18]

However, the staging port for the fleet was Alexandria, approximately another 180km [97 nautical miles] through the Nile delta. If instead we add the hypothetical 2.36 knot current to the *dromon*'s base speed of 5 knots, we still find that it will take around 13 hours to reach Alexandria from Cairo. If to that amount we add possible delays due to the corn ships traveling through the canal to Medina, layovers in Babylon, and river traffic and flood conditions along the Nile to Alexandria, it may be safe to assume another two to three days could be added to the trip. Overall, a *dromonarion* may make it to Alexandria within four days, and at the worst, possibly six.

With luck, the *cursus* fleet may have amassed at Alexandria by the beginning of the third week of September, perhaps by the 18th or the 20th. The fleet however, still had to depart the arsenal and travel along the coasts to their target.

Their progress relied on visibility, prevailing wind direction, currents, and even the wave activity of the area. Galleys, even through the high Middle ages, navigated by

[18] See Appendix III, for the mathematical processes used.

sight and landmarks along the coasts (Gardiner, 1995:210-211). Cloud cover however, would obscure the positions of the sun or stars, and would thus obliviate the usefulness of any navigational instruments the Muslims possessed. Fog was always a hazard, as was rain that was common in the winter time Mediterranean (Gardiner, 1995:210). Even during periods of good visibility, the coasts of North Africa, including Egypt, were felt to be very hazardous for galleys due to the shoals, sandbanks, and a lack of safe harbours and clear landmarks that could be spotted from a short mast (Gardiner, 1995:213). The prevailing winter winds and currents from the west aided a route along the Palestinian coast (Gardiner, 1995:206-207), but any adverse wind conditions would force a galley to quickly find shore, for a heel of more than 10 degrees would wash water across the decks and possibly break the leeward oars (Gardiner, 1995:209). Additionally, the average wave height off the coast of Egypt and Israel, from September to March, was from 1.0 to 1.2 meters in height (Gardiner, 1995:209), and may have easily washed over the low freeboards of the Muslim *dromonaria*. Low pressure systems in the northern Mediterranean increased the possibility of gales and storms, and the prevailing winds became more northerly (Gardiner, 1995:210). Simply put, the Muslims were placing themselves in unpredictable and untested situations, and their *dromonaria* in conditions they were never built for. Clearly, when the faults of the Byzantine *dromonarion* are emphasized in the winter time conditions of the Mediterranean, it is evident why the Muslim fleet abandoned it for a beamier, heavier, and stronger design.

Any progress the Muslim *cursus* fleet made was very slow and careful, and could be delayed in port or on shore at any time due to adverse conditions. A galley caught in a rising tide for example, rowing against a breeze over 17 miles an hour, was in danger of being driven ashore (Gardiner, 1995:209). Examining the Muslims' apparent seafaring inexperience, the number of ships Eickhoff predicts were lost to storms each year, and the precautions they no doubt followed, it would be expected that raids that departed Alexandria in September may have taken a month or two to reach their destination. Therefore, the assumption could be made that some of the winter time raids were not dictated by military or economic reasons, but instead by natural ones. If the Muslim fleet required the use of *carabi* or *dromonaria* from Clysma, perhaps due to shortages or losses in the arsenals at Alexandria or Babylon, the ships were unavailable until the waters of the Nile rose. Unfortunately for the

admiral of the Muslim fleet, the rising Nile did not fill the canal to Clysma until the second week of September or so, just the point at which the sailing season for galleys is closing. Any movements the fleet made after that date would have occurred in weather that was increasing in severity. In turn, their progress would slow considerably, and they would most likely reach their destination well into the winter season.

Chapter III

Merchants and Shipbuilders under Muslim Rule

But where do these changes leave the merchants residing in Asia Minor, Syria, Palestine, and Egypt? Initially, with the widespread assimilation of the Muslim culture along the shores of the eastern and southern Mediterranean, there was an associated acceptance of the Muslim trading and economic policies. Previous to the spread of Islam, Mecca had been a city full of merchants (Grunebaum, 1953:215), and Arab society before and after Islam had a positive view towards earning and amassing of capital, and even certain amounts of luxury through mercantilism (Goitein, 1957:586). *Al-hadar* tribes, such as the *Quraysh*, who were the tribe of the prophet Muhammed, were not anomalies within Arab society, and despite their mercantile activities, still became holy after the prophet's death (Crone, 1987:186). The first caliph, Abu Bakr, traded cloths, and the third, 'Uthman, imported cereals (Goitein, 1957:589). In the middle of the 8th century, the Arab writer Shaibani regards mercantilism as a religious duty, and writes that the profession of the merchant, or any trade, would please God more than government service (Goitein, 1957:586-588).

Mercantilism and individual capitalism were an essential part of Arab society before and after Islam, and the partnerships and trading policies between individuals that developed was one of the unifying aspects, besides the religion itself, of the society. As no centralized system of government had developed, contracts and agreements on credit and faith held a great deal of weight within the society, and the Covenant of 'Umar is a clear example of this. The promises made between the Muslim invaders and the capitulating city are based on good faith and acceptance of a culture, not necessarily conversion and loyalty to a culture.[1] The language of the covenant resembles that of a standard contract between partners, as long as the terms of the contract are adhered to, it will not be broken. According to al-Balâdhuri, the city of Qinnasrin was not put under siege until after it broke the covenant, and the same can be said of Antioch, which had a Muslim garrison in place also, only after it broke the agreement (Hitti, 1966:224, 227).

[1] See Tritton, 1930:12-16, the pattern treaty in *Kitab ul Umm*.

This cultural bias towards individual capitalism and partnerships held obvious gains for the merchants in Palestine, Syria, and Egypt in the early 7th century, Spain by the early 8th century, and Italy by the 9th century, areas that were previously hampered by policies under the Byzantine empire. This same cultural bias was also one of the greater contrasts between the Byzantine and the Muslim empires. While in the Byzantine empire, mercantilism and individual capitalism had been regarded as the practice of the middle and lower class, something that wealthy gentlemen would not engage in, within the Arab society, partnerships and trade were the basis of its culture. In both societies, their biases and idiosyncrasies in the 7th century were determined by centuries of development. While in the 9th century, the Byzantine Emperor Theophilus was quoted as saying that "*...commerce should be reserved for humble people...*[and that] *God had made him an emperor, not a naukleros.*" (Lopez, 1976:349), the caliph 'Umar supposedly said in the 7th century that: "*I prefer dying on my camel's saddle, while traveling on business, to being killed in the Holy War...*" (Goitein, 1957:588). Each society had developed according to the mentality of the wealthy aristocracy, a way of thinking that was often reflected by the wishes of the ruler, who then determined the policies of the society. In each culture, a cycle had developed that in one, shunned the merchant class, and in the other, glorified it.

With this new bias, came the associated goods that were suddenly available for trade. Within the Byzantine Empire, the *naukleroi* exported a very small number of luxury goods, due to government restrictions and the self sufficiency of the territory, but as a result, it also imported a very small amount, decreasing the business with merchants from the West (Lopez, 1951:225). Spices, perfumes, jewels, and cotton arrived from India and Arabia, furs and slaves traveled through the Black Sea (Lewis, 1988:57), and gold from the mines in Egypt and Nubia was imported for the production of Imperial bezants (Lopez, 1951:227), but each exchange had to occur at one of the many *apothekai*, or later, the *mitata* in Constantinople. While it could be said that it was within the territorial waters of Byzantium that merchants were able to encounter and trade these goods, there was very little that the *naukleroi*, employed by the state or not, could do. Simply put, the profession played an almost passive role in the seafaring trade of the Byzantine state, overseeing the transporting of the goods from one place to another.

Within the Muslim state however, the merchants played an active role in the economy of the society. Once the Muslims had successfully gained territory in Syria, Persia, Palestine, Egypt, and Spain, they gained control over all goods traded through their borders. The Muslim state, and thus the merchants within the state, gained access to the gold mines in Egypt and Nubia, the spices arriving from India, and all textiles and goods that had previously traveled to the Byzantine Empire from Arabia. The Muslim merchants also gained access to the exotic luxury goods traveling to Byzantium from all over the Mediterranean and the East. One document, written in the 9th century and attributed to al-Jahiz, is called *The Investigation of Commerce*, and it contains a list of items imported into Baghdad, the new Muslim capital after 750. It mentions tigers, panthers, and elephants arriving from India, ostriches from Arabia, slaves from the Khazars northwest of the Black Sea, felts from the Barbary coast, carpets and packsaddles from Azerbaijan, and numerous other items from around the area (Lopez *et al.*, 1955:28).

In addition, exclusive treatment was not limited to just Muslim merchants. In al-Balâdhuri's description of the capitulation of the city of Ba'albakk, part of the covenant mentions that the *dhimmi* merchants are entitled to go where they want in any country that has made a covenant with the Muslims (Hitti, 1966:199). In the Covenant of 'Umar outlined in *Kitâb ul Umm*, it mentions that merchants in capitulated territories are not required to pay *jizya*, a poll tax, that they may not enter Mecca, only remain in Hedjaz for three days, but otherwise they are free to travel where they please (Tritton, 1930:14). While they are required to pay to Muslims one tenth of their merchandise when they travel with it (Tritton, 1930:14), they are only required to pay half of the amount of taxes that a foreign trader would (Tritton, 1930:218).[2]

Newly conquered cities too, may have begun to profit from the Muslim emphasis on mercantilism. While it is clear that shipbuilding had been reestablished at the ports of Acre and Tyre by the mid 7th century, it is not specifically written that mercantile trade was operating out of these ports. It is, however, also clear that trade and trade routes were still operating at the port city of Caesarea, and inland at Jerusalem and

[2] One tradition says that only foreigners were required to pay 10% tax on goods, another that *dhimmis* paid 10%, and another that *dhimmis* did not pay within their own province. See

possibly Damascus. Upon the capture of the city of Caesarea, which must have had a great deal of military and economic support as it held out for over five years against the Muslims, 300 markets were found within the city, all apparently in good shape (Hitti, 1966:217). The Bishop Arculf c.680, upon reaching Jerusalem, explains that "*On the fifteenth day of the month of September yearly, an almost countless multitude of various nations is in the habit of gathering from all sides to Jerusalem for the purposes of commerce by mutual sale and purchase.*" (MacPherson, 1895:3). Whether this market was new or not is unclear, but it certainly seems as if it was an established practice that could have begun in 638 or earlier.[3] It is also unclear if this marketplace remained active through the Muslim invasion, but in that case, what may be most important is the mercantile activity that was quickly reestablished. Finally, the ability of Damascus to hold out against the Muslim besiegers, and the city's eventual payment of money along with its capitulation (Hitti, 1966:191; Palmer, 1993:128), indirectly shows a certain amount of military and economic strength. Also, Balâdhuri mentions the quarter of coppersmiths, and the market of oil dealers within the city limits (Hitti, 1966:188-189). While the economic activity of these three cities is not definitive evidence that private trade was occurring at the ports cities of Acre and Tyre, it certainly seems likely that as these two cities were supported militarily, a parallel increase in their economic activity would follow. Taking advantage of the mercantilism that was already active nearby, and which was the earlier practice of the area, would seem to be the most likely path that these cities could take.

