

**PHOENICIAN SHIPS: TYPES, TRENDS, TRADE AND  
TREACHEROUS TRADE ROUTES**

by

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I declare that PHOENICIAN SHIPS: TYPES, TRENDS, TRADE AND TREACHEROUS TRADE ROUTES is my own work and that all the sources that I have used or quoted have been indicated and acknowledged by means of complete references.

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SIGNATURE

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## SUMMARY

Phoenician ships in the broadest sense of the word are the focus of this dissertation and it encompasses the entire period of both Phoenician and Punic seafaring. The study is quantitative, largely historical and archaeological, with the use of secondary sources as well as iconography. The origins of the Phoenician construction technique, the mortise-and-tenon joints, are investigated as well as the various types of Phoenician ships. These are analysed under the headings Merchant ships, Warships and Utility ships.

The materials mentioned in Ezekiel's prophecy about 'The Ship Tyre', are analysed, whether they fit the purpose for which they are mentioned. The production process of purple cloth with the use of *Murex* molluscs is described in detail including an analysis of the boats used to catch the molluscs.

The possibility is investigated of whether the Ashkelon Dog Burials could be related to the Phoenician trade in dogs, and whether they could have served as ship dogs.

Lastly the difficulties encountered in sailing through the narrow sea straits of the Mediterranean Sea are described, which are subject to Internal waves, affecting the surface water.

### Keywords

Phoenician ships; Mortise-and-tenon joints; Byblos ships; *kubna* ships; ships of Tarshish; *Biremes*; *Triremes*; *Quadriremes*; *Quinqueremes*; Marsala Punic warship; shipyards; *hippoi*; Transports; Ezekiel 27; The Ship Tyre; purple cloth; *Murex*; Carthage, Ashkelon dog burials; Scylla and Charibdis; Strait of Messina; Pillars of Hercules; Strait of Gibraltar; Internal waves.

# CHAPTER 1

## INTRODUCTION

### 1.1 BACKGROUND

At the same time as the Ancient Near East was dominated by a succession of large empires, such as the Assyrians, Babylonians, Persians and Greeks, another type of empire slowly but surely developed. This empire was not land-based and did not come about by military conquest. Only recently has research revealed the extent of this empire, which was built up with the use of ships. Sailing with wooden vessels from the shore of the Levant, establishing small settlements and footholds on islands or near sheltered bays, this empire eventually encompassed more or less the entire length and width of the Mediterranean basin, and beyond. The people who accomplished this feat were the Phoenicians. Who they were and where they lived will be discussed more in detail in what follows.

### 1.2 PROBLEM STATEMENT

The focus of this dissertation will be on the ships that the Phoenicians used. Despite the fact that the ships were the main way with which the Phoenicians achieved their goal of trading all over the Mediterranean Sea, information about their ships is scarce and scattered over many different publications. Moreover, due to the fact that the Phoenicians needed to start building warships to defend themselves against piracy and other dangers, authors are not always sure, which ships were used for what purpose. Therefore in this dissertation an attempt will be made to create a clearer picture of which ship was used for what purpose, despite the fact that only limited pictorial information is available.

Research into the ships however, confronts the researcher with the questions asked by the earlier sources regarding the origin of the Phoenicians and of their ability to build ships and why they took to the sea for their livelihood. The research into the ships of necessity has to deal with these questions as well.

### 1.3 HYPOTHESIS

The main hypothesis of this dissertation is that the Phoenicians designed and developed their own unique types of ships and adapted these to the changing needs of the articles traded, or the type of defensive naval activities that were needed to protect their interests, as well as the smaller transport tasks for which ships or boats were needed.

### 1.4 AIM AND OBJECTIVES OF THE STUDY

By analysing the many aspects mentioned, the intention of this research is to make a contribution to a greater understanding of the existing information. By making use of a more intimate knowledge of ships and sailing as well as many other aspects of the nautical world, more light can be shed on elements that are now unclear or confusing.

The research of this dissertation will be on: Who were the Phoenicians, where did they come from, how did they learn how to build ships and what were these ships used for? In order to achieve this, the shipbuilding and seafaring activities of other nations will be investigated, ranging from the ships built by the Egyptians, to the ships of the various Mediterranean as well as the Nordic peoples. These influences are to be examined on the characteristics of their building techniques, their ways of rigging sails, their use of a boom at the foot of the sail, or of loose brailings (meaning without a boom at the foot of the sail), to give but a few examples.

### 1.5 RESEARCH QUESTIONS

For the purpose of this study the following research questions were used:

1.5.1 What do we know about Phoenician ships (texts, pictures & artifacts)?

1.5.2 From whom did the Phoenicians learn how to build ships?

1.5.3 What types of ships did the Phoenicians use?

1.5.4 How did these ships develop?

1.5.5 For what purpose were the various types of ships used?

1.5.6 What materials did they use in the construction of their ships?

And secondary to these, there are the questions about:

1.5.7 How were ships involved in the production of the famous purple cloth?

1.5.8 Are the origins of the production of purple cloth in any way indicative of the origins of the Phoenicians?

1.5.9 What were the difficulties the Phoenicians encountered when trying to sail through the Strait of Gibraltar as well as the Strait of Messina?

1.5.10 Were the trading activities of the Phoenicians in any way related to the find of so many buried dogs in the port city of Ashkelon?

## 1.6 RESEARCH METHODOLOGY

This study is to be undertaken within a multidisciplinary context, which will entail archaeology, pictography, biblical references and literary sources in order to provide as wide as possible a base from which information can be obtained.

The methodology intended for this research is a quantitative study, largely historical, as well as archaeological, and due to the scarcity of primary sources, based on many secondary sources, that is, the writing of other authors and the finds of archaeologists, including marine archaeologists. Besides that, there is iconography, i.e. the images of ships dating to ancient times depicted on murals, mosaics, tombs etcetera.

As for the archaeological finds that can be used to shed light on the Phoenician ships, there are the remains found at Uluburun by George Bass (1987:693-734), as well as Elisha Lindner's find of a ship off the coast of Israel (Lindner 1992:24-36), the remains of the ships investigated by Stager and Ballard near Ashkelon (King & Stager 2001:178-186) and the remains of the Marsala Punic warships found by Honor Frost near Isola Lunga close to the small island of Motya off the coast of Sicily (Frost, 1982:42-60).

To this all my own practical knowledge of ships and sailing will be added, because by analysing the images of the ships that are available, a number of conclusions have been made, which have not been encountered in any other written sources, so far.

This may seem preposterous, but wind, water, the practical aspects of ships, sails and sea currents have not changed since the Phoenicians frequented the waters of the Mediterranean and beyond, and in my opinion it is worth to add the extra dimensions.

In this way it is my intention to make a contribution to the available knowledge about the Phoenicians' ships by gathering material, that is now spread over many publications, into one overview and by analysing puzzling aspects from a practical perspective and also more in detail than has been done up till now.

## 1.7 STRUCTURE OF THE DISSERTATION

The structure of the dissertation is linked to the various elements that comprise the title of this study and are explained in what follows:

### 1.7.1 Phoenician Ships

The topic of Phoenician ships will be dealt with in the broadest possible sense. Ships for all uses and purposes in all sizes and in all areas under control of the Phoenicians will be described and analysed. This will encompass a long span of time starting with the earliest mention of ships arriving in Egypt from Byblos with cedar wood in ca. 3000 BCE, from what at that stage was still the Syro-Canaanite coast, till the Carthaginian ships that were in use up till the time of the defeat of Carthage by the Romans in 146 BCE.

After the introductory *Chapter 1*, *Chapter 2* will be dedicated to the possible origins of the Phoenicians. An analysis will be made of the origins of their shipbuilding in *Chapter 3*. For this purpose a detailed comparison will be made of the Phoenician construction techniques, over against those of other seafaring nations in the same era, in order to answer the question, 'From whom did the Phoenicians learn how to build ships?'. Separate chapters will contain descriptions and analyses of particular categories of ships starting with the Merchant ships in *Chapter 4*, Warships in *Chapter 5* and Utility ships in *Chapter 6*. Moreover 'The Ship Tyre', as described in Ezekiel 27, will be analysed regarding the use of materials and whether they were the correct ones for the purpose they were used for in *Chapter 7*. In *Chapter 8* a detailed description will be given of the production of purple cloth with the use of *Murex* molluscs with reference to



the origins of this particular process. *Chapter 9* will contain an analysis of whether the large amount of dogs found buried in the port city of Ashkelon is in any way related to the trade practices of the Phoenicians and for what purpose these dogs could have been used. In *Chapter 10* two famous phenomena known from Greek mythology, 'Scylla and Charibdis' as well as the 'Pillars of Hercules' will be investigated, as to what were the real or supposed dangers in those sea straits and did these affect the Phoenicians in their shipping endeavours, as they supposedly influenced the Greeks. In *Chapter 11* a summary will be provided of the findings of this dissertation.

### **1.7.2 Types**

The Phoenicians used a number of different *types* of ships, such as Merchant ships, Warships and smaller vessels, which can be grouped under the heading Utility ships. Some of the ships belonged to a specific category, such as Byblos ships, or Ships of Tarshish. Among the warships there were *Navis Lunga*, *Biremes*, *Triremes*, *Quadrirèmes*, *Quinqueremes* etcetera. The best known type among the Utility ships was called '*Hippoi*'. Some ships were mostly oared ships. Other types were mostly propelled by sails. All these types of ships will be analysed as to their use and what they could have possibly looked like.

### **1.7.3 Trends**

The word '*trends*' is used to indicate the various changes in ship design, necessitated by the changed shipping conditions and demands. Also the development of successive types of warships, which were brought about by the arms race that took place in the Ancient Near East and the Mediterranean basin in the time of the Phoenicians, will fall under this term. These trends will not be dealt with under a separate heading, but will be mentioned and indicated where applicable in the relevant chapters dealing with the various types of ships.

#### **1.7.4 Trade**

*Trade* was the most important aspect of the Phoenician way of life and culture. Therefore two chapters will be dedicated to their best known article of trade, purple cloth, and their least known article, dogs. The former was the purple thread that ran throughout the research of this thesis; the latter was a random discovery. The connection of these articles with the use of ships will be made clear in the respective chapters.

#### **1.7.5 Treacherous Trade-routes**

As a final point of interest, the *two most feared narrow passages* in the Mediterranean Sea will be investigated. These were called 'Scylla and Charibdis', and the 'Pillars of Hercules' in Greek mythology in ancient times, and are now known as the Strait of Messina and the Strait of Gibraltar. The Greeks, who coined the names by which these straits were known in those days, feared to pass through them, and the research will focus on the question of whether the Phoenicians also made use of these narrow sea passages and if so, how they were able to deal with them. The use of technology in modern times has shed light on the phenomena manifest there, which must have baffled the sailors in ancient times, but for which there are rational explanations.

### **1.8 DEFINITIONS AND DELINEATIONS**

From their early beginnings in ca. 3000 BCE till the upheavals that occurred in ca. 1200 BCE the inhabitants of the Syro-Phoenician coast are still referred to as Canaanites and only after 1200 BCE are they referred to by the term Phoenicians (Aubet 1993:12). Some scholars consider Ugarit only a Canaanite harbour city and not a Phoenician one, because Ugarit was already destroyed in ca. 1200 BCE, when the Phoenician civilization just started to emerge (Aubet 1993:21; Gore 2004:34).

In later times, from ca. 800 BCE onwards, the Tyrians who settled in Carthage, are referred to as the Carthaginians, and their culture as Punic. However, as the development of the Phoenician ships began before the time that can be called Phoenician, and continued right throughout all these different periods and slightly

distinct cultures, the generic term “Phoenician” will mostly be used throughout this study.

## 1.9 LITERATURE REVIEW

One of the significant points that emerged from the literature research is that there is no uniformity of opinion among the various scholars about the origins of first the Syro-Canaanites and later the Phoenicians. Most of them agree, based on the fact that the Syro-Canaanites and later the Phoenicians spoke a North western Semitic language (and developed a script for it), that their origins lie in Mesopotamia. The opinions expressed by these various authors are given below:

### 1.9.1 Donald Harden

In his book *The Phoenicians*, Donald Harden (1963:21) refers to several waves of migrating Semites, which were thought to have come from Arabia or the Persian Gulf. In a footnote Harden refers to Herodotus (i, l) who stated that the Phoenicians came from the coasts of the Indian Ocean and adds that: “...it is interesting to see that view gaining ground so early” (Harden 1963:218).

Harden then adds that most authorities believe that the first main wave of migration coincided with the start of the Akkadian overlordship over Mesopotamia in ca. 2360 BCE, but immediately asks the question: ‘What about the evidence of the earliest Gublites who were trading with Egypt ca. 3000 BCE? Were they not Semitic and were they not the forerunners of the Phoenician Gublites of later years (Harden 1963:21)? (Under Gublites are understood the inhabitants of Byblos, which was also called Gebal or Gebail).

There does not seem to have been an armed conquest by Semites either in Byblos or elsewhere. Only from the fourteenth century BCE were the inhabitants of Canaan calling themselves in Akkadian ‘Kinah’ or ‘Kinanu’ (Harden 1963:21). The name Phoenician (Phoenikes) is first found in Homer (ca. eighth or seventh centuries BCE), and a Phoenician culture, distinct from the general Canaanites, only emerged during the latter half of the second millennium BCE (Harden 1963:22). Harden does not supply much information about the Phoenicians in the Levant, but switches the focus

of his book to the Carthaginians about whom more was known at the time of writing of his book.

### **1.9.2 Gerhard Herm**

Gerhard Herm in *De Feniciërs, het purperrijk uit de Oudheid* (1974) is of the opinion that there were three groups that made up the later Phoenicians, and that the main group of these three originated in the Sinai and were Bedouins who emerged from the mountain ravines between the Gulf of Suez and the Gulf of Akaba (Herm 1974:16).

The second group which he considers to be part of this blending of cultures, are the Obeid people from the area between the Euphrates and the Tigris rivers, who developed a settled agricultural society there in the fourth millennium BCE.

The third group which joined the previous two groups are the Sumerians, who came to Mesopotamia in about 3600 BCE, and are believed to have originated in Central Asia or India. These merged groups developed large cities with ziggurats as temples, such as Ur in Mesopotamia, with a very high standard of living. They were eventually superseded by Sargon I of Akkad, who was a Semite (Herm 1974:20-21).

Herm then refers to a number of migrations of Bedouins (Herm 1974:21-24) and focuses on the Amorites who migrated between 2300 and 2000 BCE into Mesopotamia and also settled along the Mediterranean coast both in Palestine and the later Phoenicia, where they called themselves 'Kinahhi' or 'Kinani', (Canaanites). He adds that the name Amorites originates from the word 'Amurru', which is of Babylonian origin, meaning "Land of the West" (Herm 1974:24-26). He assumes that they started to build ships and took to the sea.

### **1.9.3 Jean Mazel**

Jean Mazel in *De Feniciërs, beschaving en expansie* (1971) contends that the Himyarites are the ancestors of the Phoenicians. This ethnic group originated in southern Arabia, in the present day region of Hadramaut. The kingdom of Himyar was closely related to that of Sheba. They had a language that was called old Southern Arabic and they migrated along the east coast of the Red Sea to the Levant. In that area there were already Canaanite tribes, and these two population groups merged to

become the Phoenicians (Mazel 1971:23-26). He explains that the Himyarites already maintained trade contacts with ships and that they established themselves in the area of present day Lebanon, where they merged with the local Canaanite population and became the Phoenicians (Mazel 1971:24-26).

#### **1.9.4 Jürgen Spanuth**

Spanuth treats the above mentioned theories with utter disdain and asks how it is possible for nomads of the desert to become nomads of the sea? How is it possible that all of a sudden they were able to build sea-going ships without the essential technical know-how to do so or without the necessary nautical skills to sail the high seas (Spanuth 1986:69)?

He provides an overview of a number of writers who have expressed opinions on the matter and quotes Herm, Baramki and Pritchard, but does not find their solutions to be the final answer (Spanuth 1986:69-60).

He then refers to earlier research by G. Schwantes (Schwantes 1939:673), who stated that there was extensive trade with ships in Northern Europe already in the Bronze era, which connected Scandinavia, Denmark, England and Ireland (Spanuth 1986:60). He states that already in the time of the Megalith builders in the 3<sup>rd</sup> millennium BCE, shipbuilding and sailing the high seas were highly developed among the people living along the shores of the North Sea. During the great migration of the Nordic people, such as the Pheres (Philistines) and Sakar to the coast of Palestine and Lebanon, the knowledge of shipbuilding and sailing the high seas was introduced to this area, and did not originate with the Semitic peoples (Spanuth 1986:60).

#### **1.9.5 Maria Eugenia Aubet (Semmler)**

The Spanish academic Maria Eugenia Aubet, in her book *The Phoenicians and the West* (1993), presents yet another opinion on the origins of the Phoenicians and of Phoenician shipbuilding. She states the name *Phoenicians* is of Greek origin and that this is neither a Phoenician nor a Semitic word, but it refers to the purple dye industry, for which the Phoenicians were already famous in Homer's time (Aubet 1993:6, 7).

The Phoenicians did not call themselves by that name. She does give a clear

chronological indication that the coastal area of present day Lebanon was inhabited by Canaanites in the second millennium BCE, that during the first millennium BCE the inhabitants of the area can be referred to as Phoenicians, and that the Phoenicians who had moved to the west, are to be referred to as Punic from about the middle of the sixth century BCE onward. She provides a wealth of solid research on how the Phoenicians navigated around the Mediterranean Sea, their trade routes, sea currents, navigation and many other aspects of how the Phoenicians established themselves on the shores of and in present day Spain.

About the Phoenician ships she makes the following statement:

The first explicit mention of Phoenician ships refers to a fleet of forty merchant ships carrying cedar, which left a Phoenician port bound for Egypt around the year 3000 BC. From at least the middle of the third millennium we have evidence of large merchant ships – the ‘ships of Byblos’ – on the open sea trading with Egypt. It is partly to this long experience that the reputation of the Phoenician pilots as experts in the arts of navigation is due, also that of the naval engineers of Tyre, highly valued as shipbuilders and sought after by other eastern monarchies like Israel. Byblos, Tyre and Sidon had learnt all these techniques from Egypt, a country with a long shipping tradition that had grown out of travel on the Nile, principally by sail but using oars for auxiliary propulsion (Aubet 1993:146).

What seems difficult to understand in this statement is that in these few sentences she jumps from 3000 BCE Byblos to Tyre and Sidon and the Israelite Monarchy’s expedition to Ophir in about 1000 BCE. She states that the Phoenicians were experts in the arts of navigation and that the naval engineers were highly valued as shipbuilders, and then concludes that they were supposed to have learned this from the Egyptians, who only sailed up and down the Nile. The question then is: ‘If the naval engineers of Tyre were so highly valued as shipbuilders, would they really have learned these skills from the Egyptians, who mostly had a shipping tradition on the Nile?’

#### **1.9.6 Glenn Markoe**

Glen Markoe, in his book *Phoenicians* (2000), is less convinced that the origins of the Phoenicians are to be traced to the area around the Persian Gulf, but does not indicate any other region they may have migrated from. He does mention their Semitic roots, but states that their ethnic identity remains a mystery (Markoe 2000:10). His description seems more accurate than that of most other scholars, and he states that:

'Their empire was less a stretch of land than a patchwork of widely scattered merchant communities. Maritime trade, not territory, defined their sphere' (Markoe 2000:11).

He does not venture to speculate about how the Phoenicians came to build ships, but does laud their achievements as seafarers, navigators and sea-traders (Markoe 2000:12-13). His book provides a really good overview of the history of especially Tyre as well as information about the establishment and development of the colony in Carthage.

#### **1.9.7 Maitland A. Edey (ed.)**

The book *The Sea Traders* (1974), edited by Maitland Edey provides a large amount of pictorial material, besides reliable information about a number of aspects on the Phoenicians both in Tyre as well as Carthage. Also a detailed explanation is given of the battle of Salamis between the Persians and the Greeks, in which the Phoenician *triremes* played a role. The one flaw, which is probably caused by the fact that the different chapters were written by different contributors, is that the information is not in any sort of linear time sequence. This can cause confusion to the reader. A positive aspect is the really detailed information about the island of Motya, which is not found anywhere else. This is located off the west coast of Sicily, and was of strategic importance for trade to and from Carthage. It had an artificially dug harbour, called a *cothon*, and a clear explanation is also given of its eventual demise.

#### **1.9.8 Sabatino Moscati (ed.)**

A number of Italian experts on the Phoenicians compiled the book *The Phoenicians*, edited by Sabatino Moscati (2001). The chapters relating to 'Ships and Navigation' (2001:84-91) and 'Army, Navy and Warfare' (2001:160-167) were written by Piero Bartoloni. Initially they seemed to supply quite an amount of useful information, but on closer comparison with other sources, some of the information seemed less reliable, or was more clearly presented by other sources.

### **1.9.9 Nina Jedidian**

In her book *Tyre through the Ages* (1969), Nina Jedidian provides a wealth of information about Tyre specifically. She also compiled a detailed study of the use of *Murex* molluscs for the manufacturing of the famous purple dyed cloth. Without her book the existence of horse transport ships would have escaped notice and she provides the description of the attack with the horse transport ship on the mole under construction on orders of Alexander the Great. Besides the written part of the book, there is also an extensive array of pictures in the second half of it.

### **1.9.1 Lionel Casson**

Lionel Casson does not express any opinion about the origins of the Phoenicians in his book *Ships and Seamanship in the Ancient World* (1971), because his book is focussed on the entirety of development of ships and seamanship in the Ancient World, and not on the Phoenicians specifically. He does however express the opinion that 'the mainstream of nautical development that was to flow throughout ancient history, did not arise in the river-oriented civilizations of Mesopotamia or Egypt, but in the open water of the eastern Mediterranean: on Crete, on the Aegean islands and along the coasts of Greece' (Casson 1971:30).

### **1.9.11 Shelley Wachsmann**

If it is allowed to be said, then Shelley Wachsmann's book *Seagoing Ships & Seamanship in the Bronze Age Levant* (1998) is just about the most brilliant book about ancient ships in existence. His analysis of all the various ships which plied the Levant, of which images of whatever nature are available, be it on potshards, temple murals, carved into rocks, on seals or on surfaces of whatever other origin, models and descriptions, is a major accomplishment. Unfortunately his book only covers the Bronze Age, and not the Iron Age, so it does for example mention the 'ships of Byblos', but not the 'ships of Tarshish', simply because the latter fall outside the scope of his book. The details he provides about the construction of Egyptian ships enabled the comparison with the construction techniques of the Phoenician ships and this study would have been all the poorer without Wachsmann's book. Extensive reference will



be made to what he has written in Chapter 3 of this dissertation, not just about the Egyptian ships, but also about the ships of the Cypriots, Minoans and Aegeans.

#### **1.9.12 Serge Lancel**

How the book *Carthage, a History* by Serge Lancel (1997) could have been written off by the Unisa Library and ended up in a second hand bookstore, where a relative found it, is an absolute mystery. It should have remained in the library, as it contains detailed information about Carthage regarding many aspects of its establishment, history, its sphere of influence as well as both its harbours, warships and ship-sheds, sea walls and so on. It provided a useful source on a number of points.

#### **1.9.13 Richard Miles**

One of the most recent publications, *Carthage Must be Destroyed. The Rise and Fall of an Ancient Mediterranean Civilization*, by Richard Miles (2010), is a very detailed description of the protracted series of wars between Carthage and the emerging Roman Empire, which eventually led to the total destruction of Carthage. Miles has done an amazing job collating all the information to write the full story. His description of the enormous genocide, that took place when the Romans finally entered Carthage is absolutely bloodcurdling, but probably very accurate. The book contains a number of good illustrations, some of which were used in this dissertation.

#### **1.9.14 Articles**

As far as articles are concerned, mention can be made of the one by George Bass, *Oldest Known Shipwreck Reveals Bronze Age Splendour* (1987) about the Uluburun wreck.

I.M. Diakonoff's article *The Naval Power and Trade of Tyre* (1992) was very interesting on the goods traded by the Phoenicians and from where they came.

Elisha Linder's article on *Excavating an Ancient Merchantman* (1992) was well written and instructive, as well as the article by R.K. Pedersen, *Was Noah's Ark a Sewn Boat?* (2005) regarding the sewn construction method of ships in the Persian Gulf area.

The article by Lawrence E. Stager, *Why Were Hundreds of Dogs Buried at Ashkelon?* (1991b), which was the second in a series about the excavations done at Ashkelon, provided much interesting information about the dogs, even though I did not agree with his conclusion of there having been a healing cult. The article by Paula Wapnish and Brian Hesse about the dogs: *Pampered Pooches or Plain Pariahs? The Ashkelon Dog Burials* (1993) was extremely well researched on the physical aspects of the dogs found, but gave as the only explanation why the dogs were buried there, that this was the local dog population.

From all other sources only small amounts of information were used.

## CHAPTER 2

### WHO WERE THE PHOENICIANS

#### 2.1 INTRODUCTION

In order to write about Phoenician ships, it is useful to first pose the question: “Who were the Phoenicians?” The Phoenicians were not a homogenous group of people like the Egyptians, the Babylonians, or the Assyrians were, with a circumscribed territory. The Phoenicians lived in a number of cities, which were located on the coast of the Levant, the eastern shore of the Mediterranean, roughly the coast of present day Syria and Lebanon.

Moreover, the Phoenicians did not call themselves by that name. The name was given to them by the Greeks and refers to the colour of the dye they produced from *Murex* molluscs. Instead they would call themselves Tyrians, Sidonians, citizens of Ugarit, Byblos, Sarepta or Arvad (Aubet 1993:9).

The oldest of these cities were undoubtedly Ugarit and Byblos (or Jebeil, Gebail or Gebal as it also has been called). Byblos was the name bestowed by the Greeks, due to the fact that in Byblos papyrus was sold, which was the material to write on and to make books with. Besides Ugarit and Byblos also the island state of Arvad (or Aradus) flourished. Later the more southerly city states gained importance. Tyre, another island based city, and Sidon flourished, as well as Sarepta.

The reason that there were city states, rather than a homogeneously populated area, was that the geographical situation was one that did not encourage much interaction between the various city states. The area consisted of a narrow strip of land, wedged between the Mediterranean Sea on its western side, and the Lebanon Mountain range on the eastern side. From these mountains a number of rivers ran to the sea, and intersected the land, which impeded contact between the city states. Where the river water could not drain properly into the sea, the stagnant water made swamps, which further hindered contact (Aubet 1993:16).

### 2.1.1 Where did the Phoenicians come from?

As to the question of where the Phoenicians came from, there is not really a unanimous answer.

Most, if not all, of the scholars who study the Phoenicians, agree that they were of Semitic origins, but the opinions differ widely on how the Phoenicians learned to build ships and particularly from whom.

Most scholars assume that they originated from the east, from the area between the Euphrates and Tigris, even as far away as the coast of the Persian Gulf near present day Basra, alternatively from the Sinai Desert etcetera, and arrived in consecutive waves of migration. This assessment is mostly due to the fact that the Phoenicians spoke a Semitic language. The older scholars only refer to their language as being Semitic (Harden 1963:21; Herm 1974:22-23), whereas the later scholars make the distinction that the language the Phoenicians spoke was North West Semitic (Aubet 1993:10), and more specifically of the Canaanite group, of which Phoenician was the most developed language (Markoe 2000:108). What is baffling to some scholars is that even though these people supposedly came from areas that were not located along the coast of a sea, they so readily built ships and took to the sea. An overview of the various opinions that have been expressed about their origins has been given in the Literature Review (See 1.9).

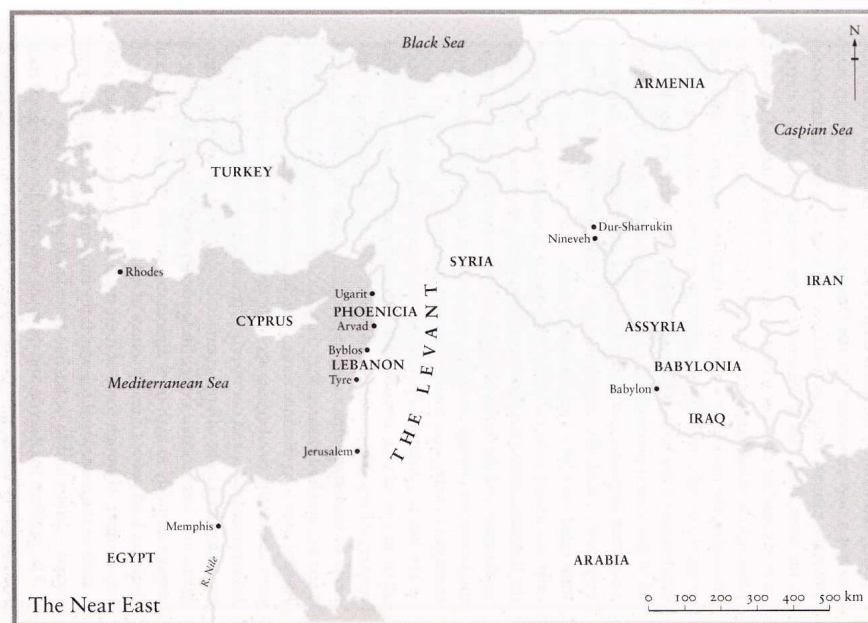
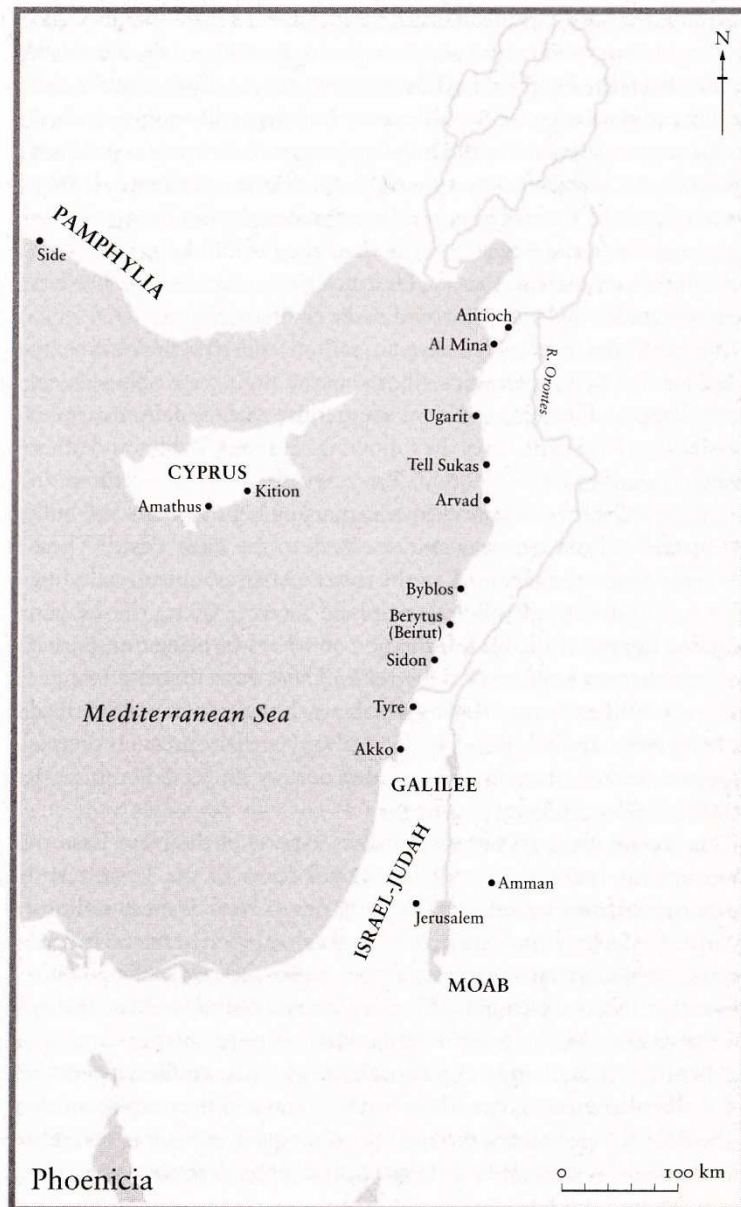


Figure 2-1: Overview Map of the Ancient Near East (Miles 2011:25).



**Figure 2-2: Map of the location of the Phoenician city states (Miles 2011:27).**

## 2.2 FROM DESERT WANDERERS TO SHIPBUILDERS

One of the most puzzling aspects about the Phoenicians is how, or from whom they learned how to build ships. Moreover, why did they begin to build ships and the Israelites did not, even though they both lived along the eastern shore of the Mediterranean? That cannot be explained simply by the abundant presence of cedar and other trees on the Lebanon Mountains alone.

When one reads the earlier authors on the subject of the Phoenicians, like Harden, Herm and Mazel, they explain the arrival of the Phoenicians as desert wanderers, from the Sinai, Mesopotamia and even as far afield as the area near present day Basra on the Persian Gulf. When they reached the coast of the Mediterranean they simply started to build ships and took to the sea.

Among the more recent researchers, Aubet expresses a different opinion, viz. that the Phoenicians learned how to build ships from the Egyptians. What is strange however is that she states just before that, on the same page, that in 3000 BC Byblos had a fleet of 40 ships (Aubet 1993: 146) and that Egypt bought ships from Byblos in ca. 2600 BCE (Aubet 1993:18). Unfortunately, she does not provide any reference for either statement.

The Austrian historian Spanuth in turn states that the Phoenicians learned how to build ships from the Pheres (Philistines) and Sakar, who originated in the Nordic realm (Spanuth 1985:60). They in turn had learned from the Megalith builders, who were (amongst other things) the builders of Stonehenge in the UK in about 2500 BCE (Spanuth 1985:61).

So now the question is: "Who is right?"

And despite all these assumptions, it does not seem that anyone has ever made an accurate analysis of the technical aspects of the Phoenician ships over against the Egyptian ships. This is what will be attempted in the chapter that follows.

## 2.3 WHICH OF THESE OPINIONS IS CORRECT?

In the above we have seen that there are a number of different opinions about the questions: Who were the Phoenicians, where did they come from and how did they learn to build ships?

One opinion is that the nomads of the desert became nomads of the sea and started building ships even though they did not seem to have had any technical or nautical knowhow (Herm 1974).

Another opinion is that they learned from the Megalith builders from Northern Europe via the Peres and Sakar (Spanuth 1985) and the third opinion is that they learned their shipbuilding and seafaring skills from the Egyptians (Aubet 1993). A fourth opinion is

that the shipbuilding skills of the Phoenicians originated in the Mediterranean basin (Casson 1971). Which one of these opinions however is the correct one?

This question is the focus of this dissertation and in order to come to a conclusion, the ships that the Phoenicians built and used will be discussed in detail.

## CHAPTER 3

### FROM WHOM DID THE PHOENICIANS LEARN TO BUILD SHIPS

#### 3.1 INTRODUCTION

In her brilliant book “The Phoenicians and the West” (1993), Maria Eugenia Aubet provides a wealth of information about the Phoenicians, both in their heartland along the Levantine coast, as well as in their western colonies. As we saw in the quote from her book in the previous chapter (see 1.9.5), she is of the opinion that the Phoenicians learned how to build ships from the Egyptians (Aubet 1993:146). For clarity sake the quote gets repeated here once more:

The first explicit mention of Phoenician ships refers to a fleet of forty merchant ships carrying cedar, which left a Phoenician port bound for Egypt around the year 3000 BC. From at least the middle of the third millennium we have evidence of large merchant ships – the ‘ships of Byblos’ – on the open sea trading with Egypt. It is partly to this long experience that the reputation of the Phoenician pilots as experts in the arts of navigation is due, also that of the naval engineers of Tyre, highly valued as shipbuilders and sought after by other eastern monarchies like Israel. Byblos, Tyre and Sidon had learnt all these techniques from Egypt, a country with a long shipping tradition that had grown out of travel on the Nile, principally by sail but using oars for auxiliary propulsion (Aubet 1993:146).

There are however too many contradictions in this statement. Therefore, an analysis and comparisons will be made in this chapter of both Egyptian and Phoenician ships, with respect to the conditions under which they were used, their construction techniques, presence or absence of a rope-spine (so characteristic of the Egyptian seagoing ships), the lotus shaped stern, the way their masts and sails were fastened and rigged, as well as any other differences that can be observed. In order to make understandable comparisons, the various aspects will be discussed in tandem.

#### 3.2 CONDITIONS UNDER WHICH SHIPS WERE USED

##### 3.2.1 Egyptian ships

Most Egyptian ships were used for travel on the river Nile. According to Wachsmann (1998:9) innumerable depictions of river boats are found in Egyptian iconography. There is however far less available about seagoing craft, most of it referring to the



seagoing trade with Punt. Opinions also differ on whether the Egyptians had a strong presence on the Mediterranean, with Wachsmann quoting T. Säve-Söderberg as voicing strong opinions in favour and A. Nibbi claiming a total absence of Egyptian maritime involvement. Wachsmann's own opinion in this debate is that the reality of pharaonic seafaring is probably found somewhere in between (Wachsmann 1998:9), and that Egyptian ships never sailed farther than the north Syrian coast (Wachsmann 1998:52).

As for the travel on the Nile, this was influenced by two factors: wind direction and current. As the Nile flows from south to north, that is the direction of the current, and a boat will float from Aswan at the First Cataract in the south the 750 miles down to the delta (Casson 1971:11). Its speed can be increased by means of using oars. The prevailing wind direction is mostly northerly, which means that in order to sail upstream, wind was the main means of propulsion and oars were used as a secondary means of propulsion (Landström 1969:6). Navigation was easy, in that the only route to be followed was to either sail upstream or downstream guided by the river banks. No navigation as is needed for sailing on the open sea was required.

### **3.2.2 Phoenician ships**

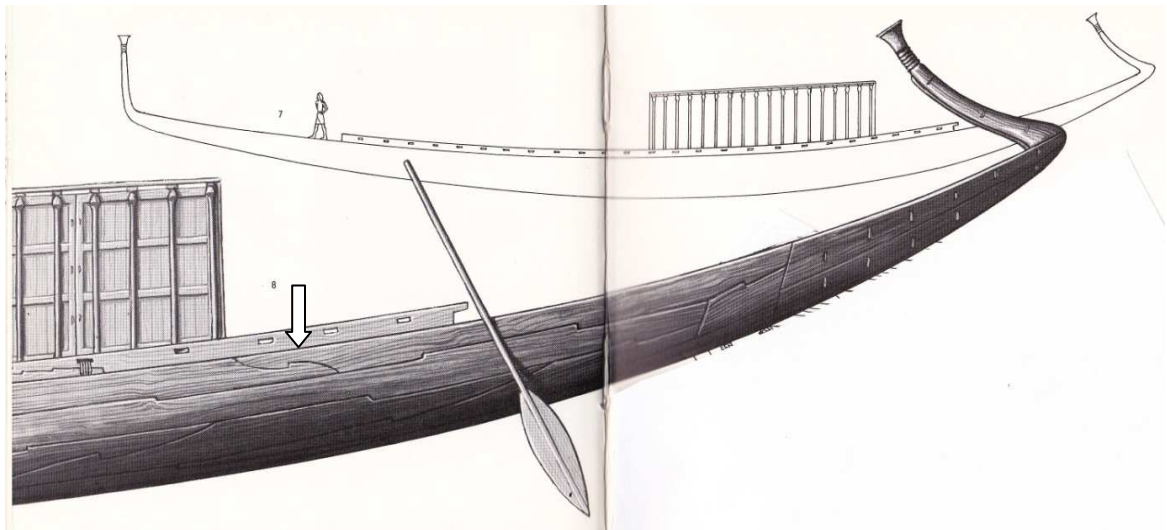
Due to the fact that most, if not all, of the Phoenician harbours were on the shores of the open sea, of necessity this required sailing on the open sea, where wind directions could vary as well as currents, and where there were no parallel river banks to guide the direction of travel, but only a shore if that was in line with the direction of travel, or some high points such as mountains. In certain places the open sea had to be traversed. Also other dangers could be present, such as partially or entirely submerged rocks. Moreover, the risk of severe storms was also far greater (Edey 1974:41). All of these factors required a different approach to navigation. When the Phoenicians started to sail the high seas, which required sailing at night, they made use of the Pole star, which is part of the constellation of Ursa Minor. In the classical world, this constellation was called 'Phoinike' (Aubert 1993:142). Even though this was much later in date than the earliest Egyptian navigation (on the open sea, e.g. to Punt), it does not seem likely that the Phoenicians learned this navigation technique from the Egyptians, who sailed down and up the coast of Africa according to the prevailing monsoon winds. These blow the one half of the year in a south-westerly direction and the other half of the year in a north-easterly direction (Van Dijk 2006:63).

### 3.3 CONSTRUCTION TECHNIQUES

#### 3.3.1 Egyptian construction techniques

The oldest available images of Egyptian ships date to 3200 and ca. 3000 BCE respectively and were found depicted on vases (Landström 1969:6). The earliest ships are believed to have been built from papyrus, as there has always been a shortage of timber in Egypt, but an abundance of reeds (Gibbons [ed.] 2001:16). Even when in later times the Egyptians built ships of imported wood, these were still built in the same shape as the papyrus boats. Small ships were built of short lengths of acacia wood, which was locally available (Landström 1969:6-7).

From at least 3000 BCE cedar was imported from the Lebanon and the oldest real ship that was found, is the Cheops boat, buried in a pit in front of his pyramid, which dates to 2650 BCE (Papanek [ed.] 1992:61-65; Landström 1969:8-9). The planks of this boat were of cedar, and were joined at the butts by means of a toggling technique of interlinking ends, somewhat like pieces of a jigsaw puzzle (See *Figure 3-1*).

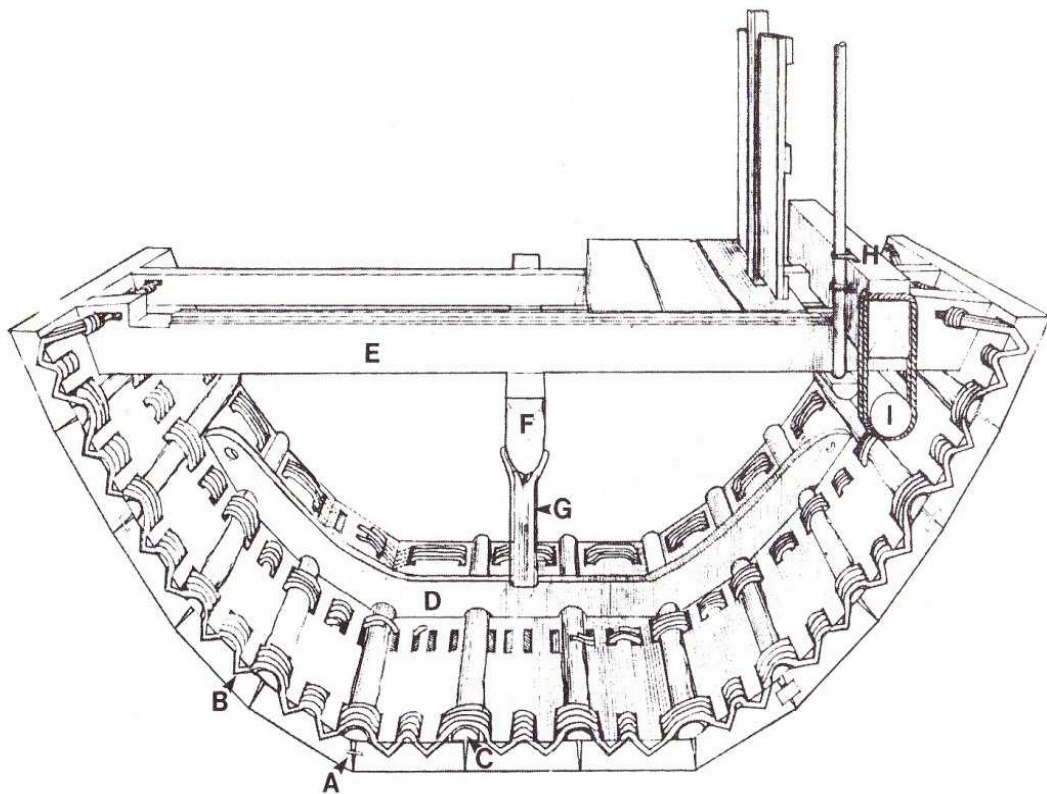


**Figure 3-1: A toggling technique was used to interlink the butts of the planks as indicated by the white arrow (Landström 1969:8-9).**

Side by side, the planks were joined by tenons in mortises, which were held in place with a type of glue (Landström 1969:9), but were unpegged (Wachsmann 1998:219). On the inside of the ship the planks were lashed together with rope made of halfa

grass, through v-shaped mortises (Wachsmann 1998:220), which did not pierce the outside of the hull, however (See *Figure 3-2*). It was an intricate method of construction, which does not know a parallel in Phoenician shipbuilding techniques, but seems to originate with the construction of papyrus boats. Only *one* pegged mortise-and-tenon joint was found on the entire Cheops ship, but the peg did not penetrate the plank's exterior (Wachsmann 1998:220).

Moreover, the Cheops ship did not have a keel, just a rounded hull underneath the waterline, which would have made it susceptible to drift. This means that it could float away sideways and not stay on a straight course. As it was propelled by oars and not by means of a sail, the tendency to drift could be controlled by the use of the oars.



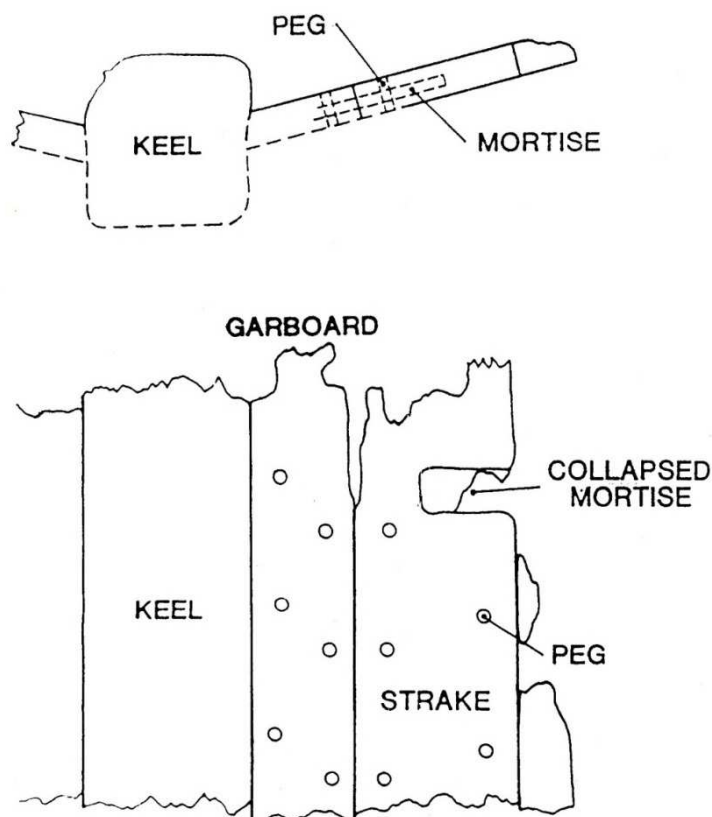
**Figure 3-2: Lashing of the Cheops ship through V-Shaped Mortises. (A) unpegged mortise-and-tenon joint; (B) V-shaped mortise for transverse lashing; (C) batten; (D) floor timber; (E) beam; (F) carling; (G) stanchion; (H) stringer; (I) stringer hold-down (from Lipke 1984:75 fig. 48, as used in Wachsmann 1998:219 fig.10.4).**

### 3.3.2 Phoenician construction techniques

The oldest Canaanite/Phoenician ship, about which information is available, is the Late Bronze Age Uluburun shipwreck, dating to ca. 1400 BC (Bass 1987:695). Admittedly

this is of a different date than the Cheops ship, but the differences are considerable. There was no toggling of unevenly shaped planks nor any lashing by means of ropes. The construction of the hull was different to that of the Egyptian ships, in that the Uluburun wreck had a rudimentary keel in the form of a keel-plank, to which a garboard strake<sup>1</sup> was attached on either side, to which in turn a strake<sup>2</sup> was attached. These all were attached to each other by means of mortise-and-tenon joints, which were all pegged (See *Figure 3-3* and *Figure 3-4*). According to Wachsmann:

Pegged mortise-and-tenon joinery seems to have been a requirement for *seagoing* ships. Already at Uluburun the joinery appears well developed, and we must assume, therefore, a considerable period of evolution leading up to it (Wachsmann 1998:216-217).

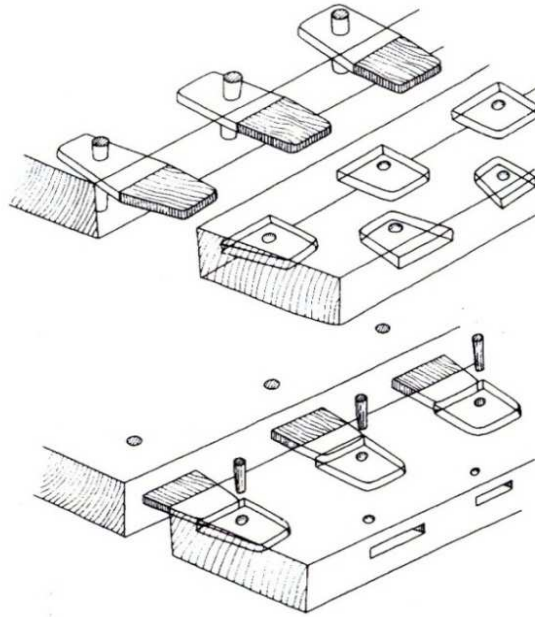


**Figure 3-3: Pegged mortise-and-tenon joint construction found in the hull remains of the Uluburun ship (late fourteenth century BCE) (from Pulak 1987:130, ill. 73, as used in Wachsmann 1998:216, fig. 10.2).**

It may be useful to re-phrase what Wachsmann is trying to say in the above quote, namely that mortise-and-tenon joints had already been in use for quite some time and had been developed long before they were used to build the Uluburun ship. This technology was not new, but the end result of a long period of development.

<sup>1</sup> A garboard strake is the strake next to a ship's keel (Webster's 1977:473).

<sup>2</sup> A strake is a continuous band of hull planking on a ship (Webster's 1977:1149).

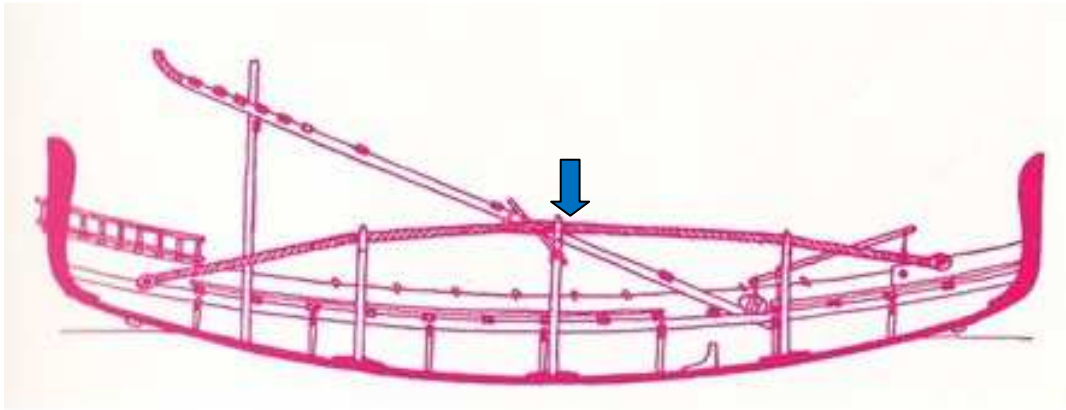


**Figure 3-4: Detail of mortise-and-tenon joint construction: wooden pegs are inserted in slots and fastened with pegs to join strakes together side by side (Carey, Allfree & Cairns 2005:28).**

### **3.3.3 Use of a rope spine on Egyptian seagoing ships**

Besides travel on the Nile, the Egyptians also undertook seagoing voyages, mostly to the region of Punt, in present day Somalia and possibly beyond. The first expedition to Punt about which information is available, took place in ca. 2500 BC, the era of the Old Kingdom, when ships were sent by pharaoh Sahure of the Fifth Dynasty (Landström 1969:10). Images of seagoing ships were found on the walls of his funerary temple. In order to be strong enough to withstand the rigours of the open sea, the seagoing ships were held together by means of a rope-spine or hogging-truss (See *Figure 3-5*). According to Wachsmann, this was done for the following reason:

A seagoing ship must have the structural strength to head perpendicularly into waves having a length between crests greater than or equal to that of the ship itself. When the crests are at the ships extremities, its midships (*sic*) section is in a trough. In this case, the upper lateral area is under compression and the lower area is under tension. More importantly, when the ship is supported amidships by a single wave, the stresses are reversed. The upper structure is now under tension while the hull's lower portion is under compression. This latter condition is encountered more often because it can be produced by shorter waves. That is, assuming a wave amidships, the previous crest has just left the stern area while the next wave has not yet reached the bow. Thus, even in a moderate sea, ships lacking sufficient longitudinal support in the form of a developed keel and framing system and with exaggerated overhang at stem and stern will tend to "hog", or break in two, unless they are given additional longitudinal support. The hogging truss allows for the required tension to be set (Wachsmann 1998:14).



