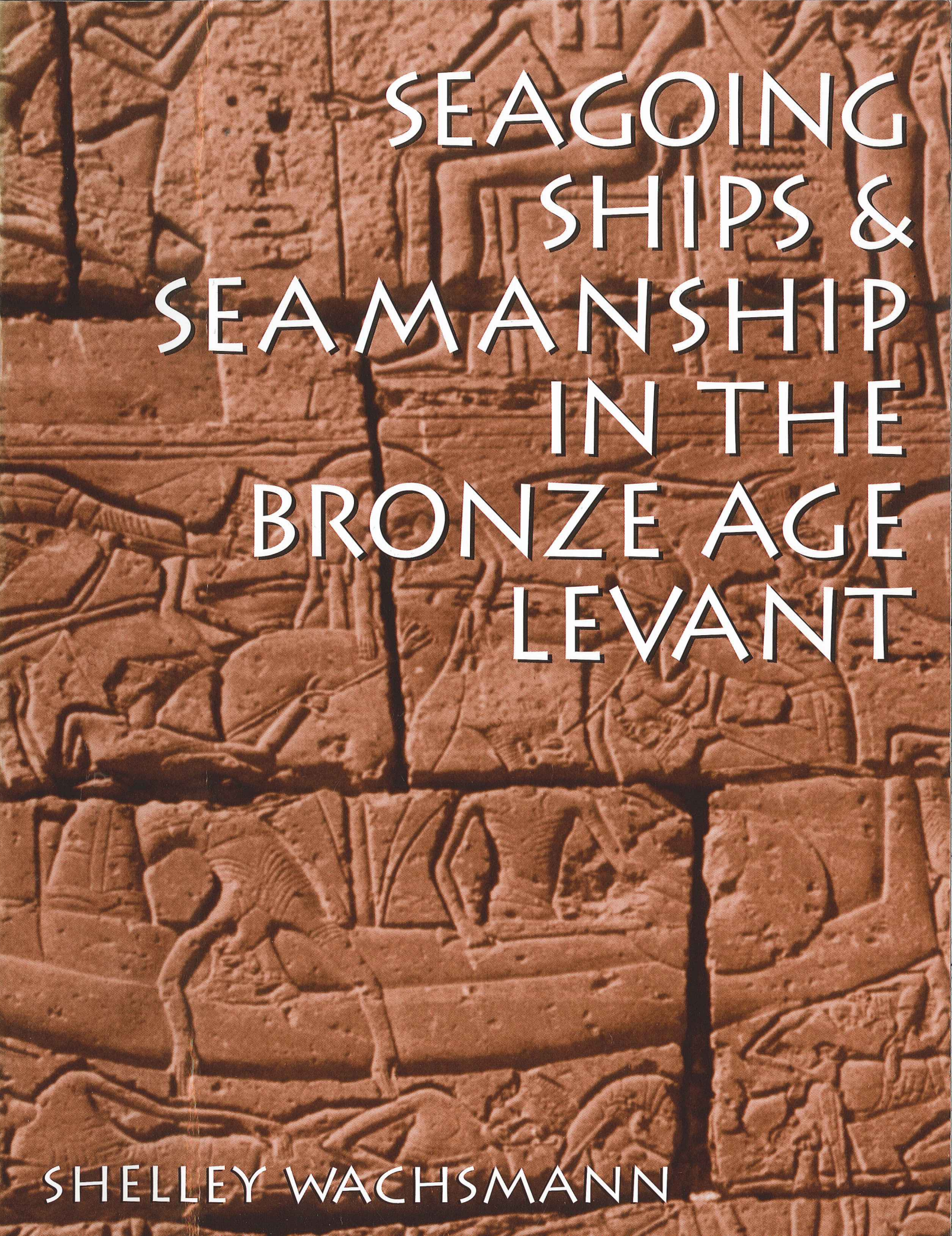
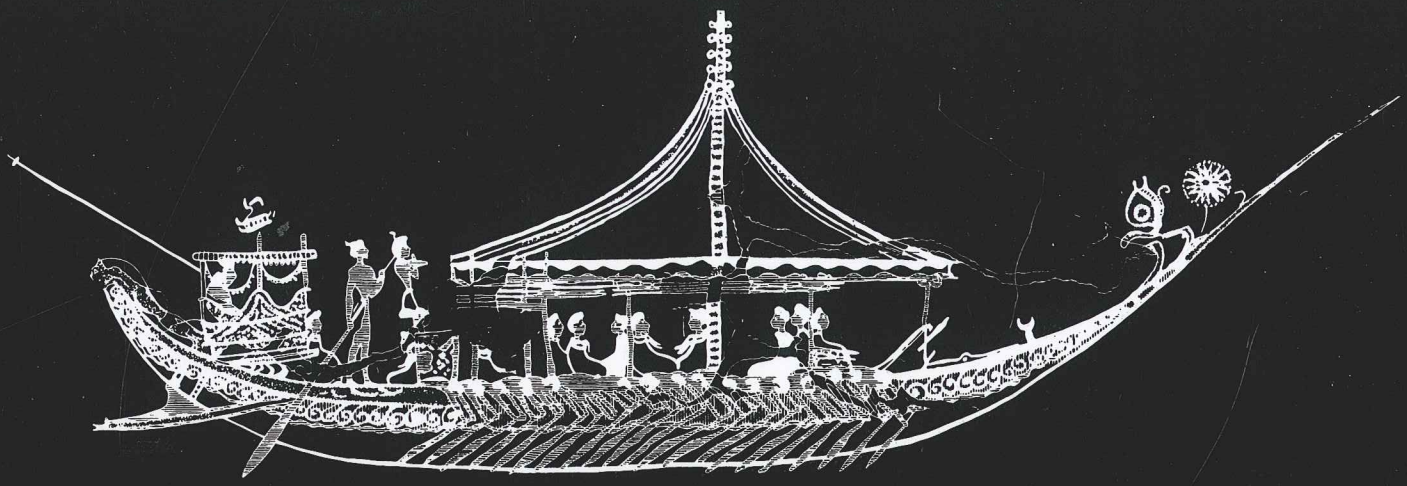


SEAGOING SHIPS & SEAMANSHIP IN THE BRONZE AGE LEVANT

SHELLEY WACHSMANN



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—VASSOS KARAGEORGHIS, former director of antiquities, Cypruk

"Wachsmann is to be congratulated for this seminal contribution to ancient seafaring and Bronze Age archaeology and history of the Levant."

—THOMAS F. STRASSER, *American Journal of Archeology*

SHELLEY WACHSMANN is Meadows Professor of Biblical Archaeology at Texas A&M University. He has published numerous articles in archaeological and popular journals and is the author of three previous books on ancient seafaring and trade.

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Seagoing Ships & Seamanship in the Bronze Age Levant

SHELLEY WACHSMANN

Foreword by George F. Bass

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FRONTISPIECE: Bird-head post ornament, with legs of a man standing on it, all that remains of a Sea Peoples' ship painted on Late Helladic IIIC 1b sherd found at Ashkelon (photo by V. Bryant; courtesy of L. E. Stager and the Leon Levy Expedition to Ashkelon)

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For Yonatan & Yishai

Some went down to the sea in ships,
doing business on the great waters;
They saw the deeds of the Lord,
His wondrous works in the deep.