A similar situation could have occurred in the port cities of Clysma, Damietta, and Babylon on the Nile, where fleets of *carabi* and *dromonaria* were stationed for the Muslim fleet. As the cities were revitalized though their military standing, economic prosperity most likely followed. Of primary importance in Egypt was its grain production, and just as the Muslims took over the Byzantine administration, they also maintained the distribution of corn and grain inside and outside the country (Lewis, 1951:79). The corn ships were now routed to Medina in Arabia, and they used the reopened Khalij Amir al-Mu'minin canal which passed the Muslim capital of Fustat, Babylon, and Clysma on the Red Sea.

Tritton, 1930:219. This example is similar to the confusion that also arose over the legality of churches.

The city of Alexandria most likely followed the same path as it became the primary naval base for the Muslim fleet, and Butler maintains that it never experienced a fall after the Muslim invasion (1978:114). Despite its revolt against the covenant and the Muslim reprisals in the first half of the 7th century (Butler, 1978:465), it no doubt remained a center of trade and industry within Egypt, and there is little reason to suspect that the Muslims would not take advantage of the city's economic resources. In the account of Bishop Arculf's visit to Alexandria, he mentions that the port must be large because it maintains the commerce generated by the entire city, which incidentally supplies a great deal of corn and other merchandise for the rest of the world (MacPherson, 1895:50).

In addition to the revitalization provided by the presence of the military, until 693, the Muslim administration in Egypt kept minting Byzantine Imperial gold bezants (Lewis, 1951:79), to ease economic tension between the two empires. Even more remarkable is the Muslim production of coinage in captured mints at Scythopolis, Damascus, Ba'albakk, Hims, Qinnasrin, and other cities in Syria and Palestine that are clear copies of Byzantine counterparts (Walker, 1956:xxiv). Within the catalogue compiled by Walker, there are approximately 77 examples of coins minted under the Ummayad caliphate that not only retain the earlier Byzantine format, but also the Greek script and the imperial figures, simply without their names.

Between the years 670 to 705, there are an additional 100 coins catalogued that do not bear a direct resemblance to a Byzantine type, but still retain definite Byzantine characteristics. All 19 examples of Ummayad coins minted in Jerusalem[4] or Palestine bear a distinctive reverse, a definite attempt to emulate coins minted under Heraclius that also bear this mark (Walker, 1956:xxxii). The remaining 81 coins have instead a cross standing on three steps on the reverse, and  are clear examples not only of the Muslim tolerance and assimilation of other religions, but of Muslim attempts to retain the confidence of non Muslims in their territory, the *mawali*. Finally, and most important, all of these examples are minted copper coins, the most common denomination in mercantile activity, and none are silver, which were rarely in use. The only minted gold coins that appear in

[3] The Exaltation of the Cross in Jerusalem occurs just the day before, and was first officially celebrated in 638.

[4] Identified in the catalogue as Iliya Filistin, the Arabic name of Jerusalem.

Muslim territory occur during and after the reign of 'Abd al-Malik in the very late 7th century, when the caliph attempted to secede from the economic reliance on Byzantium and the Emperor Justin II. The caliph proclaimed his rebellion by minting his own gold coins, a practice which was previously maintained only by the Byzantine empire[5], and removing any pictures or representations of people or things, essentially eliminating any Byzantine characteristics.[6] What he clearly maintained however, was the size and weight of his gold coins, which were nearly identical to previous Byzantine examples, and the benchmark that his coins would be judged against.

All of these practices within the Muslim territory make it fairly clear that the caliphate was aiding merchants, Muslim, *dhimmi*, or *mawali*, that were trading within its borders, or with the Byzantine empire. But what is more important is the apparent continuous economic cooperation that occured between the two empires. As mentioned earlier, the *commerciarioi* that were established in the late 6th and early 7th century along the empire's borders regulated and oversaw the buying of silk and other imports into Byzantine territory.[7] When examining the lead seals of the *commerciarioi*, what is significant is that similar to the seals of the Bishops and churches from the same period, they do not disappear. In both cases, despite what appears to be political and military instability along the Byzantine-Muslim border, the seals still reveal the presence of official government activity. In the cases of seals of *commerciarioi*, their activity suggests that not only was there a steady flow of goods across the new border, but that the economy of these border regions may have been much more stable than previously thought.

The Byzantine-Muslim border stretched from the territory of Armenia I in the northeast along the Black Sea coast, and as it progressed southwest, it became increasingly indistinct. Prior to the naval engagement at the Battle of the Masts in 655 off the coast of Lycia, the Byzantine border would have stretched to approximately Isauria, Tarsus, or Seleucia. After the battle, and the Muslim victory, any territory east of Phoenix could be considered either in Muslim territory, or easily attacked. By

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[5] See Lopez, 1978, essay VII, "The Dollar of the Middle Ages" for a full discussion of the representative and actual power embodied in the Byzantine Imperial bezants.

[6] See Walker, xxx, for the religious support of this practice in the Islamic Hadith literature, collected after the death of Muhammed.

[7] See Dunn, 1993, "The *Kommerkiarios*, the *Apotheke*, the *Dromos*, the *Vardarios*, and *The West*." in *Byzantine and Modern Greek Studies*, vol. 17, for the other aspects of the role of the *commerciarioi*.

680, despite repeated Muslim attempts to capture Constantinople, it was clear that coastal territory along the south and southwest coast of Asia Minor was vulnerable.

But, although repeated raids kept occuring almost yearly across the terrestrial border in Asia Minor, and the coastal territories of Lycia and Pamphylia were clearly within striking distance of naval attacks, numerous lead seals from these areas attest to the continuing mercantilism that occured.

Beginning along the northern edge of the border, in Armenia I and IV, two seals from the late 7th and early 8th century mention George, Synetos, and Nicetas, all *genikoi commerciarioi* of *apothekai* in those provinces.[8] In Cappadocia, just southwards, there are eight extant *commerciarioi* seals from this period, the two earliest from 659, the latest from c.692, and the position was presumably occupied well into the 8th century.[9] Cilicia, the territory encompassing Antioch on the Orontes, Alexandretta ad Issum and Tarsus, area that was overrun by the Muslim general Abu-'Ubaidah between 636 and 637 (Donner, 1981:150), was still acting as a clearinghouse or a warehouse by 668, as the first of four seals attests.[10] Moving westwards along the coast, Isauria, containing the cities of Seleucia and the monastery of Alahan, was also the location of the *commerciarius* Peter and his *apotheke* from 676-677, Kosmas from 681-682, Thomas from 690-691, and George and Theophylactos from 691-693.[11] From Pamphylia and Lycia, areas that were apparently attacked and devastated by Arab raiders[12], four seals that date after the Battle of the Masts at Phoenix in 655 and the Arab attacks on Constantinople from 672-677, may be taken to represent the economic stability of the region.[13] Areas farther inland, such as Lycaonia, Galatia, and the Opsikon theme still apparently had access to goods and trade through the region as revealed by 13 surviving seals.[14]

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[8] Zacos *et al*, #191, 219.

[9] Zacos *et al*, #142, 143, 2761, 160, 166, 170, 172, 173.

[10] Zacos *et al*, #149, 159, 212, and an unnumbered seal belonging to Julian; *apo hypaton* and *genikos commerciarios* from 691/2.

[11] Zacos *et al*, #154, 158 [same as *Oikonomides*, 1986: #21], 2763, and 177.

[12] See Foss, 1994:3 and 1996:3. Also Foss, 1994:9, 50 as the recorded inscription cannot act as evidence of Arab raiders or looting.

[13] Zacos *et al*, #189, 2764, and 225, which represented the *Apotheke* of both Lycia and Pamphylia.

[14] One seal from Galateia from 654-659 (*Oikonomides*, 1986: #14), three from Lykaonia from the late 7th century (Zacos *et al*, #166, 172, and 177), and nine from the Opsikon theme dating from early 8th century to the second half of the 9th (Zacos *et al*, #3078A, 3079, 3080A, 3081, 3096, 3113A, 3165, 3176, and 3194). The Opsikon theme developed from Hellespontus and Bithynia in the mid 8th century.

If, after the increasing Muslim threat along the Byzantine-Muslim border, the seals and the presence of *commerciarioi* disappear, then it would be natural to assume that trade from the East traveling through Asia Minor, either along the northern or southern coasts, was stopped by the hostile caliphate. The *commerciarioi* were mercantile agents working to acquire goods for government production, and as such, if the caliphate wished to disrupt Byzantine industry, they could have done so fairly easily by attacking the *apothekai*, or blocking the routes from the East. But yet, as the *apothekai* were maintained and the *commerciarioi* completed their duties, it seems that trade from the East continued, and the presence of Byzantine officials was acknowledged and accepted by the caliphate.