**Figure 3-5: The hogging-truss or rope-spine runs over the stanchions above the deck (Blue arrow) (Landström 1969:11).**

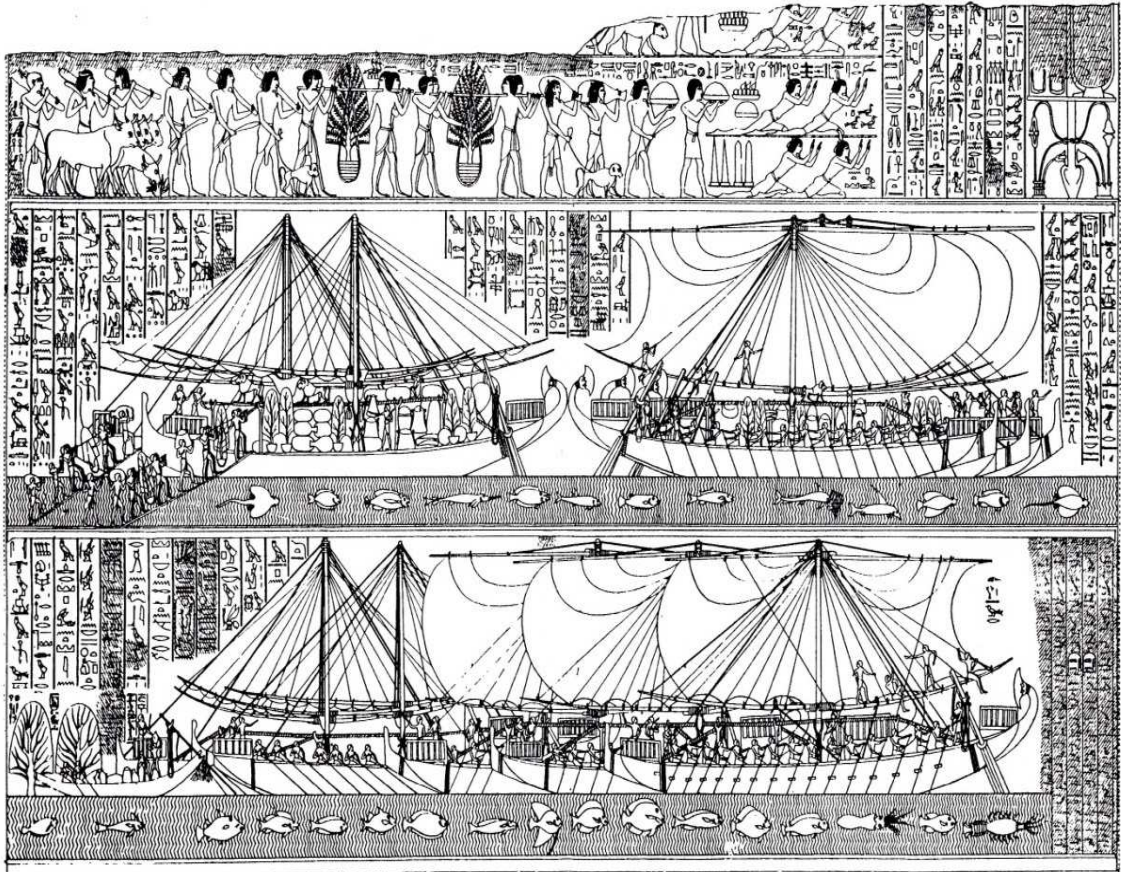
So this was the reason that the seagoing ships needed to have a rope spine or hogging truss, in order to be able to sail on the open sea without breaking. This rope spine consisted of a set of ropes attached around the hull just behind the bow, running along the length of the ship above the deck, supported on stanchions, and then attached again around the hull just before the stern. These ropes could be tightened by twisting them to achieve the required tension to prevent the ship from breaking up (Wachsmann 1998:13-14). Sahure's ships moreover had a truss girdle running along the entire length of the ship. This is a girdle of ropes around a hull to hold the hull together or to provide a point of attachment for a truss (Wachsmann 1998:381) (See *Figure 3-12*).

Whether the ships sailing to Punt went beyond the present day Punt land in Somalia and how far beyond it, is an open question. In this context it is interesting to mention that the word for 'ship' in the isiZulu language in actual fact means 'rope-spine'. This was mentioned by the South African Sanusi Credo Mutwa, who pointed out this fact to Brenda Sullivan. Apparently a ship in isiZulu is called *umKhumbi* and indicates a huge rope-spine, and this word is very old, as it goes back to the very first ships the Zulu knew, which were the Egyptian ships with rope-spines (according to Mutwa). The word *umKhumbi* has also taken on the meaning of a very strong-willed man, who has a spine as strong as a rope-spine (Sullivan 2001:74).

Wachsmann is of the opinion that voyages to Punt were common in the time that elapsed between the voyage in Sahure's time and the second expedition to Punt about which pictorial information is available, which took place in the time of the New

Kingdom, during the reign of Queen Hatshepsut of the Eighteenth Dynasty in ca.1460 BCE (Brown 2009:100-101; Wachsmann 1998:17-22; Landström 1969:18-22). There is however no information available about any seagoing ships in the Middle kingdom period (Wachsmann 1998:18). Judging by the big emphasis that was placed on this latter voyage however, with its elaborate depiction in Hatshepsut's mortuary temple in Deir El Bahri, it seems to me that quite some time had elapsed since the previous voyage had taken place. Hatshepsut's Punt ships still featured rope spines or hogging trusses, but there also were a number of new features, such as a straight stem-post, which could be indicative of the use of a keel plank. Researchers are however not in agreement with each other about this issue (Wachsmann 1998:241-242). If Hatshepsut's ships did have a keel plank or some form of proto-keel, why did the ships then still need hogging trusses? It seems as if in the 1000 years that elapsed between Sahure and Hatshepsut, no radical new design had been made to Egyptian seagoing ships, which would have made the use of rope spines superfluous. Only structural improvements were made inside the hull of the ships in Hatshepsut's time, by making use of through beams, which took the place of the truss girdle on Sahure's ship (Wachsmann 1998:24). Another improvement was the many lifts on the boom of the sail, which made the sail more adaptable to varying winds. In this respect, according to Gibbons (2001:17), Hatshepsut's ships showed 'state-of-the-art' technology (See *Figure 3-6* and *Figure 3-7*).

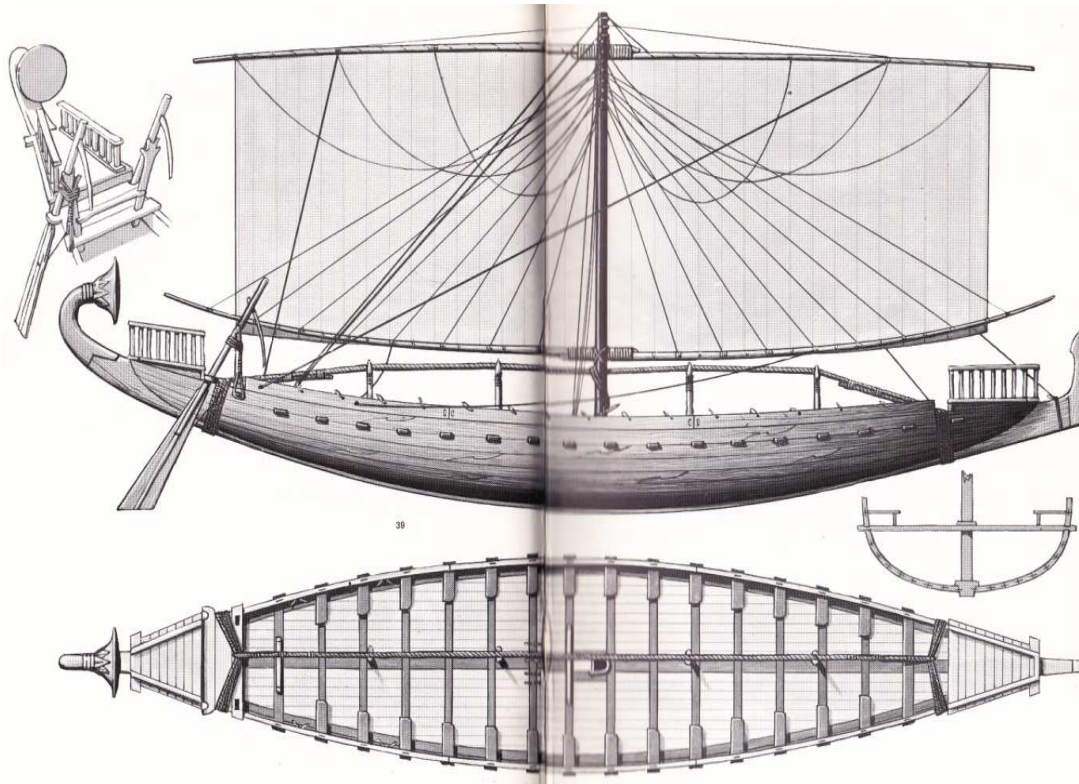
The American marine archaeologist Cheryl Ward recently has had a copy of the ships of Hatshepsut built. The 'Min of the Desert' has both a keel plank as well as a hogging truss (Schnohr 2011:36-41). The use of a keel plank however, should have made the use of a hogging truss superfluous, as the keel plank provides sufficient internal stability to the ship. If the ships of Hatshepsut indeed were built with a keel plank, it indicates that the Egyptians had changed their design, probably under influence of non-Egyptian sources. This would then indeed be 'state-of-the-art' technology. If the ships were built without a keel plank, then they would have needed a hogging-truss to keep them together. The third possibility is that the ships did indeed have a keel plank, but that the Egyptians deemed the hogging truss a necessity as a precautionary measure, because they were not sure of the new design and stuck to their old traditions.



**Figure 3-6: Hatshepsut's ships for the expedition to Punt, Deir el Bahri (from Säve-Söderberg 1946:14 fig. 1, used in Wachsmann 1998:17 fig.2.11).**

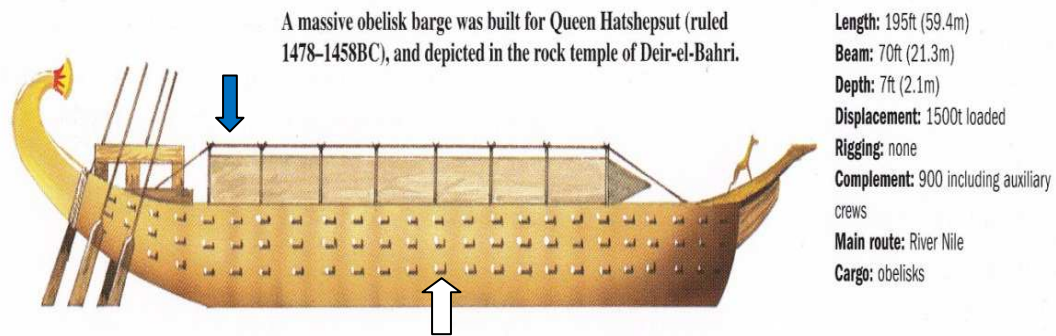
The ships sailing to Punt were called Byblos ships (*Kbn*). This does not mean that they were sailing to Byblos, but that this was a class of seagoing ships that was normally used on the Byblos run. In the course of time a broadening of the meaning of the name occurred, so that by the end of the Old Kingdom the term had come to mean a large seagoing ship, regardless of its destination (Wachsmann 1998:19).





**Figure 3-7: Hatshepsut's Punt ship in more detail. Note the straight stem-post and the ends of the through beams showing as small blocks on the side of the ship. Note the presence of the hogging truss (Landström 1969:20-21).**

One of the impressive achievements of Hatshepsut's reign was the construction of a huge wooden barge, which was used to transport two obelisks from Aswan to the temple of Karnak at Luxor, where they were placed at the entrance to the temple. The largest of these obelisks, measuring almost 30 m in height, is still standing (Stierlin 1995:88, 92). According to an image in Gibbons (2001:16-17) this ship was constructed with three layers of through beams in rows from stem to stern, of which the ends are visible in the hull of the ship, to increase structural stability. Moreover hogging trusses ran over stanchions on the deck. The ship was also depicted on the walls of the rock temple at Deir el Bahri. It was designed to transport the two obelisks side by side, did not have its own propulsion by means of sail or oars, but was towed by 27 small oared vessels with a total manpower of 900. The measurements provided by Gibbons are: Length: 59.4 m; Beam: 21.3 m; Displacement 1500 tons loaded. He is of the opinion that the two obelisks together weighed ca. 700 tons (See *Figure 3-8*).



**Figure 3-8: The obelisk barge transporting two obelisks. Note the ends of the three rows of through beams (White arrow) on the side of the ship, as well as the rope spine (Blue arrow) to prevent hogging (Gibbons [ed.] 2001:16).**

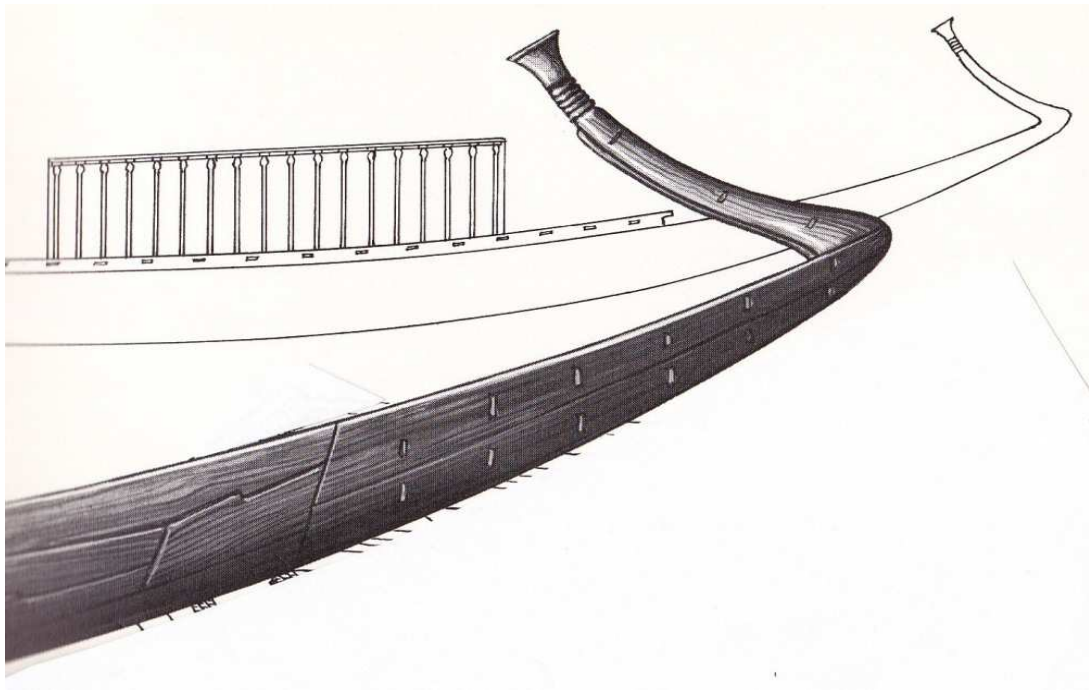
### 3.3.4 Absence of rope spines on Canaanite/Phoenician ships

When the above mentioned Uluburun ship is compared to Hatshepsut's seagoing ships, both dating to approximately the same time (Hatshepsut to ca. 1460 BCE and the Uluburun ship to ca. 1400 BCE) there is no trace of a rope spine or hogging-truss to hold the Uluburun ship together. Its method of construction was totally different, with enough strength inherent in the ship itself, due to the construction with a keel-plank, to hold it together on the waves, so that no rope spine or any form of hogging trusses was necessary (Bass 1987:694-696).

## 3.4 SHAPE OF THE STERN

### 3.4.1 Shape of the stern on Egyptian ships

When the shape of the stern on Egyptian ships is analysed, it is very often the case that the stern has the shape of a lotus flower, which is a typical Egyptian symbol (See *Figure 3-9*). This already started with the ships made of papyrus reeds, and continued when later ships were made of wood, see e.g. the Cheops ship and Hatshepsut's Punt ships (Landström 1969:6-9; 18-19; Wachsmann 1998:17). Only Sahure's Punt ships have a vertical straight sternpost (Wachsmann 1998:13).



**Figure 3-9: Lotus-shaped stern-post on an Egyptian ship (Landström 1969:9).**

### **3.4.2 The shape of the stern on Canaanite/Phoenician ships**

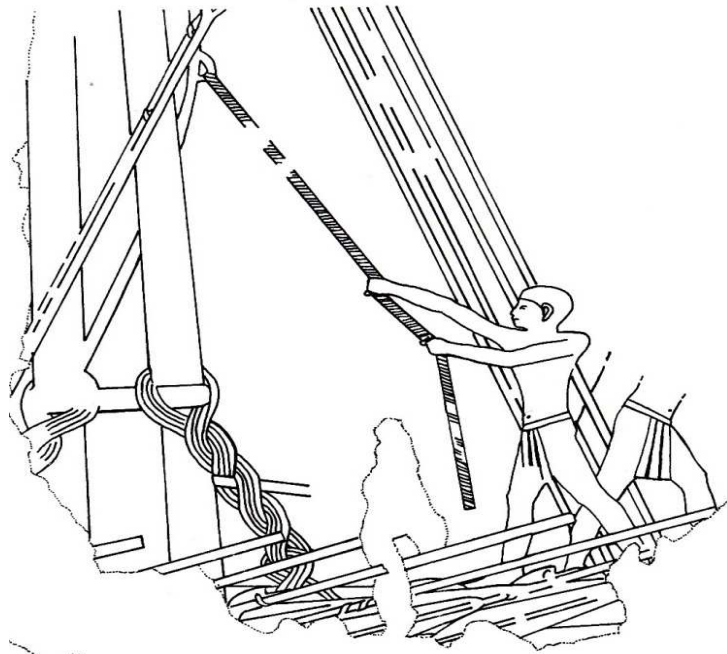
Over against the lotus shape of the sternpost of most Egyptian ships, the sternpost of the Canaanite/Phoenician ships was a simple vertical straight beam (Bass 1987:694-696; Wachsmann 1998:42-47).

## **3.5 METHOD OF ATTACHING THE MAST**

### **3.5.1 Method and problems to attach a mast on Egyptian ships**

As we have already seen, the Egyptian ships did not have a strong and thicker keel plank, but had a rounded hull consisting of identical planks in thickness. This made it very difficult to attach a mast to the ship and initially this problem was solved by the Egyptian shipbuilders by making use of a bipod (or even a tripod) mast (Wachsmann 1998:25; Landström 1969:10-11). This practice may have originated with the papyrus ships. The butt of both poles would be placed in wooden blocks fastened on the inside of the hull, and the identical poles went through and were supported by the deck planks, as well as fastened with trusses on either side. These were strapped around

the poles on the one end, while the other end was attached to the deck and the trusses were twisted to provide lateral stability to hold the bipod mast in place (See *Figure 3-10*). Extensive rigging (by means of stays) was also required to hold the mast in place. According to Wachsmann the bipod mast went out of use at the end of the Old Kingdom (Wachsmann 1998:27), so by the time Hatshepsut's ships headed for Punt, they supposedly were equipped with single masts. Even so the lateral trussing of the mast still seems to be visible on the representations on the wall of Hatshepsut's funerary temple at Deir el Bahri and the ships still required several stays to hold the mast in place.



**Figure 3-10: Lateral truss to support the bipod mast (Wachsmann 1998:16, fig.2-10).**

By the time of the invasion of the Sea peoples in ca. 1200 BCE however, the Egyptians seem to have managed to place a single mast in their ships, as the images of the ships, used to defeat the Sea peoples, show a single mast in place (Landström 1969:23).

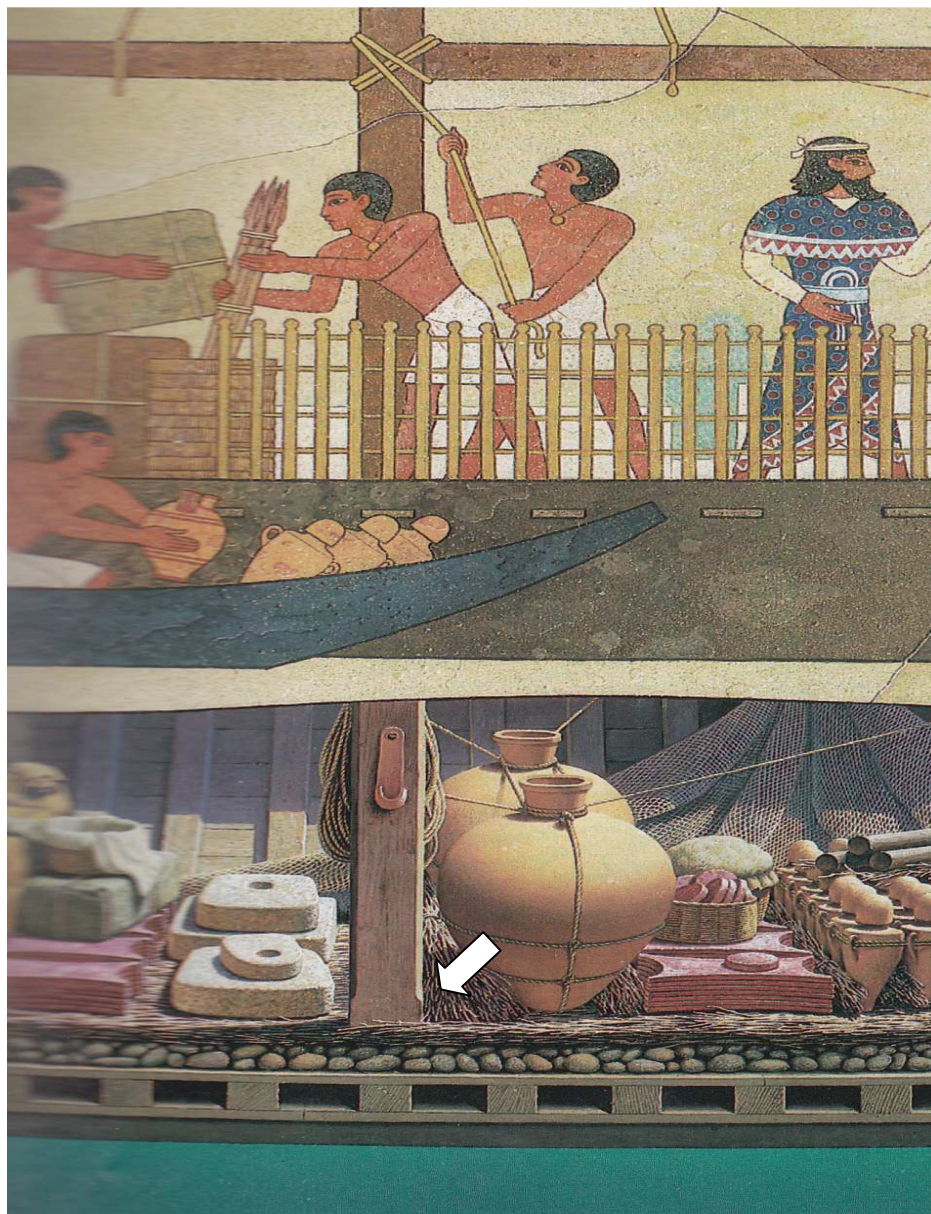
### **3.5.2 Method to attach a mast on a Canaanite/Phoenician ship**

As the Uluburun ship, already mentioned in the above, had a thicker keel-plank than the rest of the strakes making up the hull, it would have been much easier to attach a

mast to this plank, because it was so much stronger. The reconstructed model of the Uluburun ship by Bass shows the mast fastened to the keel plank (Bass 1987:694-696) (See *Figure 3-11*). Edey (1974:41-42) provides an additional description of how the mast was placed:

The Phoenician mast was short, probably set in a mast step or slot in the bottom of the ship. Since the Phoenician hull had a very strong backbone in the heavy wooden beam that served as its keel, the butt of the mast could rest in its step with little danger of being driven through the bottom of the hull. A short mast promised good hull stability during squalls and gales, and reduced strains aloft.

This type of mast also required very few stays to remain in place.

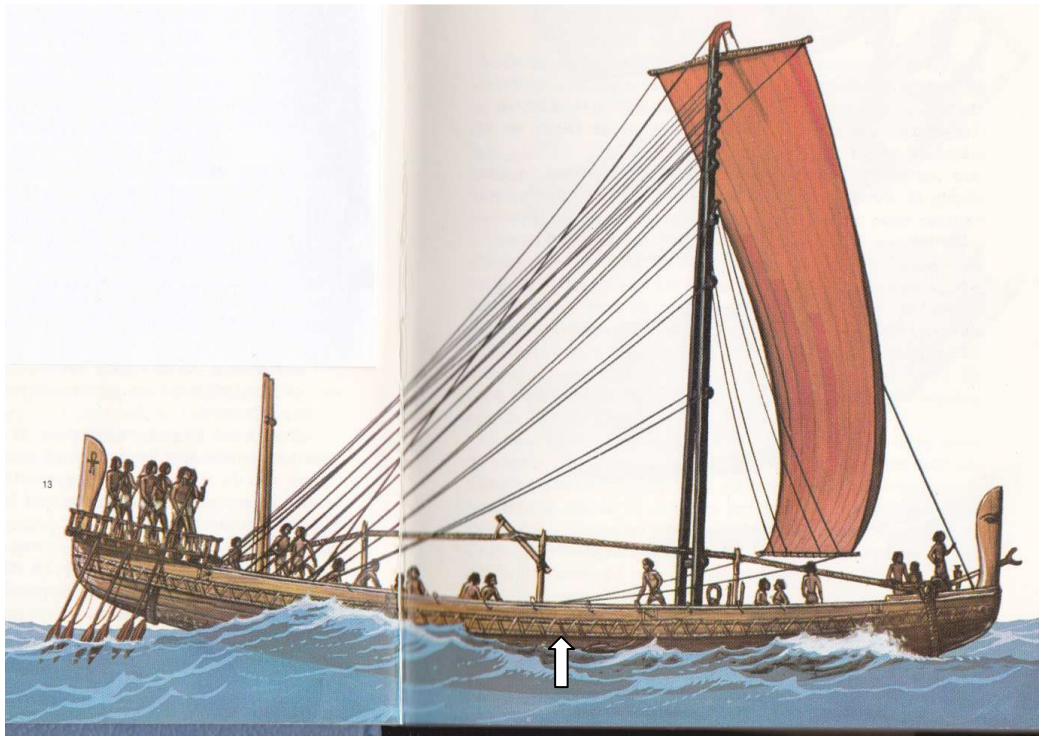


**Figure 3-11: Mast-step of the Uluburun ship (Bass 1987:694-696)**

## 3.6 SAILS

### 3.6.1 Sails on Egyptian ships

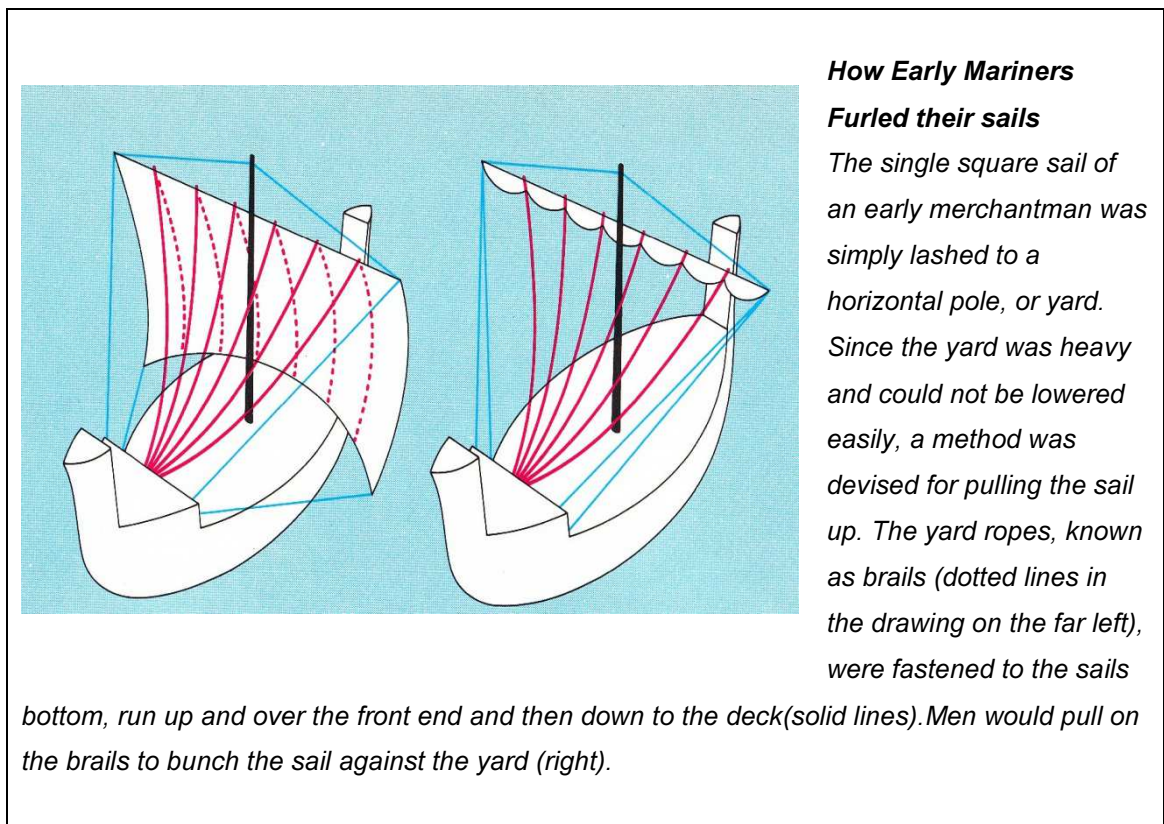
From the earliest times about which information is available, the Egyptians used a straight sail, suspended from a yard hoisted up to the mast. At the lower end, this type of sails was held in place by means of a boom. The ships sailing to Punt in Sahure's time had narrow vertical sails, suspended from a tall bipod mast (See *Figure 3-12*). By the time Hatshepsut's fleet sailed to Punt, the shape of the sails had changed. These had become broader and lower and both the yard and the boom consisted of two spars that had been latched together with ropes at their thickest sides, with the thin sides facing outward. The sails were hoisted from the boom upwards and were lowered when no longer needed and tied to the boom (Landström 1969:6-19). The use of the boom was necessary to unfurl the sail completely in order to make use of the available wind. The boom was lashed to the mast to prevent the spillage of wind (Wachsmann 1998:27).



**Figure 3-12: Tall sail on Sahure's Punt ship. Also note hogging-truss above the deck and truss-girdle (indicated by white arrow) around the ship (Landström 1969:10-11).**

### 3.6.2 Sails on Canaanite/Phoenician ships

The ships plying the Mediterranean in the time of the Minoan culture of Crete also used sails with both a yard and a boom as shown on several Minoan seals (Wachsmann 1998:95). The early Canaanite ships are believed to have used sails with both a yard and a boom as well, but at some stage this changed. The Phoenicians started using sails with loose brailings. This means that they no longer attached a boom to the foot of the sail, but attached a number of ropes, called 'brails' to the foot of the sail, which ran up over the front of the sail and then over the yard down to the deck (See *Figure 3-13*). The sailors could pull up the sail by pulling on the brails and thus furling the sail against the yard, which remained hoisted up (Edey 1974:42-43). As explanation for this practice, Edey only states that this was done so that the yard would not have to be hoisted up the mast, which was a heavy task, and that it would prevent the halyards from wearing through. In those days there were no pulleys with revolving sheaves (Edey 1974:42).



**Figure 3-13: Principle of loose brailings (Edey 1974:43)**

There are however, other reasons why the use of a sail with loose brailings has certain advantages, and I have not found these mentioned in most of the books that I have consulted, with the exception of Spanuth (1985:63). My grandfather, the yacht builder and designer Gerardus de Vries Lentsch, gave specific reasons and advantages for sailing with loose brailings. In the Netherlands the indigenous types of ships, such as Boeijers, Botters and Tjalken still make use of sails with loose brailings. Even though these are no longer the square sails suspended from a yard like the Phoenicians used, but are gaff rigged sails, the same principle still applies, because the foot of the sail is only attached to the boom at the far end of it. My grandfather explained to me that sailing with loose brailings has two main advantages: the first is that in case of an emergency, which would necessitate reducing the surface of the sail so as to catch less wind, thus also reducing speed, this can be done very quickly when the sail has loose brailings, because the sail can be bunched together by hoisting it up and by lowering the gaff. The sail then hangs diagonally from the mast to the farthest end of the boom. The second advantage is that the sail remains aloft and does not lie on deck, obstructing the movements of the crew (See *Figure 3-14*). With this in mind I would like to have a look at the one and only time that the Egyptians made use of this type of sails and rigging.





**Figure 3-14: Loose brailings on a gaff-rigged sail (Photo: Henny Buddingh, private collection).**

### **3.6.3 The invasion of the Sea Peoples**

Already before 1200 BCE the Sea Peoples made their presence felt in the Levant and Egypt. Under Ramses III a large fleet gathered in the Nile delta in ca. 1200 BCE and in a sea battle there, Egypt defeated the Sea Peoples. On the walls of Ramses' mortuary temple at Medinet Habu images depicting this battle show both the Sea Peoples and the Egyptians using sails with loose brailings (Wachsmann 1998:30-31). This was the first time Egyptian craft were depicted with this type of sails and apparently the last time as well. Spanuth states that:

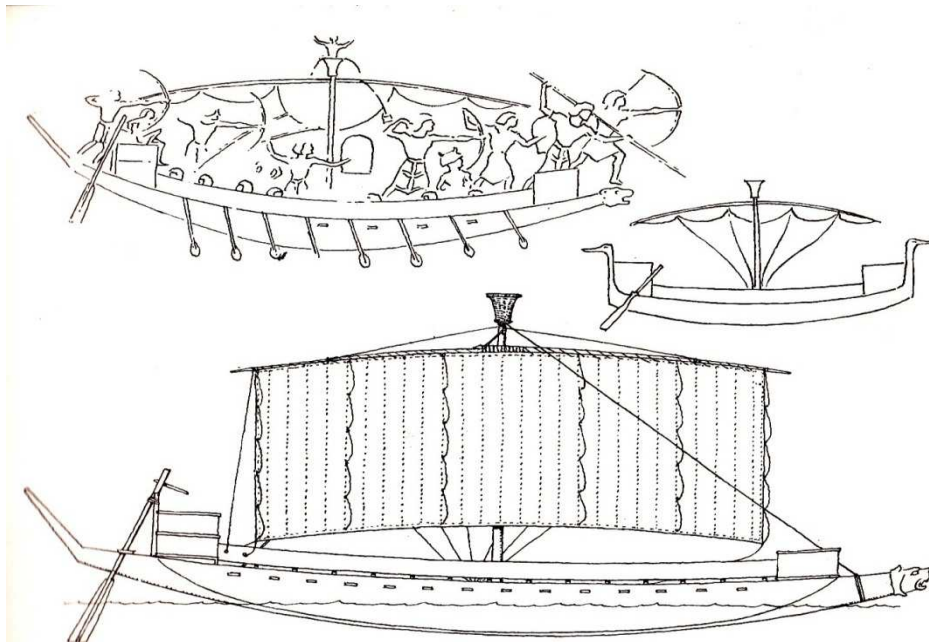
Für kurze Zeit also übernahmen die Ägypter die Weise, die Segel aufzugeien, von den Nordmeervölkern (*A.Koster, 1923, 53f.*), aber sie haben ihre alte Methode bald wieder aufgenommen (Spanuth 1985:63).

Gibbons states a similar opinion:

The Pharaoh's ships show that the Egyptians, ultra-conservative in many ways, had learned much from their neighbours and enemies about shipbuilding. Rameses' (*sic*) galleys were assembled on a keel and equipped with rams, and with protective bulwarks for the oarsmen. They have fighting platforms fore and aft, side-screens and a crow's nest for a sharpshooter or lookout. The square sail could be readily furled by brailing up, instead of by the more laborious process of lowering the yard. These ships were 'state of the art', but after this period, Egyptian naval technology ceased to advance, and mastery of the seas passed to other nations (Gibbons [ed.] 2001:17).

The use of this type of sail contributed in my opinion to the success in battle for the Egyptians. They were fighting on their own turf and unhindered by having to lower sails and having to tie them onto the boom to make the ship lie still for the battle. They could leave them hoisted up and furled against the yard to fight the battle unhindered (See *Figure 3-15*). Should they have been about to be defeated, they could have lowered the sails quickly in order to flee.

That the Egyptians went back to using boom-footed sails thereafter, is not surprising, when we take into account the different conditions under which sailing takes place on the Nile, compared to those on the open sea. On the Nile it was better to use a boom-footed sail, as this was a better method to make use of what little wind was available there. The boom assisted in unfurling the sail to its maximum extent and to keep it unfurled, so that it would not start flapping under conditions of very little wind.



**Figure 3-15: Three images of the battle against the Sea Peoples. The top image shows an Egyptian ship. The small image in the middle shows a ship of the Sea Peoples and the larger image at the bottom shows the Egyptian ship more in detail with its sail with loose brailings (Landström 1969:23).**

I hold it very well possible that the Phoenicians advised the Egyptians to make use of sails with loose brailings for the battle against the Sea Peoples. By then they had already been using this type of sail for quite some time. Phoenician ships frequented the Egyptian harbours as can also be seen on the scene depicted on the walls of the tomb of Kenamun. He was the “Mayor of Thebes” and “Superintendent of the Granaries” under Amenhotep III. The latter ruled from 1390-1353 BCE (Wachsmann 1998:42). The ships depicted on the walls of Kenamun’s tomb show Syro-Canaanite ships in much detail with straight stem- and sternposts. The strakes are joined with straight butts and there is a screen running the length of the ships at the sheer. This latter characteristic was also part of the ship excavated at Uluburun (Wachsmann 1998:44).

### 3.7 PRELIMINARY CONCLUSIONS

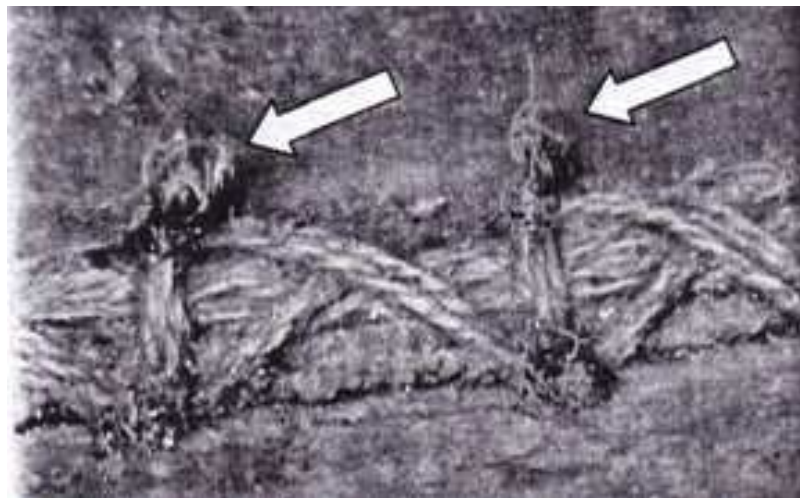
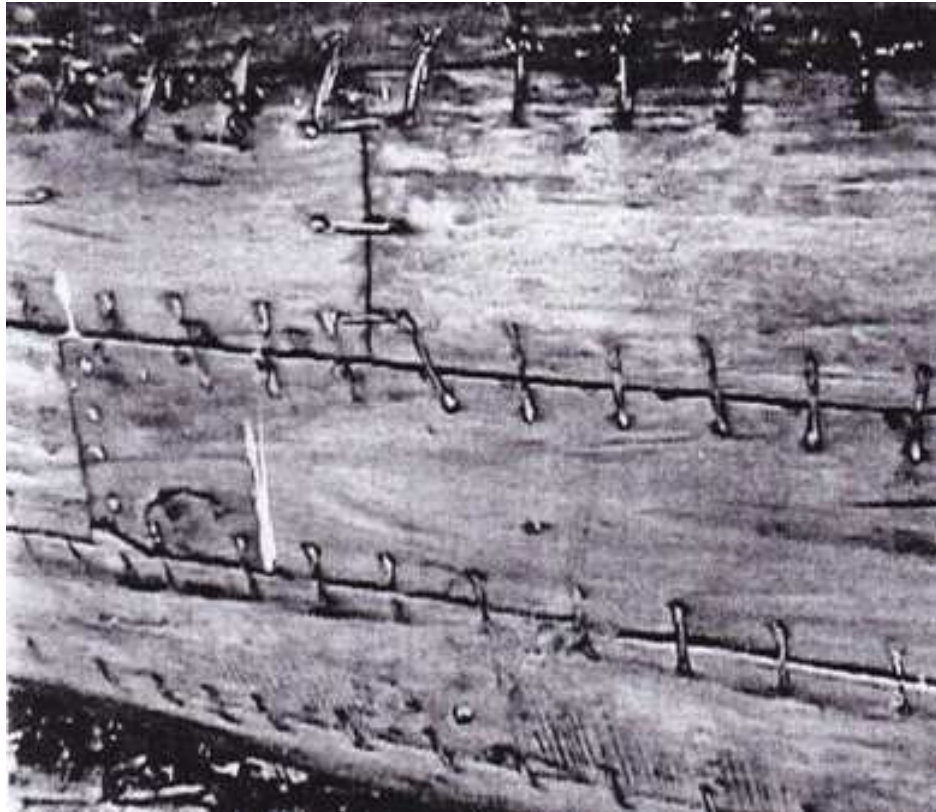
When we take all the above mentioned factors into consideration, it seems unlikely that the Phoenicians learned how to build ships from the Egyptians. There are too many differences in the way the Egyptian and Canaanite/Phoenician ships were constructed and rigged. The objection could be made that the comparisons are incorrect, as ships are mentioned from the respective cultures that did not always exist at the same time, but if the Egyptians indeed did influence Phoenician shipbuilding, then their ship building techniques should have been visible centuries later in the Canaanite/Phoenician ships, which is not the case. As stated in the above, it could be possible that the opposite was true: the Phoenicians influenced the Egyptians in their shipbuilding methods, especially at the time of the invasion by the Sea Peoples.

The question then arises whether there could have been other cultures from whom the Canaanites/Phoenicians learned how to build ships. What about the alleged origins of the Phoenicians in the east, such as Mesopotamia or the shores of the Persian Gulf? These will be investigated under the next heading.

### 3.8 MESOPOTAMIAN SHIPS

According to Pedersen (2005:21) there is little physical evidence available of the watercraft of Mesopotamia. No ancient wrecks have been found in the Persian Gulf or

in Iraqi riverbeds, and only a few models are known from iconography on seals and reliefs. However, he has made an extensive study of the shipbuilding account in the Gilgamesh Epic and is of the opinion that the ships of Mesopotamia were sewn boats, of a type that was prevalent for over two thousand years along the littoral of the western Indian Ocean and nowadays is still made in Cochin in India. Essentially this type of shipbuilding technique is Stone Age technology, as more than one type of timber can be used, preferably of a softer variety, which can be worked with stone and bone tools. This type of boat is known as 'sewn' or 'stitched' and is constructed in the opposite manner to present-day boats. First the planking is fastened to each other by means of stitching with coir, which is cordage derived from coconut fibre, through holes bored along the edge of each plank. Inside the vessel the stitching looks like cross-stitching, and when the planking is bound together, wadding is incorporated, consisting of bundles of fibre, to cover the seams. This makes the seams waterproof. On the outside only vertical stitches are visible and the holes in the planks are closed from the inside with tufts of coir to prevent leaks (See *Figure 3-16*). These boats need little interior framing, as the shell is well-fastened, but what little framing there is, is also attached to the hull with coir. The bottom of the ship is coated with a mixture of lime and shark oil to protect it against sea-worms. Until recently these boats were still built along the coasts of Yemen and Oman (Pedersen 2005:21-22). The 14<sup>th</sup> century Arab traveller Ibn Battuta, as well as the Italian Marco Polo, whose account dates from the 13<sup>th</sup> century, refer to sewn vessels being constructed near the mouth of the Persian Gulf (Pedersen 2005:22).

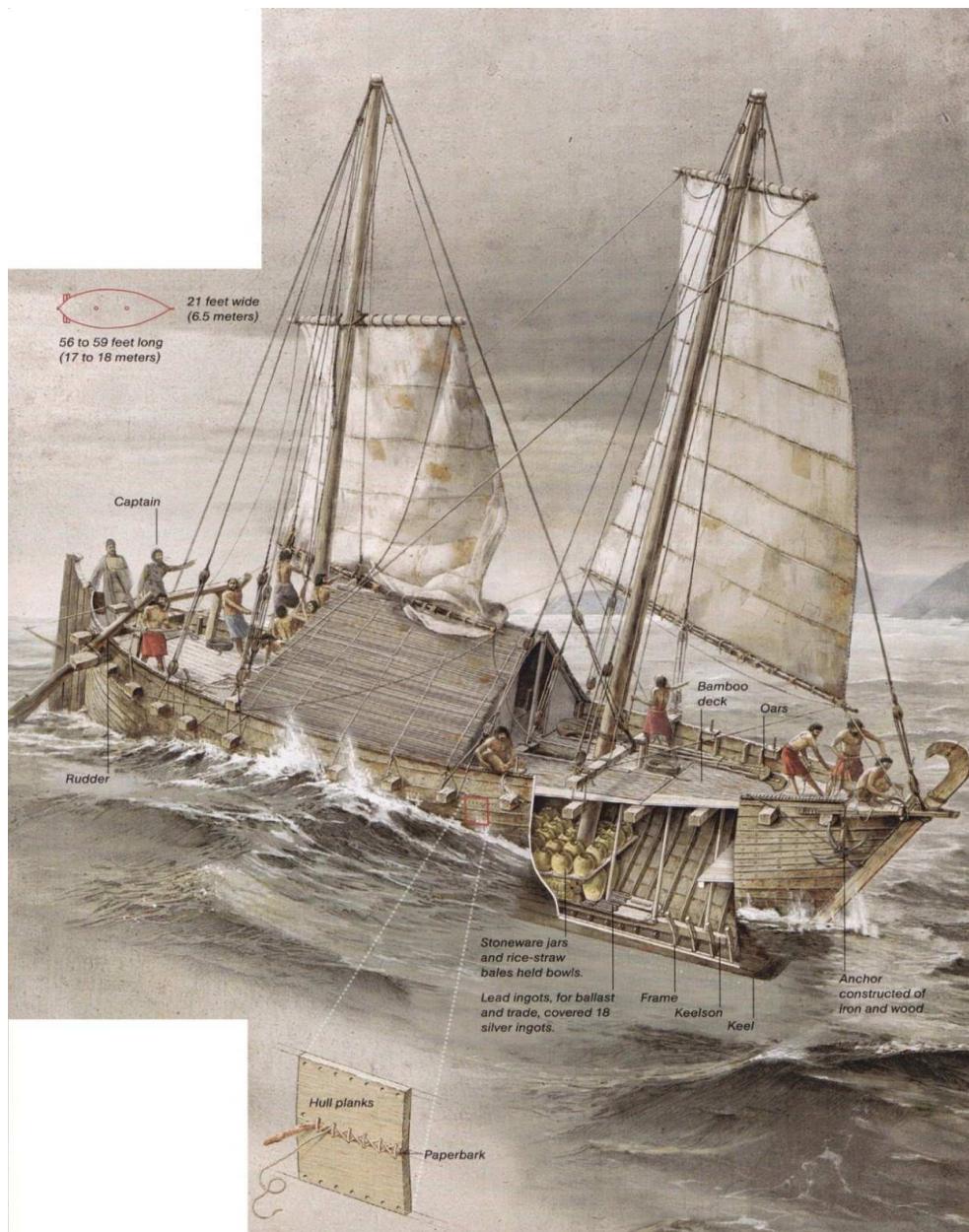


**Figure 3-16: Details of sewn ship construction. Top: outside of the hull, bottom: inside of the hull with wadding in the seam and tufts of coir to close the holes (Pedersen 2005:21).**

That these ships could travel to far-away destinations is shown by the discovery of the remains of such a sewn ship in the Gelasa Strait, between the Indonesian islands of Bangka and Belitung. The underwater excavation of the wreck revealed that it was loaded with more than 60.000 handmade articles, mostly ceramics, but also gold and silver, which originated in China at the time of the Tang dynasty. One ceramic item had a date on it, which enabled the excavators to establish an approximate date for the floundering of the ship around A.D. 826. Another interesting aspect was that the small

ceramic bowls were packed in large jars (Worrall 2009:118). This corresponds to the find on the Uluburun ship of a pithos loaded with items of pottery (Bass 1987:711). The planks of the Belitung wreck were found to have been attached to each other with the coir sewn method. Its length was approximately 17-18 meters and the ship was 6.5 meters wide (Worrall 2009:117) (See *Figure 3-17*).

Pedersen is of the opinion that the description of the building of the boat in the Gilgamesh Epic is that of a sewn boat. This would mean that this building method is much older than 2000 years (Pedersen 2005:21). All in all this method of construction seems to have been in use for several millennia.



**Figure 3-17: Belitung ship reconstruction. Note the enlarged detail of the sewn construction method (Worrall 2009:117).**

## 3.9 SHIPS OF THE MEDITERRANEAN CULTURES

### 3.9.1 What other cultures could have had ships in the Mediterranean?

As the Egyptian culture lasted for millennia, left impressive material remains as well as images, and has been the subject of study by many researchers, it seems as if that was the only culture to influence the surrounding areas. This is however not the case. There were other cultures in the Mediterranean, and as some of these were located on islands, they had ships in order to get to other parts of the Mediterranean. Wachsmann distinguishes the ships of these cultures under the headings of Cypriot Ships (1998:61-67), Early Ships of the Aegean (1998:69-82), Minoan/Cycladic Ships (1998:83-122) and Mycenaean/Achaean Ships (1998:123-158).

It is impossible and undesirable in the context of this dissertation, to go into a detailed description of all these cultures. Therefore it seems the best to just give an overview of the main points such as the era in which these cultures flourished and the characteristics of their ships, in as much as there are images available.