—PSALMS 107: 23–24

CONTENTS

FOREWORD

It was only with watercraft that ancient peoples could discover, explore, colonize, and supply the once uninhabited islands of the eastern Mediterranean, and it was mainly with watercraft that ancient peoples of the bordering African, Asian, and European coasts acquired the raw materials—especially metals and timber—that allowed the rise of Bronze Age civilizations in the Levant.

Of course there were overland caravans and inland caravan cities, but one can scarcely imagine huge cedar logs being hauled overland from Lebanon to the Nile valley or tons of copper and tin being carted from the East across Anatolia to Greece, even had there been a bridge over the Bosporus. It was on the waters of the Red Sea, not across desert and through jungle, that Egyptians sent expeditions to Punt to bring back the exotic goods of tropical Africa.

Maritime commerce turned the eastern littoral of the Mediterranean into a bustling, cosmopolitan entrepôt. Ships sailed from the harbors of Ugarit, Sidon, Tyre, Ashkelon, and Dor, transporting metals, ceramics, resins, and spices southward to Egypt and westward to the Aegean, some at least as far west as Sardinia. The role of Cyprus within this economic sphere has not yet been determined, but it must have been considerable.

The long-distance exchange of goods and ideas by sea was not always peaceful. We cannot imagine Mycenaean Greeks without the knowledge of writing and art they obtained by naval conquest from the Minoans of Crete. And Mycenaean troops did not march but sailed to Troy. Even the end of the Bronze Age in the eastern Mediterranean was marked by destruction wrought along the Syro-Canaanite coast and on Cyprus by raiding Sea Peoples.

Scholarly interest in the ships and boats of these events has not been lacking. But when I, as a young assistant professor, first offered a graduate seminar on ancient seafaring at the University of Pennsylvania in the middle 1960s, there were few general references to which my students and I could turn for the study of early Near Eastern and Aegean watercraft. M. G. A. Reisner's *Models of Ships and Boats* (*Catalogue général des antiquités égyptiennes du Musée du Caire*) had appeared in 1913, and from the mid 1920s there were M. C. Boreux's *Études de nautique égyptienne* and August Köster's *Das antike Seewesen* and *Schiffahrt und Handelsverkehr des östlichen Mittlemeeres in 3. und 2. Jahrtausund v. Chr.* For pre-Classical ships we read Spyridon Marinatos's "La marine créto-mycénienne" in the *Bulletin de correspondance hellénique* (1933) and G. Kirk's "Ships on Geometric Vases," in the *Bulletin of the British School of Archaeology at Athens* (1949).

More generally, we could consult a few pages each in R. and R. C. Anderson's *The Sailing Ship: Six Thousand Years of History* (1963), James Hornell's *Water Transport: Origins and Early Evolution* (1946), Björn Landström's beautiful but speculative *The Ship* (1961), and the splendid but popular *Illustrated History of Ships and Boats* and *The Ancient Mariners*, both by Lionel Casson.

Mostly, however, we had to seek out depictions and ancient written records on our own, slowly building up a bibliography of several hundred titles, carrying heavy armloads of books from the library to the seminar room, each tome often containing but one relevant illustration of an Egyptian painting or relief or model. Working with such primary sources is es-

sential, but we lacked handbooks like those that had proved so useful to me in learning the basics and bibliographies of subjects I had only recently studied—books like William Dinsmoor's *The Architecture of Ancient Greece*, Gisela Richter's *The Sculpture and Sculptors of the Greeks*, or the many comprehensive works on vase painting and coins.

Since that early and perhaps unique seminar on ancient seafaring, the study of ancient ships has expanded rapidly, largely because of the new field of nautical archaeology that reveals ancient ships themselves, both on land and underwater. Graduate programs in nautical archaeology are springing up around the world, with a growing number of undergraduate introductory courses on the history of ships being offered at various universities.

Publications have kept pace. Specialized periodicals, the English *International Journal of Nautical Archaeology* since 1972 and the French *Archaeonautica* since 1977, are now devoted solely to the archaeology of ships and harbors, with proceedings of conferences on those subjects published regularly from Australia to India to the Americas. Of special interest to scholars of the early Aegean are those entitled *Tropis*, published by the Institut Hellénique pour la Préservation de la Tradition Nautique. Small wonder that 75 percent of the nearly thousand references Shelley Wachsmann has listed in this book have appeared in the three decades since my first seminar.

For the Classical period, especially, there are now three outstanding reference works: Lionel Casson's *Ships and Seamanship in the Ancient World* (1971), J. S. Morrison and R. T. Williams's *Greek Oared Ship: 900–300 B.C.* (1968), and Lucien Basch's *Le musée imaginaire de la marine antique* (1987). These touch on Bronze Age seafaring, as do Marie-Christine de Graeve's *The Ships of the Ancient Near East (c. 2000–500 B.C.)* (1981) and J. Richard Steffy's essential *Wooden Ship Building and the Interpretation of Shipwrecks* (1994), but none is devoted specifically to it.

For those interested especially in the dawn of seafaring, a book that brings together the earliest writings about and portrayals of seagoing vessels—mixed prudently with ethnographic evidence—has been sorely needed.

When Dr. Wachsmann joined the faculty of the Nautical Archaeology Program at Texas A&M University, he added a seminar on Near Eastern seafaring to those we already offered on pre-Classical, Classical, medieval, and post-medieval seafaring. We soon realized the overlap between his seminar in Near Eastern seafaring and mine in pre-Classical seafaring, for the Near East and Aegean were so closely tied by ships in the Bronze Age that one cannot study the maritime history of one area without studying that of the other. We combined our two classes into one covering the entire Levant—which encompasses the Aegean and the eastern Mediterranean—after which some of our former students, we are told, commented that they especially liked the times when we disagreed, sometimes strongly (but always politely!) in the seminar room.

Now, at last, Dr. Wachsmann's new book pulls together, in a most thought-provoking manner, all the major evidence about Bronze Age seafaring in the eastern Mediterranean. It is another major step toward the day when courses on ancient watercraft can be taught as regularly as are those on ancient architecture, sculpture, and painting. And how welcome that will be. After all, we cannot imagine the Bronze Age without the ships and boats that played such a critical role in its development and demise.

George F. Bass
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This book is a developed, revised, and updated form of my Ph.D. dissertation, submitted to the Institute of Archaeology of the Hebrew University, Jerusalem, in 1989. I owe a particular debt of appreciation for the help and guidance of my dissertation advisors and mentors, Trude Dothan and George F. Bass. To Professor Bass I owe a special thanks for proposing that I turn the dissertation into a book; I am sincerely grateful for his encouragement to do so and for his advice and financial support in seeing this book become a reality.

The writing of my dissertation was made possible by generous grants. For this assistance I sincerely thank the Memorial Foundation for Jewish Culture, particularly its director, Jerry Hochbaum; and the Sarah Rabinovitch Fund. I wrote this book while serving as the Meadows Visiting Assistant Professor of Biblical Archaeology at Texas A&M University's Nautical Archaeology Program. I am grateful to Professor Bass, to the Meadows Foundation of Dallas, to the Institute of Nautical Archaeology, and to Texas A&M University for making this possible. I also thank my parents for their encouragement and assistance during the writing process.