There are other instances of cooperation between the Byzantine government and the Muslim caliphate, and the caliphate and foreign merchants. Ibn Zabala's *History of Medina* from the early 9th century clearly describes the workmen, materials, and 80,000 dinars sent to the caliph 'Abd al-Malik by the Byzantine emperor to help restore the mosques in Medina and Damascus (Gibb, 1962:56). Regulations ascribed to the caliph 'Umar in the mid 7th century that specify the tolls paid by merchants at the territorial borders, reveal that Muslim traders paid 2.5% on their merchandise, 5% was paid by those living in Muslim territory, and 10% by foreigners, the Byzantines (Gibb, 1962:57). 'Umar II, from 717 to 720, apparently prohibited the placing of obstacles in the way of seagoing mercantile trade, and previous to the reign of 'Abd al-

Malik, papyrus was still exported to Byzantine territory in exchange for dinars (Gibb, 1962:57, 58).

It seems then, that upon the Muslim expansion into these territories came unifying aspects such as Islam and its tolerance of other religions on both a local and official scale, a revitalization of coastal cities along with military revenue, an emphasis on the importance of individual mercantilism, and a certain level of economic cooperation with the Byzantine empire. It was an atmosphere in which merchants were able to prosper and compete on a local and international level, trading both within Muslim territory with local goods, and with Byzantine or Western merchants with goods from Europe, India, and the Orient.

But these merchants could fully participate in a competitive market of seaborne mercantile activity only if they had access to an adequate means of transportation, and as such, merchant shipbuilding became a valuable, and needed practice through territory conquered by the Muslims in the second half of the 7th century.

In the same territory during the first half of the 7th century, land that was the Byzantine empire, shipbuilders, similar to merchants, were affected by the policies of the government, who maintained the artisans' guilds and developed strict control over their production (Lewis, 1988:57). Shipbuilders were able to borrow money from the moneylenders, but the rates of interest were regulated by the state, limiting the shipbuilders' profits and the number of people who would invest in their products (Lewis, 1988:57). As the Byzantine state oversaw the purchasing of raw materials, the manufacturing process, prices, marketing, and final profits, the result was that the craftsmen became employees of the state working under its direction (Tierney *et al.*, 1983:89). There was certainly industrial stability (Tierney *et al.*, 1983:89), no doubt supported by high taxes and government regulation, but there was little possibility for technological change (Tierney *et al.*, 1983:90; Lewis, 1988:58). While Byzantine industry was producing the finest silks, woolen materials, mosaics, and jewelry, its efforts to maintain its stability, essentially its divine existence, resulted in a conservatism that maintained a high standard of living while sacrificing progress. On one hand, the shipbuilders within the Byzantine territories found themselves limited by

government policies, not exposed to outside influences that could enhance their techniques[15], and had little access to profits that could expand their industry.

On the other hand, the shipbuilders were indirectly affected by the lack of demand that they encountered. The heavy taxation that affected the private merchants and their inability to cross the empire's borders, resulted in a demand for ships that was initially limited by a lack of mercantile competition, and the basic cost of production.[16] Demands for a new ship certainly may have come from the wealthy or the Church who had the capital to sponsor its construction, but commercial investments by the wealthy were rare (Lewis, 1988:57), and there is little evidence that they ever participated in trade (Lopez, 1976:349). If anything, the wealthy maintained the prosperity they developed on their agricultural estates.

The shipbuilding then, and any development or change in techniques, was at a relative low point during the first half of the 7th century in the Byzantine Empire. Private merchants and shipbuilders were hampered by government policy that limited their profits, their possibilities of investment, and eliminated the competitive nature of trading. The wealthy, who could in either case aid the merchants' or shipbuilders' economic expansion, were predisposed to disregard mercantilism and concentrated on their agricultural estates. Additionally, conservatism, not on the part of the shipbuilders but maintained by the Byzantine state, played an active role at this point, and most likely combined with the low level of demand to result in a standstill in shipbuilding development at this time.

Within the Muslim empire however, merchant shipbuilders played a direct role in the vitality of merchants and the economy of the state, and were not hampered by government policies that limited their abilities. It was already discussed that the local Coptic shipbuilders were quickly employed to build the Muslims fleets for their initial raids against Cyprus and so forth. Along the Syrian and Palestinian coast, similar actions were taken. We find that it was during the caliphate of Mu'awiyah that he transferred workmen from Antioch, Hims, and Ba'albakk[17] to Tyre, Acre, and other ports along the coast to reestablish the shipbuilding industry there (Hitti, 1966:180). But the local shipbuilders most likely began to profit from more than just requisitions

[15] See Unger, 1980:23.
[16] See Bass, 1972:140, the cost of construction.
[17] Also known as Hieropolis.

for military craft and repairs. Unger's statement that "*Merchant ships were always built to serve an economic function.*" embodies the reasons behind the changes that were about to occur.

Merchant shipbuilding had a direct link to economic stability and commercial possibilities. With the widespread assimilation of the Muslim trading and economic policies, came the associated demands for shipbuilding in economically viable areas, and a revitalization of the competitive nature in merchants.

It was the resurgence of these two factors, a widespread and increasing demand for merchant ships, and a competitive market, factors that were previously missing in the Byzantine Empire, that led to the loss of the mortice and tenon construction technique. Previously, under the Byzantine state, the conservative nature of the culture itself hampered the ability and the need for shipbuilders to change their techniques. An example of this is the Yassıada ship, constructed at some point in the first quarter of the 7th century, which exhibits a use of the mortice and tenon method that is clearly degraded from examples occurring three to four hundred years earlier. During that earlier period of time, the mortices and tenons added a great deal of longitudinal strength to the hull, and obliviated the need for large internal framing. By the 7th century however, not just the size and quantity of the joints had changed, but their application as well. By this point, they were used simply as guides to aid the construction of the external planking, and added little strength to the hull (Steffy, 1982:59). They were not necessarily a superfluous addition to the construction of the ship, but overall, as a result of their degradation they were only a few simple steps away from obsolescence.

The assimilation of the Muslim culture from the second half of the 7th century onwards however, brought about new mercantile needs generated by the independent merchants. Due to the increased amount of goods freely traveling through the Muslim state, and the clear emphasis on independent mercantilism, these were needs that could be easily supported by the liquid capital available, and transformed into new demands that would have to be met by the shipbuilders. By the end of the 7th century and throughout the 8th, to take full advantage of the revenue available and remain competitive in the marketplace, the rising number of merchants required ships that were smaller, easier to maintain, faster to build, and essentially less expensive than earlier examples.

To meet these new demands, shipbuilders during this period of time would have had to make some basic changes in their techniques, and essentially, the elimination of the mortice and tenon method would suffice. Initially, it would reduce the cost of the ship, by reducing the amount of time, labour, and materials required to build it, or for that matter, repair it. To build a hull in the mortice and tenon technique requires wood not just for the framing and external planking, but for the tenons and pegs also.[18] While it is certainly possible that these tenons and pegs could be mass produced in one way or another, they still contributed to the overall cost of the ship when calculating the time, labour, and materials used. When reconstructing the replica of the 4th century BC wreck from Kyrenia for example, there were 78 mortice and tenon joints in the 9.3 meter keel alone (Steffy, 1994:43), requiring approximately .32m^3 of wood to construct all the tenons required. Within the entire 14 meter hull, which contained approximately 4000 mortice and tenon joints (Steffy, 1994:48), an additional 8.25m^3 of oak was required to construct the approximate 2000 tenons needed throughout the ship.

Additionally, the loss of the mortice and tenon technique facilitated a wider range of more efficient building designs that required less skill to assemble. This is clearly demonstrated in the technique used to construct the Serçe Limani ship from the early 11th century.

As mentioned earlier, the ship was designed and built from a set of linear measurements based on various ratios approximating the Roman foot. The keel was essentially four Roman feet by three, as were the frames, and all initial measurements in construction were dictated by an inaccurate proportion of the Roman foot, approximately 16cm (Steffy, 1994:85-89). As compared to earlier examples such as Kyrenia or Yassıada A, there was very little deadrise and a very sharp turn to the bilge, resulting in a rather boxlike midsection. Except for the elm keel, the entire hull was built of pine, and with the basis of one approximate 16cm measurement, the entire hull

[18] It should also be noted that before and after the trade embargoes designed by Byzantium c.690, there was not a vast shortage of shipbuilding timber available to the Muslim state, so it can be assumed that this was not a driving force behind the loss of the mortice and tenon technique. Oak, which was a wood primarily used for tenons, was still available in Lebanon, as were other hardwoods such as Lebek (known as persea) and Acacia in Upper Egypt. See Fahmy, 1966, 147-149, and Meiggs, 1982, pages 59-60. Softwood such as Pine, which was commonly used as hull planking, was also available in Lebanon, Palestine, Cyprus, and

could be constructed. The full frames were 128cm apart along the keel, the midship frames were 192cm wide from the edge of the keel, and the deadrise was only 4cm (Steffy, 1994:88). It is a method whose basis is remarkably similar to the construction technique of turf boats in McKee's *Working Boats of Britain* and their linear ratios. McKee gives two examples of the simple construction method needed for these boats, and in both, the length of the boat, the depth throughout, and the aft beam, are all dependent upon the beam amidships.[19] Another similar construction process is that which utilizes a rising square mold, a breadth mold, and a hollow mold, whereby the three are used to determine all the basic measurements throughout the hull (McKee, 1983:122). Steffy even mentions the possible use of a boat ell by the builder in the 11th century (1994:85, 87), most likely in a use similar to McKee's example on page 111, where it is being employed to standardize measurements and ensure symmetry.