### 3.9.2 Cypriot ships

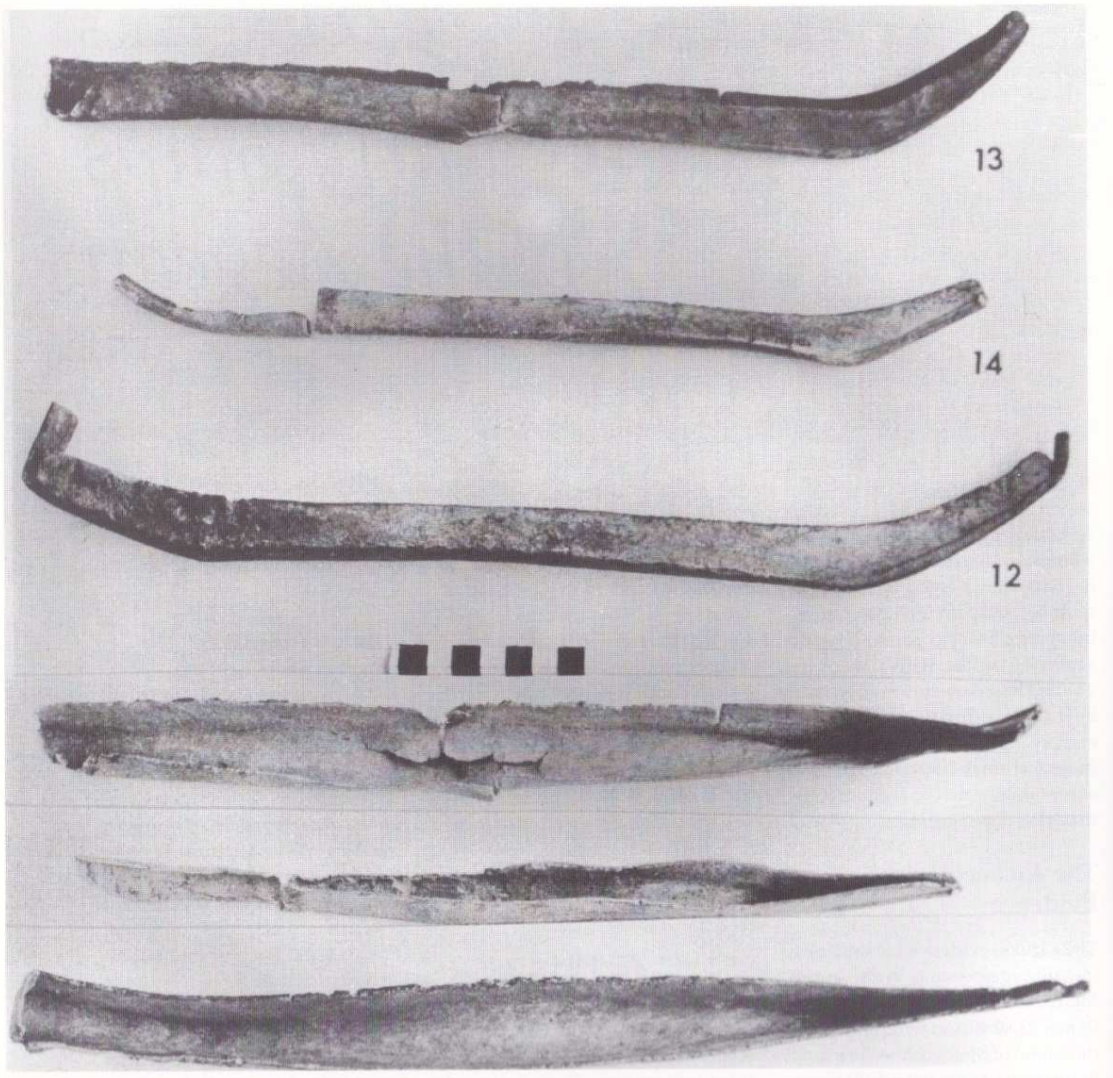
Cyprus became inhabited in about the ninth or eighth millennium BC, which could only have happened by means of ships. Its ancient name was not Cyprus, but Alashia, and much debate has taken place about whether Alashia and Cyprus are one and the same. Wachsmann is of the opinion that this is the case (1998:61). Alashia was referred to in the Amarna letters and as such, written accounts are available of its shipping activities. Unfortunately there are no images of its ships available, only terracotta models. These resemble the later Phoenician ships much more than the Egyptian ships, as they show stem- and sternposts, even though these are rather small. Wachsmann is of the opinion that these models: 'represent beamy wood-planked craft constructed with a keel' (Wachsmann 1998:66).

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### 3.9.3 Aegean ships

The Aegean contains many islands and of necessity the inhabitants needed seafaring skills. The earliest settlement on the Aegean islands dates to the Late Neolithic, and Crete became inhabited from about the late eighth or early seventh millennium BCE. The main thrust of settlement took place in the Early Bronze Age (Wachsmann 1998:69).

There are a number of ships' models and images available from this culture, such as the lead models from Naxos dating to the third millennium BCE. These are long and narrow with raised extremities (Wachsmann 1998:69-70) (See *Figure 3-18*).



**Figure 3-18: Naxos ship models (Wachsmann 1998:70, Fig. 5.1).**



A number of images of Aegean ships were found depicted on flat terracotta artefacts, that are generally called "frying pans", dating to the third millennium BCE as well. These items were not used as frying pans, and their real purpose remains unclear, although a cultic or ritual function has been suggested. The ships depicted on them are of the same type as the Naxos lead models, long and narrow, with a high post at the one end at almost a right angle to the hull. The other end is elevated at a lower angle. The parallel lines on the side are interpreted as paddles, not oars, but are the main manner of propulsion (See *Figure 3-19*).

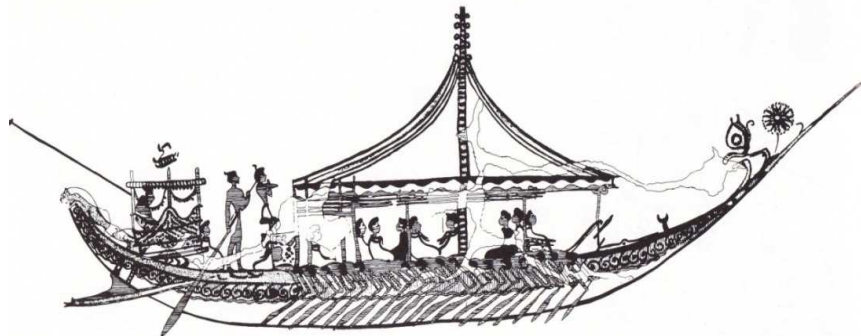


**Figure 3-19: Cycladic "frying pan" with image of a longship (Wachsmann 1998:71, fig.5.3).**

Furthermore, various models or images of ships have been found in a number of different places, such as Palaikastro, Orchomenos, Phylakopi and Tarxien (Wachsmann 1998:71-75). It is believed that there may even have been various classes of ships in the Early Bronze Age Aegean. These longships were paddled, but disappeared from the iconographic record towards the end of the third millennium to be replaced by a different type of ship, which used a sail as propulsion in the Aegean for the first time (Wachsmann 1998:80).

### 3.9.4 Minoan/Cycladic Ships

The Minoan culture developed on the island of Crete around the second millennium BCE and its Bronze Age inhabitants maintained trade contacts with far-away destinations. For example, they brought their wares to Egypt and traded for tin in Mari. For this they used ships, but until recently not much was known about the type of ships they used. There are some images available on seals and some fragmentary models, but these are too small to be of much value for a detailed analysis. This all changed when during excavations on the island of Thera (Santorini) a beautifully preserved Miniature Frieze was discovered by the archaeologist Spyridon Marinatos. It had been buried in the volcanic ash that resulted from the eruption of the island's volcano in ca. 1628 BCE. The frieze showed in elaborate detail a number of ships participating in some sort of maritime race or procession. As Thera is part of the island group called the Cyclades, situated north of Crete in the Aegean, the ships depicted are Cycladic ships. They are however very similar to the Minoan ships depicted on Minoan art, and due to the proximity of the two islands, the vessels depicted on the frieze are helping to understand the details of the Minoan ships better. For this reason the two are grouped together under this heading (Wachsmann 1998:83).



**Figure 3-20: Thera Miniature Frieze. Note the horizontal projection at the stern (Wachsmann 1998:92, Fig 6-13).**

The Cycladic ships depicted on the Thera Miniature Frieze all have 'gently curving crescentic hulls when seen in profile', as Wachsmann puts it (1998:90). They look so elegant. What is interesting is that despite the fact that both the bow and the stern have a fair amount of overhang, there are no hogging trusses needed to keep the ships from breaking up. Some of the ships have masts, but lack stays. It is believed that these were omitted from the paintings, but should have been there for longitudinal support (Wachsmann 1998:96). Even so the rather short masts seem securely placed. The sail visible on one of the ships shows the same sort of simple rigging as the later ships of the Phoenicians displayed, even though there still is a boom visible at the lower end of the sail. A difference is that the halyards are not secured in the stern, but run parallel to the mast and are fastened next to its foot (Wachsmann 1998:97). An unusual element on one of the processional ships is a stylis-like pole, which is a horizontal water-level projection at the stern, which knows no parallel in any other known type of ship of that era (Wachsmann 1998:105) (See *Figure 3-20*).

As for mortise-and-tenon joints, Wachsmann is of the opinion that the Minoan culture was acquainted with this type of joinery in buildings, even though it was not pegged, but that there is so far no evidence that this was used in Aegean ship construction (Wachsmann 1998:243).

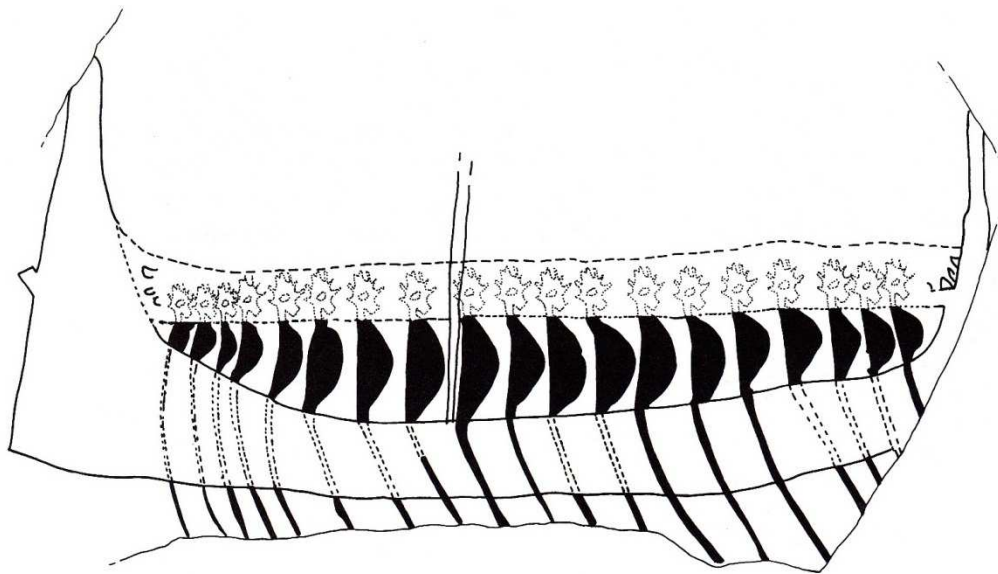
### **3.9.5 Mycenaean/Achaean Ships**

The Mycenaean culture emerged in the early sixteenth century BCE on mainland Greece (Wachsmann 1998:123) and during the fourteenth and thirteenth centuries BCE their influence replaced that of the Minoan culture and they seem to have taken over Crete as well as the outlying Aegean islands, judging by the widespread finds of their pottery (Wachsmann 1998:130). When at the end of the thirteenth century BCE the Mycenaean world was destroyed, fleeing Mycenaeans, (also called Achaeans) built settlements in Cyprus and along the Canaanite coast. According to Wachsmann, 'This waterborne emigration is one of the hallmarks of the Mycenaean culture. I consider this use of ships for the movement of populations a primary aspect of Mycenaean seafaring' (Wachsmann 1998:130).

Wachsmann dedicates an extensive chapter to the analysis and comparison of the texts in Linear B dedicated to shipping, as well as the many images of Mycenaean ships found depicted on vases, incised in stone and modelled in terracotta. From all

these, the following generalisations can be deduced. The Mycenaeans used mostly oared ships, and the likelihood is great that they operated as pirates and raiders in the eastern Mediterranean (Wachsmann 1998:124-130). Their ships were characterized by a cutwater bow, with a device on top shaped like a waterbird. The stern was more rounded and also ended in an upwards pointing sternpost. The ships mostly had only a single quarter rudder, which is remarkable because most contemporaneous and earlier ships were fitted with two steering oars placed over the quarters on either side (Wachsmann 1998:157).

Above the sheer of the ship a structure that looks like a horizontal ladder seems to be displayed. Wachsmann calls this the ‘lunates’ and each oar begins at the bottom of a lunate. Then there is a superstructure above the lunates, decorated with semicircles, that forms some sort of screen. Wachsmann concludes that the lunates are in fact the bodies of the rowers, and that their heads are hidden behind the superstructure. “The horizontal ladder motif on Mycenaean ship depictions represents an open rowers’ gallery intersected by vertical stanchions” (Wachsmann 1998:133,155) (See *Figure 3-21*).



**Figure 3-21: Oared Mycenaean ship (Wachsmann 1998:132, Fig. 7-9)**

Some later images depict the rowers operating their oars from the height of the upper deck, which could be a prototype of the later two-banked ships (Wachsmann 1998:137). In this period also the loose-footed sail with brailings appears on the scene. This can be deduced from the fact that the mast cap only has two sheaves and that a single forestay leads from the mast to the forecastle and only three lines, probably the

backstay and two halyards lead from the top of the mast to the sterncastle (Wachsmann 1998:137). Some of the images display warriors on deck (Wachsmann 1998:134-135). This period also is characterized by the development of a spur protruding from the bow at the waterline. Wachsmann doubts however that this is a true ram, as those displayed do not show that there is any hull-strengthening in place to withstand the impact, should another ship be rammed with it (Wachsmann 1998:157). He is not sure when the development of a true ram took place. For the intervening period images are lacking totally and only by the ninth century BCE images appear that show bow fittings considered to be waterline rams (Wachsmann 1998:158). It is not known whether these ships were constructed with mortise-and-tenon joint construction, or whether they were sewn (Wachsmann 1998:155).

Another interesting point is that hardly any evidence has been found for Mycenaean round-hulled merchant ships, which were solely propelled by wind. Wachsmann assumes that the Mycenaeans may have relied on sailing galleys for transport. He does however state that the oared warships form a cohesive type of ships, which in due time developed into the later Greek Geometric war galleys (Wachsmann 1998:157).

### **3.9.6 Conclusions**

Taking the various aspects of the ships of these successive cultures into account, it can be noticed that certain trends developed in the Mediterranean basin, such as ships with straight (though small) bow- and stern-posts, sails with loose brailings, narrow oar-propelled ships etcetera. Thus it seems much more likely that the Phoenician ships came about as the result of these predecessors, rather than from the Egyptian shipbuilding techniques. Before drawing final conclusions from this chapter, it will still be useful to consider still another possible influence, found much further afield than the Mediterranean Sea.

## 3.10 THE MEGALITH BUILDERS

### 3.10.1 Who were the Megalith Builders?

As stated in the previous chapter, the Austrian historian Spanuth is of the opinion that the Phoenicians learned how to build ships from the Megalith builders. Therefore it is necessary to investigate who were the Megalith builders and whether they possibly could have influenced the Phoenician way of shipbuilding.

The word Megalith is derived from two Greek words: μέγα = very large, and λίθος = stone. So the Megalith builders built structures with very large stones. And even though the culture of the Megalith builders is not very well known, what remains of one of their structures, Stonehenge, on the Salisbury Plain in England, is world famous.

The culture of the Megalith builders existed from ca. 5800-2000 BCE and was characterized by large communal tombs, stone circles and standing stones. It stretched in a broad belt from southern Scandinavia, Denmark, via Germany and France to Spain and Portugal (mostly along the coasts of the Iberian Peninsula) and all the way to the tips of North Africa and the islands in the western Mediterranean. The area also included England, Scotland, and Ireland, as well as scattered areas in Italy. It was initially believed that the culture was not indigenous, but came about through cultural influences from the Mediterranean. Better dating methods in the 1950's however, showed that the Megalithic culture had emerged as an indigenous European culture. It even predated the building of the pyramids in Egypt.

The Megalith builders are relatively well known for the remains of their tombs, which consisted of large stones covered by a soil or stone mound. These could be entered through a passage. Inside the tombs was a passage with a stone burial chamber or a corridor with lateral chambers, and the tombs were used for multiple burials over decades or even centuries. In France the necropolis of Bougon was in use for more than 2000 years (Bahn [ed.] 2000:64-65).<sup>3</sup>

Their most well known achievement, to which visitors still flock every year, especially on the dates of the solstices of the sun, is Stonehenge. According to a small snippet of news, which appeared in the Pretoria News of 22 June 2011, about 18,000 neo-pagans and curious visitors had gathered in heavy rain to watch the sun rise over the

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<sup>3</sup> In my home country the Netherlands these graves are called "Hunnebedden".

stone circle on the Salisbury Plain about 130 km south-west of London. This site is also the main reason why the Megalith builders are included in this study. In an article in National Geographic (Alexander 2008:34-59), a number of very interesting facts came to the fore.

### **3.10.1 Transport by means of ships**

In the first place the type of stone that was used for the construction of Stonehenge is of interest. The massive 4 ton blocks of stone that make up the Sarsen circle of Stonehenge, now still standing, are blue stone (their colour when wet). These stones originate from the Preseli Mountains in western Wales, 250 miles away. Researchers now believe that these stones were brought to Stonehenge by ship, sailing along the south coast of Wales, along the Bristol Channel and possibly round the coast of Cornwall, up the River Avon to a mooring site, from which they were transported along an avenue to the site at Stonehenge. This took place in about 2500 BCE, which incidentally is about the same time as the pyramids were built in Egypt. Some scholars still believe that the stones were transported overland, but in that case they would still have had to cross the River Severn (Alexander 2008:39).

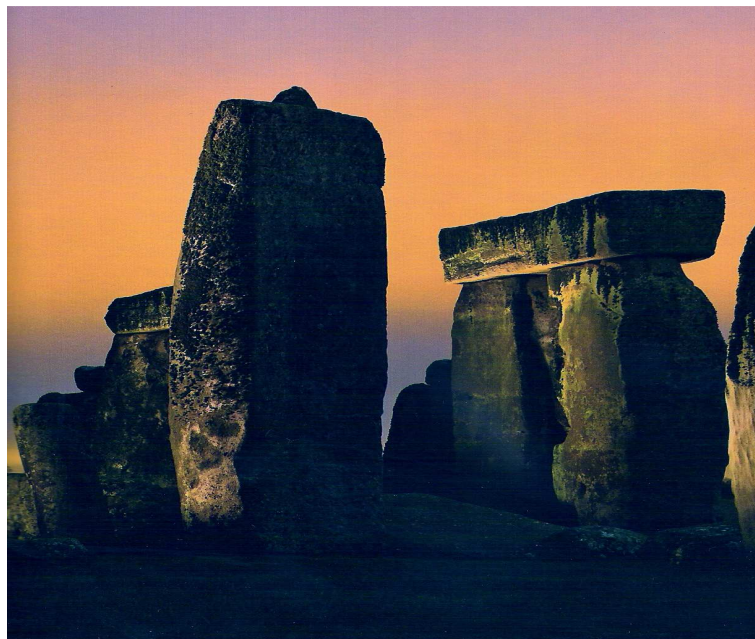
To transport four ton blocks of stone however, over a distance of 250 miles overland without roads, would in my opinion have been a near impossible undertaking. When I grew up, the family stone-mason company was right behind our house, and I know from experience how difficult it is to move large blocks of stone. Transport by ship of the blocks to build Stonehenge definitely was the better option, and the avenue between the River Avon and the site of Stonehenge seems to support the assumption that the stones were mostly transported by means of ships. A theory that glaciers swept the stones there has in the meantime been dismissed (Alexander 2008:56).

In support of the theory of transport with ships, Spanuth (1985:61) states that the shipbuilding and shipping of the North Sea peoples must have already been highly developed in the third millennium BCE, as Megalithic sites are found on all coasts and islands in north, west and south-western Europe, the western Mediterranean and North Africa, showing at the same time a parallel development of gravesites and cultus of the dead.

### 3.10.2 Mortise-and-tenon joints

Besides the fact that the Megalith Builders had ships, that were strong enough to transport 4 ton blocks of stone over a long distance, there is another interesting fact from a technology point of view. That is that mortise-and-tenon joints were used to hold the horizontally placed blocks on top of the vertical stones of the Sarsen Circle at Stonehenge. A big fold out picture spread over 4 pages in the article about Stonehenge, shows two of these visible on top of vertical stones, from which the horizontal blocks have fallen off (Alexander 2008:42-43). The caption with this picture states: "Topping the tallest stone, once part of a trilithon, is a tenon, half of a mortise-and-tenon joint, borrowed from woodworking".

It is probably useful to explain this more in detail: In the top of each of the vertical stones of Stonehenge, a slot was cut and similar slots were cut in the horizontal stones that were to lie on top. Pieces of stone were fitted into these slots, linking the vertical and horizontal stones together. These mortise-and-tenon joints were not pegged, but were held into place by the sheer weight of the top stone (See *Figure 3-22*). As the caption with the articles states: the mortise-and-tenon joint construction was borrowed from woodworking. The initial conclusion of this research was that it may have been possible that the ships of the Megalith Builders, with which they transported the big blocks, were constructed with this joining technique.



**Figure 3-22: Mortise-and-tenon joints were used at Stonehenge to anchor the horizontal stones on top of the vertical stones as indicated by the small tip at the top of the vertical stone in the foreground (Alexander 2008:42-43).**



Subsequently however, the excavation of the Dover boat was brought to my attention. This ancient boat was found in Dover in 1992 when sewerage pipes were replaced in the center of town. About 9.5 m of a wooden boat was found, made of oak timbers, which had been lashed together with withies<sup>4</sup> of twisted yew<sup>5</sup>. Part of the remains had to be left in the soil, as they were underneath a building. The boat was about 2.4 m wide and its joints were reinforced with thin laths of oak, which covered the moss pushed into the joints to seal them. The long central plank of the boat was made of 2 planks that were held together with two 'rails', which are quite prominently visible in the middle of the wreck. The boat was dated to between 1575 and 1520 BC by means of radio carbon dating, and displayed excellent workmanship by a master boat-builder. It is considered to have been capable of crossing the Channel, carrying a cargo of supplies, livestock and passengers. So here we have another example of a sewn or stitched boat ([www.dover.gov.uk/museum/bronze\\_age\\_boat](http://www.dover.gov.uk/museum/bronze_age_boat)) (See Figure 3-23).



**Figure 3-23: Dover Boat. Notice the rails in the middle of the boat.** ([www.dover.gov.uk/museum/bronze\\_age\\_boat](http://www.dover.gov.uk/museum/bronze_age_boat)).

The article in turn referred to the Ferriby boats, which were found on the shore of the Humber near East Riding in Yorkshire in 1937, 1940 and 1963 respectively. These boats also were stitched with yew, caulked with moss and capped with watertight oak

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<sup>4</sup> A withy, (plural withies) is a flexible slender branch of willow, vine or other tree (Webster's 1977:1347).

<sup>5</sup> Yew is a tree of the genus *Taxus*, more in particular the *T. baccata*, also called *English yew* (Webster's 1977:1360).

laths and were dated to between 2000 – 1700 BC ([www.ferribyboats.co.uk](http://www.ferribyboats.co.uk)) (See *Figure 3-24*). This information makes it less likely that mortise-and-tenon joints, used to construct ships, originated in the British Isles, but does indicate a long history of shipping on coastal waters in the northern European realm.



**Figure 3-24: Ferriby boat, F2 ([www.ferribyboats.co.uk](http://www.ferribyboats.co.uk)).**

As stated already in the above, what is of interest in this regard is that Stonehenge was constructed at approximately the same time as the Pyramids in Egypt (ca.2500 BCE). For the pyramids blocks of stone were floated on boats down the Nile, so shipment of stone over water to build Stonehenge should not be considered impossible. The British Isles had been populated long before that time, as far north as the Orkney Islands. According to the Scottish archaeologist Neil Oliver, archaeologists excavated two well-built houses at Knap of Howar on the island of Papa Westray on Orkney, which were occupied for half a millennium either side of 3600 BCE. They are built close together – roughly rectangular in shape, though with rounded corners – and are of dry-stone construction (Oliver 2009:25). He also states:

By 3100 BC a farming community was up and running at Skara Brae, close to the Bay of Skail on the west coast of Mainland Orkney. The site came to light in 1850 when a storm took a great bite out of a bank of sand dunes close to the sea.... Seven self-contained buildings survive, along with an eighth structure that was probably a workshop. In its original form the village may have had more homes... and it was occupied continuously for at least 500 years before it was abandoned (Oliver 2009:25).

Oliver continues by describing the houses, constructed of elegant dry-stone walls with interiors built of stone, which were built in the excavated spaces in their own midden of rubbish. These insulated chambers were connected to each other by tunnels. It is not sure what the roof covering was made of, but the houses were snug and provided good shelter from storms and cold weather (Oliver 2009:25-26).

Moreover Oliver is also of the opinion that boats had been plying up and down the length of the long island for thousands of years, carrying a variety of goods, before the Romans occupied Great Britain (Oliver 2009:33). This is also borne out by the information stated above about the Dover and Ferriby boats.

### **3.10.3 Sails**

Another point of interest of the Nordic ships is the way their sails were rigged. Spanuth (1985:62-63) writes about the type of sails that were used by the "Nordvölker" as he calls them, the people of the north. He quotes an expert on ancient ships, A. Köster, who in his book "Das antike Seewesen" (1923:53), writes about the fact that the sails of the ships of the Nordic peoples were only attached to the upper yard, but did not have a lower boom. These sails were not lowered onto the deck in case of no wind or for a battle, but were hoisted up against the yard. In this way the sail was not in the way on deck and could be unfurled quickly again. This is the type of sail that has already been discussed in the foregoing, namely a sail with loose brailings (Edey 1974:43).

### **3.10.4 Decorated stem- and sternposts**

Spanuth (1985:63) also draws attention to the fact that there are considerable similarities between the ships of the Sea Peoples, as depicted on the walls of Ramses III's funerary temple at Medinet Habu and the images of the Bronze Age Nordic ships, with their characteristic bird-shaped bow- and sternposts. Not only do they resemble

the later Viking ships, but the ships of the Sea Peoples also seem to have influenced the Phoenicians to decorate the stem-posts of their ships with horse headed shapes.

### **3.10.5 Possible development of the mortise-and-tenon joints**

The most difficult question to answer in the whole development of the Phoenician ships is: where did the *pegged* mortise-and-tenon joint originate? So far we have seen that mortise-and-tenon joints were in use in several cultures, but these were either not pegged, or were not used in shipbuilding. How could this particular use of pegged mortise-and-tenon joints have come about?

Wachsmann is convinced that the use of pegged mortise-and-tenon joints in shipbuilding is not an Egyptian invention, but possibly is the invention of the Syro-Canaanite shipwrights. Its development could have come out of the practice of pegging the rope holes of sewn ships with wooden pegs instead of with other materials (such as the method of pegging with coir as seen in the description of the ships made in the Persian Gulf area as described above). Pegging with wooden pegs also had the added advantage that this would secure the stitching and that the stitching on the outside of the ship could be cut away to reduce surface friction (Wachsmann 1998:240-241).

If we take into account that the language of the Phoenicians was of Semitic origins and that this could point to their origins in the east, it is very well possible that the sewn method of shipbuilding lies at the root of the development of pegging with wood and then of using mortise-and-tenon joinery instead of the coir sewn method, as coir was not available on the Syro-Canaanite coast. Alternatively the use of unpegged mortise-and-tenons on Egyptian sea-going ships may have come from Egypt, and I am of the opinion that this technique may have been combined with the pegging of the sewn ships in a fusion of technology.

## **3.11 CONCLUSIONS**

In this chapter a number of different shipbuilding techniques, ranging from lashing with halfa grass, to mortise-and-tenon joints and the sewn technique were discussed. The latter technique was used both in the Persian Gulf area, as well as on the British Isles,

using different materials, coir cordage made from coconut fibre in the Persian Gulf area and yew withies on the British Isles respectively. Also stem and stern shapes, hogging trusses, as well as methods of attaching masts, boom-footed sails, or sails with loose brailings and the use of rigging were analysed and discussed to determine whether the Phoenician shipbuilding techniques originated in Egypt. As these aspects have been shown to differ quite considerably between the Egyptian and the Phoenician shipbuilding methods, we can dispel the notion that the Phoenicians learned how to build ships from the Egyptians. As was already stated under 3.7, if the Egyptians did indeed influence Phoenician shipbuilding, these influences should have been visible in the Phoenician ships, even centuries later, which is not the case.

It seems that the Phoenician shipbuilding methods much more were a fusion between the various techniques originating in different areas, mostly the Mediterranean basin, and that they chose the best available technology to construct their sturdy sea-going ships. They may have adopted the use of sails with loose brailings from the Nordic realm. As far as can be determined the Phoenicians developed a unique type of ship, which enabled them to explore the world around them at ever increasing distances.

## CHAPTER 4

### PHOENICIAN MERCHANT SHIPS

#### 4.1 INTRODUCTION

The Phoenicians had different types of ships and among these we can distinguish merchant ships, warships and what would probably be best described by the word utility-vessels, the small, oar propelled ships, called *'hippoi'*, that were used for a number of tasks. In this chapter the merchant ships will be the focus of attention and in the later chapters the other types of ships will be dealt with.

The merchant ships were the heavy, cumbersome, round-bellied ships that were used to transport goods. Their large holds could stow plenty of freight. The Greeks referred to them in jest as *'gauloi'*, meaning: 'tubs'. In Latin they were later referred to as: *'naves rotundae'*, meaning: 'round ships' (Aubet 1993:148). They were about four times as long as their width, about 16 to 30 m long and 4 to 7 m wide. Their draught was about one and a half meters, which was also the height of the ship above the waterline (Bartoloni 2001:86). Their main means of propulsion were square sails and they had oars for manoeuvring or in case there was no wind (Aubet 1993:140). The ships mostly had a high bow and stern and their cargo capacity in ca. 1200 BCE was about 450 tons. This capacity may have fluctuated, depending on the size and the time in which the ship operated, to between 100 and 500 tons. If they sailed with a very favourable wind, their maximum speed may have been about 5 knots, and they could travel about 400 miles in 4 days (Aubet 1993:148). Lesser speeds, such as 2-3 knots, would have enabled them to sail about 50 nautical miles a day (Bartoloni 2001:85). The merchant ships only sailed from about March till October to avoid winter storms and bad weather (See Chapter 10 for more information about this subject).

There are a number of names by which these merchant ships were referred to. These are e.g. ships of Byblos, also called *kubna* ships, *mnš* ships, ships of Tarshish, etcetera. In later times there were also the Carthaginian merchant ships. In this chapter these various ships will be discussed in more detail.

## 4.2 TYPES OF MERCHANT SHIPS

### 4.2.1 Ships of Byblos, or *kubna* ships

As has already been mentioned in the previous chapter, there is written evidence that in about 3000 BCE a fleet of forty merchant ships loaded with cedar wood, left a Phoenician port for Egypt (Aubet 1993:146). The text does not mention from which port the forty ships left, but the most likely one would be Byblos. This ancient city, which by means of excavations has been dated to at least the fourth millennium BCE (Frost 1999:23), has a large bay to the south of it, where the valley of El Chiny ends. This was a very suitable place to bring the large cedar trees down from the mountains. These trunks were 20-30 meters long, and one of them, 30 meters long, still holds up the step pyramid of Djoser (2686-2613 BCE). Another long piece of cedar wood, 26 meters long, is part of the "Cheops ship", dating to the Fourth Dynasty (2613-2494 BCE) (Frost 1999:23).

Byblos is known by many different names and it may be useful to give a short overview of those names. Egyptian written sources refer to it as *kbn*, hence the *kubna* ships (Aubet 1993:146). The name Byblos was given by the Greeks, as the place where they could buy papyrus, which was the return freight of the Byblos ships, after the cedar wood had been delivered in Egypt (Aubet 1993:26). The word βίβλος in Greek means the bark or marrow of the papyrus plant (Bartelink 1961:55). The biblical name was Gebal, used e.g. in Ezekiel 27:9, which mentions that there were men from Gebal who caulked the seams of the Tyrian ships. In the present day and age Byblos is known as Jbeil (Frost 1999:23).

The text about the forty ships leaving Byblos for Egypt is also ambiguous in that it does not mention whether the ships that left the port were Egyptian or Syro-Canaanite ships (in 3000 BCE we cannot speak of Phoenician as yet) (Aubet 1993:12,21). Judging however by the fact that the inhabitants of Byblos were experts in felling the big trees, which were exported to Egypt, and lived close to the sea, it would be highly unlikely that they would not have had ships of their own. Wachsmann is of the opinion, that both the Egyptians and the Syro-Canaanites had Byblos ships. He states that even Hatshepsut's ships were termed Byblos ships. The name Byblos ship does not mean that the ship necessarily would only sail from or to Byblos, but that it was used on the shipping route between Egypt and Byblos. Even though the term originally was used to

indicate ships plying this route, eventually it was used to define any large seagoing ship, regardless of its destination (Wachsmann 1998:19; King & Stager 2001:178).

Due to the enormous length of the trunks, it is most likely that these were towed to Egypt by the Byblos ships (Wachsmann 1998:309-310). The Syro-Canaanite ships with their straight stern posts were by far the more suitable ships for this towing exercise, as the lotus shaped sterns of the Egyptian ships may not have been strong enough. The shorter pieces of timber were transported in the hold of the ships. The Bible also mentions logs being floated in the time of King Solomon, when he requested cedar logs from King Hiram of Tyre to build the temple in Jerusalem. These logs were tied into rafts and floated by sea (I Kings 5:9). The Egyptian demand for timber from Byblos may have fluctuated over time, but on the whole remained robust till at least the twelfth century BCE (Markoe 2000:14-15).

Now the question is: "What would these Byblos ships have looked like?" Aubet is of the opinion, that the images of the ships depicted in the tomb of Kenamun in Thebes, dating to the time of Amenophis II of the eighteenth dynasty (1390-1353 BCE), are those of Byblos ships, due to the fact that these are merchant ships manned by Phoenician (or Syro-Canaanite) sailors (Aubet 1993:146-147) (See *Figure 4-1* and *Figure 4-2*). The ships display straight stem and stern posts and a screen that runs the length of the ships at the sheer. They have two rudders with a short tiller, hung over the quarters and do not have hogging trusses. Wachsmann also is of the opinion that these ships are Syro-Canaanite, based on the identity of the crew and on comparisons with a similar ship displayed in the tomb of Nebamun, dating to the reign of Amenhotep II. Nebamun is displayed as treating a Syro-Canaanite who is ill. The artist's intention was to indicate clearly that the ship belonged to the foreigner (Wachsmann 1998:44-45). The image from the Nebamun tomb pre-dates the Kenamun images by about thirty to one hundred years and the two images are unlikely to have been painted by the same artist(s) (Wachsmann 1998:45). So the likelihood is great that these images are showing Syro-Canaanite ships, but the question is whether these are Byblos ships. Even though Wachsmann is of the opinion, that not all details of these ships are accurate, but show considerable Egyptianizing elements, he states that the vertical sternposts are not typical of Egyptian ships and neither are the screens on the side. The Uluburun ship seems to have had a screen along the side, which is typical of the Syro-Canaanite ships. Therefore Wachsmann believes that both the Nebamun and the Kenamun ship images show Syro-Canaanite ships (Wachsmann 1998:44-45).



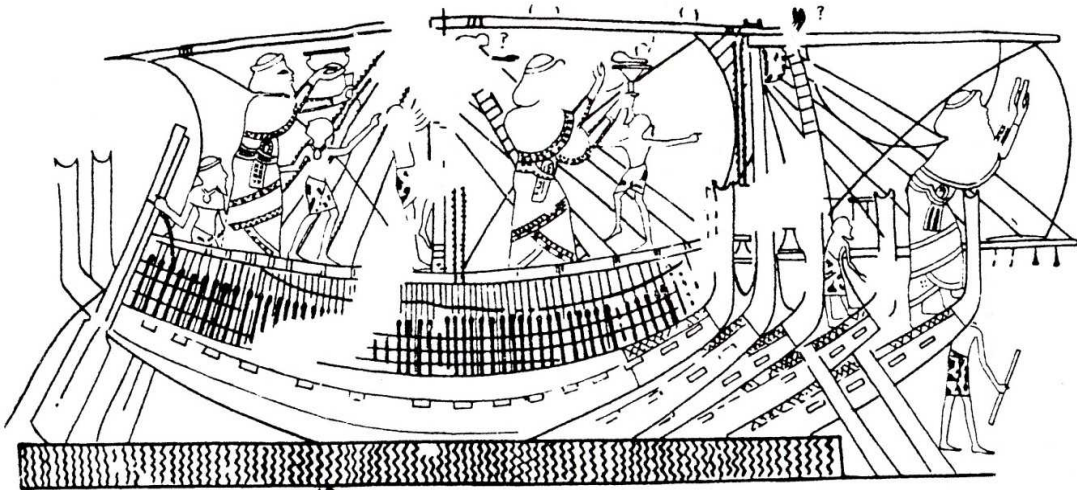


Figure 4-1: Detail of ships at upper centre of the mural in the Kenamun tomb (Wachsmann 1998:44).

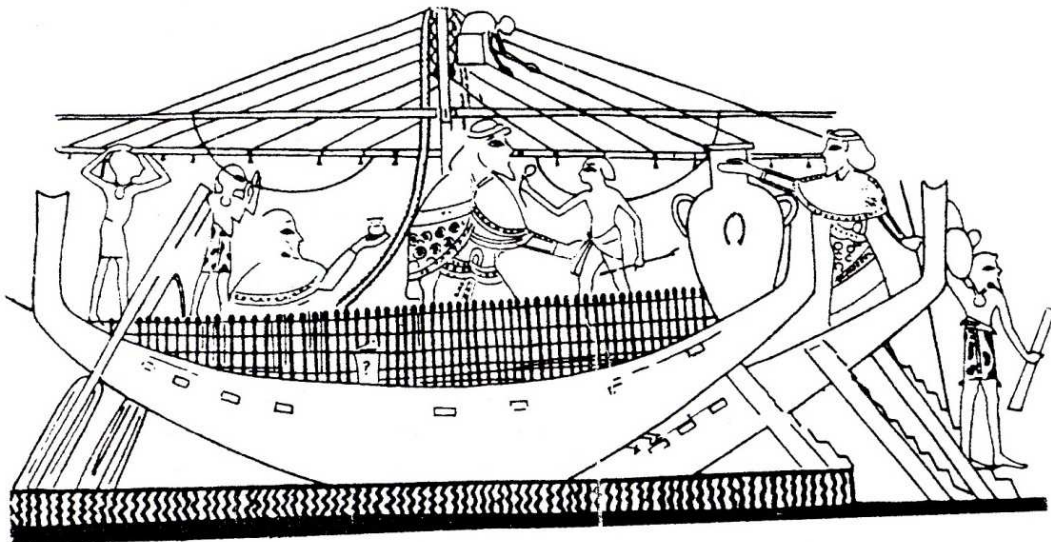
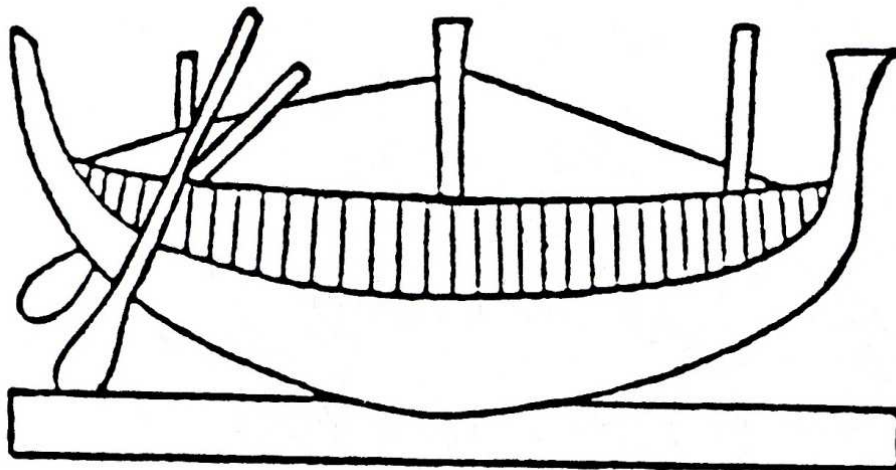


Figure 4-2: Detail of ships at lower centre of the mural in the Kenamun tomb (Wachsmann 1998:44).

#### 4.2.2 *mnš* ships

In the first half of the eleventh century BCE an Egyptian called Wen-Amon went from Egypt to Byblos to buy cedar wood. In the process of doing business with King Zakarbaal of Byblos, in whose hands the monopoly of the exploitation of wood as well as the control of the port and territorial waters rested, the latter boasted to Wen-Amon that he possessed twenty cargo ships (*mnš*) in the port of Byblos (Aubet 1987:92). According to Aubet it is not sure what these ships looked like, as she has no further

information about their shape or size available, but we can deduce that the *mnš* ships had replaced the earlier *kubna* ships. Zakarbaal explained to Wen-Amon that these ships traded in *hbr* or *hubūr*, with Smendes in Egypt. A *hubūr* was a kind of trading partnership or syndicate. This term has equivalents in Ugaritic and in Hebrew (II Chronicles 20:35-37) and can mean: community, guild, syndicate, commercial chain, firm, company, association or consortium. It usually is translated as syndicate, company or trading partnership, and designates an association or guild of merchants (Aubet 1993:92). It indicates that trade took place as the prerogative of the king, in this case the King of Byblos and King Smendes in Egypt. Other examples of *hubūr* are the joint enterprises of King Hiram of Tyre and King Solomon of Israel to obtain gold from Ophir and of King Ahaziah of Israel and King Jehosaphat of Judah in the ninth century BCE for the same purpose, as referred to in I Kings 22:48 and II Chronicles 20:35 (Aubet 1993:92).



**Figure 4-3: *mnš* ship determinative. This is the symbol used in hieroglyphs inscribed on walls to indicate this particular type of ship (Wachsmann 1998:47).**

Wachsmann is of the opinion that the *mnš* ship is a ship of the type depicted in the tombs of Kenamun and Nebamun, based on the determinative<sup>6</sup>, which appears in slightly different variations in five inscriptions of Ramses III (See *Figure 4-3*). These inscriptions are found on the temples of Abydos, Karnak and Luxor. He states that this type of ship appears earlier as distinctly Syro-Canaanite, and is of the opinion that by the time of Ramses II this type of ship was built in Egyptian shipyards. To indicate that

<sup>6</sup> The word 'determinative' is probably used here as indicating the image with which a Syro-Canaanite ship was depicted in hieroglyphic inscriptions.

these ships were merchant ships, he quotes from an inscription of Ramses II as follows: "I have given to thee (Seti I) a ship (*mnš*), bearing cargoes upon the sea, conveying to thee the great [‘marvels’] (*sic*) of God’s-Land, and the merchants doing merchandising, bearing their wares and their impost therefrom in gold, silver and copper" (Wachsmann 1998:47).

What is interesting here, is that the cargo consists (besides of ‘wares’), of gold, silver and copper. The latter would have been heavier than cedar wood and papyrus, and may have necessitated a more strongly built ship. In view of the fact that the Uluburun ship transported copper ingots (also sometimes called ‘oxhides’, due to their shape) and that it is believed to have looked like the Egyptian Kenamun tomb painting showing the arrival of a Syrian fleet, dating to the fourteenth century BCE (Bass 1987:695) it is possible that the Uluburun ship (also dated to the fourteenth century BCE) was a *mnš* ship. From all of the above, we may probably conclude that there is no image of a Byblos ship, only of *mnš* ships. The other possibility is that the *mnš* ships were a stronger and bigger version of the earlier ships of Byblos, maintaining a similar design with straight stem- and stern-posts and the wicker fencing along the sheer.

#### **4.2.3 Ships of Tarshish, or *ôniyat tar’sis***

In the previous section it could already be noticed, that the type of freight transported by the Syro-Canaanite/Phoenician ships had changed. Instead of cedar wood and papyrus, cargoes of gold, silver and copper had become important merchandise. Later iron was added. As metals are heavier than wood and papyrus, this change may have necessitated a change in ship design towards stronger ships, which could accommodate the heavier cargoes. The *mnš* ships very likely were a first developmental trend away from the *kubna* or Byblos ships, which had been designed mainly to transport cedar wood and papyrus.

Not only did the cargo change, but also the distances travelled started to change. Slowly but surely the Syro-Canaanite and later the Phoenician ships did not just ply the route between the Levantine coast and Egypt, but went farther into the Mediterranean, first to the Gulf of Alexandretta (Tarsus), and Cyprus, later to Greece, Crete, Sicily, all the way to Spain and possibly beyond. This in turn brought along other changes, such as the need to sail by night and to have shelter for the crew on board. The trading

routes no longer followed the coastline, but open sea was traversed, which necessitated ships with a higher sheer (the sides of the ships had to be higher to sail on water with higher waves). It was probably all these factors combined that led to the construction of the ships of Tarshish (*ôniyat tar'siś*).

The name of these ships has led to much controversy, as scholars do not agree on whether these ships were built to sail to Tarsus in Cilicia in Asia Minor, or to Tartessos in western Andalucia in Spain, or to both destinations. To sail to Tartessos, which was located near the mouth of the Guadalquivir near Cadiz in present day Spain (Atkinson 1960:17), higher and stronger ships were needed, as these needed to pass through the Strait of Gibraltar and would sail on the Atlantic Ocean to reach Cadiz (then called Gadir).

The question is: could Tartessos be equated to Tarshish? An attempt will be made to give an answer to this problem from a linguistic angle<sup>7</sup>. Iberian was the language of most of the Iberian Peninsula in those days (Atkinson 1960:17). Another language spoken there was Basque, in the north-western corner. This is an extremely old language, as the Basques were already there in the time of the Phoenicians, who reached them in about the third century BCE (Kurlansky 2000:27). So both the Iberian and Basque languages existed before the arrival of the Romans, who introduced Latin. We do not know what Iberian sounded like, but when we look at the development of Latin there later, it is very likely that Iberian may have contained many 'sh' and 'zh' sounds, which are still found in present day Spanish and even more so in Portuguese, but which are not found in Italian or French. (All these languages are derived from Latin). The Basque language also contains many 'tsh' sounds (spelled with 'x') and linguists believe that the language is still very close to its original form (Kurlansky 2000:21). Basque and Iberian may have been close. When a new language is superimposed over an existing one, the accents of the original language often remain. Take as an example a German person speaking English. However well the speaker can speak English, the underlying accent is still German. The same applies to an Afrikaner speaking English. The Afrikaans accent often remains. Now when one says 'Tartessos' quickly, with a bit of a Portuguese slant using the 'sh' sound (the western part of Andalucia where Tartessos was located is not far from Portugal), it can easily sound like 'Tarshish', and that is how it could have been transliterated into Hebrew, which knew the 'sh' (shin) sound. According to Lancel (1997:10), who also mentions a philological standpoint: 'Tashish/Tartessus would appear to be no more than the

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<sup>7</sup> As Spanish was part of the interpreter-translator degree I obtained in 1976, I would like to express an opinion from this linguistic background.

variable expression of a root having a consonantal variation *trs/trt* in the indigenous language of the southern Iberians.’

Moreover the name ‘Tarshish’ could also easily be a contraction of the name Tarsus with the name of Tartessos. Initially the stronger ships sailed to Tarsus to obtain copper. Later they sailed to Tartessos and because the names were rather similar, they were joined. The Phoenician traders were always very secretive about where they obtained their merchandise, so it may have suited them well to have a name that was ambiguous as to its location<sup>8</sup>.

Maybe one would object that the Phoenicians did not reach the Iberian Peninsula that early in time, but according to Markoe (2000:183) isolated finds indicate that initial trade exploration may have already taken place long before the eighth century BCE because of Phoenician interest in the Atlantic tin trade, which was already operative under native Iberian control in the ninth century BCE. The traditional foundation date of the Phoenician establishment of Cadiz, although not verified archaeologically, is 1104/3 BCE (Markoe 2000:183). This all corresponds more or less with the time in which King Hiram and King Solomon lived (ca. 960-930 BCE), who according to I Kings 10:22 sent ships of Tarshish to Ophir to acquire gold, silver, algum wood, ivory, apes and peacocks (Aubert 1993:44).

In summary one can state that the ships of Tarshish belonged to a distinct type of merchant vessel, which most likely were stronger than the earlier types of ships, in order to transport heavier cargo, consisting mostly of metals. They were designed for travel over longer distances and over stretches of open sea. What is interesting in this context as well is that Wachsmann (1998) does mention the Byblos ships, as they were part of the Late Bronze Age which is covered by his book, but that he does not mention the ships of Tarshish at all. These were part of the Iron Age, and do not fit within the scope of his book. These two types of ships belonged to different eras and were used for different purposes. We see here once again that the developmental trend changed, due to the change of cargo traded, to a stronger and probably bigger type of ship.

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<sup>8</sup> In fact the Phoenicians were ruthless in trying to prevent outsiders from finding out where they themselves obtained their goods. According to the writer Strabo a Roman vessel followed a Phoenician ship in order to find out the location of certain tin mines. The captain of the Phoenician vessel deliberately sailed his ship into shallows with submerged rocks, so that both ships floundered and were completely destroyed. The Phoenician captain was reimbursed in full by the rulers of his home port for the total value of his ship and cargo as a reward for his dramatic action to prevent the competition from practicing industrial espionage (as quoted by Sullivan 2001:xx).

We do not have any images of the fabled 'Ships of Tarshish', but in view of the fact that they sailed much farther, and in open water, they most probably were much more elaborate than the earlier types of merchant ships used by the Phoenicians. They probably had a higher sheer and no longer the wicker screen on the sides. They still had the square sail, loose-footed, or 'with loose brailings', which is very suitable to sail with on open water. This type of sails enabled the ships to make use of more diverse wind directions, as without the boom, they could be set for wind coming from a different angle than just straight aft. The likelihood is great that they had a shelter on board, see for this also the description of the ship Tyre in Ezekiel 27:7, which mentions blue and purple awnings from the coasts of Elisha (See 7.4.6). The ship carried oars for manoeuvring or in case of no wind. On the whole these ships were more strongly built as they had to transport heavier cargoes under more dangerous sea conditions. They no longer remained within the confines of the Mediterranean Sea, but sailed on the Atlantic Ocean.

It is possible that both the *mnš* ships and the ships of Tarshish existed at the same time, and that the *mnš* ships were specific for Byblos (see the story of Wen-Amon) and that the ships of Tarshish were of Tyrian design, as it was King Hiram of Tyre who according to the Hebrew Bible went into a partnership with King Solomon and supplied crews for ships of Tarshish for the voyage to Ophir (2 Chronicles 9:21).

In closing it can be said that even Ezekiel seems to confirm that the ships of Tarshish were designed for heavy cargo. In Ezekiel 27:25 it is stated that: 'The ships of Tarshish serve as carriers for your wares. You are filled with heavy cargo in the heart of the sea.'