The Uluburun shipwreck is without doubt the single most significant key to understanding Bronze Age seafaring. I have profited greatly from discussions with George Bass and Cemal Pulak. I thank them both for their insights into Bronze Age seafaring, for permitting me to take a small part in their excavation at Uluburun during the 1985 and 1986 seasons, and for their kind permission to publish illustrations from their excavation here.

In a book that deals with such a wide range of cultures and topics, it was inevitable that I would seek advice from experts in various fields of research. I was gratified to discover an openness and unstinting willingness in all the scholars whom I approached to share their knowledge and insights with me. My warm appreciation goes to Amnon Altman for his valuable comments on the Ahhiyawa problem; to Lucien Basch for kindly supplying me with a photo of the Karnak anchor; to Jacqueline Balensi, who told me about the Tel Abu Hawam anchors; to Emmett L. Bennett and John Chadwick for their valuable comments on topics relating to Linear B documents; to Lionel Casson for advising me on numerous nautical matters; to Brenda Conrad for bringing to my attention several important publications on the subject of Minoan archaeology and religion; to Fanouria Dakoronia for permitting me to use illustrations of her discoveries from Kynos in this book; to Michael Fitzgerald for our many stimulating discussions; to Honor Frost and Gerhard Kapitän for sharing with me their understanding of anchors and rigging; to Cheryl Haldane for her insights and comments concerning ancient Egyptian ship construction; to Maria Jacobsen for her assistance with aspects of Ugaritic trade; to Barbara Johnson for her valuable comments on the Late Helladic IIIC 1b sherd from Ashkelon; to Paul Johnston for supplying several illustrations; to V. Karageorghis for his comments concerning the abandonment of Kalavassos; to Christine Lilyquist for information on the tomb of Iniwia; to Ezra Marcus for bringing the Tell el Dabᶜa seal to my attention; to Robert Merrillees for noting the bird-head ship model fragment from Maroni; to Bezallel Porten for supplying me with his revised

translation of Elephantine text Cowley 26 (B12) and permitting me to publish it here; to Anson Rainey for his many important insights into many of the texts studied here; to Joe and Maria Shaw for supplying me with information and illustrations on the stone composite anchors from their excavation at Kommos; to Patricia Sibella for a variety of help; to Larry Stager for referring me to the Kamose text and for his many other insightful comments; to J. Richard Steffy for sharing with me his unique perspective on ancient ship construction and his incomparable knowledge of ancient ships; to Frederick van Doorninck, Jr., for his knowledgeable comments; to Michael Wedde for his penetrating comments on the Aegean iconographic material; to Malcolm H. Weiner for reviewing the Aegean chapters and for making numerous valuable suggestions; and to physical anthropologist Joe Zias for his observations on the Anemosphilia material.

As work progressed on the manuscript, it became clear to me that the book would be enhanced by the contributions of other scholars. My sincere thanks go to Frederick Hocker for discussing the question of keels on Hatshepsut's Punt ships as well as for writing the glossary of seafaring terms; to John Lenz for writing an appendix on the question of bird-head ship ornaments in Homer; to Thomas G. Palaima for his commentary on PY An 724 and An 1 as well as for his translation of the latter; and to J. Hoftijzer and Wilfred van Soldt for their translations of the primary Ugaritic and Akkadian texts pertaining to seafaring from Ugarit.

My study of the ship graffiti at Rod el ᶜAir was made possible by the gracious permission of the late Raphael Giveon of the Institute of Archaeology, Tel Aviv University. Professor Giveon invited me to take part in his 1972 archaeological survey at Serabit el Khadem and its surroundings and later permitted me to publish the results of my study of the ships from Rod el ᶜAir. My thanks goes to Benjamin Sass, then assistant district archaeologist of Sinai, for his help at that time.

I received much welcome assistance in researching the *shfifonim* of the Sea of Galilee region: the late Pesah Bar Adon, Dan Bahat, Amitzur Bolodo, Moshe Kochavi, the brothers Moshele and Yuval Lufan, and, of course, Mendel Nun. Special thanks are due to Uzi Avner for his penetrating comments on the cultic connotations of the Degania "A" tomb, and to Yizhar Hirschfeld for inviting me to study the fascinating *shfifon* uncovered in his excavations at Mount Berenice.

I have also learned from my students. My heartfelt appreciation goes particularly to Kyra Bowling for her artwork; to Steven Butler for his assistance during the final stages of the manuscript prior to its publication; to William H. (Bill) Charlton for his valuable editing skills and insightful comments; to Roxani Margariti for making me rethink old interpretations; to Sam Mark for his aid in tracking down obscure references; to Edward Rogers for his comments on the scenes of ship construction in the Old Kingdom tombs of Tí and Mereruka; and to Sam Turner for our stimulating conversations on the Ahhiyawa problem.

We now live in an amazing electronic age. The Internet allows the instantaneous sharing of information among scholars around the globe. Numerous lists deal with archaeological topics. Of these, I have been following the discussions on "Aegeanet," which is owned and operated by John G. Younger. This list has been particularly valuable and stimulating for me in doing this research. I thank Professor Younger and his host of contributors for enabling me to follow developments in the world of Aegean archaeology through their communications.

My past six years at Texas A&M University have been particularly valuable for me. I have had the opportunity to discuss many of the problems dealt with in the following pages with the other faculty of the Nautical Archaeology Program, who are among the foremost experts in the fields of nautical archeology and ancient ship reconstruction. I have learned much from them. Robert K. Vincent, Jr., past president of the Institute of Nautical Archaeology, was a source of encouragement. The staff of the program and of the Institute of Nautical Archaeology, Becky Holloway, Claudia LeDoux, Clyde Reese, and Pat Turner have been most helpful to me in a variety of ways. I thank them all.

I am grateful to the staff at Texas A&M University Press for their considerable efforts in seeing this book through the long and arduous path of publication.

Finally, it is my pleasure to thank Karen, my soul mate, for her endless patience, for her unstinting support, and for her excellent editing skills from all of which I—and this book—have greatly benefited.

Seagoing Ships
& Seamanship
in the
Bronze Age Levant

CHAPTER 1

Introduction

One of the most fascinating and vibrant facets of the Bronze Age—particularly during its latter half—was the expansion and intensification of cultural horizons. These international contacts resulted in an inevitable exchange in material and cultural concepts that measurably enriched the participating civilizations and significantly influenced the course of history.

For the societies ringing the eastern basin of the Mediterranean, contact was established primarily by sea. By the second part of the Bronze Age, the Mediterranean had been transformed from an impassable barrier into a superhighway by which cultures communicated. This new-found freedom primarily resulted from the ability to build vessels capable of standing up to the rigors of open-water travel and from the seafaring knowledge required to use them.

The study of seaborne exploration, trade, migrations, and colonization depends on understanding the nautical capabilities of the various nations. A knowledge of their ships and seafaring practices is a prerequisite for any understanding of the mechanisms and directions of Bronze Age cultural flows.

This raises numerous directions of inquiry. Why did these peoples go to sea? What types of ships did they build? How efficient were the ships and the seafaring practices of those times? And what insights into a culture can be gleaned from studying its ships and the manner in which it interacted with the sea?