Just as in McKee's examples, where rules of thumb are employed to make what seem to be a complex practice standardized and simple to understand, the same has occured with the method used to construct the Serçe Limani ship. These turf boats were quick, simple, and cheap to produce, and one did not even have to be a shipbuilder to build one (McKee, 1983:107).[20]

Basically, these are attributes that the Serçe Limani ship had in its construction method, and were the basis of the demands placed by the rising number of merchants in the late 7th and 8th century. It was a ship that was quick and easy to produce, cheap to build, and could be easily repaired or replaced. These are characteristics, that while they may be achieved while still using the mortice and tenon method, are much more easily attained by eliminating it.

This elimination, and shift to the frame first technique, also allowed the shipbuilder to explore a much wider range of ship designs, along with a simpler construction method. When constructing a ship in the shell first method, the basic design is encompassed in the cut and the run of the external planking, whose use is

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Mesopotamia. See Meiggs, 1982, pages 54-63. Fig and Palm, which could also be used in hull planking, were also still available in Egypt, see Fahmy, 1966, page 77.

[19] The overall length of McGruer's turf boat is 2.67 to 2.75 times the beam, the forward depth, mid depth, and aft depth are 9/16, 3/8, and 7/16 the beam, and the beam aft is 2/3 that amidships. See McKee, 1983, page 109.

[20] The boat used as an example in McKee's book was built, in fact, by a woodworker who had not produced one for approximately 35 years, and was able to reconstruct it after placing some figures on a pack of cigarettes. See McKee, 1983, page 107.

immediately limited by the mortice and tenon method. When two external strakes have a rectangular cross section, they cannot be joined by a mortice and tenon joint at angle greater than 20°, otherwise, both the tenon inside the joint, and the peg to secure it, will be too close to the exterior surface of the plank, and weaken the wood (Welsh, 1988:106). To overcome this, planks that have to join at angles more than 20°, such as those along the bilge, have to be constructed from thicker planks, and carved out to build the appropriate curve into the plank (Welsh, 1988:106). But this only increases the range of design by a limited degree, and is easily offset by the increased amount of wood wasted, and the labour required to individually carve each plank.

Using the frame first method, the shipbuilder is only initially limited by the length of wood that is available to build with, and even then, scarfing planks together can easily surmount that difficulty. In terms of design, wine glass shaped hulls, such as that from Kyrenia, long racing hulls found on *triremes*, or boxlike hulls designed around carrying cargo such as that at Serçe Limani, can be built more easily, faster, and cheaper when using the frame first method. Steffy postulates that using the mortice and tenon method, the construction of the Serçe Limani hull would have been difficult, if not impossible (Steffy, 1994:91). But what is most important about the Serçe Limani ship is that just as the methods outlined by McKee are the results of years or decades of practice and refinement, Steffy postulates that both the technique and the design of Serçe Limani could have its origins a few centuries earlier (Steffy, 1994:91), possibly the 8th or 9th century.

Thus, in addition to the clear evidence that the mortice and tenon method disappeared in the eastern Mediterranean at some time between the 7th and the 10th century, possibly as early as the 8th, there may also be answer as to why it disappeared.

In the eastern Mediterranean after the mid 7th century, a change in both the vitality of merchants and their demands appeared. While previously, due to the conservative nature of the Byzantine Empire, they were unable to amass a great deal of liquid capital and present viable demands to shipbuilders, after this point, merchants could take advantage of the mercantilism surrounding them. To do so fully, and to do so further, the merchants required ships to travel and trade from one port to another. But they not only required ships that were faster to build and repair, but cheaper also. By comparing the two ships, Yassıada from c.626, and Serçe Limani from c.1026, it is

evident that possibly as early as the 8th or 9th century, a change in techniques had developed. This change did not come about due directly to a gradual degradation of the technique, although that played a role, nor did it disappear because shipbuilders in the 3rd or 4th centuries AD decided to make a change.[21] Shipbuilders did make a conscious decision to change their techniques and eliminate the mortice and tenon method, but they did so after the Muslim invasion in the mid 7th century. After this point in time not only could the change occur, but it would do so easily and rapidly, and be economically sound. For it was a result of the Muslim invasion that there was a resurgence in the level of viable demands placed on the shipbuilders, who, if they wished to take advantage of the increased business and meet the characteristics of the new demands, would have to eliminate the mortice and tenon method.

[21] See Bass *et al.*, 1982:312. In 1994, on page 106, Casson presents the view that the technique disappeared after the 7th century because shipbuilders in the 1st century introduced procedures to reduce costs.

Conclusions

Two distinct questions were proposed at the outset of this thesis. The first was, "Why did the mortice and tenon method apparently disappear after the 7th century?", and closely related to that was the second, "Did the Muslim invasion lead to that loss?". In both cases, it must be acknowledged that presently, while there are no definite answers to these two questions, there are definite possibilities. It is clear that merchant shipbuilding is directly related to mercantilism, and the vitality of that practice, so it can be accepted that by comparing the economically regressive nature of the Byzantine Empire to the more relaxed system within the Muslim state, mercantilism and thus shipbuilding, was more likely to prosper in the latter. It is also clear that the conservative nature within the Byzantine state extended to its economic practices and its industrial production, thus limiting the demands that prospective merchants could make, and the method in which ships were built. In comparison, the Muslim state encouraged independent mercantilism, and had no preconceived notions about the construction of ships within the Mediterranean basin. Finally, it is evident that whatever the cause of the gradual degradation in the mortice and tenon technique from the 4th to the 7th centuries, it was not the result of conservative shipbuilders in the Mediterranean making a conscious decision to change their techniques. If it had been so, there is no reason to think that an immediate change would not occur, for shipbuilders in the Mediterranean had the experience to determine the outcome of changes in their design, and the use of more efficient building techniques, if they were required to implement either. As to why they did not do so, or retained the mortice and tenon technique, those are questions that descend directly from a presently unanswerable question, why use the mortice and tenon technique at all?

But at present, what were the results of this research? The loss of the mortice and tenon technique was not a direct result of the Muslim invasion, but as an indirect consequence, it seems highly likely. The early caliphate brought mercantile policies and an economic atmosphere that was missing in the Byzantine Empire, and it was these policies that allowed merchants and shipbuilders to prosper. But this prosperity would continue at the expense of the mortice and tenon method, which, by the 7th century, had undergone a change in application and a degradation in technique,

becoming superfluous within the shipbuilding sphere. Within the Byzantine Empire, merchant shipbuilding had become a static practice, where there was a limited demand for ships, and likewise, little demand for change. With the assimilation of the Muslim state however, merchants were able to play an active role in their own success, and their demands changed to reflect their new needs. Their demands resulted in ships that were built easily, quickly, and cheaply, and that, by their nature, did not require the presence of the mortice and tenon technique.

What should be recognized however, is that as initially stated, this is only a definite possibility. It is clear from the archaeological material present that the method did disappear at some point after the 7th century, and by the 10th, it seems another technique, that used in the Serçe Limani ship, may have been prevalent, but to say that the results of this research creates the best answer would be incorrect. This thesis does reveal that in the 7th century, and as an indirect consequence of the Muslim invasion, the economic atmosphere within the eastern Mediterranean was able to produce a change in technique, but it does not prove that this change necessarily occured. As this was one of the goals of this thesis, it may be said that this attempt was only partially successful. On one hand, it seems that the 7th century produced events and factors that were much more likely to bring about the loss of the mortice and tenon technique than the 3rd or 4th centuries AD, but on the other, there is currently no archaeological evidence from the 7th or 8th centuries to support this hypothesis.

But proving this hypothesis, that the Muslim invasion indirectly led to the loss of the mortice and tenon method, was not the only goal within this thesis. Equally important, was the attempt to reveal how sources of information and research not currently associated with the study of shipwrecks can be successfully coordinated with maritime archaeology. As set out in the Introduction, previous attempts at a greater understanding of the maritime sphere, specifically when examining the development of the mortice and tenon technique, tended to rely solely on archaeological material.

But the distinct drawback of that approach is that although there may be a great deal of information gained from the artifact in question, there is no historical or cultural context to place the material in. On a terrestrial site, the recovered artifacts are found within their context, and can be interpreted and examined in light of their surroundings. But a shipwreck on its own has very little relation to the surroundings

in which it is found. While the physical environment may provide information leading to theories why the ship sank, it can provide little else, especially a context in which the ship can be interpreted. That is essentially one of the reasons that this research occured. Some previous works that examined ships, shipbuilding procedures, or the change in techniques during this period, tended to gloss over the historical or maritime context in which the ship was created, without determining how that context may have affected the ship's role or usage. This research however, approached shipping and shipbuilding in the 7th century eastern Mediterranean as being an integral part of the communities that surrounded the sea, and attempted to use that surrounding context as a better means of interpreting maritime activities of the period.

The use of Hagiography to determine seafaring activity during the Persian invasion, if in limited examples, was still noteworthy in that it did reveal voyages occuring clearly along, and in one case, to Persian occupied territory. The Aphrodito Papyri has three distinct examples of nails being produced for shipbuilding purposes for the Muslim naval arsenals in Egypt. While in the Indian Ocean, where ships were sewn together with coir rope, and nails were not used as they would apparently fall out, the use of nails in the Mediterranean was common practice. These papyri then, represent a clear example of a Mediterranean shipbuilding tradition being adopted by the Muslim state.

The passage from ibn A'tham al Kufi, in which Cypriot ships are captured by Mu'awiyah and fine silk and silk brocade are taken from them, it noteworthy primarily because silk and silk products were taken. As the silk was not native to Cyprus, then it must have been imported, most likely from the East. But to do this, then the silk must have traveled across the emerging Muslim state, which had been in place for nearly 20 years. This passage, on its own, only raises questions and possibilities, namely that the Muslim state may have been allowing trade to Byzantium to continue across its borders, but in conjunction with a study of Byzantine lead seals, more definite conclusions can be drawn.