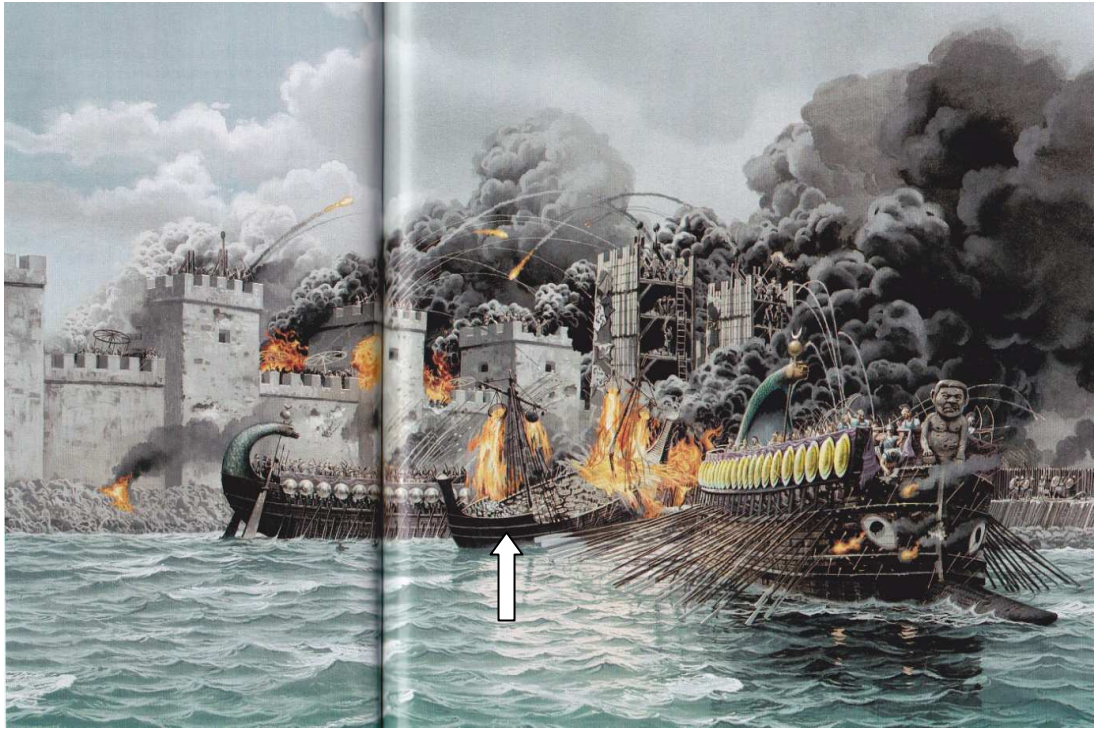
#### **4.2.4 Horse transport ships**

Quite surprising in the course of this research was the discovery that the Phoenicians, and more in particular the Tyrians, had horse-transport ships. They traded for horses in Beth Togarmah according to Ezekiel 27:14, which is the area of Cappadocia or western Armenia, according to Diakonoff. He states that they obtained horses (stallions), geldings and mules (Diakonoff 1992:187). The New International Version gives as translation: work horses, war horses and mules. In order to transport these horses, there were apparently special ships for this purpose. Nothing in detail is known about these ships, other than that they were large. They must have been equipped

though with special features to transport the horses, such as that there must have been attachments to which horses could be tied. It is possible in my opinion that these ships were barges, which were towed by ships under sail or oar. If that was the case they could have functioned without a deck. There must also have been made allowance for the hold of the ship to accommodate the horses, so that they would not have to stand on the uneven inner surface of the hold. In ancient times all ships were built with ribs on the inside, to hold the planking of the hull in place (Casson 1971:201), so a thick layer of straw or hay would have been needed to level out the bottom of the hull, so that the horses would not stumble or break a leg.

Casson (1971:93-94) states that the Greeks started using old triremes to transport horses from about 430 BCE. The triremes would be converted for this purpose by removing the bottom two rows of rowers (the thalamites and the zygites) and that only the thranite rowers would remain to propel the ship. There would be 30 rowers on either side of the ship, with 29 horses standing athwartship underneath them and the thirtieth horse just forward of the poop. Whether the Phoenicians also converted their old triremes for the same purpose is not known.

What is known however about a Phoenician horse transport ship is that one such a ship was used in an attempt to deter the attack on Tyre by Alexander the Great in 332 BCE. An account of this is found in the writings of the classic authors Arrian, Diodorus and Quintus Curtius. Jedidian (1969:73) makes use of these three accounts to summarize the story in great detail (See *Figure 4-4*).



**Figure 4-4: Horse transport ship, indicated by the white arrow, flanked by two triremes, was used to attack the mole which the forces of Alexander the Great were constructing to connect Tyre to the mainland (Gore 2004:44-45).**

The mole to connect the island of Tyre to the mainland, which was under construction as ordered by Alexander, had already come close to Tyre, and two towers had been built above the mole. These towers were equipped with war engines, by means of which the Tyrians, who had been attacking the workers from ships, could be repulsed. According to the summary by Jedidian, the following happened:

The Tyrians now took other measures to drive off Alexander. They fitted up a large horse-transport ship with dry boughs and other combustible wood, and fixed two masts on the prow each with a projecting arm from which was suspended a cauldron filled with bitumen, sulphur and other highly inflammable<sup>9</sup> materials. The stern of the vessel was loaded with stone and sand and was thus depressed. In this way the prow was elevated, so that it could glide over the mole and reach the towers. On the forepart of the vessel were piled chips, shavings and other inflammable material. The Tyrians waited for a wind blowing towards the mole and towed the transport astern with triremes. Running the "fire-ship" at full speed upon the mole they set torches to the combustible material. They dashed the ship as violently as possible against the edge of the mole. The cauldrons scattered the fiery mass in all directions. The crew of the burning ship easily swam off to safety.

Soon enough a great fire fell on the towers, and as the yards broke, they poured into the fire anything that had been made ready to feed the flame. The men in the triremes lay to near the mole, and shot at the towers, so that it was not safe for anyone bringing materials to quench the fire to get near.

<sup>9</sup> Meaning: 'flammable'. There is a difference in use of this word between American and British English.



At this stage, the towers being well alight, the citizens sallied in large numbers, and jumping into small boats<sup>10</sup> put in at different parts of the mole and easily tore down the palisade set up to protect it; besides, they burned all the engines which had not been caught by fire from the ships (Jedidian 1969:73).

It is interesting to note that the 'fire-ship' was towed by triremes, even though the wind was blowing toward the mole. This could indeed indicate that the Phoenician horse-transport vessel did not have its own means of propulsion, but was normally towed when used for its intended purpose. The ingenuity of the Tyrians is impressive. They must have had quite an amount of bitumen available, which was normally used to caulk the ships.

In the end Alexander prevailed and Tyre was defeated (Jedidian 1969:69-79). Afterwards the city came under Greek control and underwent considerable hellinization (Mazel 1971:63), thereby losing its typical Phoenician character (Markoe 2000:61).

#### **4.2.5 Phoenician trading ship second century BCE**

In the National Museum in Beirut, Lebanon, there is a bas-relief depicting a Phoenician trading ship, dating to the second century BCE. It is not known from which port this ship originated, but the image is worth analysing (Moscati [ed.] 2001:75) (*See Figure 4-5*).

The ship depicted in the bas-relief no longer has a wicker screen on the sides or a stem- or stern-post pointing straight upwards like the earlier ships, but it has a forward sloping bow, a higher sheer (this means that the sides of the ship are built up higher) and the stern is rounded and quite high, ending in an elaborate curl. The higher stern would enable the oarsman to stand high on the rear deck to steer the ship and also would prevent a high wave from crashing over the ship from the rear. Note the small pennant on the upturned curling end of the stern. There is a cabin visible in front of the steering oar (with the decorated latticed side), providing shelter to the crew. The side-strakes of the ship are reinforced with additional narrow strakes over the seams, so as to give greater strength to the ship and the steering oar no longer just hangs over the quarter, but is built in and covered by the extra strakes to a large extent, so as to protect it from getting hit by the waves and being dislodged.

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<sup>10</sup> Probably *Hippoi*

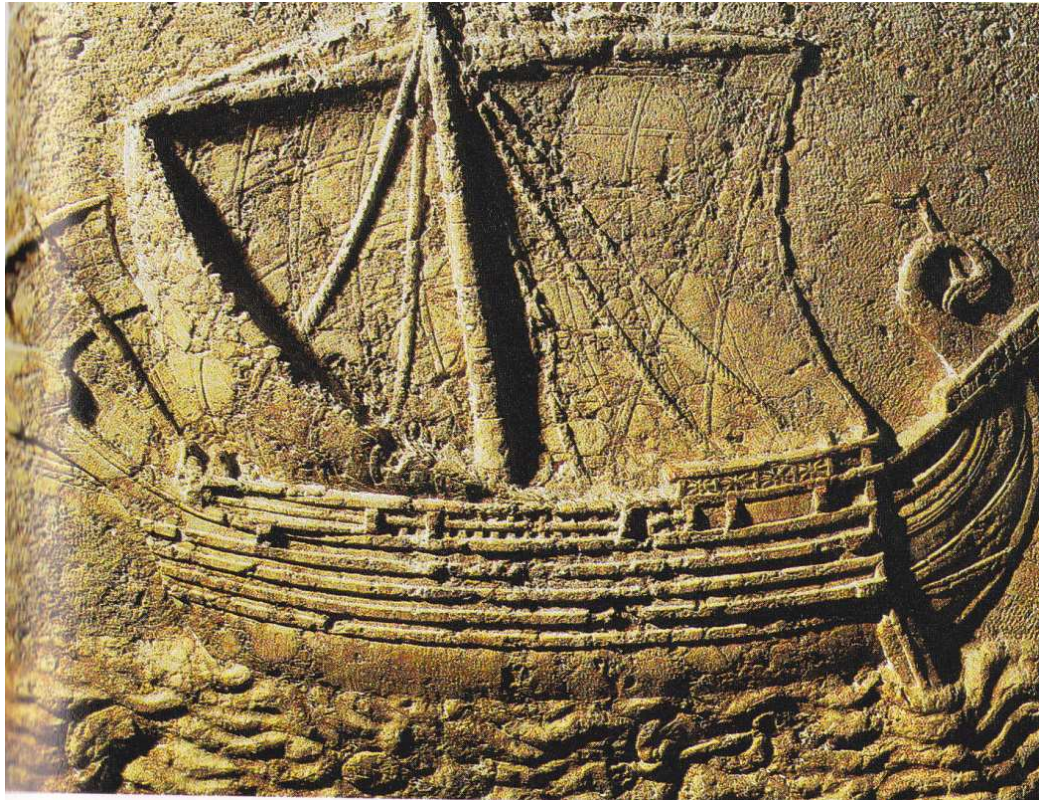


Figure 4-5: Phoenician merchant ship from Byblos, second century BCE (Moscatti [ed.] 2001:75).

A sturdy sail hangs from the yard hoisted to the short stocky mast, and there is a new feature, viz. an *artemon* sail, which is leaning forward from the bow on a short mast, almost like a high-angled bowsprit (Moscatti [ed.] 2001:75). This *artemon* sail served to balance the freighter before the wind and was also useful for manoeuvring (Villiers 1963:503,506). This latter point can be explained as follows: when the oarsman moves his steering oar, the bow of the ship needs to move to change direction, but there is a bit of delay in this movement. The wind blowing into the *artemon* sail gives a bit of extra push into the right direction to get the ship to react faster to the change in direction that the oarsman has initiated. As for the *artemon* sail assisting in balancing the ship sailing before the wind, the following explanation was given by shipbuilder Jan de Vries Lentsch<sup>11</sup>. He said that when there is a steady wind and the jib (on a modern ship, of which the *artemon* sail was a forerunner) and sail have been adjusted to the wind to sail in the right direction, the ship almost steers itself just by the interaction of these two sails. As a result the oarsman does not need to use much strength to steer the ship. The ship mostly steers itself, by the steady wind and the setting of the sails,

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<sup>11</sup> Jan de Vries Lentsch was my uncle, who designed yachts for the family shipyard "Het Fort" in Amsterdam/Nieuwendam in the 1960's and '70's. He also had much experience as a competitor in sailing regattas in the Netherlands.

into the right direction. Casson (1971:264) still adds that the *artemon* sail enables the vessel to sail more efficiently by keeping the bow from digging in. This fact was also confirmed to me recently by Pieter de Vries Lentsch, who is an experienced sailor.

An interesting detail of both the sails also is that it is quite visible that they are made up of panels that have been sewn together. A ship like this would be very suitable to sail beyond the Strait of Gibraltar, as it was designed for more hazardous sea conditions, such as higher waves, stronger winds and a longer voyage. Whether one could still speak of a ship of Tarshish at this late a stage in time, is not certain. What is certain though, is that a ship like this could easily sail to Cadiz and beyond.

#### **4.2.6 Carthaginian merchant ships**

Carthage was established on the north coast of Africa in the year 814/813 BCE by Elissa (or Dido), who was the sister of king Pygmalion of Tyre (Aubet 1993:41). Elissa, who was married to her uncle, the chief priest of the temple of Melqart at Tyre, Acherbas or Zakarbaal, was co-ruler of Tyre with her brother Pygmalion after the death of their father (Aubet 1993:131). A conflict arose, because the population wanted Pygmalion to be their king, and Elissa's husband was assassinated by her brother. She fled with a number of followers on a few ships, via Cyprus to North Africa where they established Carthage. In the process she had also managed to take along a considerable part of her wealth by means of a ruse (Jedidian 1969:50-51). The name Carthage is derived from *Qart-hadasht*, meaning 'new city' (Aubet 1993:189).

In this new city several industries developed, such as pottery, purple dye works and textile weaving (Markou 2000:104), fishing (Kurlansky 2003:46), metal foundry (Gore 2004:46) and also shipbuilding. Timber for the construction of ships, such as oak, pine and juniper, was available near Carthage both at Utica and Cap Bon (Markou 2000:104).

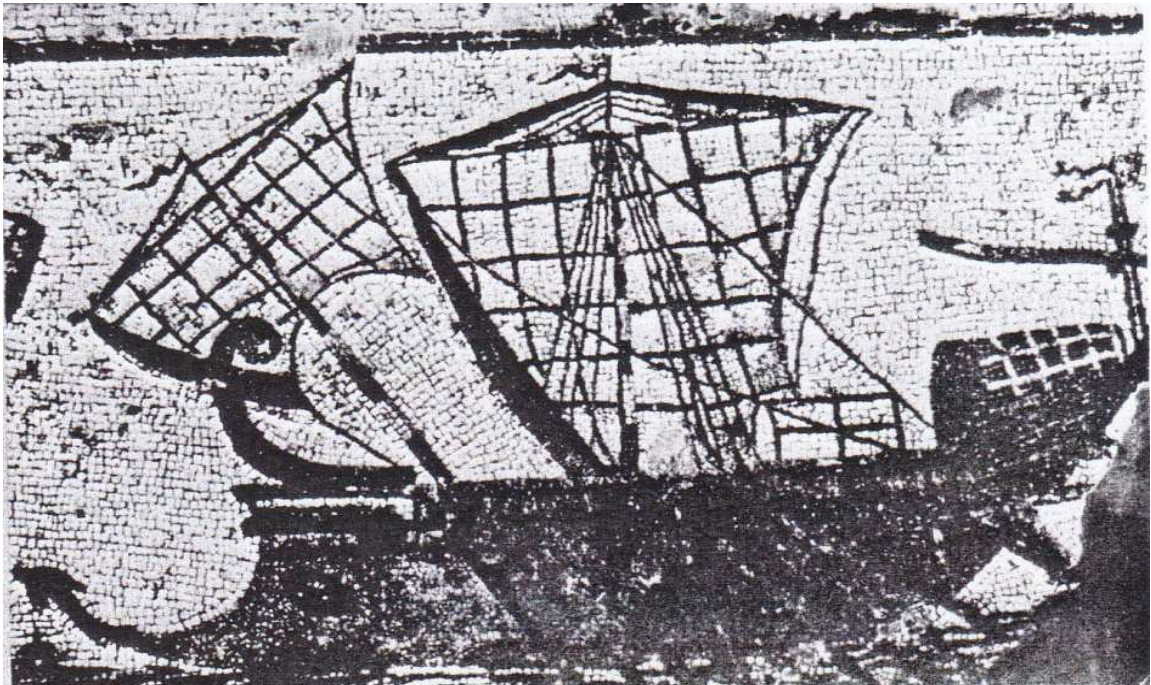
It can be assumed that initially they built ships similar to the ones they had brought from Tyre, probably ships of Tarshish. But as they set out to sail farther west, and beyond the Strait of Gibraltar, their ships were adapted to the requirements of sailing on the Atlantic.

The Museum of Sousse in Tunisia has a mosaic dating to the first century BCE, which shows a Carthaginian merchant ship (Mazel 1971:96). It has a pointed ram at the bow,

and the top of the bow curls upwards. There is an *oculus* (eye) on the bow as well. That is the rounded shape that is visible. Ships throughout the Mediterranean had these and they were intended to ward off evil.

The stern slopes diagonally upwards, and there is a shelter right over the rear deck, which could be considered an awning, a lattice with cloth cover (See also 7.4.6). The sail is shown as made of panels, without a boom and is suspended from a yard, hoisted to the short mast. There is also an *artemon* sail, but of a bigger size than the one shown on the bas-relief from Beirut mentioned under 4.1.5. Pennants are fluttering from the top of the mast, the elevated part of the stern, as well as above the *artemon* sail. The ship shows about 8 oars along the visible side, besides the steering oar near the stern, which is thicker than the rowing oars. Casson (1971:226) also refers to the fact that steering oars were far heavier in size as they had to withstand stronger pressures.

This ship displays a number of the features comparable to those of the previously mentioned ship on the bas-relief from Beirut, but it also has its own distinctive features, where the two ships' images differ, and these probably were typically Carthaginian in nature.



**Figure 4-6: Carthaginian merchant ship with its own unique features (Mazel 1971:96).**

When Carthage was defeated by the Romans in 146 BCE, the city was completely destroyed by fire (Gore 2004:46). As a result of this, the construction of ships there also came to an end.

### 4.3 CONCLUSION

From the description of the various Phoenician ships above it can be understood that there was not one single type of merchant ship prevalent throughout the entire era during which the Phoenicians plied the waters of the Mediterranean and beyond. Over time different ships were developed for different purposes and for use on different routes. The ships of Byblos or *kubna* ships were initially mostly used for the transport of wood to Egypt and papyrus from Egypt to Byblos, but later the name became also used for large merchant ships plying different routes. This was during the Bronze Age, and should still be referred to as the Syro-Canaanite era.

During the Iron Age the ships of Tarshish and the *mnš* ships were used for the transport of heavier cargo, containing metals (besides many other types of articles), rather than wood or papyrus, and travelled farther away from the home ports and under more dangerous sea conditions. These ships must of necessity have been more strongly built to be able to transport the heavier cargo. This era can be referred to as Phoenician.

There also were ships dedicated to a single type of cargo, as attested to by the horse-transport ships in use by the Tyrians, according to the description by Jedidian (1969:73).

Carthage was initially very much a colony of Tyre, but over time developed independently. In the process it developed its own industries, of which shipbuilding was one, and on their shipyards they built ships in a style that was uniquely their own, as is attested to by the mosaic from Tunisia.

Even though there are not many images available of the various ships, from the facts that are known, it is clear that the shipbuilding industry was a vibrant part of Phoenician society, which was able to adapt to the changing demands that were made of the ships. The demands of trade went hand in hand with the development of ships, so that these were suited to the particular needs of the articles traded.

## CHAPTER 5

### PHOENICIAN WARSHIPS

#### 5.1 INTRODUCTION

In Chapter 3 an analysis was made of whether the Phoenicians had learned to build ships from the Egyptians, based on a statement in that regard by Aubet (1993:146). As the chapter progressed, it became clear that there were many differences between the ships of the Egyptians and those of the Phoenicians. The likelihood that the Egyptians were the main influence on the shipbuilding skills of the Phoenicians seemed therefore less likely. At a later stage of the continued research into the Phoenician ships, another source became available, which expresses a different opinion on the development of shipping in the ancient Near East. In his book "Ships and Seamanship in the Ancient World", Lionel Casson expresses an opinion totally the opposite of the one held by Aubet. He states that:

The mainstream of nautical development that was to flow throughout ancient history arose not in the river-oriented civilizations of Mesopotamia or Egypt, but in the open waters of the eastern Mediterranean: on Crete, on the Aegean islands, along the coasts of Greece (Casson 1971:30).

In this chapter the development of the Phoenician warships and naval capacity will be analysed. The origin of oared ships, as well as the rapid development of the various types of warships that took place, will be detailed. As neighbouring peoples, e.g. the Greek city states, developed naval capacity before the Phoenicians did, it will be necessary to analyse the development of warships in the eastern part of the Mediterranean as a whole. There seems to have been an arms race in progress in those days. This brought about the development of different fighting techniques, which in turn necessitated the development of different types of warships, as a result of the required need for increased speed and manoeuvrability (Edey 1974:46-47).

The Phoenicians were more interested in trade than in warfare and seem to have developed naval capacity as a defensive rather than as an offensive means in the initial stages. Only under the domination of the Persian Empire did they get involved in warfare for the sake of attack when the Sidonian Triremes, complemented by those from Tyre and Arvad, were needed to participate in the battle of Salamis in 480 BCE (Edey 1974:49-50).

The Carthaginians had engaged in a naval battle at the beginning of the sixth century BCE, when 60 Punic ships with 60 Etruscan ships had confronted 60 Phocaeen vessels (Greek) off the eastern shores of Corsica in the battle of Alalia (Lancel 1997:125-126).

All aspects and developmental trends of the warships, in as much as these have been found in the various sources, will form part of this analysis both in the Phoenician homeland as well as in the Punic realm of Carthage.

## 5.2 THE DEVELOPMENT OF WARSHIPS IN THE MEDITERRANEAN BASIN

As was mentioned in Chapter 3, the Minoans of Crete (ca. 2000-1500 BCE) are believed to have had a naval capacity (besides their trading ships), as there were no fortifications around their cities to defend them (Casson 1971:30). Their successors, the Mycenaeans or Aegeans (ca.1500-1200 BCE), were in control of the eastern Mediterranean and developed oar-propelled ships, and used these ships for coastal raids and other acts of piracy (Wachsmann 1998:124-130). As a description has been given in Chapter 3 of these developments, they will not be dealt with in detail in this chapter. What can be mentioned as the most distinguishing features and differences between the Cretan and Mycenaean or Aegean ships however, is that the Cretan ships had rounded hulls and that the Aegean ships had straight-lined, angular-ended shapes (Casson 1971:30-31). Another interesting detail is, that a number of images show a projection where the stem-post joins the keel, and that this feature remains present on ships throughout Antiquity (Casson 1971:35). This was not a ram, as the structure of the ships at that time would not have allowed the impact of ramming another ship with it, but it was later, in ca. 1000 BCE, developed in warships for use as a ram (Casson 1971:49).

When we take all these developments into account, it is not surprising that first the Syro-Canaanite traders before ca.1200 BCE and later the Phoenicians developed a naval capacity. When valuable goods are shipped over long distances in heavily laden ships, the likelihood of being attacked by pirates is a very real threat. Also there were harbours to protect, coasts to guard and intruders to keep at bay (Bartoloni 2001:85).

Moreover in about the twelfth century BCE the Sea Peoples arrived in the eastern Mediterranean and initially caused a lot of destruction (Gore 2004:37). Their arrival

seems to have been triggered by environmental and climate change. Geological evidence indicates that a gradual rise in temperature occurred, which brought about a rise in sea level (Aubet 1993:23). The Sea Peoples seem to have been responsible for the destruction of Ugarit, a major Syro-Canaanite port in those days. Archaeologists discovered a massive destruction level there, and the fact that the city was completely abandoned after its destruction both are an indication of its catastrophic end. The city of Alalakh was destroyed as well (Aubet 1993:23).

Several groups of Sea Peoples settled in the Levant, and this was also the time when the Philistines settled along the southern part of the coast towards Egypt. Another group of them, known as the Tjeker, lived in Dor in the time when Wen-Amon undertook the journey to go and buy cedar wood in Byblos for the construction of a new sacred barge for Amon-Ra, who was worshipped at the temple at Thebes. Wen-Amon mentions the Tjeker in the account of his journey (Markoe 2000:27). The Phoenician city states do not seem to have been so much the target of destruction by the Sea Peoples. In fact, Aubet is of the opinion that they may have made alliances with them (Gore 2004:37). All these changes allowed the Phoenician city states to emerge more prominently as centers of trade (Aubet 1993:29). More trade in turn increased the need for protection, so there were many reasons why the Phoenicians would have needed a naval fleet.

In the meantime the development of oared ships in the Greek realm of the Mediterranean had continued, and as there is no evidence available of how the early warships were developed among the Phoenicians, the best way to describe the developments would be to analyse the Greek ships.

## 5.3 DEVELOPMENT OF GREEK SHIPS

### 5.3.1 Homeric Galley

Before analysing what is known of Greek warships from about 1000 BCE onwards, it is necessary to make a few preliminary remarks about Homer. His epics the *Iliad* and *Odyssey* date to ca. the eighth or early seventh century BCE, but are supposedly describing a war that was waged by Bronze Age Greeks, the Aegeans, about four or five hundred years earlier. Homer's descriptions of galleys fit those of the eighth



century BCE, but can also apply to earlier ships. He seems to have tried not to commit anachronisms (Casson 1971:43).

He describes the ships as “swift”, indicating low sleek hulls, which fits in with images dating to that time. The other epithet is “hollow”. This means that ships did not have decks. There only was a small deck forward for the lookout and a slightly larger one aft, for the captain. The crew had to remain on the benches, even to sleep, if it was not possible to go ashore, but usually nights were spent on land. Provisions and gear were stowed under the decks and under the rowing thwarts<sup>12</sup> (Casson 1971:44).

The galleys came in standard sizes. The smallest was the 20-oared, which was used for transport and despatch work. The 50-oared, or *Penteconter*, seems to have been used mostly for troop transport. The name ‘*Penteconter*’ refers to the fact that these ships had 50 oarsmen, 25 to each side. They were about 25 meters long and they had a captain, a first mate, a pilot and a team for manoeuvring sails on board (usually no more than 10 crew) besides the 50 rowers. These ships also had a ram mounted on the prow in later times. The rowing pace was set by a flute player (Bartoloni 2001:88). Initially the rowers were all seated on the same level. The Phoenicians are also reported as having used *Penteconters* (Bartoloni 2001:88). These warships, long and narrow and with only one bank of oars, were also called *navis lunga*, or long ship. This is in contrast to the already mentioned *navis rotunda*, the round bellied merchant ship (Bartoloni 2001:87).

There even were galleys with 100 rowers, and there also was a 30-oared galley, the *triaconter*, which Homer does not mention, but which is known to have existed in those days (Casson 1971:44-45). The ships were long and narrow, and also very low and light. The crew could jump from the gunwale to the ground, and could push a vessel free from a shore with a good shove with a boat pole, as well as run them up on the beach to spend the night (Casson 1971:45). The hull was black, most probably smeared with pitch and the stem and stern rose mostly straight up, but the stern ended in a curve. On the bows there were patches of decoration in red, purple or blue (Casson 1971:45). There were tholepins against which the oars were worked, with a leather strap to hold the oar against the pin and to prevent the oar from going over the side if a rower accidentally let go of it. Homer describes a single steering oar, which was customary in the Mycenaean Age, but in his day and age the double steering oars were already standard usage (Casson 1971:46). The ships were also equipped with a mast amidships, that could be raised or lowered. In order to raise it, the mast would be

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<sup>12</sup> A thwart is a rower’s seat extending athwart a boat (Webster’s 1977:1218).

hailed on the forestays from its crutch aft and set in its tabernacle (mast-step), which was fastened on the keel and projecting a certain distance above it. The mast would be kept in place by two forestays, run to either side of the bow and a single backstay. To set sail, a yard would be hoisted to the mast with a square sail suspended from it. Running rigging consisted of braces (attached to the end of the yard to move it horizontally), sheets (connected to the lower corners of the sail to hold them in place) and brails (to shorten the sail or furl it upwards completely) (Casson 1971:47, 70). Gear carried on board consisted of mooring lines, stone anchors, punting poles, long pikes for fighting, possibly side screens for closing in the waist in heavy weather, and leather bags and ceramic jars for dry and wet provisions respectively (Casson 1971:48). Even though these ships were able to make long sea-crossings, their lack of storage space forced them to put into shore regularly to obtain provisions (Aubet 1993:150). The single square sail on a retractable mast was only used for distance travelling (Bartoloni 2001:165). Masts and sails were removed before battle and only oars were used during the fighting (Edey 1974:43).

### **5.3.2 Ships of Homer's Age**

As said in the above, Homer's epics describe ships of an earlier age. In Homer's days there were still open low galleys, but further developments had already taken place and there were now also ships with an elaborate superstructure. Besides that, a major new development which had taken place was the invention of the ram, a pointed cutwater mounted at the waterline, with which an opponent could be dealt a powerful blow. This had come about after ca. 1000 BCE during the transition from the Bronze to the Iron Age (Casson 1971:49). This invention in turn necessitated other changes. The warships were no longer fast transport ships to ferry troops or bring marines close to an enemy ship in order to fight. The ships themselves became the weapon with which an enemy ship could be dealt a destructive blow. The ships therefore needed to be stronger, made of heavier materials, especially at the bow, to withstand the impact of a blow dealt to another ship (Casson 1971:49). It also required the ships to have greater manoeuvrability, to turn quickly so as to be able to deal another powerful blow to another ship. The developments emanating from this all will be dealt with under the next heading.

### 5.3.3 Biremes

So far mostly the developments of the Greek warships have been taken into account, because of the lack of information available about the developments of the Phoenician warships before about 1000 BCE. However, the Phoenicians must have developed warships, as their developing trading power required that they protect their interests. It is possible that the ram was a Phoenician invention, but if it was not, they had to follow suit very quickly to adapt to the newly developed new weaponry and tactics, which affected and changed naval strategy completely (Edey 1974:46).

In order to ram an enemy ship, quick manoeuvrability was needed. It was however not possible to make quick turns with the long warships which had been used up till the time of the introduction of the ram. This is because their turning-circle was too large, and there is also more resistance from the water against the hull of a ship when a larger vessel turns, thus slowing the turning movement. Moreover the length of the ships made them vulnerable to attack, especially amidships. Building shorter single-banked ships was not the solution either, because there would not be enough space to accommodate a sufficient number of rowers. The minimum space needed by an individual rower is about three feet (Casson 1971:53). The rowers were needed to supply sufficient oar-power, as there was no other means of propulsion available to generate the speed needed to ram an opponent. And in order to do major damage to an enemy vessel, considerable speed was required.

To increase oar power by getting more men to operate one (possibly bigger) oar, is not practical either, because the angle at which the oar enters the ship, will make it too difficult for the inmost rower to pull the oar, unless he stands up at the beginning of every stroke and then sits down again, which is very tiring. This would also require a broader ship, which is very heavy and sluggish (Casson 1971:54). So in the end a different solution was found in developing the double-banked ship, or *Bireme*. This development took place both among the Phoenicians and the Greeks at about the same time (Edey 1974:46). The Greek *Biremes* are known from vase paintings (Casson 1971:58). The Phoenicians must have had single-banked warships before this development took place, because otherwise it would have been impossible for them to all of a sudden develop *Biremes*.



**Figure 5-1: Phoenician Bireme, 7th century BCE (Moscati [ed.] 2000:75). Note the oars on two levels, the rowers seated just above the oars and the rounded shields along the side with the fighting men slightly visible above them.**

These ships were much shorter, ca. 20 meters, and were far more compact and shock-resistant as well as quicker to turn. They had a pointed bronze ram mounted on the prow at the waterline, which was used to ram and disable enemy vessels. For the Phoenicians these double banked galleys were the warships of the seventh and sixth centuries and they carried archers and lancers on the central elevated superstructure, which were protected with shields. The Assyrian wall reliefs from the palace of Sennacherib in Nineveh, dating to ca. 700 BCE, show such a Phoenician *Bireme* with oars being worked through ports in the hull of the ship as well as from the gunwales<sup>13</sup> (Markoe 2000:80-81). The oars are staggered, which means that each one of the upper oars is centered over the space between two of the lower oars (Casson 1971:56-57). The ram is cone-shaped, which was characteristic for the Phoenicians (Casson 1971:58). Besides the ram as the new tactic weapon, the ship is also still

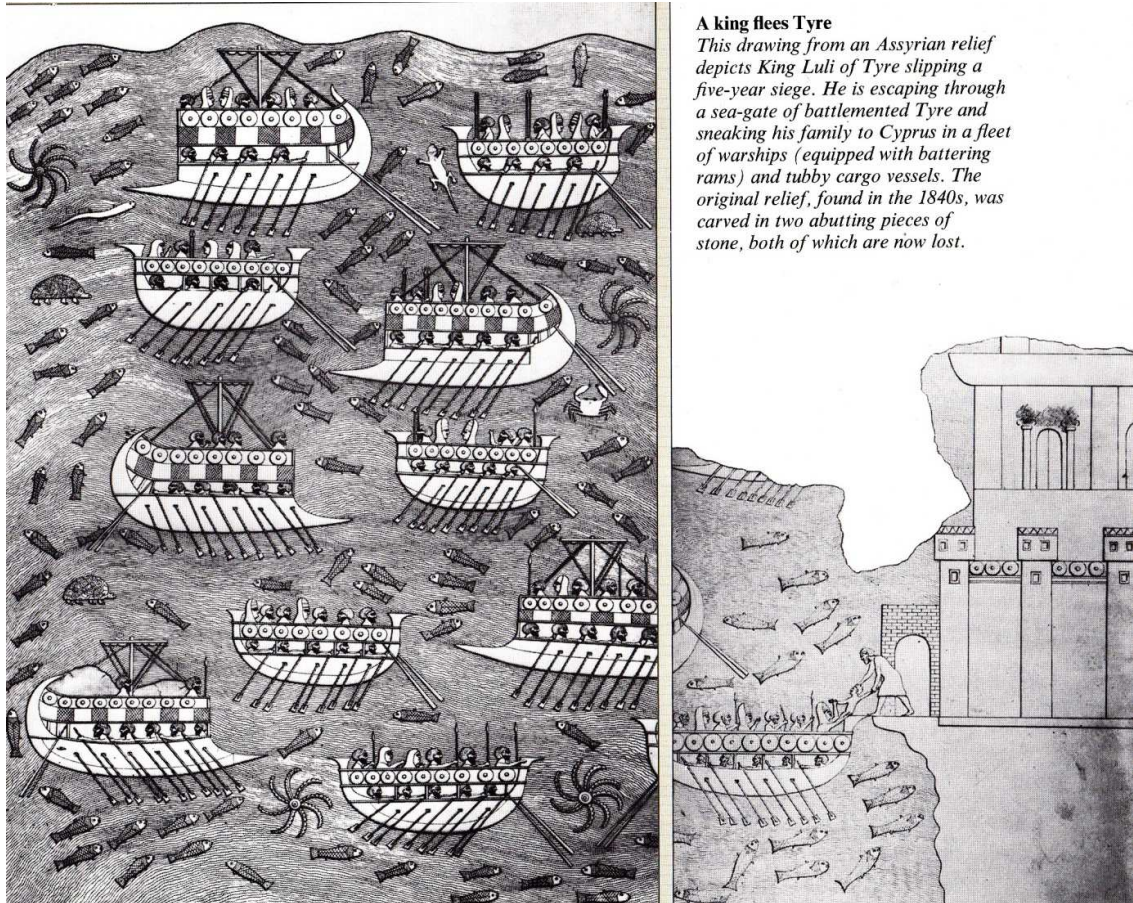
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<sup>13</sup> The gunwale is the upper edge of a ship's or boat's side, which formerly was used as a support for guns, hence this name (Webster's 1977:512).

equipped for the more traditional way of fighting, with a raised deck above the rowers, on which a few fighters are visible. Their shields are hanging on the side of the raised deck. Due to the damage to the relief, unfortunately not more fighters can be seen (See *Figure 5-1*).

Whereas the ship on this Assyrian relief still looks rather primitive, an Assyrian image from the palace of Sennacherib depicting the flight of King Luli of Tyre to Cyprus, shows a much more sophisticated image of the *Bireme* warships (Moscati [ed.] 2001:44-45; Casson 1971: Appendix, Figure 78) (See *Figure 5-2*). King Luli, who was a vassal of the Assyrians, had refused to pay the tribute that was due, and in 701 BCE the Assyrians attacked, causing the king to flee. The image provides interesting details. All the warships are equipped with rams and are of the *Bireme* variety with two staggered rows of oars. There is an elevated deck with the rows of shields hanging on the sides. Moreover the ships have a single mast, held in place by one stay at the stern and two stays at the bow. The yard is hoisted up on the mast and has a furled sail with loose brailings. All ships have a double set of steering oars at the stern. Besides some soldiers with pikes on the upper decks, also women are visible with large headdress, who probably are women of the royal court being evacuated. On the right hand side of the image a man, still standing ashore, hands over a child to a mother on the ship that has not yet departed.

On the same image also other ships are visible. These are not equipped with masts or rams, have straight stem and stern posts, as well as a raised upper deck with shields on the sides. They are also rowed by a double row of rowers, and are also being used to evacuate people from Tyre. On some ships soldiers with pikes are visible as well as women. They have a double set of steering oars and are smaller than the *Biremes* with the rams.



**A king flees Tyre**  
 This drawing from an Assyrian relief depicts King Luli of Tyre slipping a five-year siege. He is escaping through a sea-gate of battlemented Tyre and sneaking his family to Cyprus in a fleet of warships (equipped with battering rams) and tubby cargo vessels. The original relief, found in the 1840s, was carved in two abutting pieces of stone, both of which are now lost.

**Figure 5-2: Flight of King Luli from Tyre with Bireme warships and transports (Edey 1974:87).**

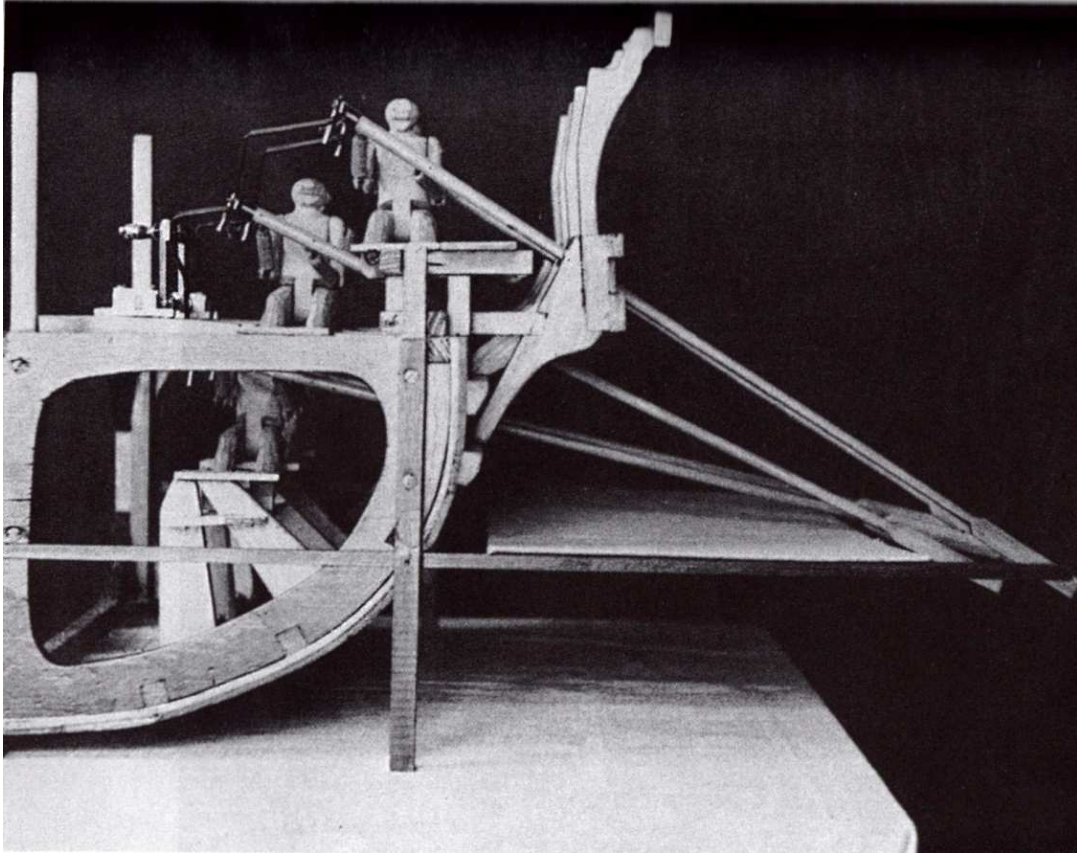
Different authors give a different explanation about these ships. Some think that these ships are merchant vessels, which are also used for the evacuation. Merchant vessels however were equipped with masts and sails, and these ships do not have any masts or sails, so the assumption of merchant vessels in this case seems to be mistaken. Casson is probably correct when he states that these vessels are transports (Casson 1971: footnote under figure 78 in Appendix of images after page 370). According to Bartoloni, *Hippo*i ships were used as communication vessels between warships in time of battle and for the purpose of towing damaged ships away or to retrieve crew from the water (Bartoloni 2001:166). (See also 6.3.6). It is very well possible that the transports are equivalent to what Bartoloni refers to as *Hippo*i. In this case they were not equipped with horse-headed prows, but only had straight stem and stern posts.

#### 5.3.4 Triremes

The development of warships continued even after the invention of the *Bireme* and as a result of the requirement of increased speed and manoeuvrability, the *Trireme* was the next type of warship that came into use. *Triremes* were ships with three vertically superimposed banks of oars, and probably originated in Sidon in about 670 BCE. They remained predominant till the 4<sup>th</sup> century BCE (Markoe 2000:86). The Greeks also developed *Triremes* at about the same time, but these differed from the Sidonian ones. The Greek naval architects accommodated the third row of oars by adding an outrigger above the gunwale of the ship and projecting this laterally (Casson 1971:81). The naval architects of Sidon managed to accommodate the third row of rowers *inside* the ship by making the ship higher. It is also possible that the Phoenician ships were beamier than the Greek ships and that this also helped to fit all the oarsmen in the span of the hull (Casson 1971:95). As for length, the Greek and Phoenician *Triremes* were the same and had the same number of oarsmen on the different levels (Casson 1971:95). Bartoloni is of the opinion that the three banks of rowers possibly had 27 rowers on either side in the upper row and 25 respectively in the 2 lower rows on each side, a total of 154 rowers (Bartoloni 2001:165). Casson states that there were 31 rowers in the top level on either side (Casson 1971:95) and that the other two levels each had 27 rowers to a side so that the total complement of rowers was 170 (Casson 1971:84).

The Greeks had different names for these rowers on the different levels. The lowest line was called the *Thalamites*, and as their oars were very close to the waterline a leather bag was fitted around the oar and the porthole, so as to keep out the sea. The next level of rowers was called the *Zygites* and their oars were worked through ports just below the gunwale. The highest level of rowers was called the *Thranites* and on the Greek ships their oars were fastened with a tholepin on the outrigger that projected about two feet from the side of the ship (See *Figure 5-3*) (Casson 1971:83). On the Phoenician ships the top row of oars were worked on a railing that ran at an appropriate height, directly over the gunwale (Casson 1971:95). The Greek ships had an *aphlaston*, or *aplustre*, a fan-shaped ornament bending inward at the top of the sternpost (See *Figure 5-4*), whereas the Phoenicians decorated the top of the sternpost with a horse-headed shape (Edey 1974:50-51; Casson 1971:389; Moscati [ed.] 2001:86). The preferred place to do battle was near the coast in a relatively quiet stretch of water and the tactics used consisted of trying to ram the opponent sideways (this was called the *periplus*), or to pass him and then turn and hit his stern with the

ram (this was called the *diecplus*) (Bartoloni 2001:89,165)<sup>14</sup>. The *Triremes* could achieve a top speed of 9 knots (Bartoloni 2000:165).



**Figure 5-3: Model of seating of Greek trireme with outrigger to accommodate 3<sup>rd</sup> level oars (Casson 1971: Picture Appendix Fig. 101).**

By this time warfare had changed from a confrontation between archers and lancers to a series of assaults whereby the first ship to inflict a vital blow to a vulnerable point of the enemy ship would have won the victory. The coordination and manoeuvring capacity of the oarsmen had become the main important factor to win the war (Aubet 1993:150).

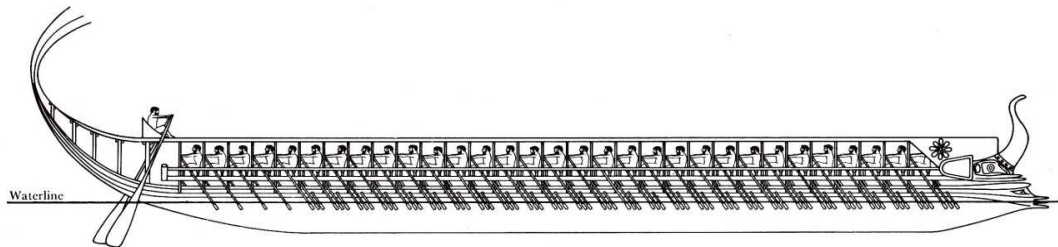
During the Persian era Sidon was pre-eminent due to its superior naval strength and from the reign of Darius onwards the Sidonian *triremes* were the fastest and most effective in combat. When Xerxes invaded Greece in 480 BCE, the Sidonians provided the majority of the naval vessels needed for this enterprise, and their commander Tetamnestras held the place of priority in the king's war council (Markoe 2000:52).

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<sup>14</sup> The Greek words *periplus* and *diekplus* are used in this context as tactical terms in nautical warfare. The word *periplus* can also mean 'sea-voyage' in a different context (Bartelink 1961:71; 194).



How the Sidonians managed to fit three banks of oars into their *triremes* has had naval architects of the present age scratch their heads in their attempts to try and reconstruct this feat, but they did succeed in the end, which is proof all the more of the ingenuity of the original designers.



**Figure 5-4: Greek Trireme with aphlaston of the 5th-4th BCE in profile view (Casson 1971: Picture Appendix Fig. 99).**

### **5.3.5 Carthaginian warships: *Quadriremes* and *Quinqueremes***

In the first centuries of its existence Carthage still maintained very close ties with the mother-city Tyre (Lancel 1995:37). Over time however, it developed its own economy and trade, made treaties with other powers, such as Rome (Markoe 2000:102), and became a power in its own right. After the defeat of Tyre by Alexander the Great in 332 BCE, Carthage was on its own and consequently had to sail a more independent course. This is also visible in the design of its warships.

In the course of the research into the Carthaginian warships, it became clear that there are considerable differences of opinion between several authors. These differences will be described and analysed, and an attempt will be made to come to a conclusion regarding the configuration of these ships.

Casson states that the Hellenistic Age, which lasted from the death of Alexander the Great in 323 BCE to the battle of Actium in 31 BCE, saw the development of new types of ships. Larger ships became the norm, whereby *triremes* became the light craft of the naval fleet (Casson 1971:97). This development had in fact already started when Dionysius, ruler of Syracuse began to build *tetrereis* (“fours”) and *pentereis* (“fives”). Casson states that according to Aristotle, Carthage invented the “fours” and according to Diodorus, Dionysius invented the “fives” (Casson 1971:97). Within half a century both Greek and Phoenician navies had these ships and during the siege of Tyre by Alexander both “fours” and “fives” were used. Syracuse later developed “sixes”

and in the aftermath of the death of Alexander the Great, warships as large as “sevens”, “eights” up till “sixteens” were developed. These oversized galleys, also called *polyereis* or *polyremes* required regiments of rowers to propel them. These massive ships did not last however (Casson 1971:97-98).

The question is: how were galleys larger than a *trireme* oared, as it is impossible to keep stacking banks of oars on top of each other and still keep a ship afloat and not let it become top-heavy? A theory was then proposed that the ships were single banked and were rowed by means of multiple rower sweeps (this means that the ships were equipped with very large oars, which were rowed by a number of rowers to one oar). The name was then determined by how many rowers were assigned to pulling each sweep (Casson 1971:99). This also has its limits though, and Casson therefore proposes the following solution: combining the two systems, whereby the superimposed banks of rowers, such as of the *triremes*, are now being equipped with larger oars (sweeps), which are rowed by multiple rowers per bank (Casson 1971:100). He is of the opinion that in this way the development up to a six can be explained, simply by assigning two men to each oar. In the fives, there would be two men to the two topmost banks of oars and one rower in the lowest bank per oar. By lengthening the oars operated by two rowers, it would be possible to keep both rowers seated at all times during rowing. In the sixes, there would be two rowers to each oar on all three levels (Casson 1971:102).

Over against Casson’s opinions however, Markoe and Bartoloni express a completely different view of how these ships were operated. Markoe states that the design of the *quadrireme* originated in Carthage and was a complete change of approach as to how the rowers were seated. Instead of the vertically superimposed banks found in the earlier naval vessels, the *quadrireme* was single banked, but accommodated 4 rowers per bank to work a single oar, and had 25 oars on either side, thus a total of two hundred oarsmen. A further development saw five rowers per bank, per oar, and the *quinqueremes*, as the Romans called them, were the main naval vessels used in the Punic wars. The *quinqueremes* would have roughly measured 40 metres in length, were about 6 m wide, with a draft of no more than 2 m. and would have had a total crew of over 300 men, which included deckhands and auxiliary mariners (Markoe 2000:86). These ships were not very high above the water, which gave them greater stability (Bartoloni 2001:88).

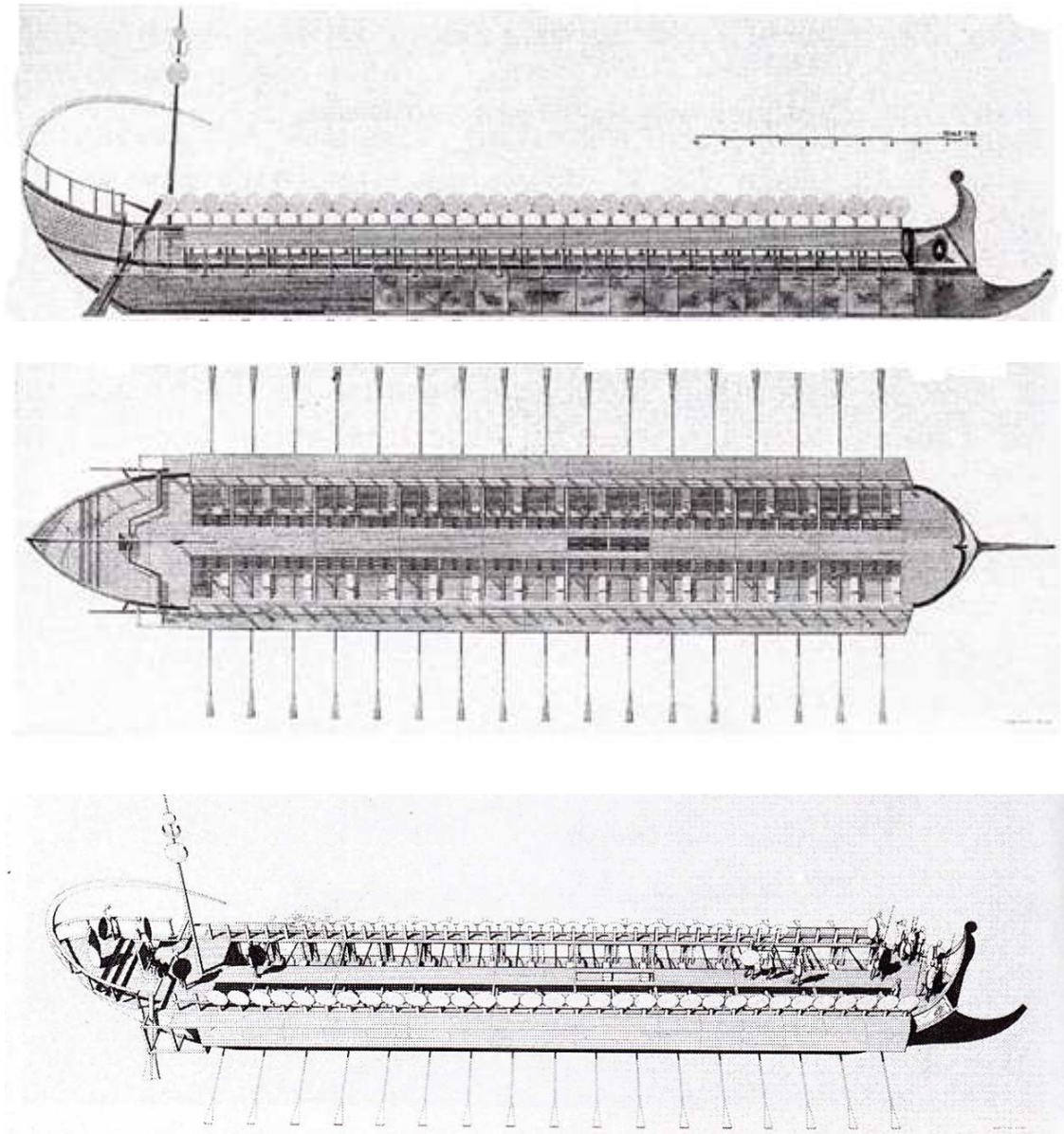
Note that Casson uses the Greek words *tetrereis* and *pentereis*, and Markoe uses *quadriremes* and *quinqueremes* for the “fours” and “fives”, but that these terms

indicate the same type of warships respectively. Bartoloni uses the term *tetreme* for a “four” (Bartoloni 2001:88). The question that now needs to be asked is: “Who has the correct interpretation of these terms?”