Although innumerable studies have dealt with various aspects of Bronze Age ships and seafaring, there is no single monograph that covers the subject comprehensively. This book attempts to do so.

The Mediterranean Bronze Age encompasses the third and second millennia B.C. Yet in order to understand and to place several of the phenomena discussed below in their proper cultural perspective, it is at times imperative to go beyond these chronological restraints. One example of the need to allow for temporal latitude is the study of the phenomenon of birdhead stem and stern devices that appear on the Sea Peoples' ships at Medinet Habu.[1] These have little meaning if they are removed from a cultural continuum that still manifests itself today. Furthermore, the absolute chronology of Egypt, upon which all Near Eastern dating systems are primarily based, is itself problematic.[2]

I have divided the study into two parts. The first discusses seagoing ships of the cultures bordering the eastern Mediterranean, country by country. The order follows the trade routes of antiquity in a counterclockwise sweep of the eastern Mediterranean, beginning in Egypt. The second part deals with seven primary aspects of seafaring: ship construction, propulsion, anchors, navigation, sea trade, war and piracy, and laws pertaining specifically to conduct at sea.

When studying evidence for Bronze Age seafaring, one should keep in mind the limitations imposed by the material—and by the types of materials studied. It is well to ponder the Indian proverb relating what happened to a group of blind men, each of whom was commanded to describe the appearance of an elephant by touching only one part of the animal. Each blind man, depending on which part he had touched—trunk, leg, body, or tail—came away convinced that the elephant was most similar to a snake, a pillar, a wall, or a rope, respectively. There is an important lesson in this parable for those of us who would attempt to reconstruct the past, for

THE SHIPS
Review of the Evidence

CHAPTER 2

Egyptian Ships

Egyptian civilization developed along the Nile River. It was, therefore, only natural that movement was primarily by water; even the concept of "travel" was expressed as "sail upstream" and "sail downstream."[1]

There are innumerable depictions of *river* boats in Egyptian iconography; here the discussion is limited to seagoing craft, or material that bears directly on them and their uses. Egypt was the only country to trade in both the Mediterranean and the Red Sea during the Bronze Age; much of the extant information on Egyptian seagoing ships derives from the trade with Punt and will be discussed below.

Primitive river craft probably existed on the Nile by Paleolithic times: the earliest Egyptian craft were presumably papyrus rafts.[2] Indeed, the Cheops ship is so technically advanced that development over thousands of years must be assumed.[3] Reed rafts, wedge-shaped bundles of reeds constructed of two conical bundles laid side by side and lashed together at intervals, were still used on the Nile in this century.[4] The modern Nubian rafts consist of pairs of bundles of reeds lashed together. J. H. Breasted notes how similar this is to the term for raft in the Pyramid texts where it appears in the dual usage ("two *sḫn*"). Interestingly, apart from the verbs meaning "to hew" and "to make," the most characteristic Egyptian word for shipbuilding is "to bind."[5]

Opinions vary as to whether Egypt can be considered a seagoing culture. T. Säve-Söderbergh argues for a strong Egyptian seagoing presence on the Mediterranean.[6] In doing so, he totally negates Syro-Canaanite seafaring. At the other extreme, A. Nibbi claims a total lack of Egyptian maritime involvement. She argues that the Egyptian term "the Great Green Sea" (*w3ḏ-wr*), normally understood to be the Egyptian term for the Mediterranean, actually refers to the Nile Delta.[7] The reality of pharaonic seafaring probably is to be found somewhere between these two extremes.

The Textual Evidence

The earliest reference to a nautical Egyptian presence on the Mediterranean Sea is a report, recorded on the Palermo Stone, of the importation of wood by Sneferu (Fourth Dynasty). The text, however, does not indicate the nationality of these transport ships.

> Bringing forty ships filled (with) cedar logs.
> Shipbuilding (of) cedarwood, one "Praise-of-the-Two-Lands" ship, 100 cubits (long) and (of) *meru*-wood, two ships, 100 cubits (long).[8]

Thus, from earliest times, timber for shipbuilding and other purposes was a primary article of trade for Egypt. Pharaonic inscriptions found at Byblos suggest that trade connections may date back at least to Nebka (Khasekhemi), last pharaoh of the Second Dynasty.[9] By the Fifth to Sixth Dynasties, Byblos had become an Egyptian entrepôt for the importation of timber.

Uni, a military commander under Pepi I (Sixth Dynasty), describes the transport of his troops by sea in his cenotaph at Abydos:

> When it was said that the *backsliders* because of something were among these foreigners in *Antelope-Nose*, I crossed over in transports with these troops. I made a landing at the rear of the heights of the mountain range on the

I made for thee (Amun of Karnak) *qerer*-ships, *menesh*-ships, and *bari*-ships, with bowmen equipped with their weapons on the Great Green Sea. I gave to them troop commanders and ship's captains, outfitted with many crews, without limit to them, in order to transport the goods of the land of Djahi and of the countries of the ends of the earth to thy great treasuries in Thebes-the-Victorious. . . .

I made for thee (Re of Heleopolis) *qerer*-ships and *menesh*-ships, outfitted with men, in order to transport the goods of God's Land to thy storehouse. . . .

I made for thee (Ptah of Memphis) *qerer*-ships and *menesh*-ships, outfitted with crews of *menesh*-ships in abundant numbers, in order to transport the goods of God's Land and the dues of the land of Djahi to thy great treasuries of thy city Memphis.

Ramses III dispatched fleets to Punt and to Atika, a land rich in copper:[33]

> I sent forth my messengers to the country of the Atika ("-*ty-ka*), to the great copper mines which are in this place. Their galleys carried them; others on the land-journey were upon their asses. It has not been heard before, since kings reign. Their mines were found abounding in copper; it was loaded by ten-thousands into their galleys. They were sent forward to Egypt, and arrived safely. It was carried and made into a heap under the balcony, in many bars of copper, like hundred-thousands, being of the color of gold of three times. I allowed all the people to see them, like wonders.

Atika, which could be reached by both water and land, was tentatively located by Breasted in Sinai.[34] An alternate identification, proposed by B. Rothenberg, locates Atika in the copper-producing Valley of Timna near Eilat.[35] Copper was mined at Timna mines by the Egyptians during the Nineteenth and Twentieth Dynasties, including during the reign of Ramses III.[36] If this identification is correct, it would mean that Egyptian seagoing ships were rounding the Sinai peninsula and penetrating the Gulf of Eilat in the early twelfth century B.C.

In the "Renaissance Period," Wenamun sailed to Byblos to bring back timber for the *Amun Userhet*, the sacred barque of Amun that took part in a yearly procession from Karnak to Luxor and back again.[37] This text indicates that because of Egypt's decline in power, sea trade with Egypt at that time was controlled by the inhabitants of the Syro-Canaanite coast. During his interrogation of Wenamun, Tjekkerbaal, the king of Byblos, speaks of transactions that had no doubt taken place during the Late Bronze Age. He mentions six shiploads of Egyptian goods that previous pharaohs had sent as payment for timber.[38] Presumably, the goods arrived in Egyptian hulls.