The dated Byzantine seals utilized in this research were primarily divided up into two groups, those from Churches and other religiously affiliated seals, and those of the *genikoi commerciarioi*, officials trading and storing goods on behalf of the Byzantine state. In many cases, the religiously affiliated seals can be found not just along Byzantine-Muslim borders areas, but well within the Muslim state, reinforcing the

claim of Muslim religious toleration, but also elevating this toleration to an almost official, cooperative level between the Empires. While seals of the *commerciarioi* were not found deep within Muslim territory, those along the southern edge of the Byzantine-Muslim border in Asia Minor were operating in clearly disputed territory, and those nearby certainly could not have performed their duties without acknowledgment of the caliphate. This is so for the same reasons that the passage from ibn A'tham al Kufi is quoted, for the goods, whether they were silk or not, had to arrive in these *apothekai* in the Byzantine Empire from the east only by crossing Muslim territory. While it is unclear if the Muslims were taking advantage of this trade through their territory, or even how common it was, it is clear that it was being received by Byzantine government officials, and to do that, its presence must have been known by the caliphate. The passage from ibn A'tham al Kufi then, in combination with the presence of the seals, represents economic cooperation at possibly an official level, between the Byzantine and the Muslim state.

As economics and mercantile shipping and shipbuilding go hand in hand, the 7th century, or this thesis, can be viewed not as an end unto itself, but as the starting point of more research that can be done. It was not really until the second half of the 7th century that the Muslim caliphate became an executive governing body over the Muslim state, and it was not until 717 that the Muslim state reached across north Africa to Spain. The greater effects of the Muslim assimilation, changes in independent mercantilism and a shift from a military power base to an economic one[1], would expand in the 8th century and later, still leaving questions. For as the Muslim state became a permanent fixture in the Mediterranean, economic cooperation with Byzantium would have to continue for the prosperity of both empires, so how did the role of the *naukleroi* change within the Byzantine state? How did Byzantium deal with the increasing number of foreign merchants within Constantinople itself? What kind of ships were in use in the two opposing navies, or the merchant fleets? More specifically, how were those ships built, and what new information will the newly discovered 9th century wreck off the coast of Bodrum tell us?

[1] See Citarella (1967), where he outlines the economic relations between Amalfi and the caliphate, and cites numerous examples of the Italian city-state defying both the emperor in Constantinople and the Pope for their economic prosperity with the Muslim state.

The Islamic state brought lasting changes to the Mediterranean basin, and even by the 8th century, it was no longer seen as a temporary religious movement that the Byzantine Empire could weather and eventually defeat. It was now a second Empire to challenge Byzantium in the eastern Mediterranean, soon to be joined by the Holy Roman Empire farther west. It was an entirely new body along the sea, with no heritage that could be traced to Athens, Alexander, Rome, or Constantine, and as such, it was entirely foreign with a powerful terrestrial and economic base that had to be cooperated with, rather than opposed. It was this cooperation that may have led to the disappearance of the mortice and tenon shipbuilding technique, but then, it more than replaced this loss with greater gains in the Mediterranean's economy, trade, and society.

Appendix I:

From ibn A'tham al Kufi, *Kitâb al Futuh*, page 119.

قال: وإذا مراكب الروم سائرة في البحر و فيها هدايا قد بعث
بها ملك قبرص إلى قسطنطين بن هرقل ملك الروم, قال: فأحدق
المسلمون بتلك المراكب فأجذوها, فاذا فيها جوار حسان وأثاث فاخر
من البزيون والديباج / والسقلاطون و غير ذلك, فأخذ معاوية ذلك
كله وسار في البحر حتي صار إلى قبرص بكل عافية وسلامة وغنيمة,
فأمر بالمراكب فأرسيت على ساحل قبرص ؛ ثم أمر أصحابه فخرجوا من
المراكب فأغاروا على قبرص...

5) *he said: he* [Mu'awiyah] *beheld all the Roman ships in the sea and in them, gifts already sent with them*
by [the] *King* [Ruler?] *of Cyprus to Constantine son of Heraclius King of the Romans, he said:*
the Muslims surrounded the ships which submitted, so beheld in them beautiful female slaves and glorious furnishings
from soft silk and silk brocade / and soft cloths and other things, then Mu'awiyah seized those
veils and the rest in the sea until he drew up the whole safely and unharmed, and he took Cyprus [as war booty]
10) *so he ordered each ship to anchor off the coast of Cyprus; then he ordered his companions*
to emerge from the ships and they raided Cyprus...

This passage was first noticed during a reading of Ibrahim Mahmood's published Ph.D. thesis, *The Social and Economic Background of the Umayyad Caliphate*, as it not only provided one description of the taking of Cyprus, but more significant to the purposes of this research, a clear description of the booty that was found aboard the Cypriot ships. Considering the date of the capture, c.649, it seems significant that what appears to be a great number of silk goods is taken, despite Muslim occupation of the nearby coast for nearly the past 10 years, directly across the path of the silk routes from the Orient. The questions it raises center on exactly how the "King" on Cyprus obtained these silk goods. As there was a *commerciarius*

stationed there from 629-631 (Zacos *et al.*, 1972, #132), these goods could have been remainders within his *apotheke* on the island, and simply sent at this date. Or on the other hand, considering other examples of Byzantine-Muslim economic cooperation, this may also be a case in which the silk was obtained through trade, or routes across Muslim territory. The text does not clarify these points, nevertheless, it is worth examination.

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[1] Muslim historiography is often based on earlier oral tradition that is eventually written down. In many cases, the compiler of the oral tradition, in this case ibn A'tham al Kufi, would recapitulate who the original teller of the historic tradition is.

Appendix II:

From the Aphrodito Papyri #1369, lines 1-5, and 19-23.

[εν ονοματι του Θεου Κορρα υιος[1] Σζεριχ συμβουλος]

Βασιλειω διοικητη κ[ωμης Αφροδιτο ευχαριστουμεν τω Θεω]

κ[αι] μετα ταυτα ανεστειλαμε[ν σο]ι [

λογω ποιησεως πησσομενων των καραβων σιδηρου

5 κεντηναρια τεσσαρα...

διαιρ$^{\varepsilon}$ κ$^{\varepsilon}$/ δ

20 μαζιου κ$^{\varepsilon}$/ β κ^{ου}/ το γ′

συλλογιου κ$^{\varepsilon}$/ β ουτως

κ$^{\varepsilon}$/ α κ^{ου}/ το γ′ **S** κ$^{\varepsilon}$/ α κ^{ου}/ το δ′

] ρ[/] σιδηρ^{ου} κ$^{\varepsilon}$/ δ

[in the name of God, Kurra ibn Sharik, [of the council -or- councillor]]

to Basil the Administrator of the village of Aphrodito, we give thanks to God.

and after [from?] that we have sent up to you,

for the fabrication of the carabos' nails, from

5 *four quintals of iron....*

divided *4 quintals*

20 *lumps* *2 quintals lightened by a third*

collection [?] *thus 2 quintals [for?]*

1quintal lightened by a third, and 1quintal lightened by a fourth

100[th?] of iron in 4 quintals

[1] υιος in Greek means 'son of'. When translated to Arabic, especially in proper names, it becomes 'ibn', literally 'son of' or 'part of the tribe of...'. See Kennedy, 1986.

As a unknown student who wandered over to the Medieval History department from Maritime Studies, I am indebted to Dr. Magdalino for his help with this translation.

Abbreviations

εγρ - short for εγραθη, 'signed'?

μ/ - short for μεν, 'in truth' or 'truthfully'

Aθ^{υ}/ - possibly A + θ^{υ}/ , which may denote A=Aphrodito, and θ^{υ}/, which is short for θυγατηρ, literally, 'the daughter' of a city

γ - can denote '3', or a '3rd'

ι^{δ}/ - short for ινδικτιονος, indiction

θ - can denote either '9', or a '9th'

διαιρ^{ε} - short for διαιρεσις, 'divided' or 'separation'

κ^{ε}/ - short for κεντηναριον, literally 'one hundred', but also used for 'a quintal'

δ - can denote either '4' or '4th'

β - can denote either '2' or '2nd'

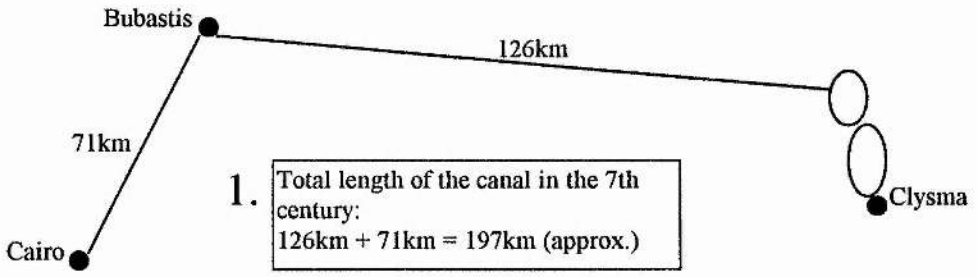
κ^{ου}/ - short for κουφιζομενα, 'to lighten' or 'reduce'

S - short for και, 'and'

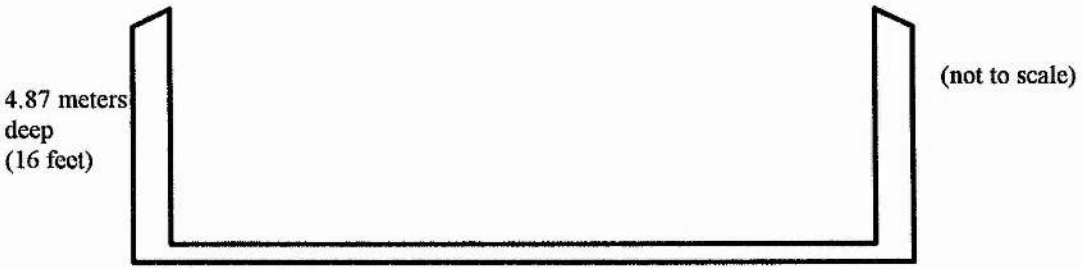
ρ$^{[/]}$ - can denote either '100' or '100th'

Appendix III:

The following is the process used to determine the volume of the Khalij Amir al-Mu'minin canal, and the speed of the current from Cairo to Clysma during the flood season. The amount of water that was calculated to be diverted from the Nile is entirely hypothetical, and does not represent actual measurements.