When trying to formulate an answer, it needs to be taken into account that Casson’s book was published in 1971, and that Markoe and Moscati (which includes Bartoloni) published their books in 2000 and 2001 respectively. This means that Casson was not able to take the find of the Punic warships near Marsala into account, as these were only excavated after they were found in 1971. So in order to formulate an answer to the above question, an analysis needs to be made of this very significant find.

### **5.3.6 The Punic Marsala warships**

In 1971 the wreck of a Punic ship was found near Marsala, which is close to the ancient town of Lilybaeum, on the western tip of Sicily. Lilybaeum was founded by the survivors from the island colony of Motya, which belonged to Carthage, after it had been destroyed by the Greek army in 397 BCE (Edey 1974:151). The British underwater archaeologist Honor Frost was asked to excavate this ship, which was done by her and her team in four seasons of excavations between 1972 and 1975. Only the stern of this ship was found, but during the final season of excavation the remains of a second ship were found nearby, and of this ship only the bow section was discovered. These finds enabled the researchers to reconstruct what these ships had looked like (Frost 1982:48) (See *Figure 5-5*). An attempt was also made to make an actual reconstruction with the help of the brothers Bonanno, local shipbuilders of wooden fishing vessels. With their expert help it was possible to establish that the ships had been equipped with a wooden ram, which could break off once an enemy ship had been rammed with it. The ram had been attached with iron nails instead of wooden nails and the iron would have rusted away. Also the ram was cut across the grain of the wood, which would have allowed it to break off much more easily (Morneau 1986:5). The ships were 35 meters long, 4.8 m wide and only had one bank of oars comprising of 17 oars to each side. These oars were operated by two rowers to each oar. Above the rowers was a deck over the entire length and width of the ship to accommodate the fighters for combat (Frost 1982:46-47). These ships were not *quadriremes* or *quinqueremes*, and it is clear that the Carthaginians had moved away in their design of warships from the *triremes* with their three banks of oars to single banked ships, which were wider and lower.



**Figure 5-5: Marsala Punic Warship reconstruction, side, top and perspective view respectively (Lancel 1997:130).**

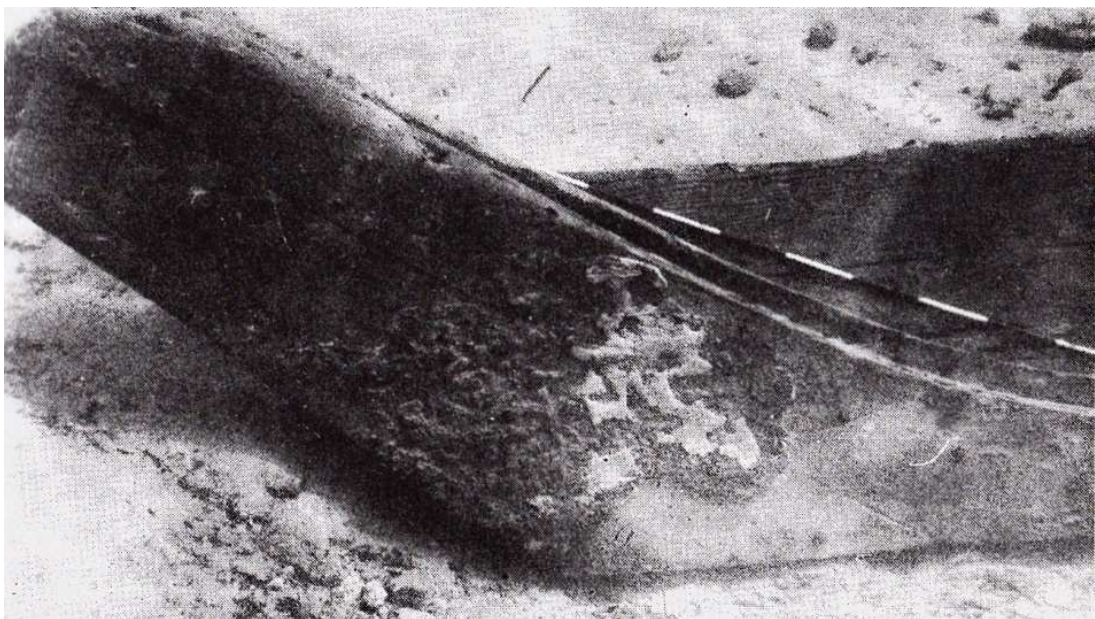
The Marsala ships are assumed to have sunk during the First Punic war which took place in the middle of the Third Century BCE (Frost 1982:44). To be more precise, the Battle of the Aegades Islands took place on 21 March of the year 241 BCE, during which 50 Punic ships were lost (Morneau 1986:9). When this information is taken into account, no conclusion can be made that the opinion expressed by Casson regarding the warships larger than a *trireme*, is correct or not.

The possibility exists, that Casson is correct in his assumption that the “fours”, “fives” and “sixes” were triremes with more than one rower per oar. It is most likely that the

Punic warships discovered off Lilybaeum are a later development. This is the opinion expressed by Lancel. He states that these ships were *monoremes*, and confirms that they had two rowers per oar (Lancel 1997:130). They were equipped with a ram, but combat on the upper deck seems to have made a come-back as the main method of warfare.

There are no indications why this change in design took place, although it is interesting to note that there were fewer rowers needed to row the Marsala ship than to row a *trireme*. The latter needed 170 rowers according to Casson (1971:84), but for the total of 34 oars on the Marsala ship (17 per side), 2 rowers were needed per oar, so a total of 68 rowers were sufficient. As the Carthaginian navy was largely recruited from its citizen body (Markoe 2000:86), and no slaves were entrusted with this task, there may have been a shortage of manpower to equip all the war-ships with sufficient personnel.

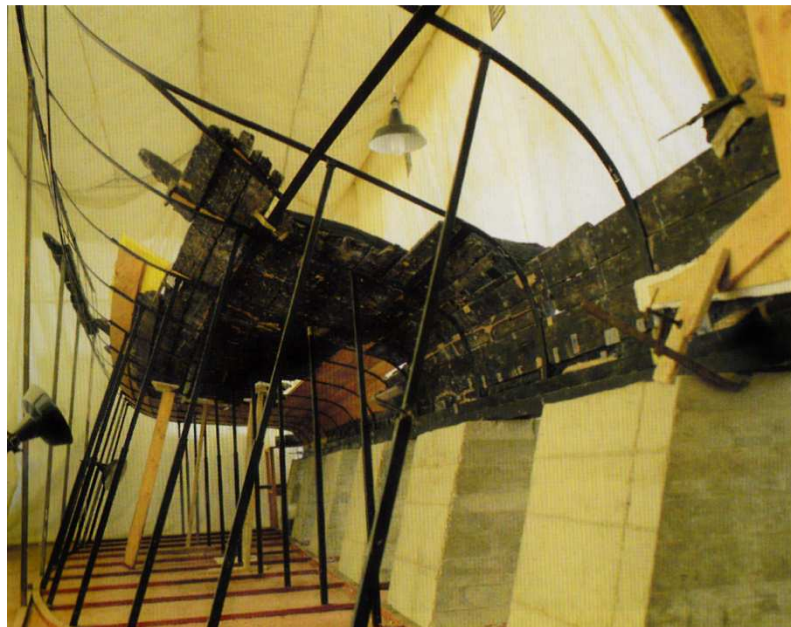
A discovery of great interest during the excavations of the Marsala warships was, that there was Punic writing on certain parts of the first hull, which are believed to be indicative of the fact that the parts of the ship were pre-designed, and that these parts only needed to be assembled into ships in time of war, when they were needed. This could explain and confirm the veracity of what Roman historians wrote, namely that the Punic warships were built with incredible speed. It is also indicative of the degree of industrial organisation (prefab and serial construction) that Carthage had achieved, which is very unlike any traditional form of shipbuilding (Frost 1982:49).



**Figure 5-6: Keel of the Marsala Punic Warship (Lancel 1997:131).**

What was of interest from a design perspective, was the discovery of a system of spray deflectors along the waterline of the hull, which would have allowed the decks, and the men on them, to stay dry during rough seas (Morneau 1986:5).

The wreck also enabled the researchers to investigate the construction techniques that had been used. The Carthaginian carpenters had made use of a different construction method than would have been expected based on modern methods of shipbuilding. The Marsala ships had been built with the 'shell first' method. This implies that once the keel had been laid and the stem- and stern-post had been attached, first the sides were put into place before the skeleton was added. The planks were assembled 'freeboard' that is, placed alongside each other edge to edge without overlap and fastened with mortise-and-tenon joints (Lancel 1997:131-132).



**Figure 5-7: Remains of the Marsala Punic Warship (Miles 2011:175).**

The Marsala ships could not have been merchant ships, as no remains of cargo were found. Instead Frost and her team found piles of ballast stones, which were used in ancient warships as a steadying weight to compensate for the absence of cargo (Morneau 1986:3). Also ample remains were found of the food supplies which the crew had brought on board for their own use. Bones of ox, sheep, goat and pigs were found in such quantities, that Frost assumes that the crew 'lived like fighting cocks on a high-protein diet'. Also remains of some amphorae which had carried wine were found as well as cannabis sticks, with which the crew are assumed to have made a mild marijuana tea (Morneau 1986:5).

### 5.3.7 The Punic Wars

It is of interest to analyse what happened during the Punic Wars. The first Punic War was fought over the island of Sicily. There the Greeks dominated the eastern side and the Carthaginians the west coast, where they had a number of ports that were of importance for their trade routes. Conflict over the town of Messene broke out when Italian mercenaries, who had seized the city earlier, called in the help of both Rome and Carthage, when the Greek dominated city of Syracuse threatened them. Rome sent a force to deal with the situation, and this brought them into a stand-off with the Carthaginians. This was the start of the First Punic War in 264 BCE (Miles 2010:199).

Rome did not have a fleet at all, and the battle took place mostly in Sicily over the next twenty years. The Carthaginians used war elephants for the first time, to no avail, and the Romans won the battle at Agrigentum in 261 BCE with the help of their superior infantry. As a result of this victory, the Roman Senate decided to build a fleet to drive the Carthaginians out of Sicily (Miles 2010:199). They captured a Carthaginian *quinquereme* that had run aground in the Strait of Messina due to a faulty manoeuvre (see Chapter 10 for additional information about the Strait of Messina) and copied it plank for plank (Lancel 1995:126). Their first maritime endeavour was a disaster, in which they lost 17 ships when they tried to occupy the harbour of the Lipari Islands, but were hemmed in on all sides by the Carthaginian fleet and abandoned ship. The Romans were however not to be deterred and came up with a new strategy. They still had 130 ships and developed the *corvus* or 'crow'. This was a type of boarding bridge of one meter wide and twenty meters long. It was levered up by means of a pulley and used in battle by releasing it so that it would fall on the deck of an enemy ship. There was a heavy pointed spike on the underside of the bridge, which would pierce the deck timber of the enemy ship and effectively join the ships together, after which the Roman marines could use the bridge to board the enemy ship for hand-to-hand combat. By using the new tactic, the Romans could make up for their lack of manoeuvrability, slowness and the inexperience of their crews. The Carthaginians were unaware of this new tactic as they still depended on their traditional tactic of ramming and sinking enemy ships. They were in for a rude awakening and met with a resounding defeat (Miles 2010:200; Lancel 1995:133). The Battle of the Aegades islands in 241 BCE, of which the Marsala Punic warship remains bear silent witness, as well as the general economic exhaustion suffered by Carthage, led to surrender on the part of the Carthaginians.

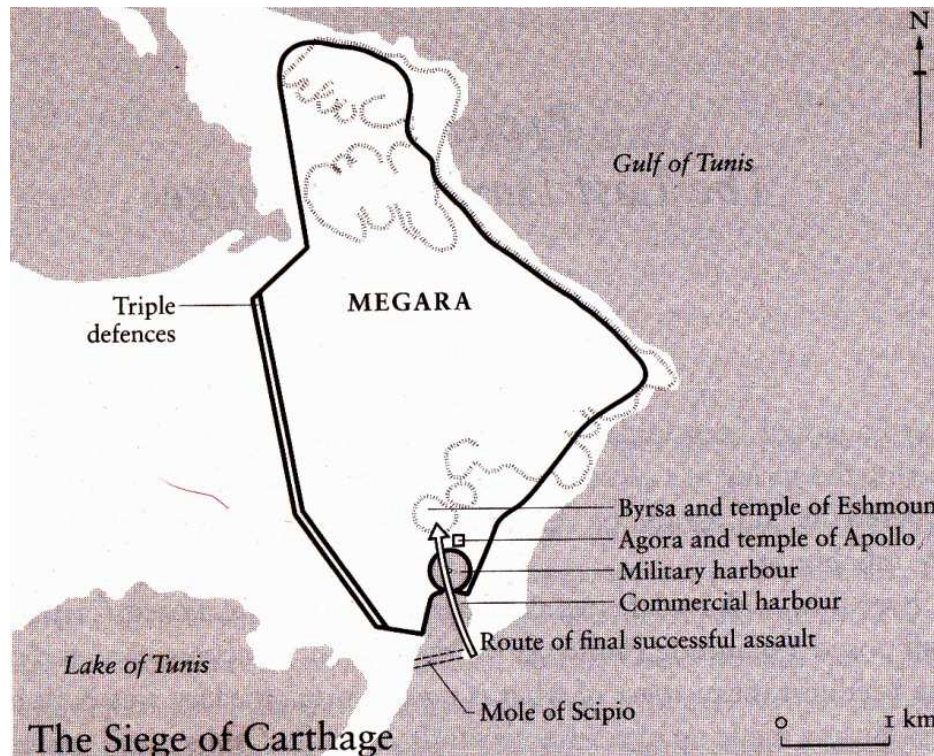
At the end of the First Punic War the Carthaginians did not have any fleet worth mentioning left, had lost Sicily and were forced to pay an enormous indemnity to Rome. As a result of this the Carthaginian general Hamilcar was sent to Spain to capture the silver mines there, in order to pay the indemnity. He achieved this very successfully by reorganising the mining process there, which became very profitable (Miles 2010:202).

The Second Punic War was almost entirely fought on land with Hamilcar's son Hannibal marching his army with its elephants all the way from southern Spain to Rome (Miles 2010:202-203). After his initial victories, he did not capitalize on the fact that the Roman armies had been annihilated, but allowed his own troops to rest and the Romans time to regroup. This led to the defeat of Carthage in 201 BCE. The peace terms were harsh: Carthage was required to pay a war indemnity of 10.000 talents of silver (26.000 kilogrammes) over 50 years and was forbidden to wage any war without permission from Rome (Miles 2010:204). By 150 BCE Carthage had paid off the war indemnities by exploiting the rich silver deposits of Rio Tinto in Spain and had become a rich city once again. They had rebuilt their fleet and had a circular harbour, which could accommodate at least 170 warships (Miles 2010:206). (For more information about the harbour, see under 5.4.7 below).

The Romans, who had been occupied elsewhere during the intervening time, turned their attention to Carthage once more. Upon behest of the senator Cato the Elder, who proclaimed at the end of every speech he made, that '*delenda est Carthago!*' ('Carthage must be destroyed!'), the Romans started a campaign to destroy Carthage. This was partly out of a sense of fear and partly a desire for revenge (the latter especially among the older generation), but probably also because of Carthage's wealth. After rejecting the outrageous Roman demand to leave their city and resettle at least 15 kilometers from the sea, the Carthaginians prepared for war and the Romans laid siege (Miles 2010:206). This lasted three years, at the end of which Rome had totally closed off Carthage from its hinterland, as well as from any contact via the sea. The city, which was totally surrounded by a wall, including a sea-wall along the shore, had one weak point, which was the harbour entrance. The Romans built a mole to close off the entrance of the commercial harbour, and mounted their final attack via the naval harbour, which was connected to the commercial harbour by a narrow entrance (See *Figure 5-8*) (Miles 2011:2). Despite the fact that the Carthaginians had defended themselves heroically, the city fell in 146 BCE and was totally destroyed by fire. The Romans mounted a bloodbath and killed large parts of the population during a six day long killing spree. They sold those who had surrendered themselves (about 50.000



people) as slaves (Miles 2010:206-208). From this time onwards the Romans could indeed call the Mediterranean '*Mare nostrum*', our sea.



**Figure 5-8: Siege of Carthage. The Romans entered Carthage via the Naval harbour. (Miles 2011:2).**

### 5.3.8 Conclusions

When all the above described developments are taken into account, the conclusion can be drawn that over the span of about a millennium, many different warships were designed and built. These designs followed the trends of different fighting and warfare strategies, ranging from transport of troops in open warships to fight on land, to combat with weapons from the upper decks of *biremes*, to ramming enemy ships with *biremes* or *triremes*. Then the strategy changed back again to more emphasis on combat from and on decks, with the possibility to ram other ships and board enemy ships with the use of the 'crow'.

The amount of energy and materials that was devoted to the designing and building of these ships is mind-boggling and is indicative of the fierce competition between a number of powers (Greek, Persian, Phoenician, Punic, Roman) for economic, political and military dominance of the Mediterranean realm. It is probably safe to state that in

that era an intensive naval arms race took place besides the arms race of land based weaponry.

## 5.4 SHIPYARDS

### 5.4.1 Introduction

So far the development of various types of ships has been described and discussed, but it is probably also interesting to find out where the ships were made. There were a number of Phoenician cities where shipbuilding flourished and in this particular section an overview will be given of the main well-known shipbuilding centers. These include Arvad, Byblos, Tyre and Sidon (Casson 1971:94), as well as Memphis in Egypt (Aubet 1993:152) and Carthage (Markoe 2000:70).

### 5.4.2 Arvad

Arvad, also called Arwad, Arados or Aradus, was a Phoenician island emporium of about 40 hectares, located 2.5 kilometers off the Syrian coast opposite present day Tortose. Very little is known of this settlement, as hardly any excavations have taken place there. It was occupied continuously from about the third millennium BCE and had a twin harbour facing east towards the mainland. This consisted of two adjacent bays, the northern and the southern one, which were separated from each other by a natural jetty of about 60 m. in length, which was still augmented by an ashlar stone construction. The entire island was surrounded by a defensive wall and it was densely populated, with people living in multi-storied houses (Markoe 2000:205-206). The city was the most dependable point of anchorage along the entire Syrian coast north of Byblos, and formed the direct point of access to the Eleutheros valley, which was the communication route with the interior (Markoe 2000:22). It is known from the Amarna letters, that Arvad already possessed a naval fleet in the Early Iron Age (Markoe 2000:32). Therefore there must have been a shipyard on the island in order to produce these ships. Wood for the construction of these ships must have been brought from the mainland, which must have been relatively easy as both harbours were facing the mainland and were relatively close to it. Naval vessels from Arvad also were part of the many units that faced the Athenians at the battle of Salamis in 480 BCE (Casson

1071:94; Edey 1973:49-50). Ezekiel 27:8 states that the rowers of Arvad were oarsmen on Tyrian ships. Unfortunately not much more is known.

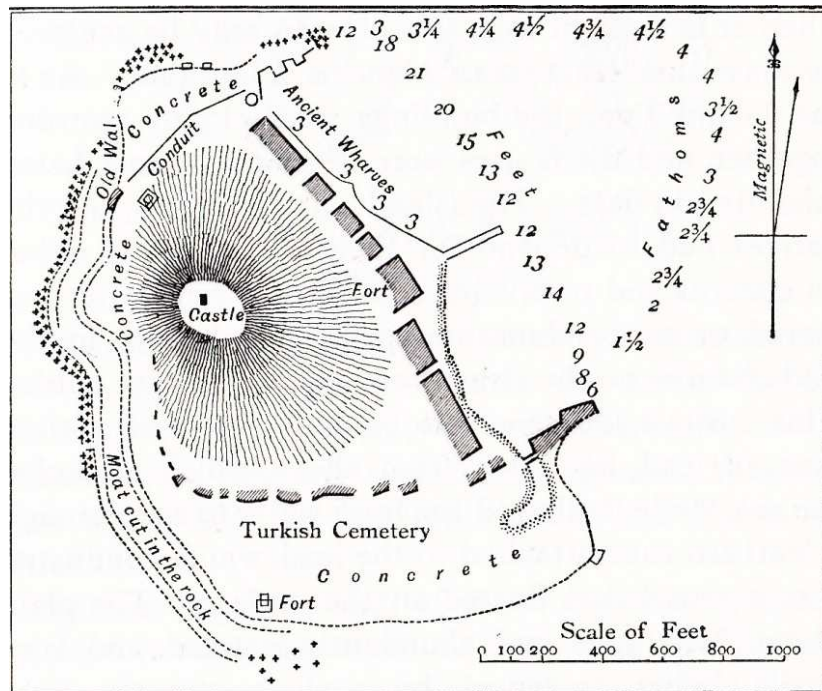


Figure 5-9: The island city of Arvad (Rawlinson 2005:51).

### 5.4.3 Byblos

Despite the fact that Byblos was in all probability one of the oldest harbours along the Levantine coast, as that was where the cedar wood destined for Egypt was despatched from in about 3000 BCE (Aubet 1993:146), very little is known about where a shipyard would have been located there. Markoe (2000:15) mentions that Tuthmosis III not only saw to it that there were ample timber supplies in stock in the Levantine harbours and that these were made ready to be shipped to Egypt on an annual basis, but also that there was on-site construction at Byblos of cedar boats, which were transported overland to the Euphrates. This took place during the Levantine campaigns of Thutmosis III, which were in ca. 1450 BCE and this is mentioned in his accounts. The scale and complexity of this type of state-controlled operations is quite mind-boggling. According to historical and archaeological records, Byblos enjoyed its highest economic prosperity in the early second millennium BCE (more specifically the nineteenth and eighteenth centuries). Together with Ugarit it was the main coastal emporium, which maintained direct trade ties with Egypt, the Aegean and Mesopotamia (Markoe 2000:15; Aubet 1993:18).

Byblos was located on a promontory with a central spring and had two small adjacent harbours. Its main location was on a circular piece of land of about 3 hectares. It already had a massive stone rampart and two gates in the Early Bronze Age and in the beginning of the third millennium BCE two monumental temples were built on the northern sector of the mound, which became a sacred precinct. The temple to Baalat Gubal remained and the foundations of the other L-shaped temple later were converted into the Obelisk temple (Markoe 2000:202). During excavations at the site of this temple seven stone anchors were found in and around the temple, dating to the nineteenth to the sixteenth centuries BCE (Wachsmann 1998:271). There does not however seem to be any information of where a shipyard could have been located in or near Byblos.

#### **5.4.4 Tyre**

Tyre or 'Sor', as it was called in texts of Ebla, was already founded and inhabited in about the middle of the third millennium BCE, according to excavations carried out in 1973-1974 (sounding by Patricia Bikai). The name Tyre is a Greek transcription of its original name 'Sor' and it is now known by its Arab name of 'Sur', meaning 'rock' (Markoe 2000:195).

There are signs that it was either abandoned or destroyed at the end of the Early Bronze Age, which coincides with an interruption of the seaborne traffic with Egypt in the period between 2300 and 1900 BCE. During the Canaanite Middle Bronze Age (2000-1600 BCE) it was not inhabited (Markoe 2000:196). From the Late Bronze Age (1550-1200 BCE) onward Tyre was inhabited again and comprehensive urban development took place in the mid fourteenth century (Markoe 2000:196). It was part of the Mediterranean trading network, linking it together with Ugarit, Byblos, Egypt, Mycenae, Syria-Palestine and Mesopotamia (Aubet 1993:19). Destruction occurred again in the transitional period to the Iron Age (1200-1050 BCE) and recovery was slow due to the blockade of the main ports along the Phoenician coast by the Philistine fleet between the years 1050 and 975 BCE (Aubet 1993:21).

In 969 BCE King Hiram I ascended the throne and from his reign onward the 'golden age' of Tyre started and it became the most important port in the Mediterranean. It originally consisted of two rocky reefs located closely together. According to a survey of the early Iron Age stratigraphy, the island was probably no larger than about 16

hectares. The principal island upon which Tyre was founded was a long narrow reef of about 500 meters length. The location of the second and smaller islet is subject to speculation, but it was probably located immediately north or east of the main island (Markoe 2000:196). Its distance from the coast was about 600-750 meters (Rogerson 1985:75).

Hiram had the eastern part of the settlement levelled with artificial embankments, and linked the main city with the adjacent islet by means of a causeway (Markoe 2000:196). Both archaeological as well as ancient sources agree that Iron Age Tyre was a densely populated city with multi-storied buildings defining its skyline. It occupied a strategic position, at a safe distance from the coast and with reefs to the north and the south, which protected it against winds and tides, as well as against possible attack from the sea (Aubet 1993:27). It was indeed an island 'surrounded by the sea' as is stated in Ezekiel 27:32 (See *Figure 5-10*).



**Figure 5-10: Phoenician City of Tyre (Gore 2004:39).**

The commercial and industrial district was located in the north-east of the island close to the harbour. Hiram had also established the mighty shipyards there (Aubet 1993:36). In order to build ships, logs had to be towed from the mainland to the harbour of Tyre. Once brought ashore, they had to be cut into wood for the keel of the ship, ribs, planks and all other wooden parts. This must have been where the ships of Tarshish were designed and built, besides an array of other ships and smaller boats such as *hippoi*.

Besides a shipyard where new ships were being built, there also was a breakers yard on Tyre, where old ships were broken down according to the classic writer Diodorus (17:46,1) as quoted by Aubet (Aubet 1993:152).

#### 5.4.5 Sidon

Sidon was already occupied in the Early Bronze Age and unlike Tyre, was located on the mainland (Markoe 2000:200). It had an oval tell, which consisted of two distinct sections: a low, flat area to the east and an elevated coastal region to the west. This latter part most likely was the site of the city's upper district, where the houses of the elite were located as well as the administrative facilities. To the south of this there was a southern circular cove. This cove was unsuitable to be used as a harbour facility, as it was too shallow, but was used instead as the offloading area for *Murex*. An accumulation of 40 meters of discarded *Murex* shells indicates that this was the place of a large purple-dye installation. Sidon is known to have had a port facility which consisted of a closed, artificially constructed inner basin and an adjoining open harbour to the north of the city, which was sheltered from the prevailing winds by a rocky offshore island and a north-easterly chain of islets and reefs (Markoe 2000:69, 200). The artificial northern port had stone built towers and bastions which had been erected on or were placed adjacent to moles and the harbour entrance (Markoe 2000:83).

As the southern cove was too shallow for ships of larger dimensions, the shipyards must of necessity have been located near the northern harbour so as to launch the newly built ships into sufficiently deep water. It was here that the *Triremes* were developed and built from about 670 BCE onwards and this continued till at least 480 BCE, the year in which the battle of Salamis took place (Edey 1974:50; Markoe 2000:52). Under the Persian hegemony, in the period of the Achaemenids, which was the early fifth century BCE, Sidon was pre-eminent among the Phoenician city-states. The main reason for this was the Sidonian superiority in naval strength (Markoe 2000:51-52) The oarsmen from Sidon must have been very capable, as they are referred to in Ezekiel 27:8 as being hired by Tyre to be oarsmen on their ships. This should not come as a surprise, as rowing the *Triremes* must have required precision rowing to make sure all the oars on all three levels would move at exactly the same time so as to not clash with each other. There does not seem to be any information of shipbuilding activities on a large scale in Sidon after the defeat at Salamis.

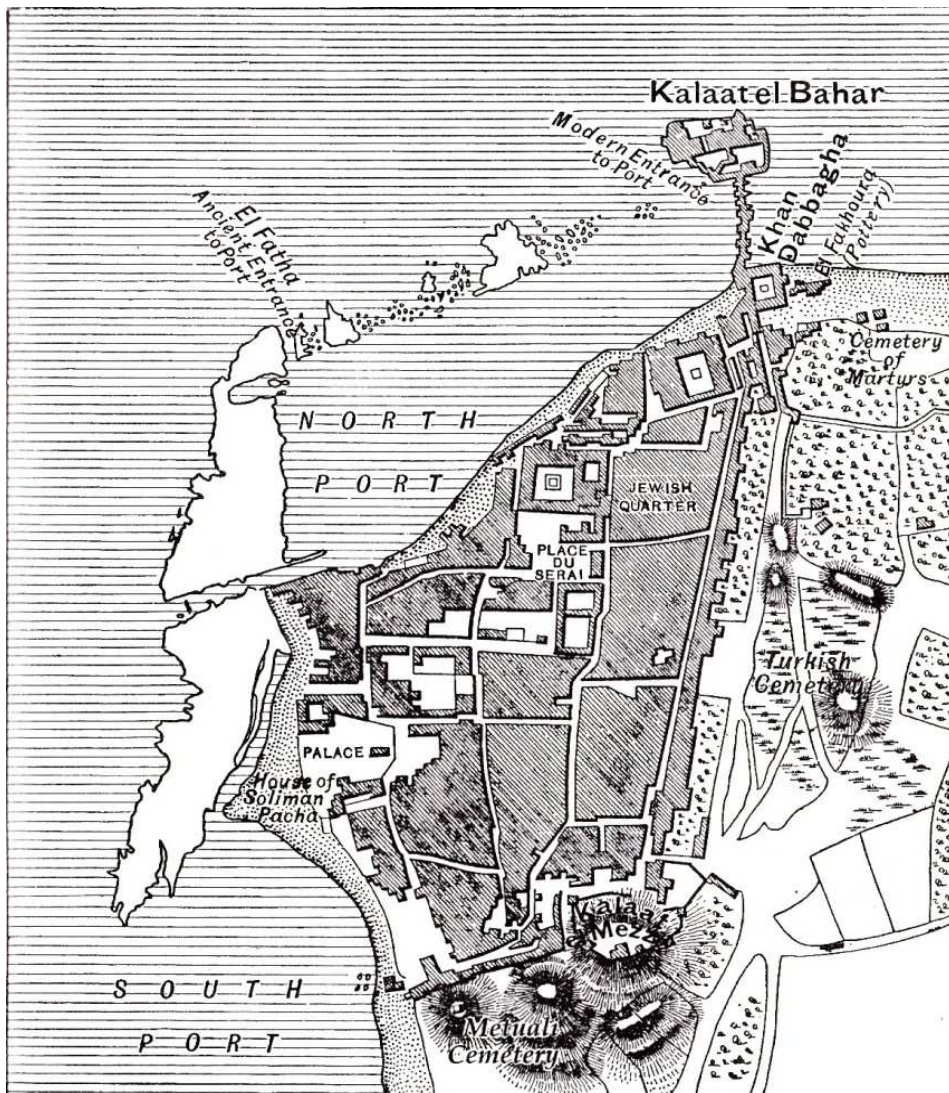


Figure 5-11: Ports of Sidon (Rawlinson 2005:47).

#### 5.4.6 Memphis (Egypt)

One of the not so likely places where the Phoenicians had a shipyard was Memphis in Egypt. Memphis had become an administrative capital in the lower Nile Delta in the early fourteenth century BCE under Amenhotep III (1391-1353 BCE), and this was an excellent location for Mediterranean trade. One of the most important commodities traded was timber from Phoenicia, not just cedar, but also fir, pine, oak and juniper. These all grew along the Lebanon range from Sidon north to Tripoli and beyond (Markoe 2000:18-19). Under Ramses II (1290-1224 BCE) there was an active presence of Levantine merchants in Egypt, especially at Memphis with its extensive dockyards and shipbuilding facilities. There were shrines to Baal and Astarte in existence there already at that time, which suggests that there was a Phoenician

enclave there. This could imply that the ships that were built under Ramses III (1186-1154 BCE) to defeat the Sea Peoples may have been built by or with assistance from Phoenician shipbuilders.

From an Egyptian document dating to 613 BCE, issued under Psammetichus II (664-610 BCE), it becomes clear that the Tyrians had established a commercial enclave in Memphis (Markoe 2000:46-47).

There definitely was a Phoenician enclave in Memphis in the fifth century BCE, as observed by Herodotus (Markoe 2000:20), who visited this so-called 'Camp of the Tyrians' himself. As has been made clear in the above, it had already been the site of naval dockyards and Phoenician trade in the Nile delta for a long time (Markoe 2000:51). Aubet (1993:152) also confirms that there were shipyards at Memphis.

#### **5.4.7 Carthage**

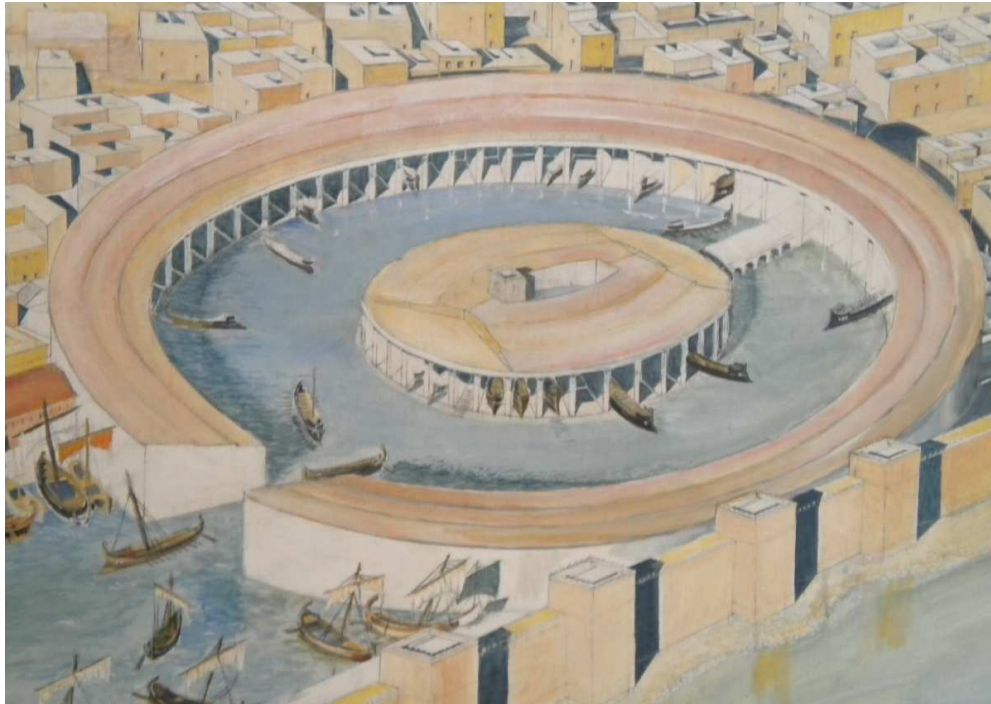
Carthage had a circular naval port, a 'cothon', dug specifically for this purpose, which was separated from the merchant port by means of a narrow channel. This could be closed off with strong chains stretched across it, if this was necessary in time of danger. The naval harbour was equipped with a central islet on which the admiralty was located according to the classic author Appian (Markoe 2000:70). From this admiralty-building instructions were sent to ships by means of trumpet signals or mirrors reflecting the rays of the sun over long distances (Mazel 1971:157). It was surrounded in Antiquity by a series of dry-docks and ship-sheds, which could accommodate two hundred and twenty warships together with their furnishings and tackle (Markoe 2000:70). Of these, 30 docks were located on the admiralty islet, and another 135-140 docks were located on the perimeter. This would be a total of about 170 docks to house ships. It is not known where the remaining 50 ships, as mentioned by the classic writer Appian, were housed (See *Figure 5-12* and *Figure 5-13*) (Lancel 1997:177-178). A similar facility existed in Piraeus for the Athenian warships. In boathouses (*neosoikoi*) galleys with their wooden gear were kept under cover and sails and rigging were stowed away in sheds (*skeuothekai*) (Casson 1971:363; Phoca & Valavanis 1999:61).





**Figure 5-12: Panoramic view of Carthage, reconstruction painting from the Musée National Carthage. The merchant harbour can be seen at the bottom left hand side connected to the circular naval harbour by a narrow entrance (Miles 2011: opposite page 174).**

The shipyards in Carthage were capable of building very large ships in a very short time (Mazel 1971:157). As has already been stated in the above, a unique feature of their shipbuilding was that they used standard designs, consisting of standard size parts, which were marked with Phoenician letters, and which could be put together at short notice (Frost 1982:49) and (<http://www2.rqzm.de/navis/Musea/Marsala/MuseoMarsalaEnglish.htm>).



**Figure 5-13: Detail of naval harbour in Carthage (Image part of private collection N. Smith).**

Slaves, especially prisoners-of-war, were put to work as labourers in the naval shipyards (Markoe 2000:91). Timber for the construction of ships, such as oak, pine and juniper, was available near Carthage both at Utica and Cap Bon (Markou 2000:104).



**Figure 5-14: The naval harbour of Carthage seen from the Admiralty island 2011 (Private collection N. Smith).**

## CHAPTER 6

### UTILITY VESSELS OR 'HIPPOI'

#### 6.1 INTRODUCTION

Besides merchant ships and warships the Phoenicians also had smaller vessels. In the earlier mentioned account of Wen-Amon (See 4.1.2), dating to the first half of the eleventh century BCE, King Zakarbaal not only boasted about the *mnš* cargo ships, but also stated that he had fifty coastal vessels (*br*) anchored in the port of Sidon (Aubet 1993:92). In this case as well, King Zakarbaal was linked in a *hubūr* with one *Wrktr*, or *Urkatel*, a resident of Tanis. This man was not a monarch, but probably was a powerful merchant very close to the royal house of Byblos, who was allowed to operate this fleet of coastal vessels (Aubet 1993:92-93). We unfortunately do not know what these '*br*' vessels looked like, but it is possible that these are the same as the '*hippoi*', (Singular: *hippos*), which is the Greek name for the coastal vessels that the Phoenicians used and the name by which they are called in the available sources.

#### 6.2 WHAT DID 'HIPPOI' LOOK LIKE?

So the small vessels that the Phoenicians used were called '*hippoi*', meaning 'horses' in Greek, as they were decorated with a horse head on the top end of their stem-posts (King & Stager 2001:179). These vessels were true work horses and were used for many different purposes. In this chapter an overview will be given of the many tasks these versatile boats were used for.

From the available images we can observe that these were typical Phoenician boats, and that they had been developed for specific purposes. They were sturdy boats with both a high stem- and stern-post. Some of them had a small mast, but most of them did without. They were propelled by oars and did not have sails. Some authors, e.g. Harden (1962:308) state that they were paddled, but the way the crew is portrayed, it is much more likely that the crew were rowing the boats. For paddling a forward movement is used, with one hand on the stem of the paddle and one hand on the top end of it, whereas for rowing a backward movement is necessary with both hands side by side holding the stem of the oar. This is what is visible on the images, especially on

the one where the boats are transporting wood (see description below). By this time the oar-lock was already in existence (Wachsmann 1998:130), and for work purposes it would have been much easier to have the oars attached to oar-locks, as they would not float away so easily when not in use. Paddles would have to be stored on board, while loading was in progress, and would have been in the way.

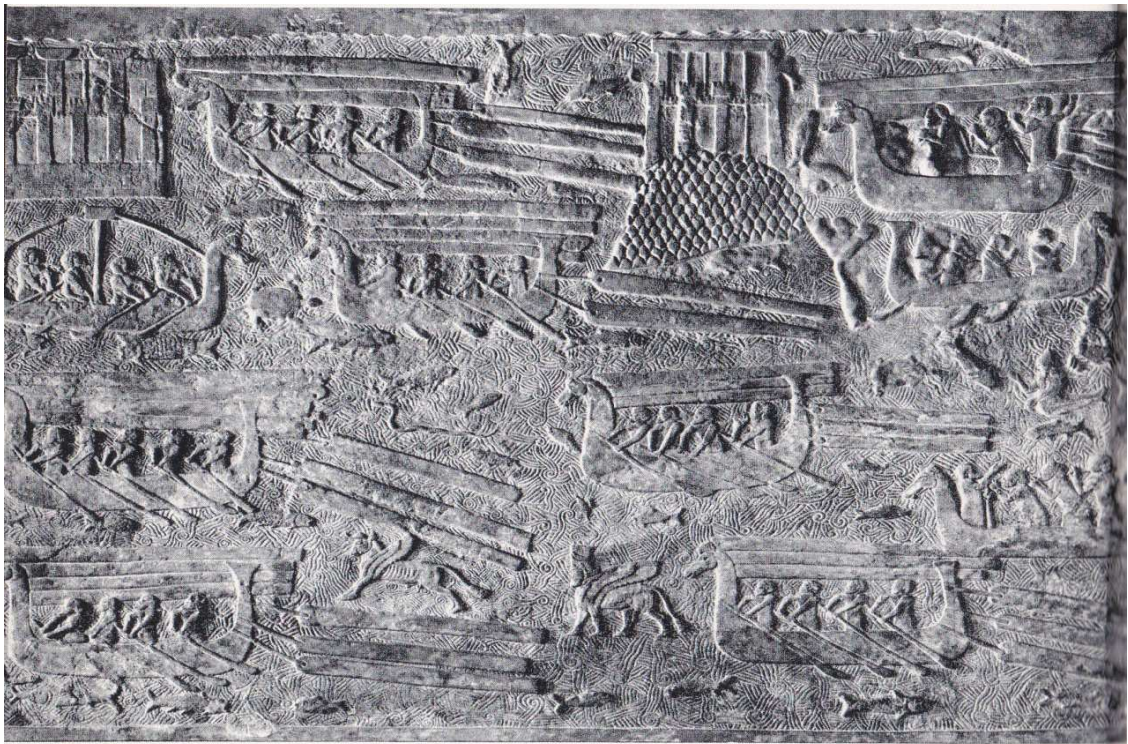
The first available image originates from the bronze bands on the gate of Balawat, which was a city located near Nimrud. These gates were erected by Shalmaneser III (859-824 BCE), king of Assyria, and the scene depicts tribute being transported from Tyre to the mainland by means of small boats. Once ashore, a long line of bearers carry the items of tribute, accompanied by Assyrian guards (Harden 1962:274, 308; King & Stager 2001:168) (See *Figure 6-1*).



**Figure 6-1: Bronze Bands from the gates of Balawat. The top bar shows tribute being transported in ‘Hippii’ from the rocky island of Tyre to the mainland. Stevedores wade into the sea and pull the boats to the shore with ropes. There porters carry the goods, as can be seen on the lower bar, with those at the back carrying oxhide shaped metal ingots on their shoulders, and others in front of them inverted bronze vats (King & Stager 2001:168).**

The second image originates from a wall relief in gypsum from the palace of Sargon (722-705 BCE) at Khorsabad, Iraq. It shows ‘hippoi’ transporting logs of timber both on board as well as towing (Harden 1962:274-275, 308) (See *Figure 6-2*). The high stern-

posts were imminently suitable for the towing purpose they were used for. Both the high stem- and stern-posts on these boats were probably also very useful for the workers to hold on to if necessary, while they were loading the boats and standing up in them. Moreover it is very well possible that the design of these smaller vessels is what was incorporated in the larger Phoenician merchant ships. It is worth keeping in mind, that it is much easier to build small ships than large ships. Therefore it is very likely that the *'hippoi'* were already in use long before these images were made, and that these vessels were what influenced the design of the later larger ships.



**Figure 6-2: Wall relief from the palace of Sargon II at Khorsabad showing *'hippoi'* transporting logs. Some of the boats had a small mast, but most of them did not. All have a horse-headed stem-post and a straight stern-post, which becomes broader towards the top. The rowers have both hands side by side on the stem of the oars, which is how rowers handle their oars. Some boats are towing wooden logs, while others also have logs on board. The city on the rock in the top of the image is supposedly Tyre (Harden 1962:274).**

It is interesting to note that the *'hippoi'* depicted on the friezes of the bronze gates of Balawat only had two oarsmen, whereas the vessels displayed on the wall reliefs of Khorsabad, had four rowers each (King & Stager 2001:168), and seem to have been larger.

## 6.3 PURPOSES FOR WHICH 'HIPPOI' WERE USED

### 6.3.1 Transport of Wood

As was already discussed in the above, the wall relief from Khorsabad shows clearly that wood was being transported by means of '*hippoi*'. The practice however, probably predates the images. Byblos as the oldest city along the Levantine coast already produced cedar wood in 3000 BCE. Due to the fact that the large bay at the bottom of the El Chiny valley had very little shelter from the prevailing south westerly winds, the merchant ships that were large enough to transport wooden logs, could not have been hauled up on the beach (Frost 1999:25). They had to be anchored at a safe distance from the beach and the cargo had to be brought out to them. So this was the task of the '*hippoi*'. The same applied to Tyre when it was in its heyday, because it was located on an island, and the wood had to be transported there to be loaded on the ships in its harbours. It also applied to Arwad, which was also located on an island reef (Frost 1999:24). So the transport of wood, both loaded on the '*hippoi*', as well as towed behind them, was one of the major tasks for these vessels, and they were imminently suited to this work. Besides wood being towed for loading onto ships, the '*hippoi*' also towed wood to Tyre itself, which was used to build ships at the shipyards that were located on the island (Aubet 1993:148).

### 6.3.2 Transport to and from Tyre

By the time Tyre was established on the two adjacent reefs running parallel to the shore, there was much to be transported from the mainland to the island. There was no water on the island, and being two rocky reefs, there was no vegetation, no trees and it was impossible to grow food there. Therefore all water, food and fuel had to be brought to Tyre from the mainland (Aubet 1993:30).

There the town of Ushu with the cisterns and aqueducts of Ras el-Ain, was the primary source of drinking water for Tyre until in the Early Iron Age, when lime-plastered, water-proofed cisterns made it possible to collect rain water on the island itself and store it for a length of time (Markoe 2000:197; Jedidian 1969:164, 235) (See *Figure 6-3*). Even so, water was probably still transported to the island, when there was little or no rain.

As the images on the gates of Balawat show, goods were also transported ashore, in this case tribute for the Assyrians, but over the centuries an array of goods must have traversed the water between the island and the shore. And people must also have been transported across the stretch of water that separated the island from the mainland.

The island of Arvad was in a similar situation, that it needed agricultural produce and raw materials transported from the mainland. Unfortunately very little is known about this island, as it remains almost completely unexcavated (Markoe 2000:205-206). The only difference with Tyre was that it had a fresh water supply that consisted of water sources under the sea. The inhabitants managed to channel this water to the island by building bronze bells, suspended under water on leather straps. The question arises how these bells were suspended in the water, and the likelihood is great that ships were used for this purpose. The bells had been waterproofed with bitumen and captured the fresh water, so that it could be used on the island (Mazel 1971:73-74).



**Figure 6-3: Plastered cisterns to store water at Tyre (Jedidian 1969:235, image 131).**

### **6.3.3 Transport along the canal in Tyre**

Tyre had two harbours, the northern or Sidonian harbour and the southern or Egyptian harbour. These were connected by a canal (Markoe 2000:198). As Tyre was a very densely populated and densely built up city with narrow alleys, transport between the two harbours of goods and people, most likely was by means of '*hippoi*' along the canal.

### **6.3.4 Fishing of various kinds of fish**

Fishing of Blue Fin Tuna was also done with '*hippoi*' in the Mediterranean as well as in the Atlantic beyond Gibraltar. The Phoenicians controlled all the narrow straits in the Mediterranean, which were the passages where the Blue Fin Tuna passed through, and thus it was easy to catch these fish, salt and transport them and offer them for sale as far away as Jerusalem (See Nehemiah 13:16) (Kurlansky 2003:46). In the Atlantic coastal waters off southern Spain and Morocco also Mackerel and Sardines were caught besides Tuna, and numerous industrial establishments existed there for the salting and processing of blue fish. Punic commercial amphorae were found at Greek Corinth dating to the fifth century BCE containing filleted fish exported from the Spanish or Moroccan coast near the Strait of Gibraltar (Markoe 2000:104).

### **6.3.5 Fishing of Murex**

These boats were also the most likely vessels to have been used for the fishing of *Murex* shells, which were fished by means of baskets with bait. The molluscs were used to obtain the dye to make the purple cloth for which the Phoenicians were so famous. Ample remains of *Murex* shells have not only been found in various places along the Phoenician coast, e.g. Tyre, Sidon, Acco, Dor, Ashdod and Sarepta (King & Stager 2001:161), but also on the island in the Bay of Mogador, on the Atlantic coast present day Morocco (Mazel 1971: 209). The production of purple dye will be discussed more in detail in chapter 8.



### 6.3.6 Communication vessels between naval ships

Another task of the '*hippoi*' was to serve as communication vessels between the naval ships in time of battle and to retrieve crew from ships that had been damaged to such an extent that they no longer could take part in the battle or to tow damaged ships away (Bartoloni 2001:166). The image of the Flight of King Luli of Tyre, which shows *Biremes* equipped with a pointed ram in which people are transported, also shows smaller vessels, also with double rows of oars, but without the ram, and these are referred to as 'transports' by Casson (Casson 1971: image 76 in picture appendix). It is very well possible that the *hippoi* serving as communication vessels and the 'transports' are one and the same (See Figure 6-4).

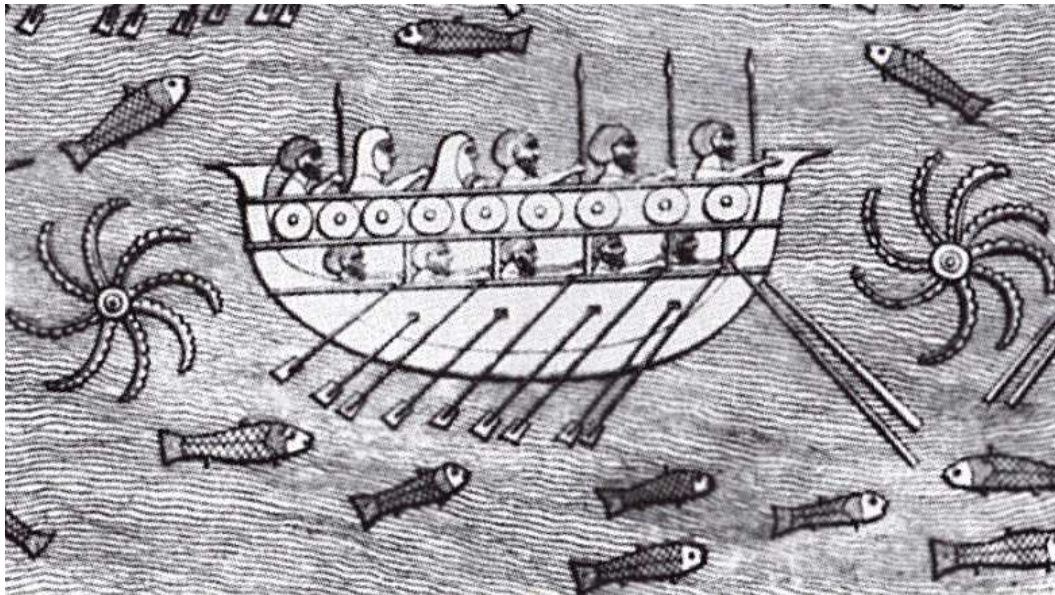


Figure 6-4: Transport ship, detail from the relief depicting the flight of King Luli of Tyre (Casson 1971: picture appendix, image 76).

### 6.3.7 Ship's boat

According to Casson (1971:248-249) sailing ships and warships had at least one ship's boat, which was towed astern. The likelihood is great that this was a '*hippoi*' type vessel. Bartoloni also confirms the presence of smaller vessels with the larger merchant ships (Bartoloni 2001:84). The ship's boat was useful to go ashore when exploring an unknown shore, while the merchant ship remained in deeper water. The Phoenicians would make use of the following trade practice when they landed on a new and unknown shore, especially on the North-west coast of Africa: if the inhabitants

would flee away from them, they would pile a number of goods on the beach. Then they would retreat to their ship(s), and remain offshore to spend the night. (They must have used a ship's boat to get to the beach if they were to retreat to their ships). The next day they would return to see if the inhabitants of that place had placed other articles of trade next to theirs. If these were of sufficient value, the Phoenicians would take those with them, but if they were not, they would return to their ship(s) without touching anything. They would then go back after yet another night to see if any other goods had been added by their invisible trading partners. This trade could continue for several days, until goods of sufficient value in this 'mute' barter trade had been accumulated on the beach for both parties to be satisfied. Only then would they load them into their ships before departing. The risk of course was to leave the first amount of goods on the beach in the hope that the inhabitants of that particular place would be interested in trade and would not disappear with the goods without putting anything of counter value in its place (Mazel 1971:61; Miles 2010:86).<sup>15</sup>

### **6.3.8 Transit of the articles brought from Ophir**

The site of the point of departure of the Ophir fleet has long been the subject of debate and confusion, but the conviction is more and more taking hold, that the island of Jezirat Fara'un, which is located in the Red Sea a few miles south of Eilath, was the site of Ezion Geber<sup>16</sup>.