The Archaeological Evidence

An axehead belonging to an Egyptian royal boat crew was found in 1911 in the Adonis River (Nahr Ibrahim) on the Lebanese coast, just south of Byblos (Fig. 2.1).[39] It bears the following inscription: "The Boat-crew 'Pacified-is-the-Two-Falcons-of-Gold'; Foundation [gang] of the Port [Watch]." The royal name "Two Falcons of Gold" was a title of both Cheops (Fourth Dynasty) and Sahure (Fifth Dynasty). In form it dates to the Third to Sixth Dynasties.

A. Rowe notes that the axehead must have belonged to one of the ship crews that sailed to Lebanon to acquire cedarwood for either Cheops or Sahure. Both rulers had trade contacts with the Syro-Canaanite coast. In addition to the text discussed above, Sahure also depicted his ships returning from a trip to that region (below). The excavated ship of Cheops is built mostly of Lebanese cedarwood, and his name is recorded on vase fragments at Byblos.[40]

Egyptian-type anchors were found in Middle Bronze Age contexts in temples at Byblos and Ugarit (Figs. 12.28: 21; 33: 11).[41] Presumably, these had been dedicated by Egyptian ship crews who had voyaged with their ships to these cities.

The Iconographic Evidence

The seeming "snapshot" quality of Egyptian wall paintings and reliefs can be misleading. Each picture must be approached with caution and interpreted in light of what is known from other sources.[42] The Egyptian artist did not always include all the same details in two representations of the same ship. For example, in the tomb of Senufer at Thebes, a funerary barge is being towed downstream from Thebes to Abydos.[43] In the scene below it, the barge is being towed back upstream to Thebes. W. F. Edgerton notes that this painting is a unit: the same barge and towing boat are represented in both scenes. Despite this, in one scene the thole bights, scarfs of planking, and through-beams are visible; in the other scene, they are missing.

Similarly, in Ramses III's naval battle scene depicted at Medinet Habu, the ships of both warring sides are stereotyped into one type of craft: the accompanying text,

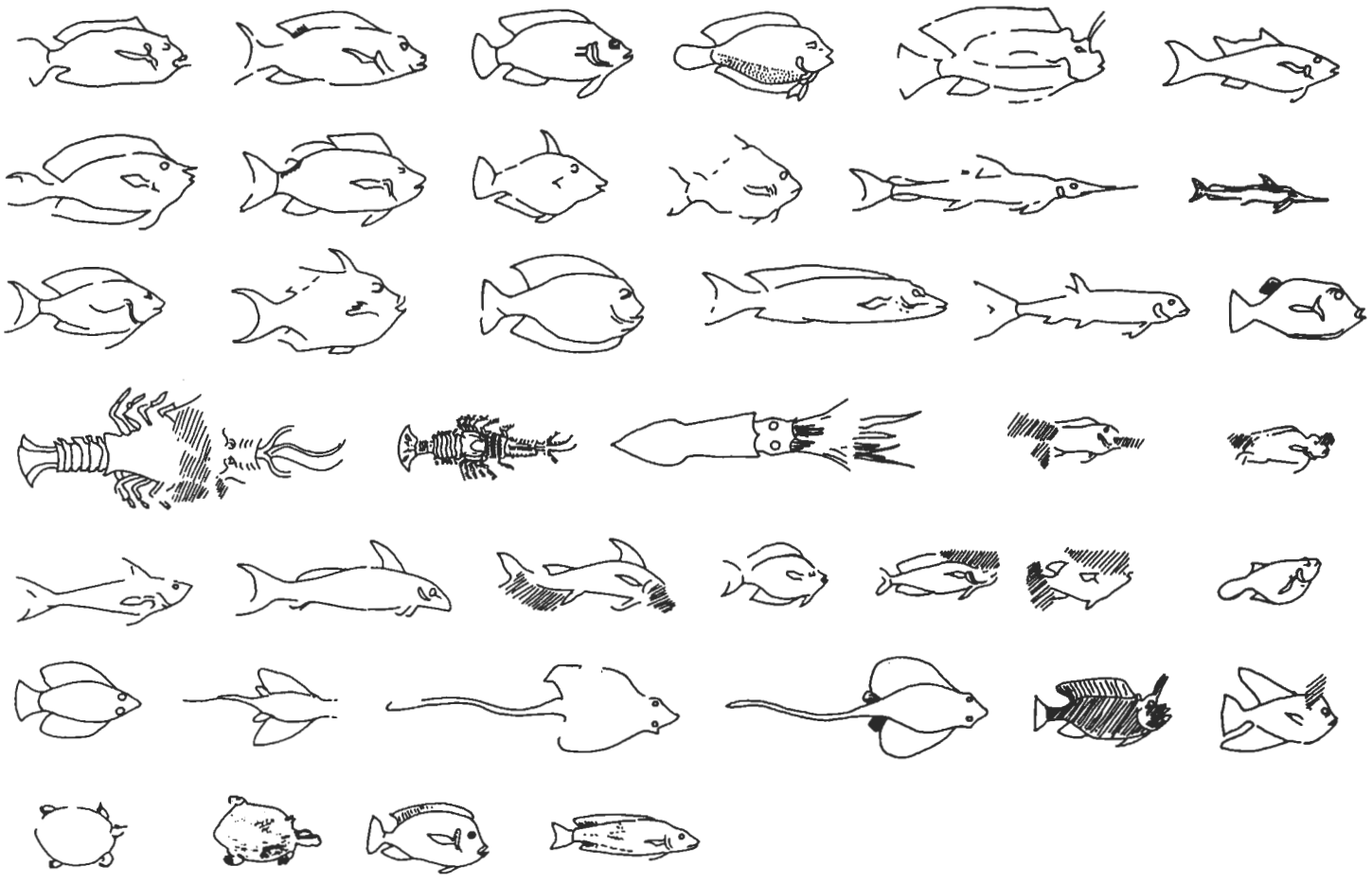

Figure 2.14. Fishes and other marine animals depicted beneath Hatshepsut's seagoing ships at Deir el Bahri (after Naville 1898: pls. 69–70, 72–75)

Punt is first mentioned in the Fifth Dynasty when Sahure lists myrrh, electrum, and wood obtained there.[70] Under Pepi II (Sixth Dynasty), Enenkhet was killed while building a "Byblos ship" for a voyage to Punt.[71] In the contemporaneous inscription of Harkhuf, Pepi II refers to a dwarf brought from Punt.[72] A short historical inscription of Khnumhotep in the tomb of Khui at Aswan (Sixth Dynasty) refers to visits to both Punt and Byblos.[73] Henu (Eleventh Dynasty) recorded the construction of a Byblos ship for a trip to Punt in his Wadi Hammamat inscription.[74]

Hatshepsut's craft are termed Byblos ships (*Kbn*).[75] The name need not indicate that the ship was bound for Byblos but instead that it was of the class normally used on the run from Egypt to Byblos.[76] Apparently, this term originally defined a class of Egyptian seagoing ship that was used on the Byblos run; however, by the end of the Old Kingdom, the term had come to include large seagoing ships, whatever their destination. The ships, probably constructed of cedarwood, may have been built on the Nile and then disassembled for transportation through Wadi Hammamat to Quseir on the Red Sea coast, where they were reassembled.[77] At the completion of the voyage, the craft would have been stripped down and carried back through the desert valley to Koptos. For this to be possible, the craft must have been of lashed construction.