1. Total length of the canal in the 7th century:
126km + 71km = 197km (approx.)



2. Volume of canal:
45.7 m x 4.87m x 197,000m = 43,844,123m³

3. Amount of water in canal in one day from Nile floodwaters:

$$\frac{700{,}000{,}000m^3}{3} x.10 = 23{,}333{,}333m^3$$

4. Length of time it would take for one day's floodwater to travel through the canal:

$$\frac{\text{Volume of canal}}{\text{Amount of water}}$$

$$\frac{43{,}844{,}123\text{m}^3}{23{,}333{,}333\text{m}^3} = 1.87 \text{ days } (44.88 \text{ hours})$$

5. 197,000 meters = 122.26 statute miles
If Distance = rate x time, then D ÷ t = r.

$$\frac{122.26}{44.88}$$ = the speed of the current is 2.72 miles per hour

6. Miles per hour x .868 = knots
2.72 m/h x .868 = 2.360 knots

ft x .304 = meters
m x 3.28 = ft
*nautical*Miles x 1.1515 = statute Miles
Miles x .8684 = *n*Miles
Km x .539 = *n*Miles
*n*Miles x 1.852 = Km
knots x 1.1515 = M/hour
M/hour x .868 = knots
*n*Mile = 6076.2 ft
Mile = 5280 ft

Appendix IV:

What was the composition of the Muslim fleet?

From the preceding research, the initial impression may be that the entire Muslim fleet consisted of *dromonaria* and the occasional *carabos* or *carabi*, but it should be noted that from Greek sources, it can be determined that it consisted of much more. Within the Aphrodito Papyri, the most common term for a ship is *ploion* (πλοῖον), a term that can refer to either galleys or sailing craft that commonly served mercantile purposes, or an auxiliary role in military situations (Casson, 1971:157*n.*1). Casson's work cites numerous Greek and early Roman sources, but even during the Byzantine period and later, it seems the same characteristics can apply. Within the *Miracles of St. Artemios*, which were compiled during the latter half of the 7th century, a ship classified as a *ploion* is found three times in three different Miracles, each time, fulfilling a mercantile, or a nonmilitary role. Its first appearance is in Miracle 5, when Euporos, a merchant in Constantinople who visited the Saint while on business, misses the ship he traveled to the city on.[i] In Miracle 27, the ship belongs to a 50 year old shipbuilder,[ii] Theoktenos, who was sailing to Gaul when the Saint cured him, and in the last instance, Miracle 35, the ship belongs to a Rhodian *naukleros*.[iii] In all three passages, each ship is mentioned as "sailing" to and from one place to another, and the distinct impression is that all three *ploia* are sailboats, but only in Miracle 5 does the dialogue make it clear that the ship is indeed not a galley, as the crew is unable to cast off due to headwinds.

As opposed to the Hellenistic period however, by the 7th century and later, *ploion* also seem to refer generally to military craft, or ships serving a military function, as well. Theophanes' account of Heraclius' voyage to Constantinople in 610 to remove Phocas from the throne refers to Heraclius' ships as *ploia kastellomena* (πλοῖα καστελλωμένα)[iv], or castellated ships. The account of the same event, recorded by John of Antioch however, refers to the ships simply as *ploia* (πλοῖα)[v], the same term that Theophanes uses when describing the Muslim fleet at Phoenix in 655.[vi] Clearly, unless both Heraclius and Mu'awiyah felt they could capture Constantinople with auxiliary craft, or even merchant ships, a *ploion*, castellated or not during this period of time, must refer to ships participating in naval combat also.

But, what sort of craft do the *ploia* in the Papyri refer to? *Carabi* and *dromonaria* are prevalent, but the terms *akation*, *ousiakos*, and *skaphos* also appear.

It is clear in this case, that unlike *ploion*, the terms *carabos*, *dromonarion*, and *akation* all refer to specific craft that are not synonymous with each other,[vii] and all three types of craft seem to have been stationed at the arsenal at Babylon. A *carabos*, or a *karabos*, is mentioned various times throughout the papyri, #1434 has six references to the craft, and describes it both with and without a protective *kastellatos*.[viii] Initially, that may imply that the *carabi* may not have been built specifically as military craft, but that when supplied with a *kastellatos*, it may act as such. Additionally, in the Miracles of St. Artemios, the 32nd Miracle concerns the healing of Menas the stevedore working for a wine merchant, who was hurt while loading clay jugs, apparently full of wine, onto a ship. But unlike other Miracles, which also mention ships and use the term *ploion*, in this case the boat is described as a *carabos*.[ix] Unfortunately, the size of the boat is not clear, it may not be that large as Menas felt he could both steady the boat and the clay jug when part of the boat's rail broke, and it should also be noted that he was not loading large amphorae aboard, but jugs, which may be smaller. Finally, not only was the boat being loaded in shallow water, but Menas may have been able to reach the level of the maindeck, or at least the top rail of the boat, to help load the jugs on board. There are no more details of the ship mentioned for the rest of the passage, but the impression is that the *carabos* may be a smaller sized galley, or possibly less, something similar to a lighter, used to transport people and/or goods from a larger ship to the shore. In either case, it seems that if the Copts were indeed building *carabi* at the Muslim arsenals in Babylon and Alexandria, then it may be assumed that *carabi*, whether they were specifically for military use, had mercantile uses as well.

There is one possible reference to an *ousiakos* in the Aphrodito text, in #1416, line 25[x], in an account which relates to miscellaneous expenses (Bell, 1910:159). An *ousiakos* was the smallest version of a Byzantine military galley, and its name was derived from the number in its compliment, or just over one *ousia* or company, approximately 100 men (Casson, 1971:149). References to *dromonaria* are common throughout the text of the Aphrodito Papyri, but unlike *ploia* or *carabi*, these craft do not seem to be mentioned in any other text of the period.[xi] Theophanes does mention the Muslim usage of *dromones* during their seige of Constantinople in 717, but *dromonaria* specifically, do not appear.[xii] Casson feels that these craft, which may not be double banked, are smaller and lighter than the standard *dromon*, as the *dromonaria*, along with the *akatia*, were commonly assigned to patrol the Nile delta

(Casson, 1971:154). The *akation* on the other hand, was a common term in Greek and Roman texts, where it was described as a diminutive form of an *akatos* (ἄκατος), a specific kind of oared galley (Casson, 1971:159). While an *akatos* had approximately 30 to 50 oarsmen, the smaller *akation* is commonly referred to as having less than 50 oars, and usually less than 20, while at times it could apparently be handled by one person (Casson, 1971:159*n*.11). Within the Aphrodito Papyri, the *akation* never seems to mentioned individually, it occurs with either the *carabi* or the *dromonaria* six times, and with both, four times,[xiii] carrying out either auxiliary functions with the military (guarding the Nile delta), or, apparently carrying nails to the arsenal at Babylon (Bell, 1910:78, #1408). But again, within the *Miracles of St. Artemios*, an *akation* appears in Miracle 40, where the Saint disguises himself as a doctor visiting a monastery. The boat that the Saint has to rush off to is described as an *akation*, and it is not a galley, but a sailboat.[xiv] There is no more information given in the Miracle about the *akation*, only that the Saint traveled in it, but similar to the textual usage of the *carabos* in Miracle 32, it is not being used in a military capacity.

The role of a *skaphos* in the Muslim fleet seems to be a varied one. It is only mentioned once within the Aphrodito papyri, in #1351, line 8, as a boat of 100 artabas[xv] burden to carry sailors, workmen, and supplies to the arsenals for the *cursus* raid of the 9th indiction (Bell, 1910:25). Casson cites one use of the term *skaphos*, used synonymously with other terms, as a "ship's boat" that was towed astern like a dinghy, or that could be stowed aboard on lines from the masthead (Casson, 1971:248-249*n*.93). He finds other definitions however, for the term *skaphe*, which could also be applied to ship's boats, harbour barges or lighters, or at the largest, a *skaphe* from the Nile, that was used for hauling wood.[xvi] However, despite its apparent nondescript purposes in the papyri, Theophanes attributes the Muslims with much greater uses of the *skaphos* or the *skaphe* in his *Chronographia*. In his account of the Muslim capture of Cyprus in 649, Mu'awiyah apparently used not *ploia*, but *skaphe* in his naval attack.[xvii] Again in 678, but described in Theophanes' account of the first Muslim seige of Constantinople in Annus Mundi 6165, he describes the Muslim ships destroyed by the Greek fire as *skaphe* and nothing else.[xviii]

The initial interpretation of a *skaphe* or a *skaphos* from the Papyri is a lighter or a barge used to transport people and goods up and down the Nile. Considering the earlier existence of the Nile *skaphe* from c.26 BC for hauling wood, it would be

possible that there is a Muslim or Coptic descendent of the earlier craft, whose use as a lighter would make sense. But Theophanes' use of the term is unexpected. If instead of *ploia*, Theophanes used *skaphoi* to describe the Muslim ships in the naval engagement in 655 at Phoenix, then as the Muslims apparently captured Lycia for the timber resources, it would make sense to have ships used as timber barges. But instead, there is little consistency in Theophanes' use of the term. If he was attempting to belittle the power of the Muslim fleet in 678[xix], when they were destroyed by the Greek fire, then why use the same term when the Muslims were successful in their capture of Cyprus? If indeed *skaphoi* were used in these two instances, as the primary craft of the raid or not, then it is interesting to note, that again, similar to the *carabos* and the *akation*, auxiliary craft that could serve a mercantile function may have been in use in the fleets of the early caliphate.