This island fits the Phoenician requirements for a harbour perfectly: a small easily defensible island, close to the coast with a sheltered anchorage and a small enclosed harbour with a narrow entrance. Just after the Six Day War in 1967, the underwater archaeologists Elisha Linder and Alexander Flinder with some others went to have a look at the island (Flinder 1985:42-82). They investigated it thoroughly both under water as well as on shore. They discovered that the anchorage between the island and the shore was very sheltered, whereas the sea on the other side of the island was quite rough. A collapsed mound of masonry near the harbour entrance may have been

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<sup>15</sup> And even if they did do business face to face, they would communicate with each other without speaking in the presence of their trading partners. This skill was acquired from a very young age. They would communicate with the batting of an eye-lid, a small nod with the head, a change in the position of the hand, or a certain way of remaining silent. It was a code that was learned early in life, only initiates would understand it, and it served them well in their business dealings with outsiders (Mazel 1971:62).

<sup>16</sup> This was also confirmed by Dr. Uzi Avner at the Thirtieth International Aram conference, held at Oxford, UK in July 2011.

the remains of a free-standing 'Dolphin', which was a characteristic of the Phoenician harbours. This was a small tower, usually of stone or concrete, placed near the entrance of a harbour, which was situated there to enable the crew to man-handle a ship into the entrance of the harbour under difficult sea conditions (Flinder 1985:56).

Shortly before they were about to leave, Flinder discovered the following: the remains of a quay of about twenty feet wide and about forty-five feet long protruding from the mainland directly opposite the harbour on the island (See *Figure 6-5*) (Flinder 1985:57). This is indicative of the transfer of goods between the island and the mainland. The cargo which had been brought from Ophir, had been unloaded from the ships of Tarshish in the harbour of Jezirat Fara'un, and was brought by means of '*hippoi*' to the mainland, where these goods were to be loaded on camels for the onward voyage to Jerusalem and Tyre (Flinder 1985:58). The ships to sail to Ophir had been built at Ezion Geber near Elath on the shore of the Red Sea (according to 1 Kings 9:26) and the *hippoi* to ferry the goods ashore, most probably as well.



**Figure 6-5: In the foreground remains of a quay on the mainland opposite the island of Jezirat Fara'un, which was very likely the harbour for the Ophir fleet (Flinder 1985:68).**

### **6.3.9 Transport of the deceased to the necropolis of Tyre and Arwad**

Both islands of Tyre and Arwad did not have much space to bury their dead on the respective islands, but this was done on the mainland opposite them in a necropolis. The necropolis of Arwad must have been located in the vicinity of Tortose (Markoe 2000:206.) As for Tyre there was more than one necropolis, one of which was located at Kabr-Hiram and the other at present day Bass (Jedidian 1969:6, 9). This practice of burying the dead on the mainland must of necessity have required transport of the deceased. The most likely means of this type of transport were *'hippoi'*.

### **6.3.10 Use of *'hippoi'* during the siege of Tyre by Alexander the Great**

As was already mentioned in chapter 4, (4.1.4), the inhabitants of Tyre jumped into small boats to assist in the battle against the builders of the mole, which was being built on the orders of Alexander the Great. After a horse transport ship had been run onto the mole with flammable materials to set fire to the siege engines that had been erected on the mole, *'hippoi'* were used by all those who were able, to be involved in the fight (Jedidian 1969:73).

## **6.4 CONCLUSION**

In this chapter a number of known and possible uses for *'hippoi'* are mentioned. This enumeration is by no means exhaustive. *'Hippoi'* were used for countless different purposes, as is the case with small boats owned by people who live close to or on the water. These versatile Phoenician boats were used for centuries and similar boats are still in use even today in the Mediterranean basin. The fishing boats still presently in use on Malta are thought to be directly descendent from the *'hippoi'*, and have retained the elevated prow (Aubet 1993:143 and Van Kampen & van der Hoff 1999: 208) (See *Figure 6-6*).



**Figure 6-6: The Fishing boats in St. Paul's Bay on Malta are believed to have descended from the Phoenician '*hippoi*' (van Kampen & van der Hoff 1999:208).**

## CHAPTER 7

### THE 'SHIP TYRE' AS DESCRIBED IN EZEKIEL 27

#### 7.1 INTRODUCTION

So far only images and archaeological remains of Phoenician ships have been taken into consideration for the analysis of the various types of ships that used to exist. Besides those, however, also a description of a Phoenician ship with the materials used for its constituent parts is found in Ezekiel chapter 27. In this chapter of the dissertation this description will be analysed from the perspective of whether the materials mentioned could indeed have been the authentic ones for the purpose they were used for. In other words, is Ezekiel's description only an allegoric one, and did he just mention whatever sort of material that would come to mind, or did he describe a real Tyrian ship and are the materials mentioned indeed those that would have been used? How accurate or not is Ezekiel's description? These research questions will form the focus of this chapter.

#### 7.2 THE PROPHET EZEKIEL

In order to understand the context in which the prophecy in Ezekiel 27 was uttered, it is useful to first give an overview of who the prophet Ezekiel was and in which time he prophesied and for what reason. Ezekiel is believed to have been among the first group of exiles, who were taken to Babylon by Nebuchadnezzar in 597 BCE. He settled in Tel Abib, along the river Kebar in Chaldea, where he lived with his wife. As a result of a failed effort by the remainder of the kingdom of Judah under the vassal king Zedekiah to rebel against Babylonia, with the assistance of Egypt, Phoenicia, Ammon and Moab, Nebuchadnezzar returned to Jerusalem and destroyed the city by fire. In the context of these enormous upheavals Ezekiel was called upon by God to prophesy about God's greatness and against a number of nations. It is interesting to note that his prophecies against the nations are against those nations that had lured Judah into the rebellion against Babylonia, namely Egypt, Ammon, Moab and Phoenicia, and more specifically against Tyre as the most powerful of the Phoenician city states. As

the destruction of Jerusalem took place in 586 BCE, Ezekiel's prophecy against Tyre must be dated after this event (De Groot 1977:7-9).

### 7.3 THE LAMENT FOR TYRE IN EZEKIEL 27

The verses 1 – 9 of Ezekiel 27 describe Tyre in terms of a ship. These verses will be analysed further below. As for the remaining verses of the chapter, these refer to the following:

The verses 10 - 11 mention the foreigners who served to defend Tyre.

The verses 12 – 24 give an overview of the many nations that Tyre traded with, as well as the articles that were procured from each destination.

In the verses 25 – 36 God's destruction of the ship Tyre is described as well as the shocked and horrified reaction of Tyre's trading partners.

For the purpose of this dissertation, no further attention will be given to the verses 10-11 and 25-36 of Ezekiel chapter 27. The verses 12-24 however, have been the subject of a detailed study by Diakonoff (1992:168-193). In his article, 'The Naval Power and Trade of Tyre' he gives a detailed description and analysis of the many nations that Tyre traded with as well as the goods traded, and he proves this description to be not only detailed but also accurate. The only point where he is not totally sure is in vs. 23, regarding Canneh and Eden, although he tentatively accepts Eden to be Aden and the possibility that Canneh is *Qn'*, a port on the Indian Ocean in South Arabia (Diakonoff 1992:191). Bahn [ed.] (2000:88) provides further interesting information in this regard. On the map for Southern Arabia in ancient times, a harbour, Qana is shown, further along the coast from Aden. It was close to the area where Myrrh and Frankincense were obtained, which was resin, tapped from small thorn trees. These aromatics were highly valued throughout the ancient world. Both Aden and Qana were part of trade routes by sea as well as overland by camel caravan (Bahn [ed.] 2000:88-89). Inland from Aden and Qana was the territory over which the queen of Sheba reigned, who came to pay a visit to King Solomon (I Kings 10:1-13).

If one considers it unlikely that Tyre would be in trade contact that far away in the sixth century BCE, the time in which Ezekiel prophesied, and which Diakonoff (1992:192) considers to be the time to which Ezekiel 27 refers, then maybe it is useful to consider

the following: According to Prof. Meir Bar-Ilan, of Bar-Ilan University,<sup>17</sup> Ophir, the destination of Solomon and Hiram's trade in the tenth century BCE, is located in India. He provided interesting and compelling reasons for this assertion. His reasoning was as follows: Ophir is a place called Sophir or Souphir in India. This place name is mentioned both in the Septuagint as well as in Josephus. The omission of the letter S has a parallel in the name Sindh, the name for India that the inhabitants used for their country.<sup>18</sup>

The wood that was obtained by the expedition to Ophir in the time of Solomon and Hiram of Tyre, is called *Almug* or *Algum* wood in the biblical text. This is Red Sandalwood, which comes from India, where it is called *Valgu*, or *Valgum* in the Tamil language. Apes are mentioned as well, which Prof. Bar-Ilan thinks is a wrong translation, because apes are the large monkey species which are only found in Africa, and cannot be kept as pets. What were brought from India are monkeys, which would make a better pet to give to the king to keep in his palace. In the Hebrew text they are called *Qophi(m)*, deriving from the word 'Kapi', which means 'monkey' in Sanskrit. Then the word used in the biblical text for peacocks is *Tuki(m)*. In modern Hebrew this word means 'parrots', which is wrong, because it should mean peacocks and is derived from the Tamil word 'Tokei'. The translation 'parrots' has caused much confusion about the location of Ophir, because parrots are found in Africa. The land and river Havila refers to the Indus river and valley, and the name Havila was already mentioned by Eusebius. Other goods that were brought from Ophir were gold, silver, ivory and precious stones, which are all commodities that were to be found in India at that time. The expedition to Ophir is described in I Kings 9:26-28, I Kings 10:11-12 and 22.

When asked at the end of his presentation if he thought that the queen of Sheba came to Solomon to discuss the competition that the Ophir fleet presented to her camel caravans, (as stated in his Master's dissertation by Van Dijk 2006:13), Prof. Bar-Ilan gave an interesting response. According to him the fleet only transported the heavy commodities, such as gold, silver, precious stones, and *Algum* wood. The light-weight commodities, such as spices and incense were still being transported by the camel caravans.

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<sup>17</sup> In a paper presented at the ARAM conference, in Oxford, UK, July 2011, to be published in Feb. 2013.

<sup>18</sup> The name 'Sindh' is still in use for a region in present day Pakistan near the lower end of the river Indus according to a map published by National Geographic Magazine with their Dec. 2001 issue.



Whether the ships that went there, sailed over open water from Qana as the map that he provided indicated, is not sure. The ships could have also followed the coast of Southern Arabia and then have only traversed open water at the mouth of the Persian Gulf to reach India. The wind direction indicated on the map for the monsoon wind would make a coastal route more likely. Moreover there is a current flowing in easterly direction along the coast from May to November, called the Oman Coastal Current (Warne 2012:75). The research by Prof. Bar-Ilan mentioned above, does indicate that the ships of Hiram and Solomon did travel that far in the tenth century BCE, so it is not unlikely at all that Tyre should be in trade contact with the harbours along the coast of Southern Arabia in the sixth century BCE. Diakonoff (1992:192) is convinced that the information about the trading partners of Tyre as provided by Ezekiel 27 is correct for the beginning of the sixth century BCE. The question that arises is: does the same apply to the details of the description of the 'Ship Tyre' in Ezekiel 27: 1-9?

#### 7.4 ANALYSIS OF THE DETAILS OF THE SHIP TYRE IN EZEKIEL 27

For the purpose of an analysis of the details of the 'Ship Tyre', the first nine verses of Ezekiel 27 are quoted here in their entirety from the NIV version of the Bible:

1. *The word of the LORD came to me:*
2. *"Son of man, take up a lament concerning Tyre.*
3. *Say to Tyre, situated at the gateway to the sea, merchant of peoples on many coasts, 'This is what the Sovereign LORD says: "'You say, O Tyre, "I am perfect in beauty."*
4. *Your domain was on the high seas; your builders brought your beauty to perfection.*
5. *They made all your timbers of pine trees from Senir; they took a cedar from Lebanon to make a mast for you.*
6. *Of oaks of Bashan they made your oars; of cypress wood from the coasts of Cyprus, they made your deck, inlaid with ivory.*
7. *Fine embroidered linen from Egypt was your sail and served as your banner; your awnings were of blue and purple from the coasts of Elishah.*
8. *Men of Sidon and Arvad were your oarsmen; your skilled men, O Tyre, were aboard as your seamen.*

9. *Veteran craftsmen of Gebal were on board as shipwrights to caulk your seams. All the ships of the sea and their sailors came alongside to trade for your wares.*”

These verses will be analysed more in detail under separate headings:

#### **7.4.1 Verse 1 and 2**

1. *The word of the LORD came to me:*

2. *“Son of man, take up a lament concerning Tyre.*

In these verses we see how the LORD speaks to Ezekiel and commands him to prophesy a lament about Tyre. These verses are just the introduction to what is to follow. And a lament of course, does not augur well for Tyre.

#### **7.4.2 Verse 3**

3. *Say to Tyre, situated at the gateway to the sea, merchant of peoples on many coasts, ‘This is what the Sovereign LORD says: “You say, O Tyre, “I am perfect in beauty.”*

In this verse two important characteristics about Tyre are stated. The first one is that it is situated at the gateway to the sea, which is an indication of the monopolistic position it found itself in. A gateway can be closed, controlled, and is a means of including or excluding, as well as a place where taxes can be levied. In short, it is a symbol of power.

The second characteristic is that Tyre is the merchant of peoples on many coasts. That also is an indication of a certain power. Tyre is the link between many peoples and the goods that they produce, to transport these goods to wherever they are needed. Tyre has the linchpin position in these interactions. They have the ships to transport the goods.

In the second half of verse 3 a direct attack is uttered against the absolute sense of perfect beauty displayed by Tyre. There is such an overinflated sense of self. This will stand in stark contrast with what is to follow later in the verses 25-36, when the total and utter destruction of Tyre is predicted.

#### 7.4.3 Verse 4

4. *Your domain was on the high seas; your builders brought your beauty to perfection.*

In this verse the analogy between Tyre, the city, and Tyre as a trading ship begins. Tyre as city was located on an island off the coast, and from a distance it may have given the impression of a large ship floating on the sea. Moreover they ruled over the sea. Again, as in the previous verse the perfection of its beauty is referred to and it was something that its builders brought about as an intentional characteristic. It purveys the sense of something almost too good and too perfect to be true.

#### 7.4.4 Verse 5

5. *They made all your timbers of pine trees from Senir; they took a cedar from Lebanon to make a mast for you.*

In this verse we see the first reference to a specific material. The timbers of the ship Tyre are made from pine trees from Senir. According to De Groot (1977:76) Senir refers to Mount Hermon or part thereof and King & Stager confirm this (2001:182). It is interesting to see that wood was brought from quite a distance away to build ships with. According to King & Stager (2001:182) the material used was juniper (*běrôšîm*, *Juniperus excelsa*). Juniper is apparently harder than pine by about 35 % and also smells nice as it contains aromatic oil (<http://juniper.oregonstate.edu/factsht.htm>).

The fact that pine trees were used for the ship's timbers may come as a surprise, because one would suspect that these would be of cedar. To mention a few examples of ships made of cedar, the first and oldest that comes to mind is the Cheops ship, which was found buried at the base of the Great Pyramid of Giza in 1954. It was found to be almost 4500 years old (Papanek, [ed.] 1992:61-65). A second example is that from the story of Wen-Amon, dated to about 1070 BCE, who was sent to Byblos to buy cedar wood for the construction of a new ceremonial vessel for the god Amon-Re (Aubert 1993:24, 296). However, these were very special vessels, and the fact that over time the supplies of cedar were decreasing and getting expensive because they were still very much in demand, may have led to the use of pine or juniper for the construction of commercial ships. When we look at the details of the ship that was found and excavated at Ma'agan Michael, off the coast of Israel, dating to ca. 400 BCE, it can be seen that for this ship pine wood was used for its hull (Linder 1992:28).

It came as quite a surprise to the excavators that the planks were still remarkably strong, even after about 2400 years under water (Linder 1992:29). Therefore pine definitely was a suitable material for the ship's timbers and juniper even more so because it was harder (see above), and they were most certainly used for the construction of ships.<sup>19</sup>

Even though the timbers of the 'Ship Tyre' are made of pine, and not of cedar, at least the mast is made of cedar of Lebanon, according to the second half of verse 5. The mast of a ship is very important, as it needs to be strong in order to support the weight of the yard as well as the sail that is suspended from it. Moreover the mast needs to withstand the enormous forces that come into play when the sail is propelled by wind. Its own weight should not be too heavy either. A mast needs to be straight and tall, it should not bend easily, but should not snap quickly either. Cedar wood is imminently suitable for a mast, as the trees grow very tall, the wood is not too soft, so that it would bend, but neither too hard, so that it would snap. According to Te Wechel (1945:60) cedar of the Lebanon is not hard and not heavy, but strong and very durable. Boerhave Beekman (1941:89) still adds that the cedar tree also was the symbol of greatness, power, lofty grandeur, and immortality. In conclusion, it is eminently suitable to be used as a mast for a ship, but the image is also used to indicate Tyre's greatness and importance.

#### **7.4.5 Verse 6**

*6. Of oaks of Bashan they made your oars; of cypress wood from the coasts of Cyprus, they made your deck, inlaid with ivory.*

Besides a mast to support a sail for the ship's propulsion, another important item to have on board was oars. These were used both as rudders (either single or double at the stern) as well as to row. The verse quoted states that the oars were made of oak. Some of the aspects of oak are that it is a wood with a straight grain and it is also

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<sup>19</sup> It is interesting to note that the so-called Galilee boat, which was excavated on the shore of the Sea of Galilee, was made mostly of cedar planking on oak frames, with some smaller pieces of Sidar, Aleppo pine, hawthorn, willow and redbud to make repairs (Wachsmann 1988:30). This vessel is much younger than the Ma'agan Michael ship, dating to ca. 40 BCE. So one can conclude that cedar was still in use even in later times, and it probably depended on what the shipbuilder had available or the customer could afford, what type of wood was used to build a ship. Casson (1971:212) expresses a similar opinion and the same opinion was also expressed in a private communication from my uncle shipbuilder Jan de Vries Lentsch from the Netherlands, unfortunately now deceased.

strong and durable (private communication Jan de Vries Lentsch as well as Te Wechel 1945:67). These qualities make it very suitable for use as oars, as one should take into account that oars are subjected to transverse forces. When the rower pulls the oar on the one end, the other end, the blade, pushes against the water. If a weak type of wood would be used, the oar would bend and be ineffective, or snap, with adverse effects for the rower or the oarsman, who would lose his balance. The Phoenicians must have imported oak, as it also specifically states in the verse mentioned, that the oaks came from Bashan. This area was found on the east side of the river Jordan and was renowned for its good quality oaks (De Groot 1977:76).

The second half of verse 6 indicates that the deck of the ship was made of cypress wood from the coasts of Cyprus. In the first place it can be said, that the cypress tree probably got its name from the island of Cyprus, and is typical for the Mediterranean basin. It is a tall narrow tree, and its long, narrow planks were very suitable for decks of ships. Te Wechel (1945:62) states that cypress wood is strong, has elasticity and toughness, is lightweight and extremely durable under wet and hot circumstances. A better wood one could hardly wish for to use for deck planking. Moreover Boerhave Beekman (1941:89) states that cypresses of the variety *Cupressus sempervirens L.* also grew among the cedars on the Lebanon. So the use of this type of wood, whether it came from Cyprus or was felled locally, is quite understandable.

The next point for consideration is the short reference to the fact that the deck was inlaid with ivory. At first glance this may seem like a real waste of ivory, but as there was extensive carving of ivory in Tyre (King & Stager 2001:204), there must have been waste material, small chips of ivory, for which there was no other use. By carving small slots into the ship's deck planks of cypress wood, it was easy enough to slip a small chip of ivory in each slot and thus create a pattern. It is not at all unusual to decorate ships, as has been done by many different shipbuilders in many different eras on many different ships (Gibbons, [ed.] 2001). Think for instance of the extensive wood carvings decorating the ships of the VOC (Dutch East India Company) as well as of ships with figureheads, royal sloops in various countries, etcetera. Moreover ivory does not disintegrate under the influence of sea water, as was conclusively proven by the find of a piece of ivory amongst the cargo of the Uluburun wreck (Bass 1987:696). An alternative opinion is expressed by Markoe, who states that:

'Ezekial's (*sic*) 'ship of Tyre' is said to have possessed a cedar cabin with an ivory pavilion within' (Markoe 2000:146).

The biblical text however, does not refer to a cedar cabin, but an awning of blue and purple from the coasts of Elisha, as will be seen in what follows, and the presence of an ivory pavilion seems highly unlikely for that reason.

#### **7.4.6 Verse 7**

*7. Fine embroidered linen from Egypt was your sail and served as your banner; your awnings were of blue and purple from the coasts of Elishah.*

Whereas up till this point the description of the 'Ship Tyre' has been within the normal parameters of the materials used for the particular purposes, it seems that here in verse 7 either the prophet does not know what he is talking about, or is suffering from a severe case of hyperbole. Alternatively the Tyrians seem rather extravagant in the use of 'fine embroidered linen from Egypt' for their sail and the expensive purple and blue material from far away Carthage for awnings on their ship. Even King & Stager (2001:183) are at a loss how to explain embroidery and fine linen, as they write: 'Byssus with embroidery (?) from Egypt was to be your sail, to be (rigged) for you to the yard.'

Closer analysis however, can provide answers to these seeming anomalies. In the first place, sails were never made from one single piece of linen, for the simple reason that there were no looms large enough to weave such a large piece. So sails were always made of smaller pieces of material, which were sewn together, be they linen in ancient eras, or cotton in later times (Casson 1971:48). Even to this day sails and jibs on ships are sewn together of panels of material, which also provide the opportunity to shape a sail with a certain amount of rounding to enhance the sailing ability. Moreover the seams that hold an entire sail together also make a sail stronger and less likely to tear in one foul swoop. A seam will often limit tearing of the sail to the particular panel where the tear occurs. That the sails of the Phoenicians consisted of square panels can be seen on the few available images of such ships. See in this regard the images of the merchant ships discussed in Chapter 4, under 4.1.5 and 4.1.6 as published by Moscati (2001:75) and Mazel (1971:48). Another example is provided by Penry Jones (1965:8). It is possible that the sails of the Phoenicians were sewn with thread dyed purple, which then immediately would give the impression of embroidery. And should this explanation not be accepted, the word for embroidery could then possibly mean "sewing", as both embroidery and sewing use the same implements, namely needles. In ancient times needles were made of bronze, bone or ivory (King & Stager

2001:158). Still another possibility is that the sails were embroidered with a specific decoration, which indicated from which harbour or nationality the ship originated. Even to this day sails of yachts may carry a logo indicating the type of yacht, a letter of the alphabet to indicate its country of origin, registration number or the sponsor of the yacht for a race. Maybe it seems far-fetched to assume the presence of a symbol of some sort, embroidered onto the sails of Phoenician ships, but what may be indicative that this could be the case, is the fact that the various Bible translations differ considerably as to the translation of verse 7. As was stated above, King & Stager refer to: *“Byssus with embroidery (?) from Egypt was to be your sail, to be (rigged) for you to the yard.”* The New International Version states: *“Fine embroidered linen from Egypt was your sail and served as your banner”*. The Amplified Bible gives the following translation: *“Of fine linen with embroidered work from Egypt was your sail, that it might be an ensign for you”*. Notice the word “banner” in the NIV translation and “ensign” in the Amplified Bible here. Webster’s (1977:380) gives as definition of ensign: 1: a flag that is flown (as by a ship) as the symbol of nationality and that may also be flown with a distinctive badge added to its design. 2b: Emblem, Sign. So an embroidered kind of emblem is a distinct possibility in this context. An ensign is also useful to observe from a distance which ship is coming closer, friend or foe.

A further point of interest in this verse is the fact that fine linen from Egypt is mentioned. Linen is made from Flax (*Linum usitatissimum*), a wetland plant, which is considered to be the oldest textile fibre (King & Stager 2001:148). The most prized linen came from Egypt. Flax was grown there with the use of irrigation and this produced linen of a better quality, due to the longer fibres that were thus produced (King & Stager 2001:149-150). Many centuries later Egypt also produced (and probably still produces), the best quality cotton. In this context the following story is an illustration that could explain the choice of Egyptian linen for sails in ancient times.

In the early 1970’s grandfather de Vries Lentsch needed a new sail for his ship. He insisted that he wanted a sail made of Egyptian cotton. Those were the days when the president of Egypt, Gamal Abdel Nasser, bartered the agricultural production of Egypt to obtain weapons from the Soviet Union, and Egyptian cotton simply was not available in the Western world. So in the end there was no other option than to buy another type of cotton canvas for the sail that needed to be made. The choice was American cotton and the sail that was sewn, was an exact copy of the old sail. In the short sailing season from ca. mid May till mid September in the Netherlands, this new sail stretched to such an extent that by the end of the season an entire panel of material had to be removed from the back edge of the sail, approximately 40-50 cms

(the panels ran vertically from the gaff to the boom). Halfway through the sailing season this stretched part had to be tied down, so as to not affect the sailing ability of the ship. Grandfather had never seen something like this before in all his seventy years, and the sail-maker was also very surprised. American cotton simply was not of the same quality as Egyptian cotton. Very likely other qualities of linen in ancient times were not the same as Egyptian linen, so the Phoenicians were not stupid in their choice of material for their sails, and were not 'penny-wise, pound-foolish', to use a modern expression. Linen of a cheaper quality simply was not a good enough choice where sails were concerned.

Moreover, fine linen still had another purpose. When there is not much wind, a thin sail is needed. Casson (1991:89) states that sails came in two grades of linen, heavy and light. That can be explained as follows: when the wind is strong, a heavy sail is needed to prevent it from tearing. Under conditions of a light wind, a breeze, a thin sail can be made to billow by the wind, thus providing propulsion, whereas a heavy sail cannot. (As a comparison, on modern yachts, the very large, often colourful spinnakers are made of very thin Dacron to provide maximum speed under downwind conditions). In ancient times fine linen was the most suitable material for the same purpose. In the context of the 'Ship Tyre', the image of the fine Egyptian linen is one of "everything is going plain sailing" and "life is a breeze".

Despite the description of the sail as being unfurled, it does not seem that the description of the ship is one of a ship that is sailing. Ezekiel's prophecy sounds more like the ship is moored in the harbour of Tyre or anchored close by. This enables us to analyse the latter half of the verse, namely:

*...your awnings were of blue and purple from the coasts of Elishah.*

According to Webster's (1977:79) the word 'awning' has the following meanings: 1: a roof-like cover extending over or before a place (as over the deck of a ship or before a window) as a shelter and 2: a shelter resembling an awning. So an awning can both be part of a house and of a ship, which is exactly the point Ezekiel is trying to make in his allegorical "Ship Tyre". So now when does a ship or a house need to use an awning? Usually an awning is used when the sun is very hot. When a ship is sailing, its movement cools it off, due to the wind blowing and the ship moving, but when a ship is anchored or moored and is lying in the hot sun, it gets very hot, because the sun is burning on its deck. Then an awning can bring much needed relief. It can just be tied to the rigging of the ship and not only does it provide the necessary shade, but it also



generates a draft underneath it, as usually there is a bit of wind along a coast. This cools the ship down.

There also can be a more permanent awning on a ship, but then it needs to be attached to a frame and in a more permanent manner than just a loose awning fastened on a hot day, otherwise it will flap in the wind, be in the way or blow overboard when the ship is sailing. The image already mentioned in 4.1.6 from Mazel (1971: 48) which is a mosaic image of a Carthaginian ship, shows a rounded shelter near the stern. This may be the type of awning that Ezekiel refers to. Moreover, the possibility exists that Ezekiel in his prophecy had more than one type of awning in mind, as it could be possible that there were awnings over the roofs of the houses in Tyre. The city was densely built up on the island of Tyre and the city walls were high and as such it may have been very hot there in the summer sun. The inhabitants may have tried to find a cool spot on the roofs of the houses, and an awning would have been a great way to reduce the heat, both by creating shade and generating a draft, as described above. It was normal practice in the eastern Levant for people to make use of the roofs of their houses as additional living space (King & Stager 2001:35).

Whereas one might think that the use of blue and purple cloth for an awning would be a real waste of a very precious piece of cloth, made of wool with extract of *Murex* molluscs, it needs to be kept in mind that the colour was brought about by exposure to sunlight, once the wool had been saturated with the extract. So there was no harm to hang such a cloth in the sun. It would not be bleached by the sunlight, in fact the opposite was the case. (For further information about the manufacturing process of purple and blue cloth, see Chapter 8).

For 'the coasts of Elisha', De Groot (1977:76) gives three possible locations: Alasia in Cyprus, Elis in Greece, or Carthage. In my opinion Elis in Greece does not qualify, because why would the Phoenicians buy blue and purple cloth from there, when they themselves were the best producers of this material? Trade in purple cloth from Cyprus does not seem very likely either and Diakonoff (1992:176) also expresses doubt about that. Moreover that particular commodity does not get mentioned by Ezekiel in his enumeration of the nations with which the Phoenicians traded. The most likely explanation of 'the coasts of Elisha' is that it refers to Carthage. This was the settlement that had been established on the coast of North Africa by Elissa or Elisha, also named Dido, a princess from the royal house of Tyre. She had fled after the murder of her husband, the chief priest, and had settled in North Africa with a band of followers in 814-813 BC (Aubert 1993:41).

The thought has occurred in this context that the Tyrians did not use their own purple cloth, which was very much in demand and could be sold for an extravagant price, but the purple from Elisha. Would this have been considered to be of lesser quality? If it was made with wool that was not pure white, possibly difficult to obtain in North Africa, this may have affected the eventual shade of purple that was produced, making it less valuable. Another possibility is that there was quite a glut of purple production from Elisha, which was exchanged for the supplies of food, which were shipped by Tyre to their colony in Carthage, as the latter only established their own food production on a substantial scale in the Medjerda River valley by the end of the fifth century (Markoe 2000:56-57). *Murex* was definitely found near the coast of Tunisia (Diakonoff 1992:176) and huge mounds of crushed *Murex* shells excavated in Carthage are indicative of large scale purple cloth production there (Gore 2004:46). The resulting excess production may have brought about a drop in prices, and the use of the purple from Elisha/Carthage, which now seems a tremendous waste of an expensive material, could have come about by the perceived lack of value of these purple cloths by the Tyrians over against their own purple cloth production. The imported material was simply used as awnings or tarpaulins. Markoe (2000:104) states that textile weaving and dyeing were a major Carthaginian industry, as attested to by archaeological finds at Le Kram and Kerkouane, and that their textile production was one of the items they exported on a large scale, whereas they did not actively export their other manufactured goods abroad.

Another consideration would be what alternative material for the woollen cloth would be available? A linen awning would most certainly let water through, whereas a densely woven woollen one would be more water- and also wind proof. It would also provide warmer shelter at night. It needs to be taken into account that by the time of Ezekiel's prophecy, Carthage had already been established and that the Phoenicians by then already were sailing around the entire Mediterranean, if not already beyond Gibraltar. Water and wind resistant material was required. In addition to this statement the fact can be mentioned that before the arrival of rubberized waterproof material for sailing gear, even our family would still wear thickly woven woollen jackets in the 1950's and 1960's, which were mostly wind proof and would take quite some time before they rained through.

#### 7.4.7 Verse 8

*8. Men of Sidon and Arvad were your oarsmen; your skilled men, O Tyre, were aboard as your seamen.*

The word “oarsmen” in this verse can refer to two tasks: the man standing at the steering oar (or oars, these could be connected to each other by means of a horizontal bar, or would each have a tiller, and the oarsman would hold one in each hand) or the men doing the actual rowing. Under normal wind circumstances handling the steering oar(s) is not too strenuous a task. It only gets difficult under strong wind conditions. However, rowing is another matter altogether. Let us consider an example first: most of us have seen images on TV of the annual rowing regatta between the universities of Oxford and Cambridge on the Thames. Two row-boats with an 8-men crew and a coxswain battle it out for the honour who can row the fastest over a certain stretch of the river. At the end of the race all the rowers are exhausted. These boats are narrow and designed for speed, with the oars of a thickness that a human hand can encircle. In comparison to this, try to imagine what it would be like to row a tubby freighter built of heavy timber and loaded with merchandise. The oars are like poles and it requires a strenuous effort to pull the oars, so that the ship moves forward. Moreover in those days it was not the custom to get slaves to row the ship (Edey 1974:46). Rowing was the task of the citizens from the home port. The wealthy inhabitants of Tyre came up with a different solution: they hired oarsmen from other Phoenician harbour cities, in this case Sidon and Arvad. Sidon was nearby and judging by the fact that in the later wars against the Persians one hundred years after Ezekiel uttered his prophecy against Tyre, the shipbuilders from Sidon were the ones who built the triremes, which made up the fleet of the Persian ruler, there must have been both a shipbuilding capacity in Sidon as well as quite a number of trained oarsmen (Edey 1974:46). Arvad was an island further to the north off the Phoenician coast, like Tyre, but of earlier development, and had a naval fleet as early as the time in which the Amarna letters were written (Markoe 2000:32) and therefore oarsmen. (Unfortunately very little is known of Arvad, as no excavations have ever taken place there [Markoe 2000:205-206]). So the Tyrians simply hired people to do their heavy work, in this case the rowing of their ships, while they themselves served as the skilled seamen. They stayed in charge of their own ships and determined their direction and destination.

#### 7.4.8 Verse 9

9. *Veteran craftsmen of Gebal were on board as shipwrights to caulk your seams. All the ships of the sea and their sailors came alongside to trade for your wares.*”

The name Gebal indicates Byblos (Markoe 2000:202). Even to this day the name of the city is Gebeil or Jebail. Byblos was the name the Greeks gave to it, as this was where Egyptian papyrus could be obtained. As already mentioned before, Gebal or Byblos is the oldest Phoenician city, as there was trade in cedar wood there from about 3000 BCE onward. It was the main port from which the Egyptians received their cedar timber. It also was the place where the first ships were built and for that reason the craftsmen from Gebal had the most experience in shipbuilding. Diakonoff (1992:177) states that: “The Byblian ‘elders and wise men’ can hardly be thought of as men hired for money.” What he does not take into account however, is that the craftsmen from Gebal were brought in for their expertise. They apparently were the most experienced in this process of caulking seams. Diakonoff talks about ‘caulking the chinks’ between the planks (1992:177). It seems like a lot of wisdom to make sure that the ships do not leak if one wants to transport a number of different commodities that are valuable. Take for instance iron ‘oxhides’, the manner in which iron ore was transported. It would not do to let these get wet and start rusting! Or take purple cloth, or spices or animals, like horses. None of these should get wet. So caulking seams was a wise precaution to make sure the ships were watertight.

Caulking was done with bitumen and the nearest source of this material was the Dead Sea. Clumps of this substance were found floating on the water (Nissenbaum 1993:130) and were most likely brought to Tyre by means of camel caravans. The process of caulking entails stopping up the seams with it and thus making them watertight (Webster’s 1977:177). It is also possible that the seams were first stopped up with fibres such as linen (or later cotton) and then covered with bitumen for a better hold. This was still the way it was done in the twentieth century in The Netherlands.

It is maybe interesting in this context to mention the following: In the Dutch language there is an old word ‘*kalefateren*’ which means to caulk, to repair a ship’s hull with tar. It is derived from the French ‘*calfater*’, which in turn comes from the Greek ‘*kalaphatein*’, both with the same meaning, and this in turn comes from the Arabic word ‘*qafir*’ meaning ‘asphalt’ (De Vries 1973:108). An equivalent word in Hebrew is ‘*kopher*’ (Nissenbaum 1993:133). The Hebrew dictionary gives as principal meaning for ‘*kopher*’: ‘to spread over = to cover with pitch, and refers to Genesis 6:14

(Holladay1988:163). Judging by the development of the respective words in the different languages, the process has been practised for millennia.

From the text of Ezekiel 27 we may infer that the experts in this process were found in Byblos in Ezekiel's time, and the shipping magnates from Tyre were so wise as to hire them for their expert skills.

The latter half of verse 9 indicates that ships and sailors came from all over the Mediterranean to trade with Tyre. Here there is also a double image, as ships from all over did not just come to the harbour of Tyre to exchange their wares, but ships would come alongside each other for the purpose of exchanging goods as well. In this way business could be conducted very quickly as goods did not have to be unloaded in the harbour first and then loaded onto another ship again, but would be transferred straight from one ship to the other ship alongside it.

In this context the image of the Dutch '*parlevinker*' comes to mind. This was a small boat loaded with an array of goods and it would ply a harbour or waterway and would come alongside river freight ships. The skipper of the freight ship or his wife could buy groceries, fresh bread and milk and many other necessary supplies from the '*parlevinker*' without having to moor their ship and go in search of the articles in a harbour's shops. This service would save the people working and living on the river freighters a lot of time. It was quick business and they used to be seen in Amsterdam harbour in the 1960's and 1970's, but this practise no longer exists ([http://www.youtube.com/watch?v\\_jHpQe\\_r6iY](http://www.youtube.com/watch?v_jHpQe_r6iY)).

As a final observation from a linguistic perspective about this allegorical description of Tyre as a ship, it can be noted that all the verbs from vs. 4-9 are in the imperfect tense, not the present tense, as one would expect, because Tyre at the time of Ezekiel's prophecy was still at the pinnacle of its power. This use of the imperfect gives the impression that Tyre has already undergone the punishment of the total destruction that God is going to mete out to the city.

## 7.5 CONCLUSION

From what has been analysed above, it can be deducted that Ezekiel's prophecy about the 'Ship Tyre' was very accurate. The chapter gives the impression that Ezekiel had detailed knowledge of Tyre, its ships, its cargo and its trading partners. Ezekiel did

not just mention a number of different types of wood at random, but indicated in accurate detail what the various types of wood were used for and these indeed were very suitable for the applications they were used for. The same applies to the material used for the sails. And even though the use of the purple cloth for awnings may sound extravagant, there is a strong possibility that these were indeed used for lack of a more appropriate material. In the following chapter the production process of purple cloth with the use of *Murex* molluscs will be discussed in greater detail.

On the whole the image of Tyre as a ship gives the impression of wealth, of perfection, of having achieved everything that could be achieved and more, of being at ease with itself, everything is going plain sailing and what could still go wrong? Ezekiel however makes it clear by means of the prophecy that despite Tyre's power, God's power is greater.

## CHAPTER 8

### THE MOST WELL-KNOWN ARTICLE OF TRADE: PURPLE CLOTH

#### 8.1 INTRODUCTION

The Phoenicians manufactured, bought, transported and sold a myriad of different articles (Diakonoff 1992:168-193), but their most famous and most expensive product no doubt was purple dyed cloth, also called Tyrian or Royal Purple. In this chapter an overview will be given of the origins and production methods of this precious commodity, various types of purple cloth, purple thread for embroidery and cords, as well as other uses for *Murex* shells. Attention will also be given to the involvement of ships in obtaining the *Murex* molluscs and in the trade of the finished articles.

#### 8.2 THE INVENTION OF PURPLE DYED CLOTH

Cloth dyed purple with dye derived from *Murex* molluscs no doubt was the most expensive material produced in ancient times. The material was more costly than gold. Its invention has long been attributed to the Phoenicians, but the origins of the dye process are much older and have now been found to date to the Minoan era (Stieglitz 1994:46-54). A Greek legend attributes the invention of the dye to Heracles. In the Phoenician culture it is attributed to Melqart, the main deity of Tyre. The legend explains the invention as follows: as the deity was strolling along the shore of the Mediterranean one day with his dog and the nymph Tyros, the dog bit into a large sea-snail which caused its mouth to be stained purple. The god immediately dyed a gown with the extract and gave it to his consort (Markoe 2000:163) (See *Figure 8-1*).



**Figure 8-1: Coin of the mid-3rd century BCE showing the dog finding the murex shell on the beach (Hanson 1980:39).**

As the molluscs come into shallower water to mate in the late spring, it is very well possible that a dog biting into a shell would end up with purple in its mouth, thus leading to humans discovering the possible use of this dye for cloth (McGovern 1990:33). The actual process of producing the dye is however rather more complicated than a dog biting into a mollusc. As already stated in the above, the invention of purple dyed cloth which has long been attributed to the Phoenicians is in fact much older. According to King & Stager (2001:161) purple dyed cloth was already produced in ca. 2000 BCE. Stieglitz (1994: 46-54) provides very convincing evidence that the invention of the dye process probably originated on Crete with the Minoan culture. Several sites with large amounts of discarded Murex shells have been identified there, most notably at Palaikastro on the southern slopes of the Kastri and on the small island of Kouphonisi, south-east off Crete. He is of the opinion that both of these are Minoan sites. Minoan art also attests to the use of purple dye, as garments decorated with purple stripes can be seen depicted on a Minoan sarcophagus found at Hagia Triada, dating to about 1450 BCE, and on frescoes of Thera, dating to about 1550 BCE (Stieglitz 1994:52-54).

The Phoenicians however were the ones who started producing this commodity on a much larger scale. They had already been present on the eastern shores of the Mediterranean, and made use of the power vacuum created by the decline of the Mycenaean and the Egyptian cultures at the end of the Bronze Age (ca. 1200 BCE) to



start trading farther out on the Mediterranean Sea (Bikai 1990:24, 28). One of the main commodities they traded was purple dyed cloth, which made them famous and also gave them their name. The word 'Phoenician' is derived from the Greek '*phoinós*', meaning 'red', 'blood', 'to stain with blood', 'death' or 'crime'. The origin of the word is linked by Greek lexicographers to the manufacture of purple textiles. The Greeks began to call the inhabitants of the area where purple cloth was produced '*phoinikes*' and from there it was a small step to use the name 'Phoenicia' to indicate 'the country of purple cloth' (Aubet 1993:6-7). Only the Greeks used the term "Phoenicians", but it was not used by the Phoenicians, as they would refer to themselves as Tyrians, Sidonians or inhabitants of Byblos, Arvad, Sarepta, etcetera (Aubet 1993:9).

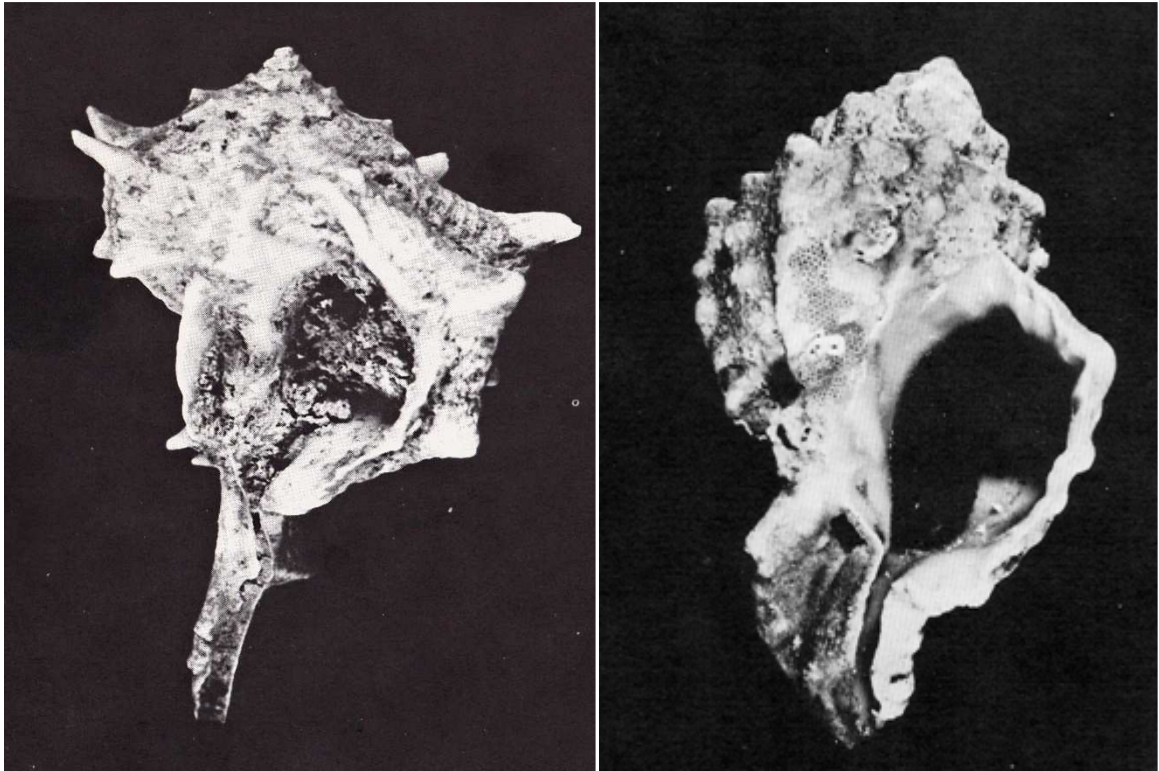
The fact that the legend about the invention of the purple dye as well as the technique to produce it by means of *Murex* molluscs originates in the Mediterranean and not in Egypt, could also be an indication that these came along with the ability to build ships, and that they reached the shore of the Levant together. As was shown in Chapter 3, the shipbuilding techniques of the Phoenicians do not seem to originate in Egypt, as Aubet maintains (Aubet 1993:146), but were much more likely of Mediterranean origin as Casson states, as referred to in Chapter 5 (Casson 1971:30). The Levantine coast was settled by people who had both the shipbuilding skills as well as the skills to manufacture the purple dye. That they spoke a Semitic language was probably because the new arrivals adopted the language that was spoken by the Canaanites, who were already present along the Levantine coast.

## 8.3 PRODUCTION PROCESS OF PURPLE DYE

### 8.3.1 Collecting the molluscs

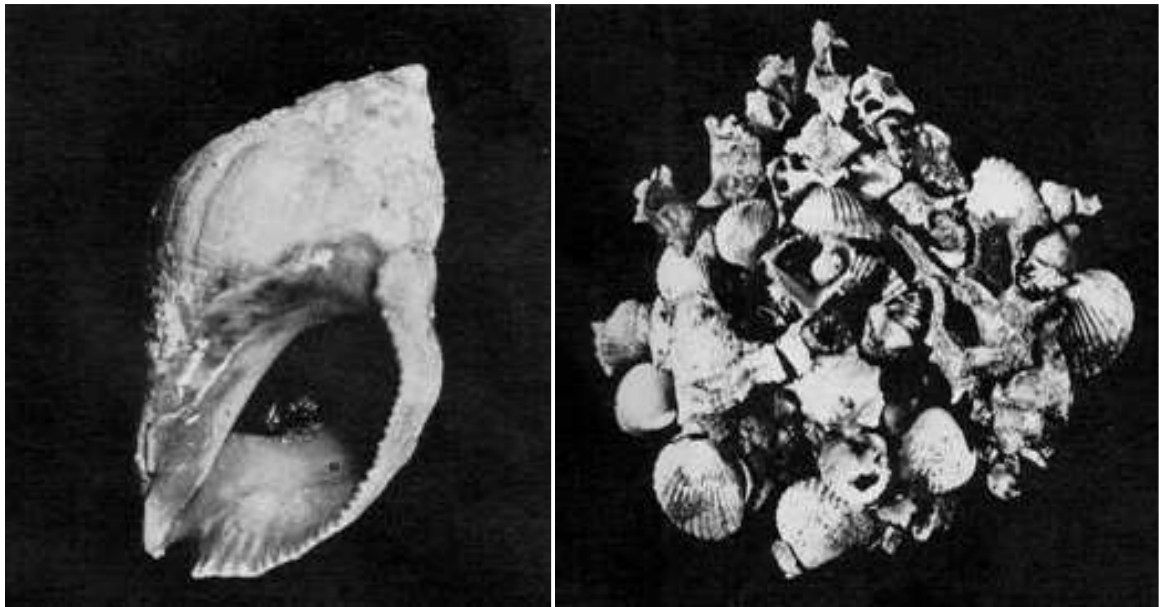
The first step in the production process of purple dye was to collect as many *Murex* molluscs as possible. As crushed shell remains have shown (Markoe 2000:164; McGovern 1990:33), several different species of molluscs were used, and as different names are used, it is useful to first clarify the terminology used in the various sources which were consulted. *Murex trunculus* or trunk *murex*, is equivalent to *Hexaplex trunculus*. The second variety is *Murex brandaris*, or banded dye *murex*, which is equivalent to the now official name *Bolinus brandaris*. A third variety is the redmouthed rocksnail *Thais haemastoma*, also called *Purpura haemastoma* (Forstenpointner,

Quatember, Galik, Weissengruber & Konecny 2007:204). The general term *Murex* will however mostly be used in this chapter (See *Figure 8-2* and *Figure 8-3*).



**Figure 8-2: Murex Brandaris (left) and Murex Trunculus (right) (Jedidian 1969:238-239).**

These molluscs could be found attached to underwater rocks along the Levantine coast (King & Stager 2001:161), as well as farther afield, more particularly as follows: *Murex trunculus* lives in shallow shore waters of the Mediterranean at depths varying from 1.5 to 12 meters on rocky bottoms or on coarse sand with pebbles. *Murex* or *Bolinus brandaris* prefers a sandy, silty or muddy environment at a depth varying from 10 to 150 meters off the Mediterranean coast and *Purpura* or *Thais haemastoma* lives on rocks in water less than 1.5 meters deep both in the Mediterranean as well as on the Atlantic coasts of Africa. The latter species did not produce a fast dye alone, but was used in combination with *Murex* species (Ziderman 1990:99) (See *Figure 8-3*).