The scene depicts memorable details of the voyage and the land of Punt, its inhabitants, and the sea creatures encountered during the voyage (Fig. 2.12). Note particularly the grossly fat wife of the leader of Punt (Fig. 2.13).[78] The fishes and other marine animals depicted here are, for the most part, indigenous to the Red Sea (Fig. 2.14).[79] Some, however, are fresh-water Nile fish that have been transferred to this scene.[80] Presumably, the marine creatures were recorded after they had been hooked—or netted—by the crew but before they ended up in the pot.[81] The artist did not see the animals in their natural habitat. This is evident from the manner in which they are depicted. All the fish and other creatures are depicted swimming to the right, in-

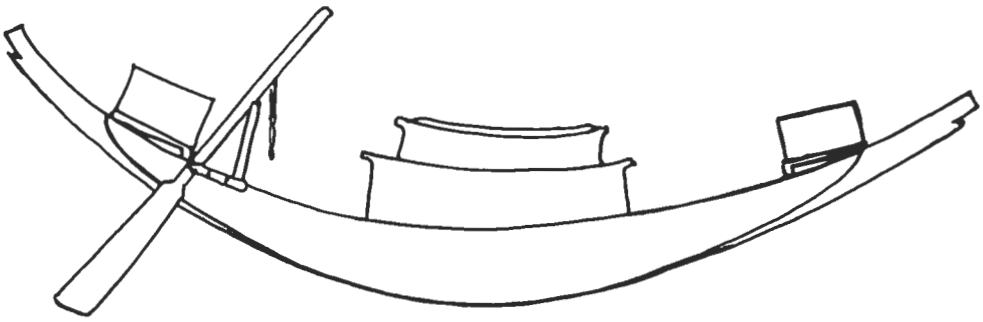

Figure 2.23. Wooden model of a traveling ship from the tomb of Tutankhamen (after Landström 1970: 107 fig. 331)

hull form that appears in the New Kingdom and is known from models found in the tombs of Amenhotep II and Tutankhamen (Figs. 2.19–23).[96] These models have long, nearly horizontal stem- and sternposts. The Punt ships differ in several details from the models: they lack the central cabin, their extremities are finished in a different manner, and they are outfitted with hogging trusses. The models suggest a beam/length ratio of about 1:5 for this ship type.[97]

Only one hull at Deir el Bahri has the rectangular butt ends of through-beams evident (Fig. 2.15). Either the beam ends were painted on the other hulls and have subsequently disappeared, or the artists never bothered adding them. R. O. Faulkner believes that the through-beams took the place of the truss girdle that appears on Old Kingdom seagoing ships (Figs. 2.2–3).[98] The Old Kingdom vertical sternpost was replaced with a conventionalized recurving papyrus umbel, a decoration also used on New Kingdom Nile traveling ships.[99]

Each ship is portrayed with fifteen rowers to a side. Assuming a standard minimum *interscalmium* of about one meter and allowing another four meters at both stem and stern, the total length of these craft would have been about twenty-three meters—*if the number of rowers is not a convention*. The ships show prominent and no doubt exaggerated overhang, both fore and aft. The waterline is indicated, although it is unconvincingly low. The stempost is vertical with a straight forward face and a curving rear surface. It lacks the Eye of Horus decoration, but with that exception is basically identical to stems on Old King-

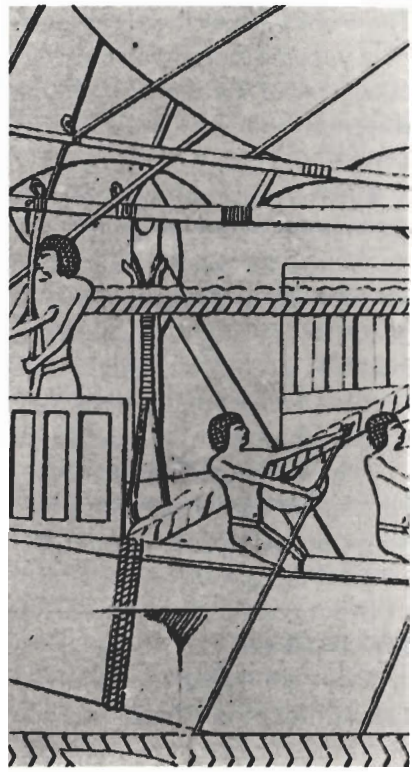

Figure 2.25. Bow section and quarter rudder on two of Hatshepsut's Punt ships (detail from Naville 1898: pl. 73)

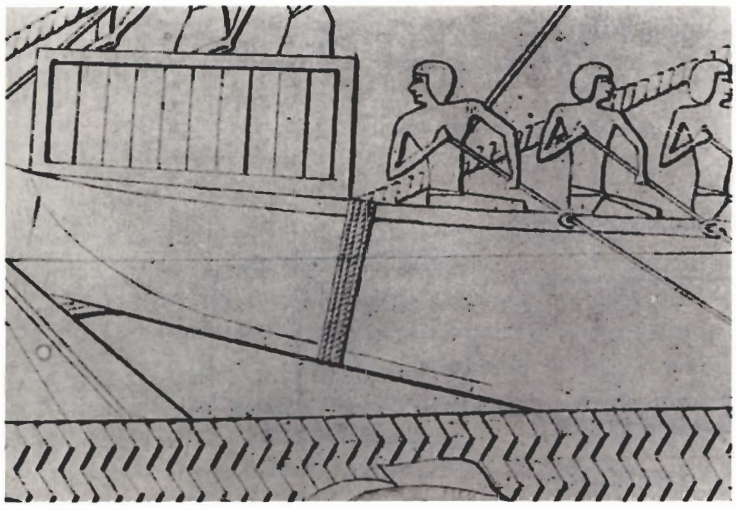

Figure 2.24. The bow section of a Punt ship (detail from Naville 1898: pl. 72)

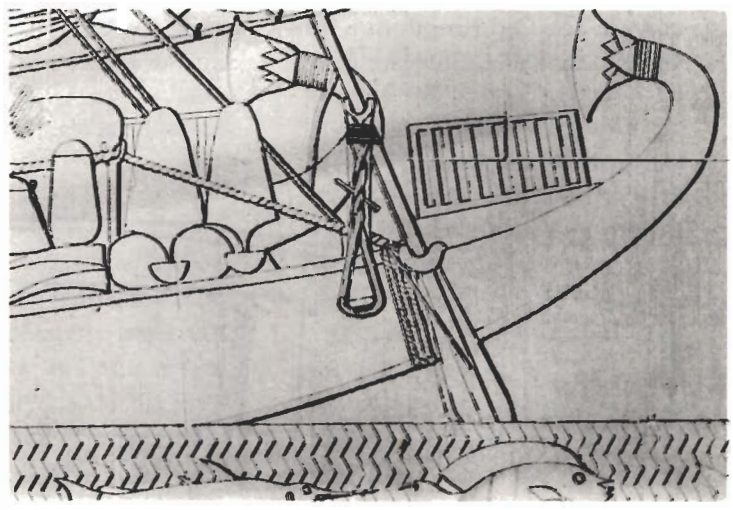

Figure 2.26. A Punt ship's stern (detail from Naville 1898: pl. 74)