This work is clearly not complete and much more can be done, but it seems that the conclusions that the Copts simply rebuilt Byzantine craft for the Muslim arsenals in Babylon and Alexandria is a valid one. What remains to be explained however, is the characteristics of the ships themselves, or their specific uses. If the Muslims did possess *akatia*, *carabi*, and *skaphoi*, as the Papyri suggests, were they using them solely for military purposes? From Byzantine texts, it is clear that they also served non military roles, occasionally as mercantile craft, but can the same roles or parallels be assumed in the Muslim state? As it is clear that the *akatia*, *carabi*, and *skaphoi* did exist in the Muslim state, then it is tempting to argue that mercantile ships, or ships that could be used in a mercantile capacity, were being produced by the Copts in Egypt. If this was so, then there was very little standing in the way of independent merchants who wished to take advantage of the new Muslim policies governing mercantilism.

But then, it must be recognized that this is preliminary work, and a much larger analysis of the roles of these craft in the Aphrodito Papyri must first be accomplished. Until that time, while it can be recognized that a wide variety of craft were serving the caliphate in Egypt, and that those craft may have had parallels in Byzantine territory, it remains to be seen what the characteristics of those ships are.

[I] The italics refer to specific terms for ships in the Greek. See Crisafulli *et al.*, page 85: "...he departed without success in the *ploion* in which he came," and the Greek, page 84, lines 22-23: ἐν ᾧ ἐνέβαλεν *πλοίῳ* ἀνεχώρησεν ἄπρακτος.

[II] See Crisafulli *et al.*, page 153: "...and he sailed off in his own *ploion* to Gaul." and page 152, lines 16-17: καὶ δὴ ἐξέπλευσεν ἐν τῷ κατ' αὐτὸν *πλοίῳ* εἰς Γαλλίας.

[III] See Crisafulli *et al.*, page 185: "...he was also a *naukleros* with his own *ploion*," and page 184, lines 13-14: ὢν καὶ *ναύκληρος* ἰδίου *πλοίου.*

[IV] See DeBoor, page 298, line 16: "Heraclius came from Africa with his *kastellated ploia*" (ἦκεν Ἡράκλειος ἀπὸ Ἀφρικῆς φέρων *πλοῖα καστελλωμένα*...) Casson (1971) on page 134, mentions the terms *kataphraktos* and *aphraktos*, or ships that are shielded or protected, and those that are not. He explains that the first term refers to the larger of the two craft, and in n.128, gives an example of *aphraktos* and *ploion* used synonymously. By the 7th century, it seems that instead of characteristics such as *kataphraktos* and *aphraktos*, a ploion instead may be *castellated*, or have a pavesade, a light framing on which shields can be hung for protection. It should be noted however, that simply because a *ploion* during this period of time is not mentioned as being *castellated*, does not imply that it is not a warship.

[V] See *Scriptorum Graecorum Bibliotheca* volume V, *Fragmenta Historicorum Graecorum*, page 38, passage 4: "...the arrival of the marshaled *ploia* with Heraclius from Africa." (...τὴν παράταξιν τῶν *πλοίων* τῶν ἐλθόντων μετὰ Ἡρακλείου ἀπὸ Ἀφρίκης.) In volume I, page 44, Pringle make use of this passage, the *ploia* associated with Heraclius in AD 610 cited above, and the text of John the Bishop of Nikiu in *Notices et Extraits des Manuscripts de la Bibliothèque Nationale*, tome 24, chapter CIX, lines 22-25: "*Heraclius l'aîné fit partir Heraclius le jeune, son fils, pour Byzance, avec des vaisseaux et un grand nombre de barbares, afin d'attaquer Phocas.*" to determine that Heraclius traveled with a merchant fleet to Constantinople, and not warships in particular. This assessment of the text from John of Antioch and Theophanes however, is a very loose translation of *ploia*, and in light of other contemporaneous uses, it seems incorrect. At present, the original text of John the Bishop of Nikiu eludes translation by this author, but it is clear that the French text does not mention any specific type of ship in particular, most likely accurately reflecting the original Ethiopian.

[VI] See DeBoor, page 345, lines 16-17: "In this year Mu'awiyah created great armed *ploia*..." (Τούτῳ τῷ ἔτει ἐπέτρεψε Μαυιας γενέσθαι ἐξόπλισιν μεγάλην τῶν *πλοίων*...)

[VII] In the Aphrodito Papyrus #1435 from the early 8th century AD, the terms carabos, akation, and dromonarion are all distinguished individually in line 3: "...καρ(ρ)$^{\alpha}$ **S** ακ$^{\tau}$/κ$^{\tau}$/ **S** δρ^{o}ρ$^{(o)}$..." Abbreviations are used throughout the papyri to save space, and because many common phrases were repeated. In this case, *καρ(ρ)$^{\alpha}$* is *κάραβος*, *ακ$^{\tau}$/κ$^{\tau}$/* is *ἀκάτιον*, and *δρ^{o}ρ$^{(o)}$* is *δρομονάριον*, see #1348, lines 2-3, where they are not abbreviated. The parenthesis are brackets in the original text, and are supplied by the editors for missing letters of words, and **S**, which is the original text, is a common scribal mark for *και*, or *and*. See the Index of Symbols and Abbreviations in Bell, 1910.

[VIII] Line 35: καῤῥ καστ$^{\lambda}$, abbreviated. Line 115 just mentions the καῤῥ.

[IX] See Crisafulli *et al.*, page 165: "This man was loading clay jugs brimming full onto a *carabos* and," and page 164, line 23: οὗτος ἐνεβάλλετο ἐν *καράβῳ* μαγαρικὰ ἔγγομα.

[X] See Bell: ῥ κωδικ$^{\omega}$/τ$^{\omega}$ *ουσι*$^{\cdot}$ τ$^{\eta}$ παγαρ$^{\chi}$... The term *ουσι*$^{\cdot}$ is the abbreviation for *οὐσιακῶν*. It should be noted that there are numerous references to an *ousia* itself in three different papyri, the largest number occuring in #1419. In #1414, and #1447, it occurs with *ploion* (and *carabon* in #1414), but at present, it is unclear how many *ousia* are being referred to, and how they may relate to the ships in question.

[xi] Of Casson's eight references to *dromonaria* in 1971, seven are from the Aphrodito Papyri, and refer to Muslim usage. The last is from G. Zereteli, *Papyri russicher und georgischer Sammlungen*, volume IV 6.4, and refers to a *dromonion*, which may synonymous with a *dromonarion*, in the 10th century Byzantine fleet.

[xii] See DeBoor, page 395, lines 23-25: "...with Suleiman's expedition, it possessed.....great *naus*, armed .....and *dromons*" (.....Σουλεϊμὰν μετὰ τοῦ στόλου καὶ τῶν ἀμηραίων αὐτοῦ ἔχων παμμεγέθεις *ναῦς* καὶ πολεμικὰς κατήνας καὶ *δρόμωνας*) It should be noted that *dromon* was also used as a general term for either a *dromon*, a *dromonarion*, or an *ousiakos*. See Casson, 1971, page 150, and Gardiner, 1995, page 94.

[xiii] *Akatia* and *carabi*, #1433:163, #1434:112 and 175, #1435:36 and 60, #1437:14.
Akatia and *dromonaria*, #1434:242, #1435:108, #1441:100, #1449, 53 and 56, #1452:24.
All three: #1348:2, #1410:2, #1435:3, #1442:1.

[xiv] See Crisafulli *et al.*, page 207: "Today in the house of the Forerunner there is a great celebration; there is a great gathering of celebrants and I cannot stay since moreover the *akation* which I sailed on and came here on is waiting for me." and page 206, lines 28-30: "Εὐωχία μεγάλη ἐστιν σήμερον ἐν τῷ οἴκῳ τοῦ Προδρόμου. συναθροισμὸς πολὺς ἑορταζόντων καὶ οὐ δύναμαι μεῖναι, ἐπειδὴ καὶ τὸ *ἀκάτιον*, ἐν ᾧ ἔπλευσα καὶ ἦλθον ὧδε, ἀναμένει με".

[xv] An *artaba* (ἀρταβη), was originally a Persian measurement that equaled approximately 1 *medimnus*, or about 40kg of grain. See Liddell and Scott's *Greek Lexicon*.

[xvi] See Casson, 1971, page 248*n*.93, page 330 and *n*.5, and page 336. The Nile *skaphe* was approximately 16m by 5m, see Casson, 1971, page 330*n*.9.

[xvii] See DeBoor, page 343, line 31: ".... but *skaphe* against(?) and ....Constantia with the whole island..." (εἶχε δὲ *σκάφη* ᾧ καὶ παρέλαβε Κωσταντίαν σὺν τῇ νήσῳ πάσῃ...)

[xviii] See DeBoor, page 354, line 15: "...of the Arab's *skaphe*..." (...τῶν Ἀράβων *σκάφη*...)

[xix] Whatever a *skaphe* or a *skaphos* represents, it must be a relatively small craft, as in early Greek, the term did not refer to a ship at all, but to a trough or a tub.

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Glossary:

Most of the information below was gained from two sources; *The Oxford Dictionary of Byzantium*, abbreviated *ODB*, and Nicholas Oikonomides' article, "Silk Trade and Production in Byzantium from the Sixth to the Ninth Century: The Seals of Kommerkiarioi." in *Dumbarton Oaks Papers*, vol. 40, 33-53 (1986), abbreviated as *Oikonomides*. Any other sources will be specified within the text.

This Glossary is specific to this research only, and may not necessarily apply to other works. For a valuable glossary of ships' terms, and a visual glossary, consult, J.R. Steffy's *Wooden Ship Building and the Interpretation of Shipwrecks*, or Casson's *Ships and Seamanship in the Ancient World* for a glossary of Greek and Latin nautical terms.