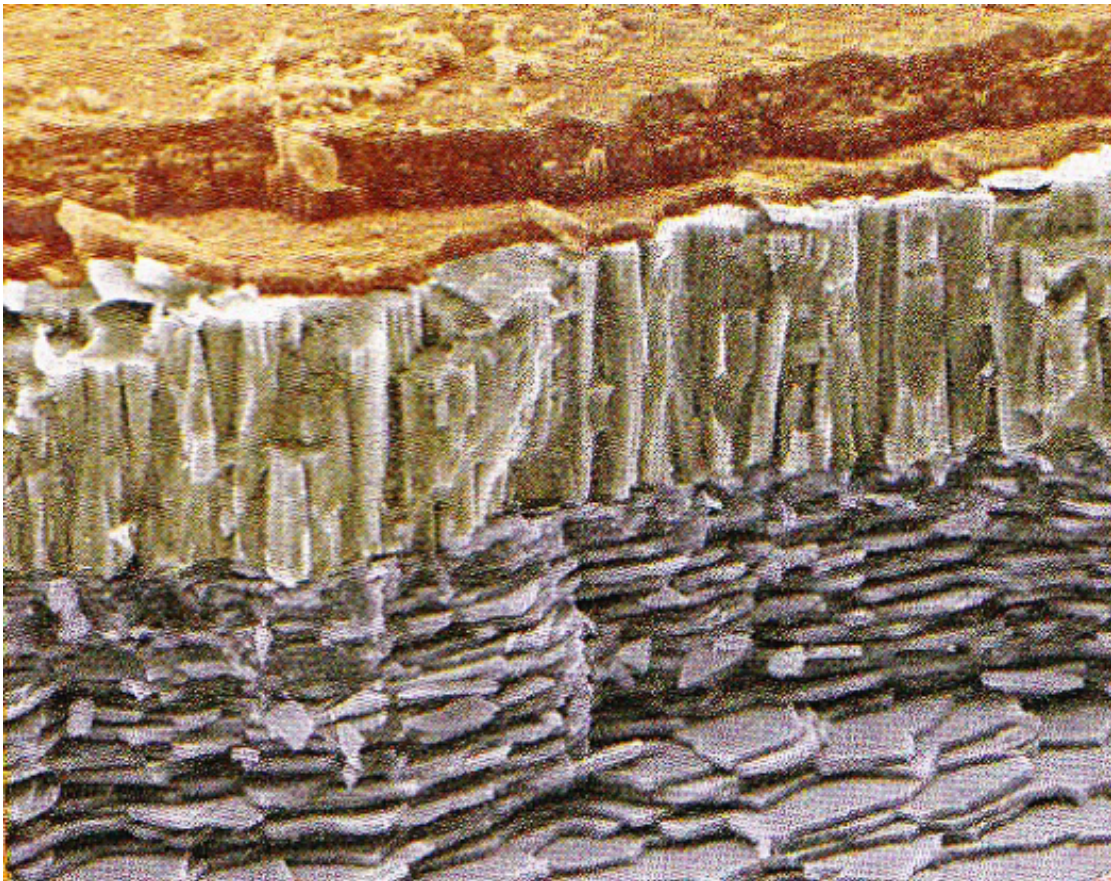
**Figure 8-3: Purpura Haemastoma (left) and Cardium shells together with Murex (right) (Jedidian 1969:238-239).**

Fishing the molluscs may have been done in various ways: such as by means of diving, nets or traps (Hohlfelder & Vann 1998:30). The writings of Pliny the Elder, entitled *Natural History* dating to the mid-first century CE, give a detailed description of the use of loosely woven baskets made of wicker or reeds with bait to capture the molluscs (McGovern 1990:33). Jedidian (1969:143) is of the opinion that the fishing technique with the reed baskets was the only one used and points out that the *Cardium* or cockle shells, found with the remains of the *Murex* shells, were the principal bait that was used to catch the *Murex* (See *Figure 8-3*). The cockles would be put into the baskets that were lowered into the sea with long ropes. The *Murex* would stretch out their tongues to eat the cockles, which were open as they were lowered into the water. The cockles would then clamp themselves shut on the tongues of the *Murex*, which would hang suspended and were thus lifted out of the water (Jedidian 1969:150). It was of the essence to keep the *Murex* molluscs alive once they were caught, as they would no longer have the colour producing juice if they were dead. Hence the ships fishing the *Murex* must have had a storage facility containing sea water on board to bring the *Murex* to shore alive. *Murex* may also have been kept in storage facilities ashore, like rock-cut pools or *vivaria* (also called *piscinae* in Roman times) until sufficient quantities had been collected to produce the purple dye (Hohlfelder & Vann 1998:34; Stieglitz 1994:49). If they were kept there for too long without sufficient food, they would start cannibalizing each other (Ziderman 1987:29). The best time to collect the molluscs was during the mating season in the

late spring (McGovern 1990:33), when they would collect into shoals. Pliny recommended a seven month cycle for harvesting them (Ziderman 1987:29).

### 8.3.2 Producing the dye

At the beginning of the production process the shells had to be broken to remove the secretion that produces the dye (Ziderman 1990:98). This was not as easy as one would think. The sea-shells may look fragile, but are in fact remarkably strong because they are multi-layered. The inner layer called 'nacre' or mother-of-pearl has microscopic scales. This horizontal layer looks like flakes of slate, neatly layered. Attached to this is a vertical layer that looks like miniature basalt pillars, and it is all covered by an outer layer of protein rich gum originally excreted by the shellfish, which mortars it together (Awake! 2009:25) (See *Figure 8-4*).



**Figure 8-4: Enlarged cross-section of the inner layer of a mollusc shell (Awake! 2009:25).**

The shell of the larger molluscs had to be broken with a blunt tool at exactly the right place in order to expose the hypobranchial gland, from which the fluid containing the dye had to be extracted (Jedidian 1969:142). The smaller ones were crushed with shells and all (Stieglitz 1994:46). The gland is a white vein with a very small amount of liquid in it, which is a colourless dye precursor and as stated above, it needed to be extracted from the *Murex* while it was still alive, because it discharges this juice when it dies (Ziderman 1990:98).

To the mass of these tiny glands, salt had to be added, in the proportion of about one pint for every hundred pounds. This had to be left to dissolve for three days, and no longer, as the fresher the solution, the stronger the dye. Then water was added, in the ratio of seven gallons to every fifty pounds. The mixture was then heated for nine days in a large lead vat, which was kept at a moderate temperature by a pipe connected to a furnace some distance away. The flesh adhering to the veins would be skimmed off at regular intervals, and after nine days the contents of the vat were filtered. A fresh fleece was dipped into it by way of trial and then the dyers would heat the liquid until they felt confident of the result. This is the description of the process as written down in the Roman Era by Gaius Plinius Secundus, Pliny the Elder, in his *Historia Naturalis*, first century A.D. (Kurlansky 2003:76-77)).

In the course of the boiling process the dye had gradually liquefied out and produced a colourless compound that yielded a colour-fast purple dye once the dyed material had been exposed to sunlight. The use of lead or tin vats may have been mostly in Roman times, as ceramic containers and assemblages for the production of purple dye have been found in a number of older sites. This is the case at Minet el-Beida, the harbour quarter of Ugarit, where a shard with traces of the dye has been found dating to the fifteenth-thirteenth centuries, also at Sarepta (in Sounding X), and Tel Akko both dating to the thirteenth century BCE. Furthermore at Tel Keisan, dating to the eleventh century BCE and at Tel Dor where a ceramic dye installation was found with traces of dye in a channel and a pit (Karmon & Spanier 1988:184), which also contained a thick deposit of lime in the channel (Stern & Sharon 1986:208). At Tel Shiqmona a pottery vessel was found intact with a ring of colour inside it. Where the upper surface of the dye had been in contact with air, the purple colour had left a trace (Karmon & Spanier 1988:186).

The explanation given by Stern and Sharon for the presence of the lime deposit in the purple dye installation in Tel Dor was that the quicklime was used to extract the dye from the molluscs (Stern & Sharon 1986:208). There is however a more specific

reason why lime was used. When researching the use of the Madder plant to dye fabric (this produces the so-called 'Turkey Red') an interesting fact came to light. In order to obtain a more intensive red colour when using the roots of the Madder plant to make the dye, calcium carbonate is used in the dying process ([www.wildcolours.co.uk](http://www.wildcolours.co.uk)). This explains the find by Stern and Sharon of the lime deposit in the ceramic dye installation in Tel Dor. The lime (=calcium) was used to obtain a more intensive colour by changing the pH level of the water in the dye solution.

### **8.3.3 Dyeing the wool**

A well-washed woollen fleece was dipped into the dye and allowed to soak for five hours (Ziderman 1990:99), then re-exposed to air when placed in the sun and the colour would emerge. The range of colour varied from rose to dark violet, depending on the dye strength used. The Tyrian purple was produced by double-dipping the wool (one wonders whether this might have doubled the price as well!). The best results were obtained by submerging the wool into the reduced compound before oxidation, so that the dye would permeate the textile's fibres (Markoe 2000:164). For an approximate shade of purple colour see *Figure 8-5*.

The wool that was used by the Phoenicians for this process was imported from Syria via Damascus (Markoe 2000:95). This was a very white type of wool and produced the best results as the natural colour of the wool would not influence the resulting shade of purple.

About 8000 molluscs were needed to produce one gram of dye (King & Stager 2001:161) and the dye vats found reflect this, as they were very small (*ibid*:159). The monetary value of the compound was more than its weight in gold and the purple fabrics were worn by royalty from early on (Markoe 2000:164), as wearing dyed fabric was a sign of status (King & Stager 2001:159). Stern (1994:195) mentions that linen was also dyed purple by the Phoenicians.



**Figure 8-5: Woman wearing Purple dyed fabric made with Murex in modern times (Gore 2004:42).**

In Tyre the purple dye industry already experienced a boom between 1650-1050 BCE, as was attested to by the sounding done there by Patricia Bikai in which considerable amounts of *Murex* shells were found (Aubert 1993:290).

In Sarepta the purple dye industry experienced an increase in production from 800 BCE onward (Aubert 1993:290), but had already been in existence from at least the thirteenth century, as this is where Pritchard discovered three potshards from a storage jar that were covered with purple dye, as well as a spouted vat containing residues from that era (King & Stager 2001:161). Mounds of *Murex* shells indicative of purple production have been found all along the eastern shore of the Mediterranean in places such as Sidon, Beirut, Ugarit, Ashdod, Shiqmona, Tell Keisan, Tel Dor and Ashkelon (King & Stager 2001:161-162).

The pile of crushed *Murex* shells in Sidon was 40 meters high and was found south of the Acropolis next to a large purple dye installation. The southern cove there may have

been used as the beaching area for small vessels which were used to obtain the *Murex* shells. (Markoe 2000:200).

#### **8.3.4 Noxious smells**

Usually these mounds of crushed *Murex* shells are found on the lee-side of town, and it is assumed that this was because of the nauseating stench that resulted from the production process. Not all authors agree on the stench problem however. Markoe states that stench was a problem (2000:164), but King & Stager do not think that this was the case, but rather the fact that fires were burning constantly to heat the vats in which the dye was produced (King & Stager 2001:162), so heat and smoke were a problem. Ziderman (1987:28) probably has the final word on the issue, and the find by Stern and Sharon of lime in the channel at Tel Dor is important in this context (Stern & Sharon 1986:208). The addition of lime, which is an alkali, to the dye extraction process in a ceramic assemblage, releases mercaptans. These contain sulphur and produce noxious smells<sup>20</sup>. The use of lead vats in Roman times can also be explained in this regard. Lead contains antimony, and this compound acts as a catalyst in the manufacture of the dye. Ziderman (1987:28) mentions that Doumet managed to reproduce the dyeing process as described by Pliny the Elder, but only when he used a vessel made of a 5% antimony alloy of lead. Whether additional lime was used in this case was not possible to ascertain.

### **8.4 OTHER USES OF *MUREX* MOLLUSCS**

#### **8.4.1 Ingredient for incense**

Besides the hypobranchial glands, still another part of the molluscs was used and that was the *operculum*, the foot plate. It is the lid or cover used by the animal to seal itself in its shell (Hohlfelder & Vann 1998:31). These button-like plates were used as an ingredient of ancient incense. Hundreds of these plates were found close together during the underwater excavation of the Phoenician merchant vessel at Uluburun off the coast of Turkey. Their presence there was not accidental, as they had been part of the cargo. Evidence was found in literature by Cemal Pulak, one of the archaeologists

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<sup>20</sup> With thanks to my husband for sharing his knowledge about mercaptans with me.



participating in the excavation, that these plates were an ingredient of incense in Antiquity (Bass 1987:729).

#### **8.4.2 Strengthening of metal**

The Carthaginians still discovered another use for *Murex* shells. They started adding large amounts of crushed shells (calcium) to the metals used to manufacture weapons in order to strengthen them (Gore 2004:46). Huge amounts of crushed shells together with basalt grinders and grindstones were found during the excavation of the metalworking site in Carthage.<sup>21</sup> (Gore 2004:46).

#### **8.4.3 Food**

*Murex trunculus* also is edible, even though it has a rather distinct taste, so the molluscs also may have served as food (Hohlfelder & Vann 1998:31). If left to rot, this would have contributed to the stench problem.

### **8.5 OTHER LOCATIONS WHERE MUREX SHELLS HAVE BEEN FOUND**

The massive mounds of *Murex* shells in all the major Phoenician centers on the Levantine coast bear silent witness to the millions of molluscs that must have populated the rocks and muddy shallows of that coastline. But eventually the stocks of *Murex* must have been severely depleted, and the Phoenicians had to go further afield in the Mediterranean to obtain *Murex*.

It is very well possible that the establishment of Phoenician colonies and the development of their navy was a result of the quest for new sources of purple dye (Ziderman 1990:98). Large mounds of *Murex* shells have been found on the island of Djerba, situated on the Mediterranean coast of Africa, but opinions are divided on

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<sup>21</sup> This technology, which is similar to the present day *Bessemer* process, was only re-discovered and developed in the 19<sup>th</sup> century CE (Gore 2004:46).

whether this is a Phoenician or a Roman site. Markoe (2000:182) states that there was very little Phoenician settlement along the North African coast east of Carthage, and does not mention Djerba at all. The site can only be dated to Roman times as the place where Menebian type purple was produced, as Djerba was called Meninx in those days (Mazel 1971:165). Herm (1974:165) however, suggests that there may have been a Phoenician presence on Djerba before Roman times, based on the enormous amount of shells found. Moreover, Djerba is not that far away from Carthage and it is very well possible that Carthaginian ships would have gone to Djerba to obtain *Murex* without ever establishing a settlement there. The presence of *Murex* shells in Carthage is indicative of purple cloth production in that city (Gore 2004:46).

Ample remains of *Murex* shells have also been found on the island in the Bay of Mogador, which is located on the Atlantic shore of present day Morocco. That is beyond the Strait of Gibraltar. The Phoenicians had a settlement there and used *Purpura* or *Thais haemastoma* molluscs to produce Gaetullian purple (Mazel 1971:208).

Aubet mentions that *Murex* shells were also found in Almuñecar, Toscanos and Morro de Mezquitilla in present day Spain, which is indicative of the production of purple cloth in that region, although the volume was limited (Aubet 1993:264). Other Phoenician colonies where dye was produced were on Sicily and Malta (McGovern 1990:33). At Motya on Sicily, whale vertebrae were used as crushing platforms to break up the *Murex* shells (Reese 2005:110).

## 8.6 PURPLE YARN AND PURPLE CORD

Besides the production of purple dyed cloth also purple dyed yarn and purple dyed cord was produced. These items will be discussed under separate headings.

### 8.6.1 Purple dyed yarn

In Antiquity another sign of luxury and of royalty, was the wearing of embroidered garments. Embroidery was decorative needlework with different coloured threads of

various colours in specific patterns by means of needles made of bronze, bone or ivory (King & Stager 2001:158).

As was stated in the above, embroidery on garments is already attested to in the Minoan culture. This may have been the older form in which purple thread made with the use of *Murex* molluscs, was used. In the Old Testament embroidery was used for religious purposes. We find a detailed description of the use of blue-purple, red-purple and scarlet yarn, which were to be embroidered onto fine linen in Exodus 26 for the construction of the inner layer of the 4 layers that were to make up the roof of the Tabernacle. Also the curtain at the entrance of the courtyard, that of the entrance to the Tabernacle as well as the curtain that was to separate the Holy Place from the Most Holy Place, were made of finely twisted linen embroidered with blue-purple, red-purple and scarlet yarn.

The ephod, which was the upper tunic of the garments worn by the High Priest, was to be embroidered with gold, blue, purple and scarlet yarn according to Exodus 28. Underneath the ephod, a purple robe was worn by the High priest, which was decorated at the hem with pomegranates of blue, purple and scarlet yarn, alternating with gold bells (Exodus 28:31-35).

The Hebrew words used for these colours are: *'argāmān*, *tēkēlet* and *tôla'at šānî*. The latter is kermes, the scarlet dye extracted from *Kermococcus vermilis* as well as related species of scale-insects that live on oak trees (Ziderman 1987:25). *'Argāmān* is Tyrian purple, to be more exact 6,6'-dibromoindigotin, produced from the sea-snails *Murex (Bolinus) brandaris* and *Thais (Purpura) haemastoma* (Ziderman 1987:25). *Tēkēlet*, which is a more blueish purple than *'argāmān*, is derived from banded dye-murex *Murex trunculus* also sometimes called *Trunculariopsis trunculus* and contains more indigotin besides 6,6'-dibromoindigotin (Ziderman 1987:27).

For this purpose mostly wool was dyed, and linen was used as the material onto which embroidery was applied.

### **8.6.2 Purple dyed cord**

Another use for which purple dyed thread was prescribed is the following: according to Numbers 15:38-39 all male Israelites are required to wear tassels, called *'tzitzit'* in Hebrew, on the four corners of their clothing. These tassels are to include a blue-

purple cord each, called a '*techelet*' in Hebrew, to remember all the commandments of the Lord. Thus, blue purple thread was used to make cords. Even to this day religious Jews still wear tassels on their clothing, but the commandment to include a blue-purple cord could no longer be kept from about the 7<sup>th</sup> century CE, as at that time invading Moslems destroyed the *techelet* dye industry, which still existed along Israel's northern Mediterranean shores (Sadan 2002:14). For the next 1500 years after that, the tassels have been white.<sup>22</sup>

## 8.7 END OF THE PRODUCTION OF PURPLE DYE

From the above it can be deduced that the manufacturing of purple dye with the use of *Murex* molluscs still continued after the demise of the Phoenicians. During the Roman era the practice continued until there was hardly any *Murex* left. An archaeozoological field survey of the purple dye facility that existed in Andriake in Lycia (South-west Turkey) dating to the sixth century CE, found that the top layer of the ca. 300 m<sup>3</sup> of shell debris consisted of a majority of small and thus young snails. The researchers also came to the conclusion that there probably had been over-exploitation of the purple snails that might have caused the termination of the purple-dye production there (Forstenpointner et al 2007:208,212). This over-exploitation combined with the invasion of the Moslems that was mentioned above, and possibly other factors, brought the manufacturing of purple dye to an end. The knowledge of the production process also was lost, and was only re-discovered in the twentieth century (Sadan 2002:14).

## 8.8 ECOLOGICAL IMPACT OF THE EXTENSIVE USE OF MUREX SHELLS

Over the centuries that purple dye was produced in Antiquity, millions of *Murex* shells must have been removed from the Mediterranean Sea. There must have been *Murex* present in abundance. That brought about the question: 'why was there so much

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<sup>22</sup> As an interesting aside: after the fall of Constantinople in A.D.1453 the very last remnants of the purple dye industry ceased to operate. As a result of this the church also no longer could use purple dyed vestments and Pope Paul II issued an edict in 1464 to instruct the cardinals to use kermes as dye for their vestments (McGovern 1990:76).

*Murex* there? The answer possibly lies in the following: the Mediterranean Sea is a very enclosed body of water. The opening to the Atlantic Ocean at Gibraltar, through which fresh ocean water can flow into the Mediterranean, is only 14 km wide (Encyclopedia Britannica, digital 2008). Evaporation causes the Sea to be more salty as well ([www.internalwaveatlas.com](http://www.internalwaveatlas.com)). This all necessitates an eco-system that purifies the water in a different manner. *Murex* molluscs are filter-feeders. That means that they filter the water through their tiny systems and filter out what is in the water as nutrients for themselves. In this way they purify the water and thus are part of the eco-system in maintaining a healthy water quality. By removing the *Murex* in large quantities in order to produce the valuable purple cloth, the Phoenicians and other producers of purple dye had a severe impact on the eco-system that purified the sea water.

## 8.9 WHAT SHIPS WERE USED TO GATHER THE MUREX MOLLUSCS

The question what ships would have been used to collect the *Murex* is not an easy one to answer, as there is no literature, or any kind of image that would shed light on the issue. It may however be determined by way of reasoning out what would be the most suitable type of vessel.

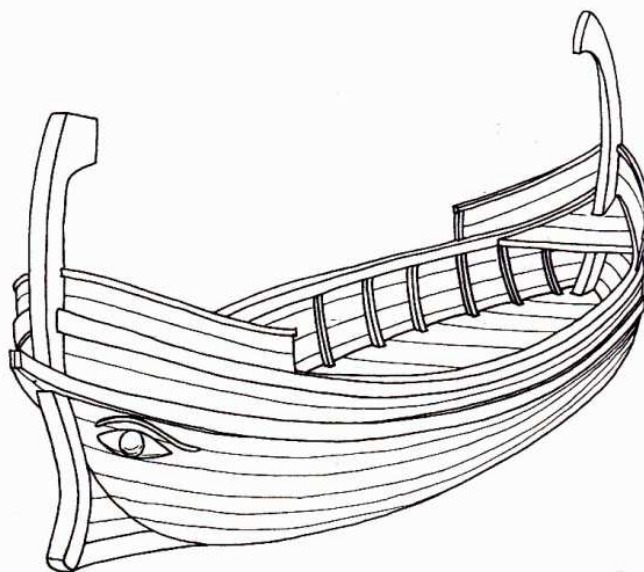
It would have been unlikely that the merchant ships would have been used, as these were too heavy, difficult to manoeuvre and it would have been unsafe to bring them too close to the shallow depths and underwater rocks where the molluscs were to be found.

Warships were not suitable either, as these were used to patrol or fight, and may not have had space for a holding facility for the live *Murex*, due to the fact that they were narrow ships, and needed all their available space for their large number of rowers.

The greatest likelihood is that small boats were used, possibly *Hippoi*, or another type of fishing vessel. Boats with shallow draft, not too high above the water, propelled by means of oars, would have been best, as the live *Murex* had to be collected from the reed baskets, which had to be hauled up out of the water. The *Murex* should not be out of the water for too long, lest they die and lose the precious liquid that provided the dye precursor, so boats with a low gunwale would have been preferable.

It was however not possible for very small vessels to have sailed all the way to Mogador beyond the strait of Gibraltar. The presence of small boats there to fish for *Murex* can be explained as follows: larger ships would have one or even more ship's boats with them (Casson 1971:248). This means that merchant vessels would tow smaller vessels to where they were needed, such as for the fishing of *Murex*. In this way the smaller vessels could have been brought to places like Mogador and other far away destinations. Large sailing ships could even have hauled a ship's boat on board by means of lines rigged from the masthead (Casson 1971:249). This can also be read in the account of Paul's voyage to Rome in Acts 27. In verse 16 it talks about making the lifeboat secure, and in verse 17 it says: "When the men had hoisted it aboard". Then in verse 30 the sailors wanted to attempt to escape from the ship and they let the lifeboat down into the sea and were prevented from doing this because Paul warned the centurion not to let it happen, so the soldiers cut the ropes that held the lifeboat, so that it fell away. Paul's story is of a later date than the time of the Phoenicians, but the practice of having a ship's boat, or lifeboat on board of ships was already an established practice by then.

The use of small boats in the fishing process is the most likely, also because the boats had to beach in shallow water to bring the *Murex* ashore, such as was the case in Sidon (Markoe 2000:200). The image of a Punic boat, a descendant of the *Hippii*, as reconstructed by P. Bartoloni in 1979, probably is the most likely shape of boat to have been used for the fishing of *Murex* (Lancel 1997:124) (See *Figure 8-6*).



**Figure 8-6: Punic boat (after P. Bartoloni) (Lancel 1997:124).**

## 8.10 TRANSPORTING THE FINISHED PRODUCT

In his presentation at the Aram conference in Oxford (which was mentioned in Chapter 7), Prof. Bar-Ilan expressed the opinion that the expedition to Ophir took purple dye in vials along as an article of trade. This is however an incorrect idea. According to Diakonoff (1992:188) the purple dye was not stable. It could only be used straight away when the dye had boiled long enough for it to be effective, and only while it was hot, to dye a woollen fleece. The only way for the Phoenicians to use the purple as an article of trade, was to take along the finished product, the purple cloth, on board their trading ships, such as the ships of Tarshish, to trade for whatever articles they wanted to obtain in exchange. In this way purple dyed cloth was traded throughout the entire ancient Near East.

## 8.11 CONCLUSIONS

From the above it can be concluded that the production of purple cloth with the use of *Murex* molluscs was invented before the Phoenicians made it one of their main products for sale. Its origins in the Minoan culture may be an indicator of the origins of the Phoenicians. It was produced by the Phoenicians and Carthaginians all over the Mediterranean basin and even beyond the Pillars of Hercules at Mogador. The search for more supplies of *Murex* may have been one of the reasons for the westward expansion of the Phoenician realm (Ziderman 1990:98). The other main reason probably was the search for metals (Aubert 1993:53). The production process of the purple material was messy, smelly, lengthy and complicated and probably did not always produce the same shade of colour. The use of lime in the production process was intended to enhance the colour, but also caused the noxious smell through the release of mercaptans.

The use of ships was integral in the process of collecting the shellfish and bringing them ashore, as well as in selling the finished product. It was not possible to transport the dye in containers for use elsewhere. Eventually the stocks of *Murex* became depleted to such an extent in Roman times that the production of purple material ceased altogether. The knowledge about the production process was lost and only re-discovered at the end of the twentieth century.

## CHAPTER 9

### THE LEAST KNOWN ARTICLE OF PHOENICIAN TRADE: DOGS

#### 9.1 INTRODUCTION

In the previous chapter the most famous article of trade manufactured by the Phoenicians, purple dyed cloth, was considered in detail, as well as the ships used for the collection of the molluscs and the ships to transport the finished product to its destination. In this chapter the least known article of trade will be discussed, namely dogs. It was quite a random discovery to find out that the Phoenicians traded in dogs, as this is not mentioned in any of the academic publications, but can only be found in dog encyclopedias. In this chapter the various types of dogs, supposedly traded by the Phoenicians, will be described as to their type, characteristics and geographical distribution. Following this a possible link will be explored between the trade in dogs and the buried remains of over 1200 dogs which were discovered in Ashkelon by the archaeologists of the Leon Levy Excavations. These took place under the leadership of professor Lawrence E. Stager, who was the director of the expedition sponsored by the Semitic Museum of Harvard University. A number of different opinions have been expressed about the origins of these dogs, but so far no definite conclusion has been reached (Stager 1991b:26-42; Wapnish & Hesse 1993:55-80; Gore 2001:82-83). As final part of this chapter the possibility will be discussed as to whether some of these dogs could have been ship dogs on Phoenician ships.

#### 9.2 TRADE IN DOGS

##### 9.2.1 Pharaoh Hound

One of the not so generally well known facts about the Phoenicians is that they traded in dogs. This was a random discovery while paging through a dog encyclopedia (Various authors 2002). One of the breeds was called a 'Pharaoh Hound', but when reading the description, it became clear that this type of dog, which originated in Egypt, is now considered a native dog in Malta. Apparently this breed of dogs had been taken



there by Phoenician traders (Cunliffe 1999:218), but does not seem to exist in Egypt any longer (See *Figure 9-1*).

Further research revealed the following about the Pharaoh Hound: it is regarded as the oldest domesticated dog and it closely resembles the images of dogs depicted on the tomb walls of the pharaohs and also on ancient Egyptian artefacts dating as far back as 2000 BCE. It is a hunting dog with a tan, glossy, shorthaired coat, sometimes with small white markings on the chest. It has a long, lean, well-chiselled head, with large erect ears, which function to radiate heat, and has amber eyes. Besides to Malta, these dogs were also taken to the nearby island of Gozo by the Phoenicians (Various authors 2002:150).



**Figure 9-1: Pharaoh Hound (Various authors 2002:150).**

In the great cemetery west of the pyramid of Cheops, at Giza, an inscription was found in 1935 by archaeologists about such a dog, called Abuwtiyuw, which had been buried

with great ritual ceremony by order of the kings of Upper and Lower Egypt (Cunliffe 1999:150). The Pharaoh Hound also resembles the Egyptian dog-god Anubis, which was tasked with guiding the souls of the newly departed into the after-life (Various authors 2002:150). Egyptologists often refer to Anubis as the representation of the jackal, but in actual fact the image of Anubis resembles the Pharaoh Hound much more closely, including the yellow eyes. A very beautiful sculpted image is portrayed in Stierlin (1995:136-137), and the accompanying commentary states that the wooden sculpture was found in the tomb of Tutankhamun, guarding the entrance of the canopic chamber and represents the god Anubis in the shape of a wild desert dog, with elongated ears, pointed muzzle and small feet, which roams at night. This image also has yellow eyes (See *Figure 9-2*).



**Figure 9-2: Watchdog of the Necropolis, the god Anubis guards the entrance of the canopic chamber of Tutankhamun's tomb. This three-foot-long (1m) wooden sculpture represents a wild desert dog and not a jackal. The animal, with elongated ears, pointed muzzle and small feet, roams at night and represents the master of the City of the Dead. The statue is covered with black varnish highlighted with gold: the eyes are alabaster and obsidian (Egyptian Museum, Cairo) (Stierlin 1995:136-137).**

It is maybe of interest to mention here as well, that dogs were part of the cargo that was brought back by the ships sent to Punt by Hatshepsut. This is mentioned in an inscription on the wall of the temple in Deir el Bahri, above the image of the ships (Wachsmann 1998:22). So trade in and transport of dogs was not unusual in ancient times.

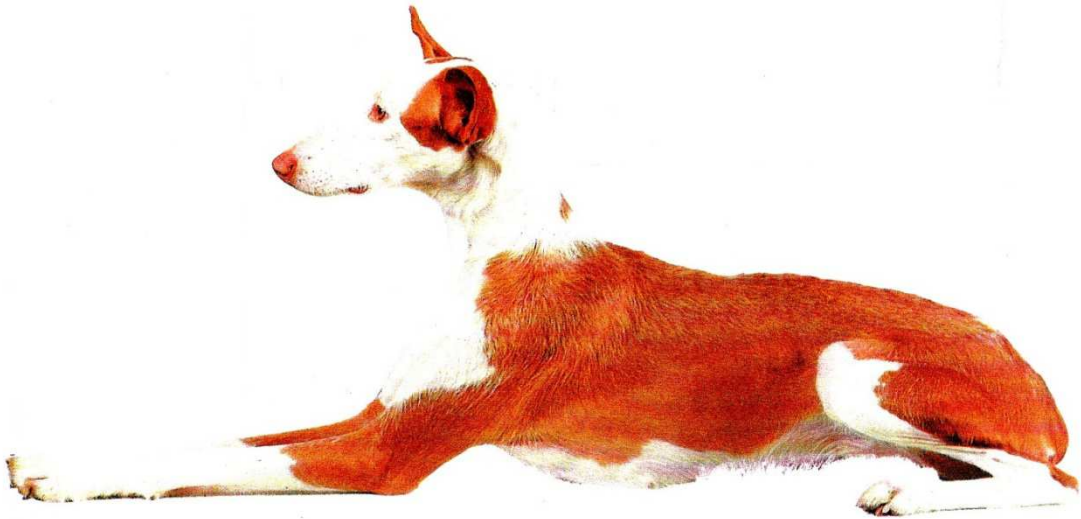
Another interesting detail is the image of a dog on the bow of the giant ship that was used to transport Hatshepsut's obelisks (See Chapter 3, *Figure 3-8*) (Gore [ed.] 2001:16)

### **9.2.2 Sicilian Hound**

Searching further in the dog encyclopedias brought additional information: not only did the Phoenicians bring dogs to Malta and Gozo, but also to Sicily. The Sicilian Hound, also known as the Cirneco dell'Etna, is thought to have been brought there by the Phoenicians. Here the author added an interesting comment, namely that: "the Phoenicians are reputed to have carried on a profitable trade in greyhounds and other sighthounds, which they acquired in Africa and Asia and unloaded in Aegean and Mediterranean mainland ports and islands, including Sicily." The characteristics of the dog that were described include that this type of dog resembles the Pharaoh Hound, but is smaller, has a rougher coat and a more oval shaped head. It is a hunting dog, used in Sicily to hunt wild rabbit, hare and other game on the slopes of Mount Etna (Various authors 2002:151).

### **9.2.3 Ibizan Hound**

The Phoenicians took their trade in dogs even farther, because the Ibizan Hound is said to have been brought by them to the Balearic Island of Ibiza, where the Phoenicians are known to have had a settlement. It also resembles the Pharaoh Hound, but has much more white in its coat. Its lower legs are white, as well as large parts of the head, neck and chest. These dogs are also called Podenco Ibicenco and Ca Eivessenc and make good hunting dogs (Various authors 2002:152) (See *Figure 9-3*).



**Figure 9-3: Ibizan Hound (Various Authors 2002:152).**

#### **9.2.4 Spanish Greyhound**

And even farther afield the Spanish Greyhound or Galgo Español is also believed to have been brought to Spain by the Phoenicians. It is of tawny colour with a black mask, or black streaked with a light undercoat and is used for coursing on the race-track (Various authors 2002: 152).

All these varieties may have descended from or have been related to the Pharaoh Hound of Egypt, but also display characteristics of Salukis, which originate in Iran. These dogs enjoy running and can achieve great speeds. Salukis were also used for coursing and for hunting gazelle in Antiquity. They occur in a wide range of colours, such as white, cream, fawn, golden, red grizzle or tan, tricolour, black and tan, or variations of these colours (Vicente [ed.] 2011:126).

#### **9.2.5 Mastiff**

According to the South African Dog Directory 2011, the Mastiff, also known as the Old English Mastiff, is thought to have descended from large Mastiff type dogs that were brought to Britain by Phoenician traders in the sixth century BCE. The Mastiffs were crossed with local fighting dogs and were subsequently used to hunt the wolf. Later these dogs became combatants in blood sports such as fighting lion and bear. The

Mastiffs supposedly originated from Assyria (Vicente [ed.] 2011:120-121) and were used by the Assyrians in war (Cunliffe 1999:71) (see *Figure 9-4*).



**Figure 9-4: Assyrian troops used dogs in war (Cunliffe 1999:71)**

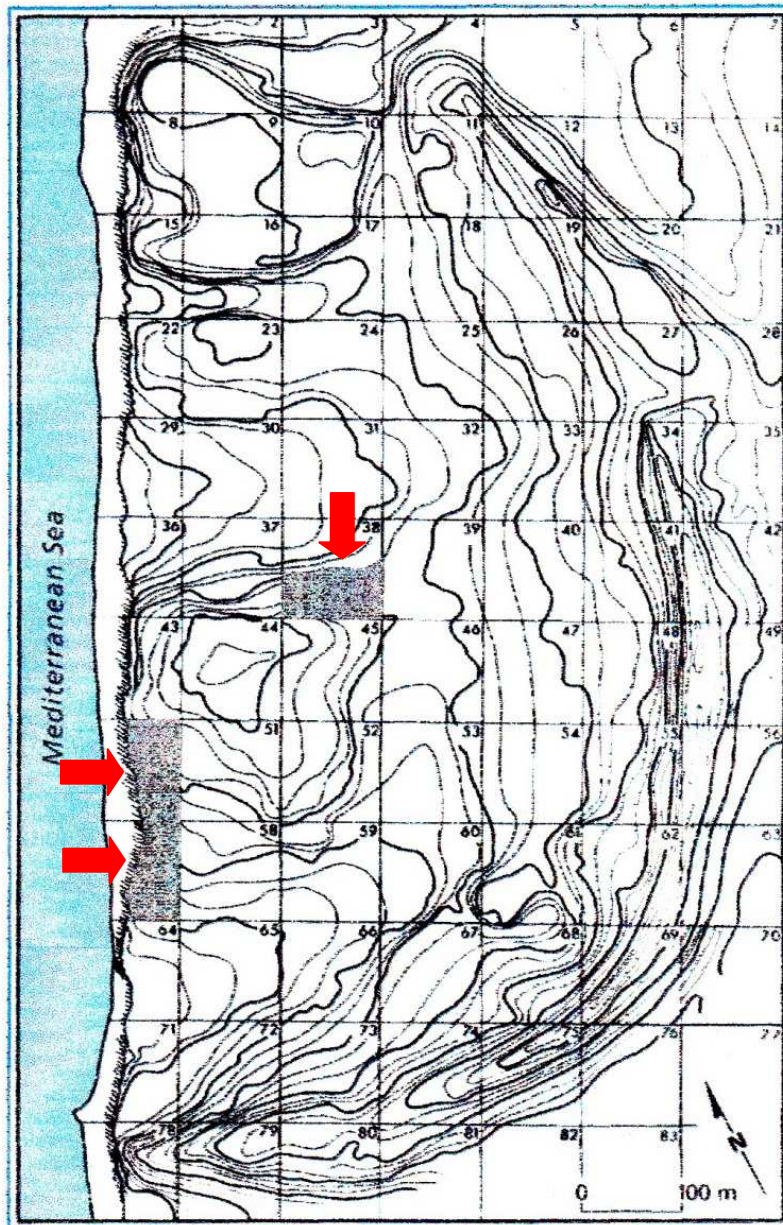
### **9.2.6 Summary**

So the Phoenician dog trade seems to have been wide-spread, comprising dogs from different origins. It is also interesting to note that the dogs mentioned above have survived mostly on islands. The insularity of the islands may have helped to maintain the breeds as they could not easily move anywhere else or get interbred with other types of dogs. It also means that the Phoenicians must have brought more than one dog to each place where they are still found at present, otherwise they would have died out. Another consideration is that in view of the fact that after 2500 years the above mentioned breeds still exist, the Phoenicians may have taken many more dogs to other destinations around the Mediterranean or further afield, which died out or disappeared in other ways.

### 9.3 THE ASHKELON DOG CEMETERY

As a result of the widespread distribution of the dogs traded by the Phoenicians, the article on the Ashkelon excavations in National Geographic in 2001 came to mind (Gore 2001:66-93), and with it the question of whether the more than 1200 buried dogs, found during the ongoing excavations of Ashkelon somehow might be linked to the Phoenician trade in dogs.

The dog burials were excavated from the layer dating to the Phoenician presence in Ashkelon during the Persian Era (Gore 2001:82-83) and were reported on by the leader of the Leon Levy Excavations, Professor Lawrence Stager, in an article in Biblical Archaeology Review in 1991 (Stager 1991b:26-42). In this article he stated that it was unlikely that the Persians would have buried the dogs, as the way the dogs were buried, was not according to the rules for burial of the Zoroastrian faith of the Persians. The Egyptians at Ashkelon did not bury the dogs either, as they would have had them mummified, and none of the dog remains found showed any sign of mummification. As for the Greek segment of the population, this was too small in Ashkelon to have had enough authority to use a prime piece of property to bury so many dogs. Therefore the only population group large enough and with enough authority to bury such a large amount of dogs, would have been the Phoenicians. They were in charge of Ashkelon during the Persian Era. According to Stager, 'it was the Phoenicians... who were responsible for the dog burials at Ashkelon and who considered the dog a sacred animal' (Stager 1991b:39). It is also worth noting that Ashkelon, which was a cosmopolitan center in the Persian period and as a port drew people from all over the Levant, was the nearest large harbour city close to Egypt, and also was on the trade route that came from the north and north-east going down to Egypt, the Via Maris. Due to its location it could have been a very convenient harbour city as a transit center for the dog trade. From here dogs could be shipped all over the Mediterranean.



**Figure 9-5: Dog burial areas in Ashkelon (Wapnish & Hesse 1993:55).**

The main area of the dog burials was located close to the coastline, in excavation grid areas 50 and 57 and the dog burials took place in an area, where in about 500 BCE a large building complex was begun, which was subsequently levelled and then used for the dog burials (Wapnish & Hesse 1993:57) (See *Figure 9-5*). In the lengthy and very detailed article in which they consider a number of options, they are of the opinion that all the dogs conform to the appearance of local unmanaged dog types in the region (Wapnish & Hesse 1993:74). In this regard they differ from the opinion expressed by Professor Lawrence Stager, who believes that the buried dogs were part of a short-

lived dog cult, because 'dogs were associated with healing in many cultures because they lick their sores and wounds' (Gore 2001:83).

These dogs were not buried as sacrifices, as they do not show trauma or cut marks (Gore 2001:83, Wapnish & Hesse 1993:60), and there does not seem to be any relationship either with the dog cult of Anubis in Egypt at Saqqara. There a crypt was found full of dog bones, dating to the period after 748 BCE, when black pharaohs ruled Egypt and when dogs were sacrificed to Anubis underneath his temple after they had been taken there by priests from kennels in the temple precinct. ([www.spiegel.de/international/world/0,1518,732654,00.html](http://www.spiegel.de/international/world/0,1518,732654,00.html)).

Has anybody given any thought to the possibility that the Phoenicians might have had a dog breeding facility in Ashkelon? Instead of paying money for dogs, it would have been easy to breed with the dogs that they had bought in Egypt, Persia or elsewhere. In those days diseases like Canine Distemper and Parvo Virus could not be prevented by vaccinations, so dogs presumably died and may have been buried to prevent the spread of these diseases. That could also explain why there were so many puppies buried, as about 60-70% of the buried dogs were puppies (Stager 1991b:31). Dogs that had died, had to be disposed of, and other options, such as throwing them into the sea, (which is one of the options Prof. Stager mentions in his reply to Prof. Smith (Smith 1991:14), or burning the bodies, were not practical. Throwing them into the sea would have seen wave action washing them ashore again, as the prevailing wind direction along the entire Levantine coast is south-westerly (Marriner, Morhange et al. 2005:1303). Burning a dead dog would have caused a lot of bad smell and would have required precious fuel (wood) to be burnt as well. Burying them in the soft beach sand was a much easier and quicker solution. That would also explain why dogs were found partially buried over one another. As dogs were buried over time according to Wapnish & Hesse (1993:61), the burials accumulated intermittently. Previous burial places were not marked and a new hole, dug at random, could easily overlap with a previous burial. Stager (1991b:39) states that the ground occupied by the dog cemetery was in an area that was devoted to profit-making enterprises connected with the export-import business. Were dogs kept in this industrial area, which was also close to the shore, so that shipping them would have been easy?

If these dogs were simply the local dog population roaming the streets of Ashkelon as Wapnish & Hesse maintain (1993:67), then the inhabitants of the city must have gone to extraordinary lengths to bury all these dead dogs, and there must have been an amazing abundance of dogs in Ashkelon. What is lacking in the entire article by



Wapnish and Hesse is the human intervention in burying the dogs and the economic, religious or other motive to do so. A few dogs buried at Tel Dor (Wapnish & Hesse 1993:68-69) can still be explained, like the seven remains that were found there, out of a sense of respect or reverence, or the single dog buried at Tell Qasile or several dogs at Gezer (Stager 1991b:39), but more than 1200 dogs? Who would carry on with that unless it was for a specific purpose or necessity? If these were dogs roaming the streets, why would the puppies that were buried, be so remarkably well preserved? Small puppies are very vulnerable and would have disintegrated fairly rapidly if they had died in the streets.

Maybe there was a dog cult as Prof. Lawrence Stager suggests, although no cultic center has been found anywhere nearby, and there does not seem to be much other reference to a dog cult in any other literature either about Ashkelon or about the Phoenicians, except for a center on Cyprus (Stager 1991b:40).

There seems to be a tendency in the USA however, (which I noticed during the year that I spent as an exchange student at the University of Arizona in 1971-1972), that if no interpretation of an archaeological find could be given in any way, the one-size-fits-all explanation would be that it had something to do with a religious practice. Prof. Morton Smith, in a reaction to Stager's article, which was published in a subsequent issue of *Biblical Archaeology Review*, warned against just this practice, of labelling everything as religious, if no other explanation could be given. He was of the opinion, that an epidemic had killed the dogs (Smith 1991:13-14), but that would not account for the approximate 50 year span during which the burials took place, as an epidemic would have been of a shorter duration. This was the opinion of Prof. Stager expressed in response to Prof. Smith and this reaction was printed after the submission by Prof. Smith in the same magazine issue.

Would it not be a much more practical interpretation and one in line with the down-to-earth Phoenician practice of trade, of earning a profit with all that they did, that these dogs were kept in Ashkelon for trading and breeding purposes? Dogs were considered very special by the Persians and this short-lived trade in dogs corresponds to the era when they ruled. This was a sort of fad, which passed after a span of about 50 years.

That the Phoenicians were no strangers to the trading of animals can be deducted from the fact that they brought monkeys and peacocks from Ophir (See 7.4), and that they had horse transport ships for their trade in horses and mules (See 4.1.4).

Another purpose for the trade in dogs may have been that they were a source of food. According to Richard Miles, dogs were eaten in Carthage. He states that about 3% of the bone sample found there were dog bones, which often show signs of having been butchered (Miles 2011:76, 392).

## 9.4 SHIP DOGS FOR PHOENICIAN SHIPS

In closing the possibility that these dogs were intended as ship dogs will be investigated. For this reference needs to be made to what my grandfather Gerardus de Vries Lentsch once shared about dogs on ships. He explained that skippers on the wooden merchant ships, such as the Frisian Tjalken, which plied the waters of the Netherlands with freight in the eighteenth and nineteenth century CE, and which also were about 16 - 20 meters long, about the same size as the Phoenician merchant ships, never had a big dog on board of their ships. They only had very small dogs such as the Schipperke and that was because of the following reason: if a big dog starts running forth and back along the length of the ship, this causes a sinusoidal wave, which brings about a harmonic, a vibration which moves in waves along the length of the ship and which takes on a momentum of its own, getting stronger the longer the dog keeps on running, until eventually it becomes so strong that the wood and joinery of which the ship is made, starts breaking up. At first this theory sounded highly unlikely, but eventually it all made sense. What he did not explain is if it is only the weight of the dog or the length of its stride, or the combination of the two, that causes the wave to become so strong that it destroys the ship.<sup>23</sup>

A Schipperke dog only weighs about 5,5-7,5 kg (Various authors 2011:129), but the dogs found at Ashkelon weighed an estimated 11-20 kg (Wapnish & Hesse 1993:62). The above-mentioned dog-breeds, which the Phoenicians are said to have distributed all over the Mediterranean, are also of that weight or heavier. When the dogs were transported by the Phoenicians, they most likely were kept in cages, or were restricted in their movements until such time that they had reached their destination. They were not allowed to run freely on deck because of their size and the risk this posed to the ship. Their purpose was not to be ship dogs, but they were sold as merchandise by the Phoenicians in whichever harbour there was anybody willing to buy a dog, possibly for hunting or other purposes.

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<sup>23</sup> It is the same principle as a long column of trucks that moves at the same distance from each other and at the same speed over a bridge and causes a sinusoidal wave and the harmonics of that wave are what make the bridge collapse.

## 9.5 CONCLUSION

When we weigh up all the above mentioned facts, such as the distribution of dogs by the Phoenicians over the Mediterranean basin and beyond, the central location of Ashkelon, the popularity of dogs in the Persian era, the many dogs buried in Ashkelon in a prime piece of industrial land connected to import-export activities, the absence of a cultic center to which the buried dogs could have belonged, the period of time over which the dog burials accumulated, which excludes an epidemic as cause of death, the sheer amount of dogs as well as the well-preserved state of the remains, which excludes slaughter or ritual death, and we combine this with the main focus of Phoenician activities, namely trade, then a strong case can be made for the possibility that there was a transit and breeding center for the export of dogs in Ashkelon.

The dogs were transported by means of ships, as it would have been impossible to reach the various islands on which there still are dogs of the above mentioned varieties, without ships as modes of transport. As the dogs were too large in size to be ship dogs *that* was not the purpose for which they were on board. They simply were transported as merchandise and the trade in dogs lasted about 50 years.

## CHAPTER 10

### TREACHEROUS TRADE ROUTES

#### 10.1 INTRODUCTION

In the course of the research into the various types of Phoenician ships, other points of interest emerged and these in turn led to some interesting questions. The expression “Pillars of Hercules” was used by some of the authors (e.g. Aubet 1993:169-170), as well as “Scylla and Charybdis” (e.g. Mazel 1971:101-102), names last referred to in the Greek mythology class in High School. There, those names simply indicated unworldly, mythological places, but what if these waterways really existed, not just in the imagination of the Greek poet Homer, but somewhere in the Mediterranean? In Greek mythology these sea straits were described as very dangerous, but would the Phoenicians also have tried to sail through these narrow waterways, and would they have encountered the same sort of difficulties as the Greek seafarers?

Another question was raised by the recent discovery of a Roman ship wreck in deep water off Corfu. If the Romans took the risk of sailing across open water, and did not remain close to the coasts of the Mediterranean, would the Phoenician seafarers before them have risked the same? What about the remains of two Phoenician cargo ships investigated by Ballard and Stager off the coast near Ashkelon? Were these located in deep water? What were the dangers inherent to sailing on the Mediterranean Sea, and if the Phoenicians indeed did sail on the Atlantic Ocean, what influence would that have had on the types of ships they used?

As the subsequent research proved very interesting, it was decided to add this information in a final chapter to the dissertation.

## 10.2 DANGERS INHERENT TO SAILING ON THE MEDITERRANEAN SEA

### 10.2.1 Seasons and weather

In summer, the Mediterranean Sea is relatively calm and sun-drenched and not too difficult to sail on (Aubet 1993:157). Winter however presents a totally different picture, with violent storms as well as fog and limited visibility. As a result of this, sailing in Antiquity was limited to the periods of good weather, more or less from the end of May till mid-September, although the outside limits were from 10 March to 10 November (Casson 1971:270). All vital transport of goods had to take place during the summer months. During late fall and winter sailing only took place if absolutely necessary, such as for military purposes or for transmitting vital dispatches. During this period the sea lanes were mostly deserted and the ports in a state of hibernation (Casson 1971:271). The risks were simply too great and consisted more precisely of: scant daylight, long nights, dense cloud cover, poor visibility and the violence of winds doubled by the addition of rain or snow (according to the ancient writer Vegetius, as quoted by Casson) (Casson 1971:272).

At this point Casson also posed an interesting question in a footnote, stating the following:

An important subject that has never been treated is the extent of the economic dislocation that all port towns had to suffer because of the limited sailing season (Casson 1971:271).

It is not surprising that he should raise this question, because in this day and age planes fly year around and the economy must be active continuously. However, the answer to Casson's question is in fact rather simple: the summer season was used to transport all the necessary goods and stockpile these in the available storage near the harbours. The winter season was used to repair, maintain and caulk the ships. Sails, tackle, oars, all equipment had to be inspected to see if it would last another sailing season, and would have to be repaired or replaced, to have everything ship-shape once the sailing season started again. The sailors not only knew how to sail, but also how to maintain their ships. During the sailing season only emergency repairs would be performed, and in depth maintenance would only be done when time was available in winter. This is still the case in every harbour where sailing ships are moored (nowadays mostly recreational craft). There would be a summer and a winter economy, and the people affected by this type of economy would have a different job

in summer and in winter and needed to be multi-skilled. In this context it is also worth referring back to the verse in Ezekiel 27:9 regarding the old craftsmen of Gebal, who were in Tyre to caulk the seams of the ships. These old hands no longer would go to sea for long voyages, but their experience to caulk seams of ships was invaluable for the maintenance process of the ships. They were probably very busy with this task during the winter months, with caulking of new ships done in summer.

### 10.2.2 Wind direction and currents

Other factors to influence sailing on the Mediterranean in Antiquity, were prevailing wind directions and currents. As already mentioned, the sails that were used in those days were square, suspended from a yard and with loose-footed brails. These were incapable of sailing against the prevailing wind direction by means of tacking<sup>24</sup>. Only sailing downwind, or with wind coming from the quarters (that is a bit sideways either side from the back) was suitable to propel a ship. If the wind was against, then the only alternatives were the use of oars, or to wait for a more favourable wind. Usually the latter prevailed (Aubet 1993:155)<sup>25</sup>.

Generally speaking currents were not such a strong factor in the Mediterranean, with exception of the narrow sea straits, where they could be quite dangerous. They were mostly the result of the prevailing wind direction and sailors tried to use both wind and current to their advantage. The most prevalent current in the entire Mediterranean basin is anti-clockwise, running from Gibraltar along the African coast to Port Said, and turning northwards along the Levantine coast, where it combines with the current from the Black Sea to head west and following the coastlines of Greece and Italy all the way to the Gulf of Genoa, where it heads southward, following the Spanish coast to

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<sup>24</sup> Tacking is a zigzag movement of the ship to make use of the available wind to reach its destination when the wind is blowing from the direction where the ship is heading. This is done by changing the direction of the ship when sailing close-hauled by turning the bow to the wind and shifting the sails so as to fall off on the other side at about the same angle as before (Webster's 1077:1186).

<sup>25</sup> The inability to tack with square sails was proven quite convincingly in modern times by Timothy Severin, who sailed a boat made of leather hides (a curragh) from Ireland to Newfoundland during the summers of 1976 and 1977. This expedition was an attempt to prove that the 6<sup>th</sup> century voyage of St. Brendan, known from ancient literature, was no figment of the imagination, but had indeed taken place. The "Brendan", as the leather boat was called, was rigged with two square, loose-footed sails, both suspended from a yard, and the crew needed to learn to sail with this type of rigging from scratch, as there was no information available as to how this would work. When the wind was unfavourable for the direction they wanted to sail to, they would simply be blown backwards, as tacking was impossible. Despite these difficulties, Severin and his crew did succeed in reaching Newfoundland (Severin 1977:776, 780-781; Severin 1978:53, 289).