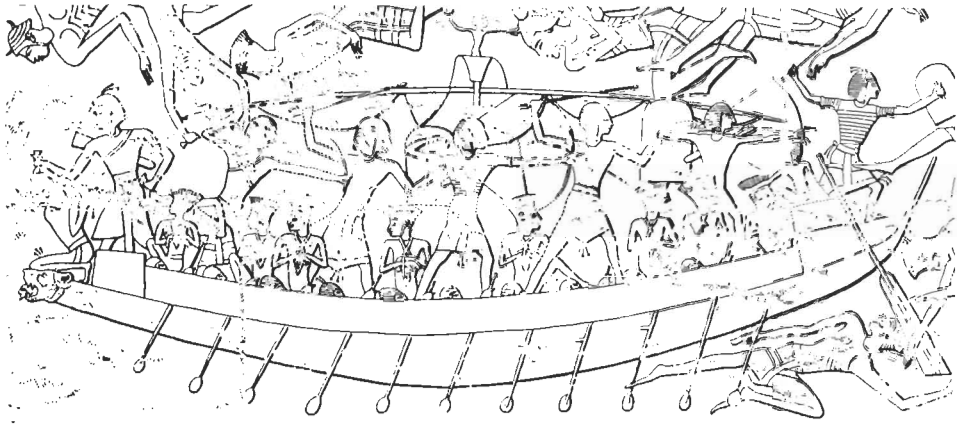

Figure 2.41. Ship E.4, Medinet Habu (Ramses III) (detail from Nelson et al. 1930: pl. 39; introduction © 1930 by the University of Chicago, all rights reserved, published June, 1930)

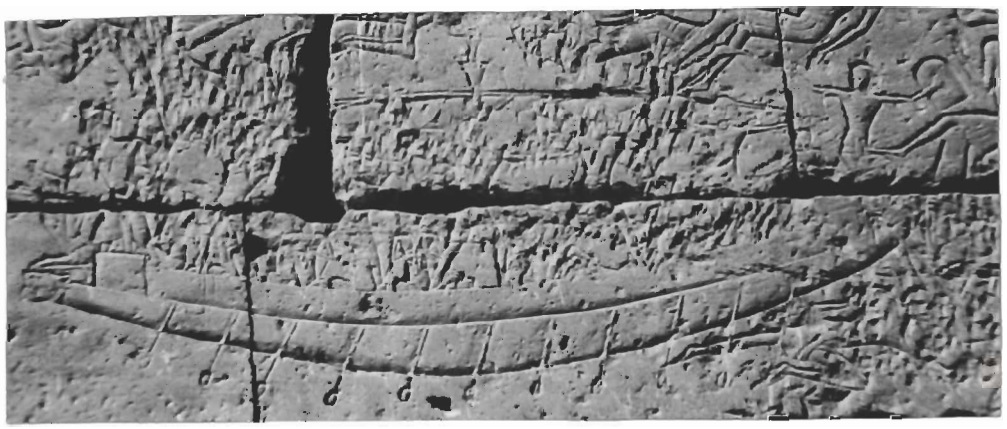

Figure 2.42. Ship E.4 in the naval battle at Medinet Habu (Ramses III) (photo by B. Brandle)

hurl stones at the invaders. This is the earliest depiction of a crow's nest on an Egyptian ship.

Discussion

The Seagoing Vessels of Punt

An unnamed tomb at Thebes (T. 143; Amenhotep II) contains a unique scene of a watercraft from Punt bringing trade items (Figs. 2.43–44).[142] The accompanying text notes, "Making rich provision (?) . . . gold of this district (Punt?) together with gold of the district of Koptos and fine gold (?) in enormous amounts."[143] The items brought by the Puntites include gold, incense, ebony, trees, ostrich feathers and eggs, skins, antelopes (?), and oxen. This scene also shows people of Punt bringing their cargo to an Egyptian port, perhaps Quseir on the Red Sea, where the Egyptians bartered with them. The background of the scene is pink—as is the land of Punt in the Deir el Bahri display. Norman de Garis Davies feels that this represents the inhospitable Red Sea coast.

The hulls portrayed are narrow and rectangular with rounded ends, colored pink like the background. Obviously, these craft were unfamiliar to the Egyptian artists. Davies suggests that they are coracles; alternately, they may depict dugouts. The figures and items of trade are portrayed above the body of the vessel rather than in it, perhaps because of a desire to show them in their entirety.

The rig is very simple and is similar to that used on some Old Kingdom ships.[144] It consists of a single yard with a triangular sail of black cloth or matting. No outrigger is shown, but if these craft were dugouts, an outrigger would have been necessary to prevent them from capsizing when a sail was used. Interestingly, the much later *Periplus of the Erythraean Sea* repeatedly mentions similar small-scale trade taking place in various types of rafts and other small craft in the lowermost area of the Red Sea.[145]

The Egyptian Ship Graffiti at Rod el ᶜAir

Turquoise, the Egyptian *mfkȝt*, was considered particularly valuable in pharaonic Egypt. The Egyptians went to considerable effort to mine it in southwest Sinai. During the Middle and New Kingdoms the center of turquoise mining was at Serabit el Khadem, where the Egyptians built a temple to Hathor, the goddess of turquoise.

The Egyptian expeditions reached the plateau of Serabit el Khadem via Wadi Rod el ᶜAir, where a base-camp has been found.[146] The smooth rock faces of the wadi contain numerous hieroglyphic inscriptions and graffiti. These include a unique group of Egyptian ship graffiti that is of particular interest to pharaonic seafaring: it is at present the only such group known that was drawn by Egyptians outside the geographic borders of Egypt and separated from it by a sea.

There are indications that, at times, the Egyptians reached Sinai by ship. The "Tale of the Shipwrecked Sailor" indicates that, in the Middle Kingdom, expeditions were sent to the mines of Sinai by ship. Further evidence of this is found in the various nautical titles that appear at Serabit at that time.[147] The port at Wadi Gawasis was apparently a starting point for