Apo Hypaton: (from Hypatos, in Greek: ὕπατος) Hypatos is a Greek term for a consul, and *apo hypaton* is the ex consul, an honorific title bestowed on those holding various offices, in this case, commonly associated with *genikos commerciarios*. The importance of the term declined after the 6th century. *ODB*

Apotheke / Apothekai: (in Greek: ἀποθήχη) The term essentially has two meanings, one literal and the other is more figurative. Literally, in association with the commerciarioi, it can mean a "warehouse" or specific building within a city that acts as clearinghouse for goods under the authority of the commerciarios. The goods may be in transit, being examined for distribution, or being prepared for administrative processing. Figuratively, it can also refer to an administrative unit encompassing a specific geographic region, where there may be actual *apothekai*, or where goods or materials are administratively processed in a similar way, under the supervision of a commerciarios. *Oikonomedes*

Athlit ram: Currently the only surviving piece of a multibanked warship from antiquity. It is the bronze ram that was placed upon the front of a *trireme* or *bireme*, dating from the 2nd century BC. It was recovered in 1980, off the coast of Athlit, Israel, and it contains 16 fragments of wood from the ship's bow section. It provided valuable proof that previously was only speculated, that warships were also built in the mortice and tenon fashion. Not enough of the bow section survived however, to speculate on hull design. See Steffy's *Wooden Ship Building and the Interpretation of Shipwrecks*, page 59-61, or the separate publication, *The Athlit Ram*, edited by Lionel Casson, J.R. Steffy, with the principal investigator, Elisha Linder.

Beam: Usually the width of a boat or ship measured amidships, and either at the waterline, at the deck height, or at the sheer height. It can be measured from one external edge of the midships frame to the other edge, or from the edges of the external planking. In many cases, boat plans, or "lines" will also specify the beam at specific intervals along the hull, at the third frame from the stem, the sixth from the stern, etc.

Bishop: (in Greek: ἐπίσκοπος) The highest ranking minister of the Byzantine clergy, and usually had the final decision when deciding matters of discipline, doctrine, and the administration of the bishopric itself. The term could also include Metropolitans and Patriarchs in a more generic sense. All ecclesiastical properties, institutions, and hospitals within the Bishopric were under control of the Bishop's office, but were usually administered by other officials. They had a great deal of privilege and authority. *Oikonomedes*

Boat ell: A stick of wood or other material that is unlikely to warp or break easily, and whose length is a specific, and common measurement, throughout a ship or boat being built. Along the length of the ell can also be delineations specifying other measurements required for construction. It would be similar to a yardstick with only five or six measurements on it, each one specific to certain parts of the boat to be built. Once the order of the boat construction is understood, and what each specific length along the ell specifies, it becomes a record of how to build the component parts of the boat, and the boat itself. See Eric McKee's book, *Working Boats of Britain*, and his chapter, "Realization of Boatshape", or the chapter by A.E. Christensen "Boatbuilding Tools and the Process of Learning" in *Ships and Shipyards, Sailors and Fishermen* (1972).

Commerciarios / Commerciarioi: (also: Kommerkiarios, in Greek: κομμερχιάριος) The term first appears c.500 AD, and usually applies to a person within an appointed office who carries out trade on behalf of the Byzantine state. It was first felt that they dealt solely with silk or luxury items imported from the East, but more recently it has been argued that they dealt with nearly any items that circulated in and out of their appointed theme or province. Most commonly, their trade dealt with imported raw silk, which they then sold to the state appointed silk workers and weavers, apparently taking in a profit from the money that was circulated back to the Byzantine state. Each appointment to the position was commonly for only a year, and Oikonomedes argues that there was a certain amount of political leverage involved with the position, as some lead seals of the commerciarioi appear in one year with a specific emperor, and disappear the next. Their position, and existence, is known primarily through extant Byzantine lead seals, which display the name of the office holder, any honorifics, and the date of their administration. *Oikonomedes*

Deadrise: Applies to the design of a ship or a boat that runs from the keel or garboard plank to the point at which the external planking, or the internal framing, begins to become more vertical, essentially forming the side of the craft. The deadrise itself is the measurement, not necessarily an exact measurement in degrees, of how much this stretch of the hull rises above the horizontal. A ship which has a very flat bottom and a very quick turn to vertical sides, is said to have very little deadrise and a sharp turn at the bilge (or in some cases a hard chine). A ship which has more deadrise, such as a ship with a wineglass shaped hull, or a modern sailboat, has a greater difference between the vertical measurement at the garboard plank and the turn of the bilge.

Frame: The internal structure upon which, in the frame first method, the exterior planking on a boat is affixed. It is very similar to the internal framing in a house as they are load bearing members of the structure, and support both the exterior walls, or hull, and the floors within, or decks. They are commonly affixed to the keel itself, and can act as a guide around which the exterior hull is constructed. Within the term "frame" itself, there are many variants such as half frames, full frames, risers, floors, and parts of the frame itself that make up shipbuilding terminology, but that do not need to be examined here. In most cases the frame itself is approximately a **U** shape, with the apex of the curve affixed perpendicular to the run of the keel, and the vertical elements may extend to the sheer height, of that of the deck.

Garboard plank: The very first exterior plank fitted along the length of the keel. It may fit at a 90° angle against the vertical edge, or at a range of angles between that and vertical. Commonly, it may be slightly larger or thicker than external planking higher in the hull, to provide strength.

Hagiography: The modern term for Byzantine literature which attempts to venerate a specific Saint, their ideal Christian behavior, while documenting the Saint's life. It often portrays historical figures, and can be used as a source for later chronicles, as it also conveys historical information and dates. They can provide information concerning their subjects and the places they lived, political and military events, and due to various amounts of bias, different texts can provide differing accounts of historical events. In this thesis, the terms **Hagiography** and **Vita / Vitae** were used almost synonymously, although the latter refers primarily to a biography of a Saint, while the former is a larger, more general term. *ODB*

Keel: The primary load bearing timber within a boat or ship, it may be made up of various long pieces of timber joined together, or of one long piece of wood, one is not necessarily better than the other. It usually runs the length of the craft, and on smaller craft, may also play the role of stem and stern posts at either end. Usually on larger craft, where single pieces of adequate long timber is rare, the keel will be met at either end by a stem and a stern post, which technically, are not part of the keel, although they can be generally thought of in that way. In some craft, depending greatly on size and use of the craft, there may also be a "keelson", a length of timber similar to the keel itself, adding support and strength along the length of the ship, and helping to secure frames that may be attached to the keel or the keelson itself. In some cases, exterior planking may be fixed directly to the keel where the two meet, and in others, the keelson may be involved. For an example of the number of keels, keelsons, and other timber that may be involved, see J.R. Steffy's *Wooden Ship Building and the Interpretation of Shipwrecks*, page 285.

Metropolitan: (in Greek: μητροπολίτης) The head of the Episcopate in ecclesiastical territory, also within a civil provincia or eparchia. The Metropolitan presided over the provincial synod which was held twice a year. Some Bishops that were lacking suffragans could be given the title, and some Metropolitans could also be called Archbishops. *ODB*

Mortice: (also: mortise) A single groove that tends to be deeper than it is long, technically half of a "mortice and tenon joint". It is commonly used along with a tenon to join two pieces of wood, either at a corner, such as the corner of a door, or longitudinally, where two planks meet side by side, such as a chopping block or a cutting board in a kitchen. Similar to a "tongue and groove" joint, where the mortice plays the role of the "groove", but not in a continuous fashion along the edge of the plank. See the diagram in the Introduction, the mortice is the deep, thin groove that accepts the tenon in the side of the external plank.

Patriarch: (also: Patriarchates) The term was originally used to designate prominent members of the episcopate, and in the 6th century, the title gained its precise sense, applied to the incumbents of the five major sees in the Byzantine Empire. They can exercise power above that of the Metropolitans, and descended from powerful Bishops in Rome, Alexandria, and Antioch. Not to be confused with the title **Patrikios** (πατρικίος), a high ranking title that can be found on lead seals. *ODB*

Province: (in Latin: provincia, Greek: ἐπαρχία) The primary administrative district in the Roman Empire. *ODB*

Sheer height: As opposed to the height of the deck, which is just below the sheer height. The sheer height, or just "sheer", is a term usually applied to the highest continuous edge of the hull, from stem to stern. On a set of boat plans, it can be measured vertically from the very bottom of the keel, if that corresponds with the baseline from which all measurements are made, or simply from the baseline itself, if the keel does not correspond to the baseline. On actual boats, the sheer can be measured vertically from the ground, if the boat is on relatively level ground, or vertically from the base of the keel itself. Commonly, on a set of plans, the sheer height will be specified as certain heights above either the baseline or the keel, at various places along the length of the boat, such as the third frame from the stem, amidships, the sixth frame from the stern, or at the sternpost itself.

Strakes: A term that refers to the individual, longitudinal planks that make up the exterior of a ship or boat. Synonymous with "planking", "strakes" can usually be substituted for "exterior planking".

Tenon: A small, usually thin piece of wood, longer than it is wide or thick, and technically, the other half of the "mortice and tenon" joint. It is usually twice the depth of the mortice it is to be seated into, but otherwise similar in width and thickness. Each end would be seated into a mortice in a corresponding piece of wood, or plank, and the two pieces of wood would be forced or hammered together, securing the tenon inside. In some cases, glue may be used to strengthen the joint, or in Antiquity, treenails or pegs were forced through holes through the tenon inside the joint, to essentially "lock" the entire joint. In other cases, the tenon fits snugly enough into each mortice that further security is not needed. See the diagram in the Introduction, the tenon is the tab of wood along the longitudinal edge of the planking that is going to fit inside the mortices in the plank above.

Treenail: (also: trenail) A wooden peg that can be used to lock a joint, like a mortice and tenon joint, that is forced through a hole drilled for it, then either a wooden wedge or a nail is hammered into one end to expand the treenail within the hole, seizing the peg within the hole. Literally, a "tree nail". Wooden pegs can become treenails, but a treenail should not be confused with just a wooden peg, which may not offer any strength to the joint in which it is used.

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