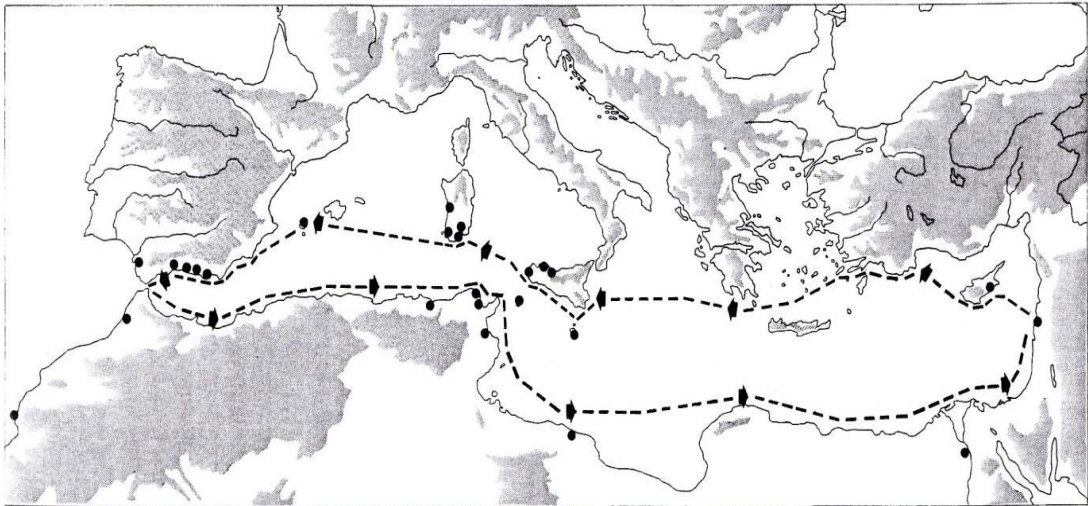
Gibraltar. These conditions together with the prevailing wind conditions determined the sea routes that were followed to sail on the Mediterranean Sea (Aubet 1993:156-157).

### **10.2.3 Sailing on the open sea**

The recent find of a Roman cargo ship by Greek archaeologists at a depth of between 1.2 and 1.4 kilometers between the island of Corfu and the Italian coast (<http://www.business.standard.com/generalnews/news/deepest-ever-roman-era-shipwrecks-found-near-greece/15558>), brought the question to the fore again of whether the ancients sailed over the open sea, instead of close to the shoreline as has often been assumed up till now. If the Romans were able to do it, would the Phoenicians already have done this before them?

Aubet states that both the currents and the wind conditions made it necessary to sail on the open seas. The main shipping route from the Phoenician coast ran in a north-westerly direction to Cyprus, then from there along the south coast of Asia Minor, across the open sea to the southern reaches of Greece, then across the open sea to Malta or along the south coast of Sicily to Motya. From Motya on the far western tip of Sicily, the route continued to the southern shores of Sardinia, and then across open water to Ibiza, from where the coast of Spain could be reached over open water. Along the coast of Spain the route continued to Gibraltar and beyond (Aubet 1993:157,161) (See *Figure 10-1*).

Aubet is absolutely convinced that the Phoenicians sailed the open seas and did so by means of the Ursa Minor constellation. Sailing the open seas requires sailing by night and can only be achieved by means of making use of the stars as guiding lights (Aubet 1993:142).

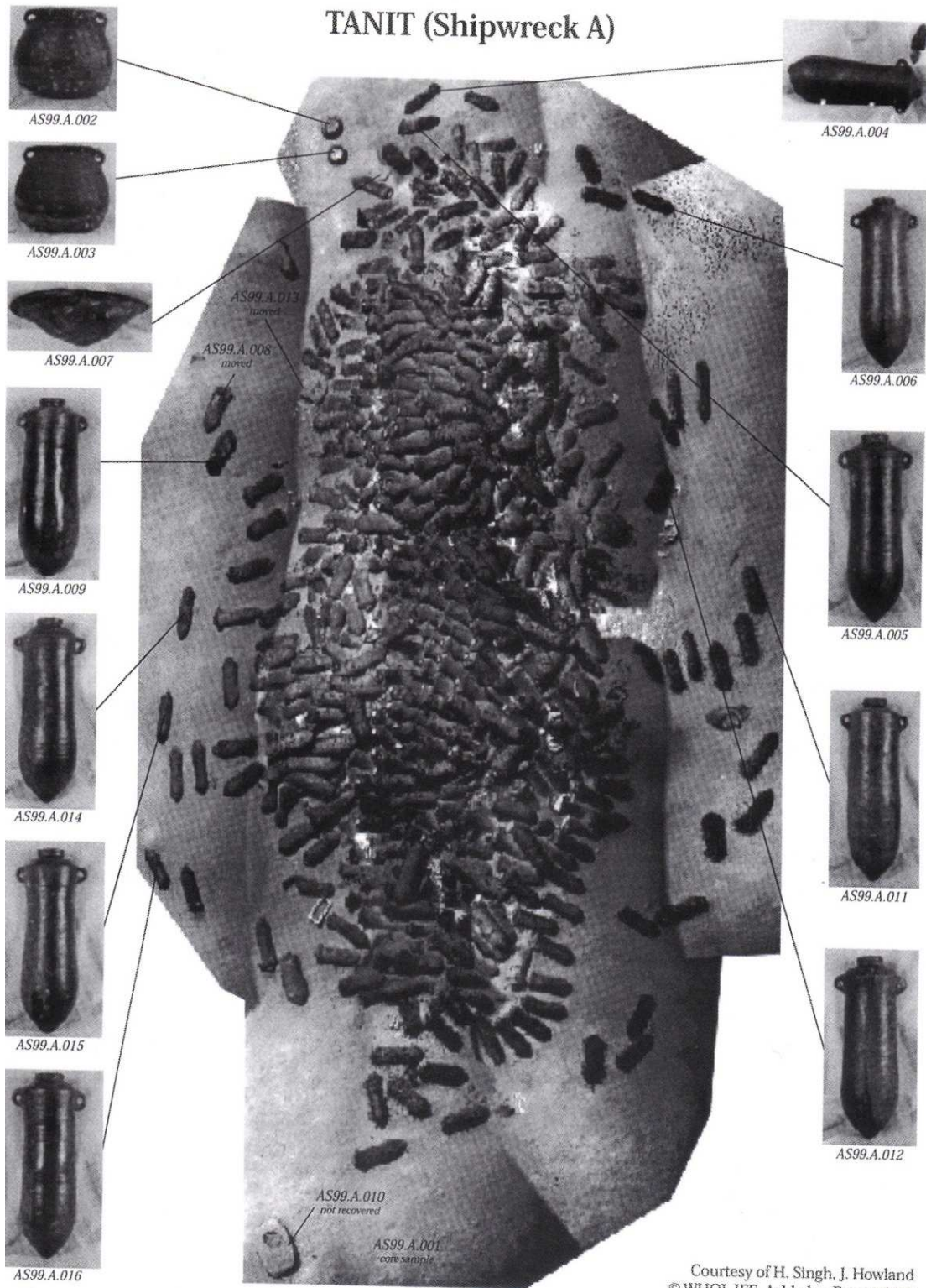


**Figure 10-1: Shipping routes in the Mediterranean (Aubet 1993:161).**

Further support for the theory of sailing the open seas comes from the find of two Phoenician merchant ships quite far off the coast of Ashkelon by means of an underwater expedition conducted by Robert Ballard (who also located the wreck of the Titanic) and Professor Lawrence Stager, leader of the Leon Levy Excavations in Ashkelon. In 1999 they led an expedition to locate and survey two ancient ships, which had sunk about 50 kilometers west of the seaport of Ashkelon. Ballard had been informed that these wrecks had been seen from a US Navy submarine patrolling in that part of the Mediterranean (Gore 2001:91-93). By retrieving a number of articles from the sea floor, such as cooking pots and amphorae, it was possible to date these ships to between about 750 and 700 BCE. They had set sail from a Phoenician port, probably Tyre (Gore 2001:92) heavily laden with a cargo of between 10 and 12 tons of wine-filled amphorae each, and had apparently floundered in the same storm. The treacherous “east wind” or *rûah qādîm*, that “shatters the ships of Tarshish” according to Ezekiel 27:26 (see also Ps.48:7), were probably the cause of their sinking (King & Stager 2001:185). The ships were found with their bows heading in a westerly direction far away from the coast, and may have had Egypt or Carthage as their destination. At that stage, the latter place was still heavily dependent on food supplies from its mother city Tyre (King & Stager 2001:179-180,185; Markoe 2000:56) (See *Figure 10-2* and *Figure 10-3*).

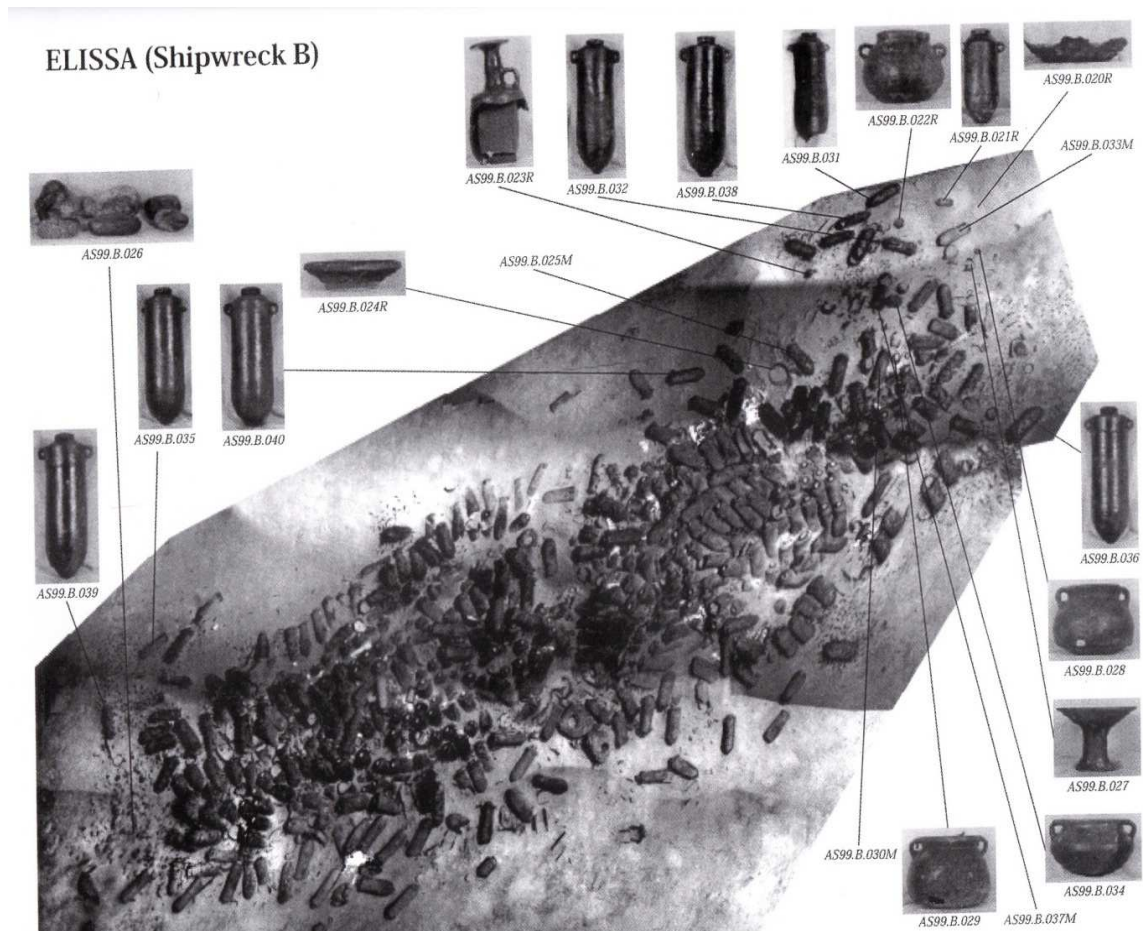
From the above we can deduce that sailing the open seas was in all probability already practiced by the Phoenicians at quite an early stage in Antiquity. It was in fact probably safer not to sail too close to the coastline, due to possible dangers lurking under water, such as submerged rocks or sand banks etcetera.





Courtesy of H. Singh, J. Howland  
 © WHOI, IFE, Ashkelon Excavations

**Figure 10-2: A Phoenician shipwreck now dubbed *Tanit*, latter half of the eight century BCE, with a cargo of wine. Retrieved artefacts are indicated in the margins (King & Stager 2001:180).**



**Figure 10-3: A Phoenician shipwreck now dubbed *Elissa*, from the latter part of the eight century BCE, with a cargo of wine. The artefacts retrieved from the seabed are shown in the margins. (King & Stager 2001:181).**

## 10.3 DANGEROUS SEA STRAITS

### 10.3.1 Scylla and Charybdis

Finding oneself “between Scylla and Charybdis” is a somewhat archaic way of saying that people find themselves “between a rock and a hard place”, having to choose between two evils. The expression originates in Antiquity, as the oldest reference to the names Scylla and Charybdis is found in Homer’s *Odyssey*. This classic text recounts the difficulties encountered by Odysseus and his men on their way back home after the defeat of Troy (Rieu [transl.] 1946:195-196). Scylla and Charybdis are described as two sea-monsters, out to destroy passing ships and crews.

Scylla was believed to be a six headed monster, living in a cave located high in a rock near the water. Each head had a long neck, which would bend down to enable the

mouth to grab a member of a passing ship's crew and drag these off to devour them in the cave. In this way Odysseus lost six of his crew when passing through the Strait (Bulfinch1993:299-300).

Charybdis was a gulf, nearly on a level with the water. Three times each day the water rushed into a frightful chasm and three times it was disgorged. If a vessel came too close near the whirlpool when the tide was rushing in, it would be totally engulfed and broken to pieces (Bulfinch 1993:299-300).

The question is: were these dangers only mythological, or did they really exist? And could they have affected the Phoenicians as well as the Greeks?

Scylla and Charybdis have been identified as respectively located as a shoal-rock on the coast of the Italian mainland, where there is now still a rock as well as a place with the name of Scylla, and a vortex caused by the meeting of currents at the top end of the Strait of Messina on the Sicilian side of the Strait. If ships tried to avoid the vortex, they were likely to land up too close to the rock and vice versa. According to Mazel, villagers living in the vicinity of the vortex (or whirlpool), told him that it was still in existence in the 19<sup>th</sup> century, but has since disappeared (Mazel 1971:101). As the area is volcanic and breaks in tectonic plates can cause friction, geological changes may have caused the vortex to disappear. Even so, Mazel reports that when sailing in this part of the Mediterranean strange phenomena can occur such as tremors, which can affect the sailing vessel (Mazel 1971:102).

Moreover, recent investigations have discovered that there is still another phenomenon present in the Strait of Messina. That is the regular occurrence of an Internal Wave. This comes about as follows: The Strait is a narrow channel, at its narrowest 0.3 km. This is also where there is an underwater sill present, an elevation like a threshold, and the depth there is about 80 m. To the south the depth increases rapidly to 800 m, 15 km south of the sill and to the north it increases to a lesser extent and reaches a depth of 400 m, 15 km from the sill. The water to the north of the sill belongs to the Tyrrhenian Sea, and is warmer. This is called the Tyrrhenian Surface Water (TSW). The water to the south of the Sea is the colder and saltier Levantine Intermediate Water (LIW). These water masses do not mix, but flow over each other and are separated at a depth of 150 m. Even though there is very little tidal displacement in the Mediterranean Sea (on average about 10 cm difference between high and low tide), the tidal displacement in the Strait of Messina is much larger because the tides north and south of the Strait are approximately in phase opposition. This can lead to currents through the Strait with speeds up to 3.0 meters/second. This

in turn can also still be influenced by changes in wind and air pressure. ([http://internalwaveatlas.com/Atlas2\\_PDF/IWAtlas2\\_Pg199\\_StraitofMessina.pdf](http://internalwaveatlas.com/Atlas2_PDF/IWAtlas2_Pg199_StraitofMessina.pdf)).

Besides the tidal influences, the presence of the sill causes another phenomenon, which is the generation of an Internal Wave. This wave occurs between the two different layers of water as described above and the wave is caused by the obstruction, caused by the sill when the tidal flow pushes the layered water body over the sill. This leads to a series of underwater waves fanning out either to the north of the Strait or southward into the Strait, depending on the direction of the tide. Even though these waves are not easily visible on the surface, they influence the surface current and cause a change in sea surface roughness (choppier waves). Modern techniques such as satellite images have made it possible to detect these phenomena, which seafarers already experienced in ancient times, but could not explain (<http://www.ifm-geomar.de/fileadmin/personal/fb1/po/pbrandt/RSES07.pdf>) (See *Figure 10-6*). So the Greeks had ample reason to fear passage through the strait, and the references to this phenomenon in ancient literature most definitely had a purpose.

It is interesting that the Phoenicians initially had settlements on the eastern coast of Sicily, and thus must have sailed through the Strait of Messina, probably between the twelfth and the eighth century BCE (Mazel 1971:102; Aubet 1993:138). When the Greeks appeared on the scene in about 720 BCE, however, the Phoenicians abandoned the eastern coast of Sicily completely and only retained settlements on its north-western side, such as Panormus (now Palermo) and Soluntum, as well as the island of Motya off its west coast. These were also easy to reach from the newly established settlement at Carthage (Markoe 2000:102). Motya, with its man-made inland harbour, (called a *cothon*), was located in a shallow lagoon with excellent anchorage, and in about 600 BCE its fortifications were drastically improved (Edey 1974:151-155) (See *Figure 10-4* and *Figure 10-5* ). In order to reach it, there was no need to sail through the dangerous Strait of Messina. As such it was a much safer place to reach, as the Phoenician ships could sail along the south coast of Sicily, which provides shelter from the prevailing north winds (Aubet 1993:160). This would also have made much economic sense. If an entire ship floundered with its cargo, it was an expensive loss and by only retaining footholds on the western and north-western coast of Sicily, there was no longer a need to sail past the dangers of Scylla and Charybdis.

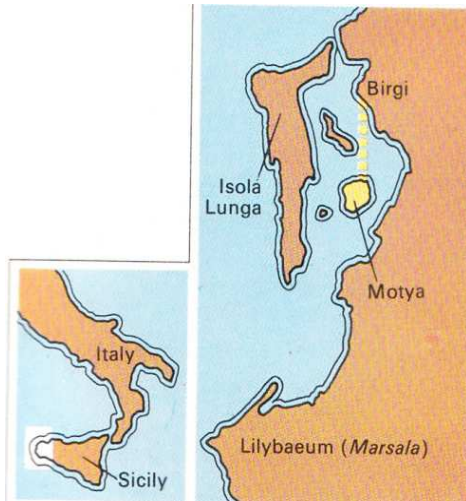


Figure 10-4: Motya was located off the western tip of Sicily surrounded by a safe lagoon (Edey 1974:151).



Figure 10-5: Motya had a dug harbour, called a *cothon*, as well as a causeway, which connected it to the mainland (Edey 1974:153)



Figure 10-6: Strait of Messina. The semi-circular wave patterns visible just above the Strait, as well as at the bottom of the picture in the center, show the internal waves generated by the sill in the narrowest part of the Strait (<http://www.ifm-geomar.de/fileadmin/personal/fb1/po/pbrandt/RSES07.pdf>).

### 10.3.2 The Pillars of Hercules

In Antiquity the Strait of Gibraltar was known as the “Pillars of Hercules”. This name originated from the mythological stories about the “Twelve Labours of Hercules”. Hercules (or Heracles, as he was called in Greek), was the son of a Greek god and a human mother. He was supernaturally strong and had to fulfil twelve impossible tasks. One of these was that he opened the Strait of Gibraltar, by pushing two mountains to either side, hence the name “Pillars of Hercules” (Bulfinch 1993:179). That this symbolism has endured to this day is reflected in the Spanish coat of arms, which shows two pillars, representing either side of the Strait of Gibraltar (<http://spain-flag.eu/>).

In the course of their westward movement, in search of metals and other trade, the Phoenicians eventually reached the Strait of Gibraltar. When this took place exactly is still the subject of debate and speculation. Even though the archaeological record of the Phoenician presence in Spain only goes back to the eighth century BCE, trade exploration may have started long before that, and the traditional foundation date for Cadiz (1104/3 BCE) could be more accurate than has been assumed for a long time. According to Markoe isolated finds of older date now suggest an earlier presence (Markoe 2000:183). Aubet disagrees with Markoe, and is more in favour of a later date of arrival. She is of the opinion that this took place somewhere between the tenth and eighth century BCE (Aubet 1993:173). This means that somewhere around that time Phoenician ships started sailing through the Strait of Gibraltar. This was a hazardous undertaking and why that was the case will be explained in what follows.

The narrow strait, only about 14 km wide and ranging in depth from 300 – 900 m. is the place where the Atlantic Ocean meets the Mediterranean. The water of the Mediterranean has a much higher salt content, due to evaporation, than the water of the Atlantic. When the colder and less salty water from the Atlantic flows into the Mediterranean, it floats on top of the warmer and heavier salt laden water of the Mediterranean. A density boundary separates the layers at 100 m. depth. More water flows eastward, from the Atlantic to the Mediterranean, due to the evaporation in the Mediterranean (<http://www.internalwaveatlas.com/Atlas-PDF/IWAtlas-Pg099-StraitGibraltar.PDF>).

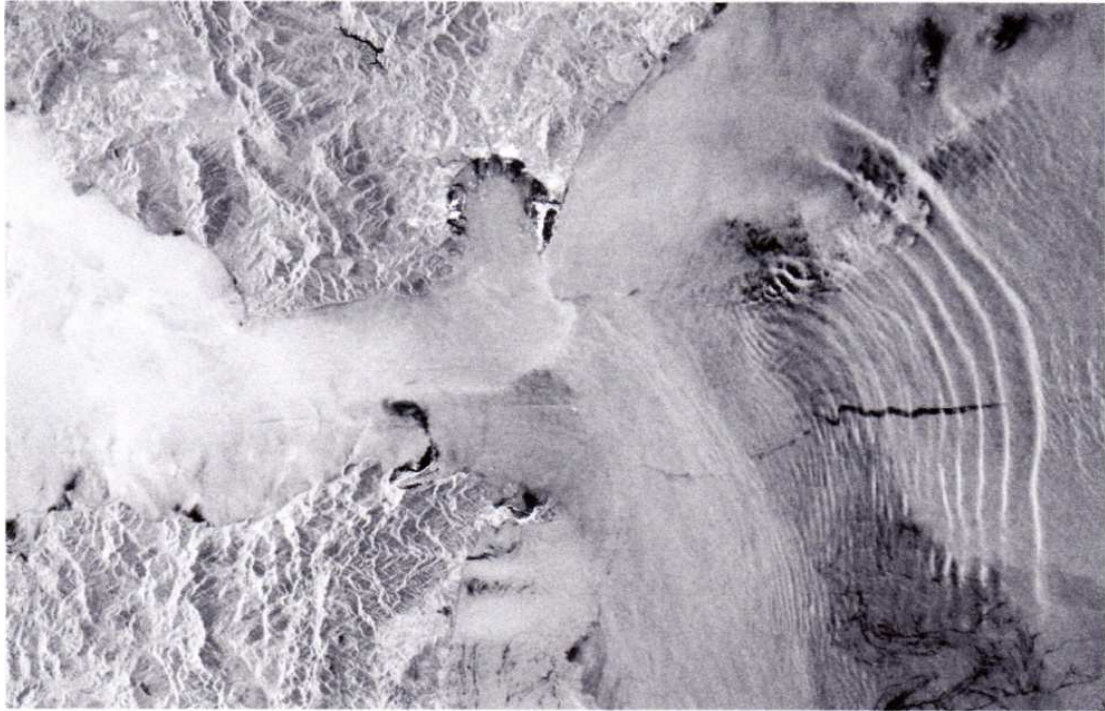
This current from the Atlantic can reach a speed of up to 5 or 6 knots, which only begins to slacken when it reaches Cape Gata, quite far along the coast of Spain in the Mediterranean Sea (Aubet 1993:157).

On the western side of the Strait there is a shallow submarine barrier close to where the continental shelf ends, called the Camarinal Sill, which restricts the water flowing in. When large tidal flows enter the Strait, internal waves (which are waves at the density boundary layer) are set off at this Camarinal Sill as the high tide relaxes. These waves can be from 80 to 100 m. in height and travel eastward as an internal bore<sup>26</sup>, but because they occur at great depths, almost nothing is visible on the surface. They can however be traced by the sun-glint on the water.

When a lee wave is developed, the manifestation of high amplitude waves is observed at the sea surface as high-frequency chaotic oscillations, named boiling waters. Moreover the propagation of the eastward waves (that is into the Mediterranean) is not constant, but can move into northeast, central or southeast mode, which means the incoming water flows either towards the south coast of Spain, straight to the island of Alboran, or to the north coast of Morocco (See *Figure 10-7*). The whole phenomenon makes for very unpredictable wave patterns in the narrow strait, as well as just outside it. As such these waves, moving along the south coast of Spain, may have influenced the shipping from the Phoenician settlements that were located there, such as Malaga, Toscanos and Sexi (Almuñecar). At times also westward moving waves develop, although these are less prevalent (<http://www.internalwaveatlas.com/Atlas-PDF/IWAtlas-Pg099-StraitGibraltar.PDF>).

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<sup>26</sup> A bore is a tidal flood with a high abrupt front (Webster's 1977:128).



**Figure 10-7: Strait of Gibraltar. ERS-1 SAR image acquired on 1 January 1993 at 22:39 UTC (orbit 7661) showing sea surface manifestation of a packet of internal solitary waves generated in the Strait of Gibraltar and propagating eastward into the Mediterranean Sea. The dark line intersecting the packet results from an oil spill, probably released from a ship. Imaged area 100 km x 50 km (<http://www.ifm-geomar.de/fileadmin/personal/fb1/po/pbrandt/RSES07.pdf>).**

Furthermore the prevailing wind directions in the Strait are only east or west winds, with east winds prevailing in the months of March, July, August, September and December with alternating east or west winds during the other months of the year. Moreover certain winds prevail in certain years, leading to years being called easterly or westerly, depending on which wind prevails. When west winds prevail it is very dangerous to sail through the strait to reach the Atlantic (Aubet 1993:157). When we take the inability of Phoenician ships to tack into account, as discussed above, sailing through the Strait with a westerly wind prevailing, was impossible. The optimal conditions to sail through the Strait from east to west would be with an easterly wind and outgoing tide.

Sailing from west to east through the Strait was considerably easier, as wind, tide and greater flow inward, would all have contributed to the ship being propelled in that direction. Also the main current prevalent in the Mediterranean along the coast of North Africa, which flows in an easterly direction, would have made sailing to either Carthage or Tyre easier than the outward journey (Aubet 1993:163-164). That the



Phoenicians sailed through the Strait of Gibraltar is certain, as they had established a settlement at Gadir (now Cadiz) close to the mouth of the Guadalete, in order to ship metals from the area of RioTinto and the valley of the Guadalquivir to Carthage and Tyre (Aubert 1993:221-223).

They also had a settlement on the island of Mogador, off the northwest coast of Africa, where they produced purple dye (Mazel 1971:209). Moreover they fished extensively for Blue Fin tuna (Kurlansky 2003:46), as well as mackerel and sardines in Atlantic coastal waters off the coasts of southern Spain and Morocco. The fish was processed and packed into amphorae before being shipped to destinations in the Mediterranean (Markoe 2000:104). The Phoenicians are even reported to have eaten whale meat, as whales were still abundant in this part of the Atlantic in Antiquity, although it is not sure whether they hunted whales, or made use of one that had beached itself (Kurlansky 2000:48).

### **10.3.3 How far beyond the Pillars of Hercules did the Phoenicians go?**

If one takes into account that the most westerly settlement of the Phoenicians was Cadiz, and that they were also operating from Mogador in front of the west coast of Africa, then it is not hard to imagine that they could have gone farther. They had experience of sailing on the open sea, so the likelihood that they indeed reached Cornwall to obtain tin, is a distinct possibility. According to the classic writer Strabo, the Phoenicians of Cadiz traded with the Cassiterides. These are assumed to be the islands off the south-west of England, now called the Scilly Isles (Mazel 1973:133). More likely Cornwall was the source of the tin that was traded, as there are remains of many tin mines still present there. On the Scilly Isles there is no tin to be mined, but the ore may have been brought there to be traded. The ore containing tin is called Cassiterite. Even though the presence of the Phoenicians in Cornwall cannot be proven by archaeological means, several sources refer to it (Mazel 1973:133-137; Rowe & Nute 2012:9).

The possibility exists that the Phoenicians set course straight from the Pillars of Hercules with a steady easterly wind in a westerly direction to the Azores, where they would round the islands and steer a north-easterly course. Thus they would catch the North Atlantic Gulf stream, which would have propelled them straight to Cornwall. According to an eighteenth-century Spanish account (unfortunately unverified)

allegedly Carthaginian coins were found on the Azores (Markoe 2000:13). Moreover the high mountain top of the Pico Alto on the island Ilha de Pico of the Azores, would have been visible from afar to serve as a beacon (Spanuth 1985:74-75).

Other expeditions, such as the exploration by Hanno the Carthaginian of the north-west coast of Africa in the late fifth century BCE, also become more plausible, if we take the above mentioned facts into account. He may have travelled as far as present day Senegal (Mazel 1971:194-199).

Also the successful circumnavigation by the Phoenicians of the entire continent of Africa, as ordered by Pharaoh Necho of Egypt (610-595 BCE), should not be written off as impossible (Markoe 2000:188). To our modern mind it may seem impossible for small vessels like those of the Phoenicians to circumnavigate the Cape of Storms and brave the mighty Atlantic Ocean. Not even two years ago however, a fleet of small sailing yachts set sail out of Simonstown early in December to sail to St. Helena. Our friend, retired Vice-Admiral of the South African Navy Martin Trainor, took part in this regatta, called "The Governor's Cup". The voyage was recorded and subsequently broadcast on SABC in two parts. The yacht he crewed on as navigator reached St. Helena without a problem, as did most of the yachts that had departed with them. These yachts were not bigger than about 10 - 15 meters maximum.

That there is truth in the account of the circumnavigation of Africa by the Phoenicians in the time of Pharaoh Necho, can be deduced from one observation which Herodotus (4.2.2) mentions in his description of the voyage and that is that the sailors reported that they had had the sun on their right hand the whole way. This means that they observed the sun in its zenith in the north, which is what one sees in the Southern hemisphere, whereas the people in the Mediterranean were only ever used to seeing the sun in its zenith in the south (Herm 1974:138-140; Markoe 2000:188).

As the writing of this dissertation drew to an end, new information came to light regarding the recent circumnavigation of Africa with the replica of a Phoenician ship. This ship set sail from the Syrian coast in 2009 and circumnavigated the continent of Africa over a period of 3 years, with Phillip Beale as the captain and with volunteer crews (See *Figure 10-8*). The ship even spent time in Cape Town in 2010. [http://www.phoenicia.org.uk/educating-photo-gallery\\_NAtlantic.htm](http://www.phoenicia.org.uk/educating-photo-gallery_NAtlantic.htm) .

Why there was nothing mentioned in our local newspapers about this at the time is the question that comes to mind, but maybe there was too much attention for the World Cup Soccer. This year (2012) the ship sailed from Lebanon to London, where it was on

display for a number of weeks<sup>27</sup>. This entire enterprise shows once again, that it is possible to sail the high seas, and circumnavigate Africa with ships of the size the Phoenicians used.



**Figure 10-8: Phoenicia, the replica ship that circumnavigated Africa between 2009 and 2011. ([http://www.phoenicia.org.uk/educating-photo-gallery\\_NAtlantic.htm](http://www.phoenicia.org.uk/educating-photo-gallery_NAtlantic.htm).)**

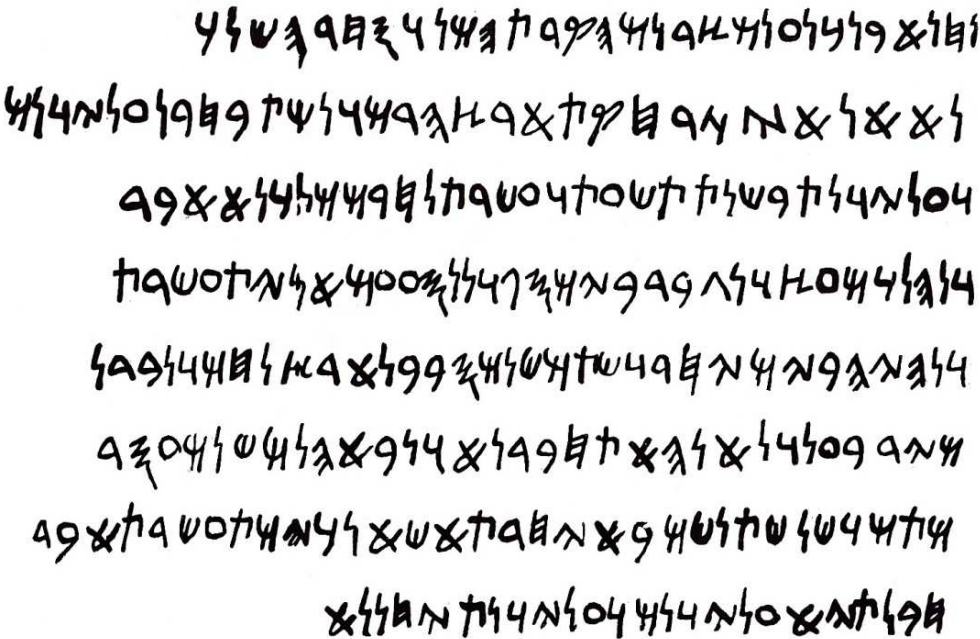
In closing the Parahyba inscription can be mentioned (See *Figure 10-9*). This inscription on a rock face, found in Parahyba in Brazil, has been the subject of much debate as to whether it is genuine or a fake. The inscription recounts the arrival of a Phoenician ship, which had been thrown off course by a storm off the coast of Africa, and had landed up on an unknown shore. The entire text in translation, as quoted by Sullivan reads as follows:

We are sons of Canaan from Sidon, the City of the King. Commerce has cast us on this distant shore, a land of mountains. We set (sacrificed) a youth for the exalted Gods and Goddesses in the nineteenth year of Hiram, our mighty king. We embarked from Ezion-Geber into the Red Sea and voyaged with ten ships. We were at sea together for two years around the land belonging to Ham (Africa) but were separated by a storm (literally: from the hand of Baal) and we were no longer with our companions. So we have come here, twelve men and three women, on a ... shore, which I, the Admiral, control. But auspiciously may the Gods and Goddesses favour us.” (Sullivan 2001:xix).

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<sup>27</sup> With thanks to my cousin Louise de Vries Lentsch who alerted me to this fact by sending a newspaper article which she found during her holiday in the UK.

Despite the fact that the inscription has been declared a fake on the basis of linguistic aspects, there are some points that do not seem to have been taken into account in the analysis of its veracity.

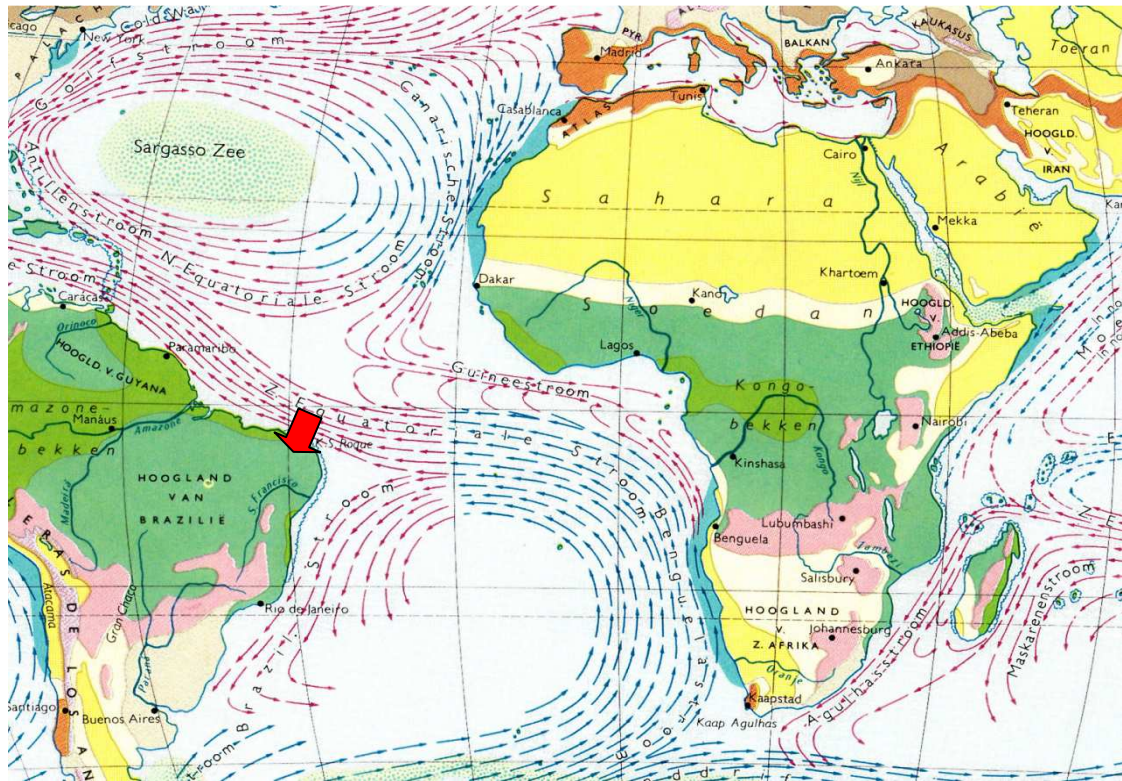


Handwritten Phoenician script in black ink on a white background. The text is arranged in seven lines, with the first line being the longest and the last line being the shortest. The characters are stylized and consistent with ancient Phoenician script.

Figure 10-9: Facsimile copy of Parahyba inscription (Spanuth 1985:81).

In the first place the question is: “Who would still have been able to write such a text many centuries afterwards, with the limited knowledge of the Phoenician language at that time?” Secondly: “Why would anyone have wanted to go through the trouble of composing such a text, and inscribing it on a rock face in a place like Parahyba?” Thirdly: “Who would have thought of adding the aspect of sacrificing a youth after the safe landing on the shore?” And fourthly: “Why are other aspects not taken into account in the judgement of whether it is fake or real, such as the fact that especially the Cape of Good Hope (also nicknamed the Cape of Storms, and in Portuguese: Cabo Tormentoso) here in South Africa, as well as the Skeleton Coast of Namibia are known for their severe storms? A ship that gets thrown off course can easily end up in the current that runs across the South Atlantic in westerly direction, which lands up at the coast of Brazil, exactly at Parahyba (Ormeling [ed.] 1971:152,135) (See *Figure 10-10*). A further aspect is something that Vice-Admiral Trainor mentioned in the televised program about the regatta from Simonstown to St. Helena, and that is that there is an underwater mountain range off the coast of Namibia called the Walvis

ridge, which can cause enormous waves, that can throw a ship off course. This too could have been an additional factor in a ship ending up in the westerly gulfstream that runs to the Brazilian coast. Maybe the Parahyba inscription is not a fake after all.



**Figure 10-10: Ocean currents between Africa and South America. Parahyba indicated with red arrow (Ormeling 1971:152,135).**

## 10.4 CONCLUSIONS

The main points discussed in this chapter are that sailing mostly took place during the summer months, as the inclement conditions made seafaring during winter a hazardous undertaking. Winter was used as the season for maintenance of ships.

Ships did not always remain close to the coastline, but from early on sailed the open seas, as shown for instance by the wrecks investigated by Stager and Ballard. Moreover the mythological Greek stories about the dangers of Scylla and Charibdis, as well as the Pillars of Hercules were not a figment of their imagination, as the physical aspects of these sea passages caused a number of very real dangerous conditions for ships to negotiate. These did not just affect the Greek seafarers, but the Phoenicians ones as well. The tidal activity and the internal waves in combination with the direction from which the wind was blowing and at which strength, must have made passing

through both the Strait of Messina, and the Strait of Gibraltar with a heavily laden vessel a very hazardous undertaking for even the most seasoned Phoenician captain.

These difficult sea and wind conditions can explain why the Phoenicians built ships that were higher, bigger and stronger than the earlier ships they used to transport goods to Egypt and along the Levantine coast (ships of Tarshish over against Byblos ships). In Chapter 4 a more detailed description was given of the developmental trends of these ships. Moreover the heavier loads such as metal ingots and amphorae filled with wine, olive oil or fish, made the construction of stronger ships an absolute necessity, if the loads were to reach their destination safely. The Phoenician shipbuilders and seafarers must have been brilliant in order to achieve what they did, both in shipbuilding and in seafaring. In Antiquity they already had skills that most of us would not believe possible, and many people underestimate their achievements. In this chapter an attempt has been made to show what they were capable of. Even if they did not land up in Parahyba in Brazil, they did sail regularly through the Pillars of Hercules, despite the difficulties outlined in this chapter. They did reach Mogador, fished in the Atlantic, and very likely sailed around Africa as well as along the north-west coast of Africa. Those feats by themselves are impressive and unparalleled.

# CHAPTER 11

## CONCLUSIONS

### 11.1 INTRODUCTION

When the Romans finally entered Carthage in the spring of 146 BCE after a siege of almost three years, they went on a genocidal killing spree of six days and burned the city to the ground. They sold the approximately 50.000 men, women and children who had surrendered, into slavery (Miles 2011:1-4).

In this horrendous way one of the most unique civilisations of Antiquity came to an end after about a thousand years, if one counts both the Phoenicians of the East as well as of the West, between about 1200 BCE and 146 BCE. The civilisation was unique in that its sphere of influence extended mostly over sea, instead of over land, and was located predominantly on small footholds on the shores of the Mediterranean. During its existence its main focus had been trade, and in the process fortunes had been made and lost, new technological developments had taken place and had been disseminated to many different places. Products had been manufactured or bought, were transported and traded, and had linked many diverse people groups on many different shores. The Assyrians had been supplied with metals, in the hope that it would buy the peace that was needed to continue to trade, but in the end had used the weapons they had made from the metals, to subdue the many smaller nations surrounding them, including the Phoenicians (Miles 2011:24, 26). Fashions (purple dyed cloth and carved ivory decorations, to name a few) had come and gone. Fads, such as the breeding and trade of dogs, had had their day. All this would have been impossible without the ships that the Phoenicians built, which they used to transport the many items of cargo that they traded.

The focus of this dissertation has been on the ships that the Phoenicians built to serve the various tasks they were designed for, and below a summary will be given of the conclusions that were reached as a result of this research.

## 11.2 ORIGINS OF THE PHOENICIANS AND THEIR SHIPBUILDING SKILLS

Most of the scholars who have studied the Phoenicians, especially the earlier ones, are of the opinion that the Phoenicians came from the East or South-east over land and arrived in the Levant, where they started to build ships and took to the sea. This conclusion was mostly based on the fact that the language that was spoken by the Phoenicians was a North Western Semitic language. This was discussed in Chapter 2 under 2.4.

In this analysis of the origins a number of other aspects were not taken into account, such as the fact that the ships of the Phoenicians were much more closely related to the types of ships that were prevalent in the Mediterranean Sea before the Phoenicians became a trading population, than to the ships that were built by the Egyptians. See for this analysis Chapter 3. Casson's assessment in this regard (See 2.4.7) was the more correct one.

Another aspect that has been overlooked is the fact that the origins of the production of purple thread or cloth with the extract of the *Murex* molluscs, originated in the Mediterranean basin, in places such as Crete and Thera, as there was an abundance of *Murex* in many places in the Mediterranean Sea. Moreover, the myth about the invention of the purple dye is a Greek myth, with Heracles as the main protagonist. This was only later attributed to Melqart, who by then had become the substitute for Heracles in the Phoenician pantheon. This was explained in Chapter 8.

A further point of importance that was overlooked is the fact that in the Greek realm there was already a script called Linear B, which may have been a forerunner of the Phoenician script. Knowledge of this script may have assisted the Phoenicians in developing their script, rather than the Hieroglyphic script of the Egyptians or the Cuneiform script prevalent in Mesopotamia.

A further factor to be taken into account is the fact that the Phoenician city states were located on the extreme tips of the Levant and are an indication that very likely small groups of people arrived from the Mediterranean, who settled on the edges of the land already occupied by the Canaanites. The newcomers had to adopt the Semitic language spoken by the bulk of the population already present, in order to be able to make themselves understood. It can be compared to the arrival of immigrants in the



United States of America. They all had to learn English to be able to fit into their new country.

From the above the conclusion can be drawn that the Phoenician culture was in all probability a fusion culture between those who arrived from their Mediterranean origins and those of Canaanite origins, who were already present in the Levant.

When all these factors are added together a much more plausible explanation can be given for the shipbuilding skills of the Phoenicians. These skills did not originate in Egypt, as was shown in Chapter 3, but came from the Mediterranean shores and may have been assisted by the shipbuilding skills originating along the shores of the Persian Gulf. The technique of using mortises and tenons originated in the Mediterranean realm, and the technique of drilling and filling of the holes in the sewn construction technique, was in use in the Persian Gulf area. These two techniques may have been combined to make the pegged mortise-and-tenon joints, which were strong and prevailed as a shipbuilding technique in the Mediterranean for many centuries. This joining technique only went out of use in the Byzantine era (Wachsmann 1988:22). If this conclusion seems farfetched, then in its defence it can be stated that Wachsmann seems to be hinting in a similar direction (Wachsmann 1998:239-241).

### 11.3 TYPES OF SHIPS

From the description of the various types of ships it has become clear that these could be classed under three separate headings, viz. Merchant ships, Warships and Utility ships, which were discussed in detail in Chapters 4, 5 and 6 respectively. In these three categories, there were a number of ships which were developed over time, of which also the developmental trends were indicated.

#### 11.3.1 Merchant ships

The Merchant ships as they are known from the Egyptian wall paintings, as well as the remains of the Uluburun ship, dating to the fourteenth century BCE (Bass 1987:694-696) with the straight stem and stern posts and the wicker fencing in between them, slowly but surely developed into the merchant ships of later date. These lacked the

wicker fencing, were built up higher and with stronger planking to reinforce the sides, so as to withstand bigger winds and waves. The steering oars were covered by planking as well to protect them against the elements. They were designed to carry heavier loads, when metals began to be traded instead of wood and papyrus. Also the development of the *Artemon* sail can be mentioned, which made the ships much more manoeuvrable. This was described in Chapter 4.

### **11.3.2 Warships**

The Warships went through many developments, from transport ships for troops, to ships with elevated fighting decks, from which war was waged. From there to the ships equipped with rams and the fighting technique of ramming enemy ships in order to destroy and sink them. After that tactic it was back to more emphasis on the fighting platform again and eventually to the crow, so as to enable soldiers to board enemy ships in Roman times. Ships changed in size and shape over time, were initially equipped with single banked sets of oars, after which came the *biremes* and then the *triremes*. Subsequently larger warships became the norm and many different configurations of oars, and ships of different length, height, and width were designed and put to the test. All these developments were analysed in Chapter 5. The conclusion can be drawn that a veritable arms race took place, which included naval capacity, among the powers that dominated the political scene at the time, such as the Assyrians, Persians, Greeks and Romans, with the Egyptians to a lesser extent, and the Phoenicians providing the expertise in shipbuilding for a number of these nations.

### **11.3.3 Utility ships**

The Utility ships were many and varied. They served many purposes, such as the fishing of fish and *Murex*, transport close to the coast of water, food, people and fuel, the towing of logs, transport of troops and supplies, in short, just about anything and everything that needed to be transported. This was described in Chapter 6.

#### **11.3.4 The 'Ship Tyre'**

In Chapter 7 the prophecy by Ezekiel regarding the 'Ship Tyre', as found in Ezekiel 27, was analysed in a different manner than by means of existing Bible commentaries. An analysis of the accuracy of the materials mentioned as to their use for different parts of the ship was made. Moreover, other material aspects of the 'Ship Tyre' as described by Ezekiel, were analysed as to the use they were put to. This analysis of the types of wood, sails, the way the sails were made and the use of wool dyed purple showed that Ezekiel was remarkably accurate in the aspects mentioned.

### **11.4 COMPLEMENTARY TOPICS**

The last three chapters of the dissertation consisted of topics, which had emerged prominently during the research.

#### **11.4.1 Purple cloth**

In Chapter 8 a detailed description was given of how the coveted purple cloth was manufactured, where it had originated, as well as how much effort and how many *Murex* shells were required to produce it. This production was widespread throughout the entire Mediterranean basin, and even extended as far as the Atlantic Ocean. An answer was provided to the question of why ceramic dye installations were found containing a deposit of lime. This was necessary in the production process to adjust the pH level to produce a more intensive colour, but was also responsible for the very noxious smell produced during the production process as the result of the release of mercaptans. The final conclusion of the chapter was that the manufacturing process had caused ecological damage to the Mediterranean Sea, due to the fact that the *Murex* was almost fished to extinction in the Roman era.

#### **11.4.2 Dog burials**

In Chapter 9 the dog burials, excavated in Ashkelon as part of the Leon Levy Expedition, were subjected to a new analysis in view of the fact that several breeds of

dogs are said to have been brought to a number of places in the Mediterranean by the Phoenicians as stated in several large dog encyclopedias. The possibility was investigated of whether there could have been a dog breeding and export center in Ashkelon during the Persian era, based on the location of the burial sites in a prime industrial area and the absence of a cultic center, where dogs could have been part of a healing cult. The latter possibility had been suggested by Prof. Lawrence Stager as the reason why there had been so many dogs in Ashkelon, and why so many burials had taken place.

As the Phoenicians' main focus of all their activities was trade, and they are known to have traded in other animal species, such as horses and mules, trade in dogs by them may have been very likely. This took place during the Persian era, when the Phoenicians were in control of the port city of Ashkelon. The Persian reverence for dogs could have been a contributing factor in the fact that this trade took place.

The possibility that the dogs found at Ashkelon could have served as ship dogs, was excluded on the basis of their size, as they were too large to be suitable.

#### **11.4.3 Treacherous Sea Straits**

The focus of Chapter 10 was on the conditions and seasons during which shipping took place. Moreover the dangerous sea straits that are present in the Mediterranean, viz. the Strait of Messina and the Strait of Gibraltar were subjected to an analysis. An attempt was made to answer the question of whether the Phoenicians had also attempted to pass through these Straits. By analysing the conditions prevalent in both these Straits, which have been determined with the help of modern technology, an explanation could be given of why the Straits were (and are) so dangerous. The conclusion was arrived at that the presence of internal waves causes irregular wave patterns and currents, which indeed were, and still are, a danger to shipping. The Phoenicians are known to have passed through both these Straits, in fact, quite regularly through the Strait of Gibraltar in order to reach their prominent colony at Gadir, now called Cadiz. Their achievements in this regard can be considered truly impressive.

#### **11.4.4 Beyond the Mediterranean Sea**

Other accounts of exploratory voyages by the Phoenicians, such as the circumnavigation of Africa, as recorded by Herodotus, and the voyage of Hanno, were also analysed as to their veracity. The conclusion was reached that these voyages had indeed taken place, based both on modern findings as well as specific details of the accounts themselves.

### **11.5 FINAL REMARKS**

In closing it can be stated that the writing of this dissertation has been a voyage of discovery in itself. Despite the fact that so much information about the Phoenicians has been lost, that what is available, sheds light on their skill as seafarers, navigators, explorers, shipbuilders, traders, people of enormous technical ability, inventors, craftsmen and masters of a huge array of skills.

Despite the fact that the Bible either painted the Phoenicians in a negative light, or downplayed their influence over Israel and Judah, their close proximity and relationship must have been a major influence on these nations.

The ancient Near East was not some quiet backwater with people safely dwelling on farms in rural settings, but was a very interconnected, vibrant world, where products, ideas, technologies and many other things were exchanged. This was also confirmed in a recent article in TIME Magazine, which stated that the societies of the second millennium BCE were remarkably interconnected (Tharoor 2009:45). This trend only increased in later times and initially the Syro-Canaanites and thereafter the Phoenicians were the main link between all the different people groups on different shores. Their ships played a major role in all they achieved. Without them life in Antiquity would have been totally different. It is regrettable that so much information about their culture and achievements has been lost and that so few images of their ships are still in existence. As a result this present study has only been able to paint a limited picture of what possibly has been one of the most influential cultures that the ancient Near East has ever known.

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