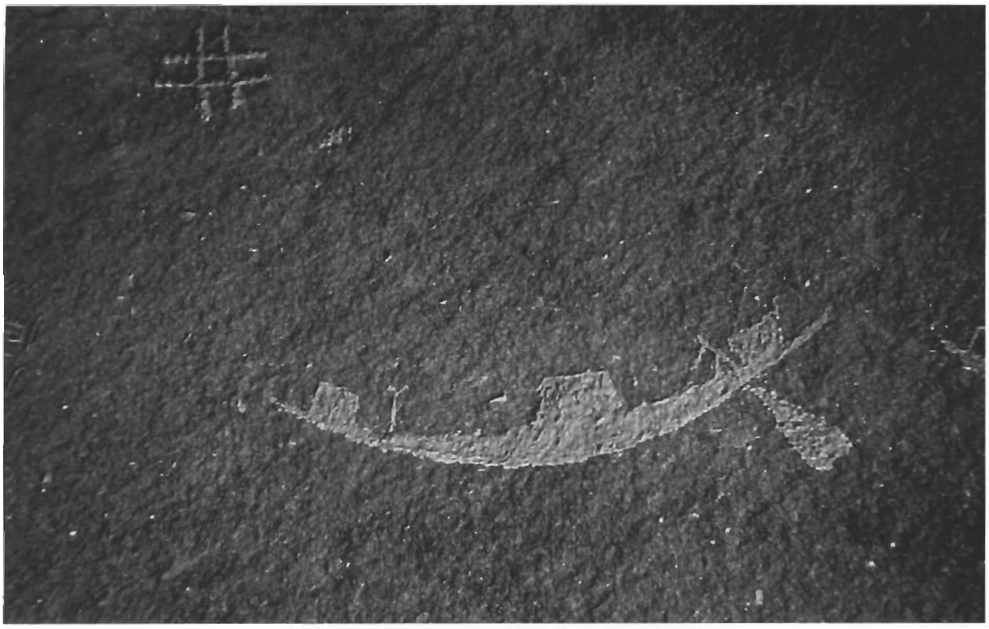

Figure 2.59. Ship graffito no. 12 (Rod el ʿAir) (photo by the author)

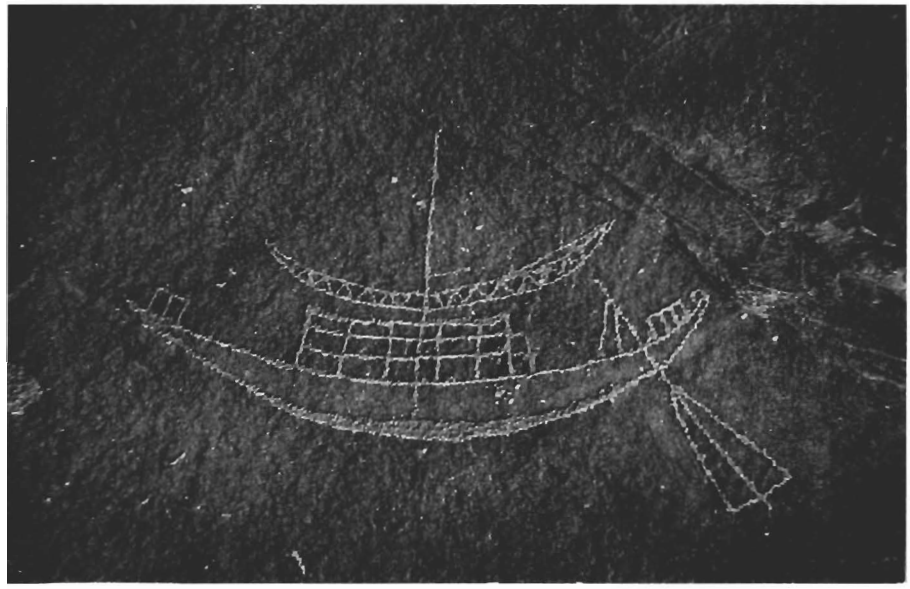

Figure 2.60. Ship graffito no. 13 (Rod el ʿAir) (photo by the author)

SHIP NO. 13. Ship facing left (Fig. 2.60). This is the most detailed of the three ships. It has a crescentic, spoon-shaped hull; the lower part of the hull is worked. Apparently the artist intended to work the entire surface of the hull but never completed the task. The hull ends in the stern in a recurving (decorative?) element. A large steering oar is placed on the quarter and supported by a short stanchion. The oar has a very wide blade; the tiller is connected to the loom forward of the stanchion. A large deck cabin, crossed by horizontal and vertical lines, is placed amidships. Landström suggests that deckhouses on New Kingdom traveling ships were made of a timber framework covered by highly decorated tent cloth.[170] This graffito seems to display just such a wooden framework.

The rectangle behind the cabin was probably intended as a flight of steps but was never finished.[171] Castles are located at stem and stern. The forecastle is crossed vertically by one line, the sterncastle by two. The mast is stepped amidships and passes through cabin and hull. The sail has been struck down: the yard, boom, and sail are secured in a crisscross pattern. No rigging is represented.

CHAPTER 3

The Ships of the Syro-Canaanite Littoral

The Iron Age Phoenicians are considered the seafaring merchants par excellence of the ancient world. This is largely because of the respect the Classical Greeks held for them as merchants and seafarers. But the Phoenicians were not new to the sea; their Syro-Canaanite ancestors had already come to know the Mediterranean intimately.[1]

The Textual Evidence

T. Säve-Söderbergh, in lauding Egyptian Mediterranean involvement, leaves little room for the Syro-Canaanites. At the same time, J. D. Muhly downplays the role of the Syro-Canaanite sea traders of the Late Bronze Age, arguing that Homeric references to Phoenicians in Mycenaean Greece must represent an Iron Age reality.[2] A significant role for Syro-Canaanites in maritime mercantile trading during the latter part of the Late Bronze Age was first proposed by G. F. Bass on the basis of the Cape Gelidonya shipwreck and Egyptian iconographic evidence and by J. M. Sasson based on the Ugaritic texts. The many texts dealing with maritime matters found in Ugarit, as well as in Egypt, indicate an intense level of involvement in maritime trade by the Syro-Canaanite city-states among themselves and with other lands and cultures.[3]

Despite long-standing assumptions to the contrary, Homeric references to Phoenician (Syro-Canaanite) sea traders in Mycenaean Greece are entirely compatible with Late Bronze Age realities.[4] A review of the following textual, archaeological, and iconographic materials indicates that the Syro-Canaanites were particularly active—although most certainly not alone—as sea traders in the Late Bronze Age and possibly earlier.

In addition, it is important to emphasize that this seagoing trading ability did not translate into political power. Recent studies indicate that Canaan—modern-day Israel and Southern Lebanon—was politically and financially impoverished during the Late Bronze Age, when Syro-Canaanite sea trade was at its height.[5] The Syro-Canaanites, including the major trading "power" of Ugarit, did so at the pleasure of their Egyptian or Hittite overlords.[6] Thus, terming Ugarit—or any other Late Bronze Age Syro-Canaanite city-state, for that matter—a "thalassocracy" is a misinterpretation of the evidence.[7] The Syro-Canaanites did not "rule the waves."

Most textual references to their ships refer specifically to heavily laden merchantmen with rich cargoes. During his expulsion of the Hyksos from Avaris, Kamose describes the capture of numerous Hyksos ships in which he found a wealth of trade goods.[8] This is the earliest known reference to trading ships definitely owned, and presumably constructed, by Syro-Canaanites: "I have not left a plank *under* the hundreds of ships of new cedar, filled with gold, lapis lazuli, silver, turquoise, and countless battle-axes of metal, apart from moringa-oil, incense, fat, honey, *itren*-wood, *sesedjem*-wood, wooden *planks*, all their valuable timber, and all the good produce of Tetenu. I *seized* them all. I did not leave a thing of Avaris, because it is empty, with the Asiatic vanished."[9]

Thutmose III supplies the next description of Syro-Canaanite ships when he describes his capture of two cargo-laden Syro-Canaanite merchantmen during his fifth campaign (year twenty-nine; 1450 B.C.): "Now there was a seizing of two ships, . . . loaded with everything, with male and female slaves, copper, lead, *emery*, and every good

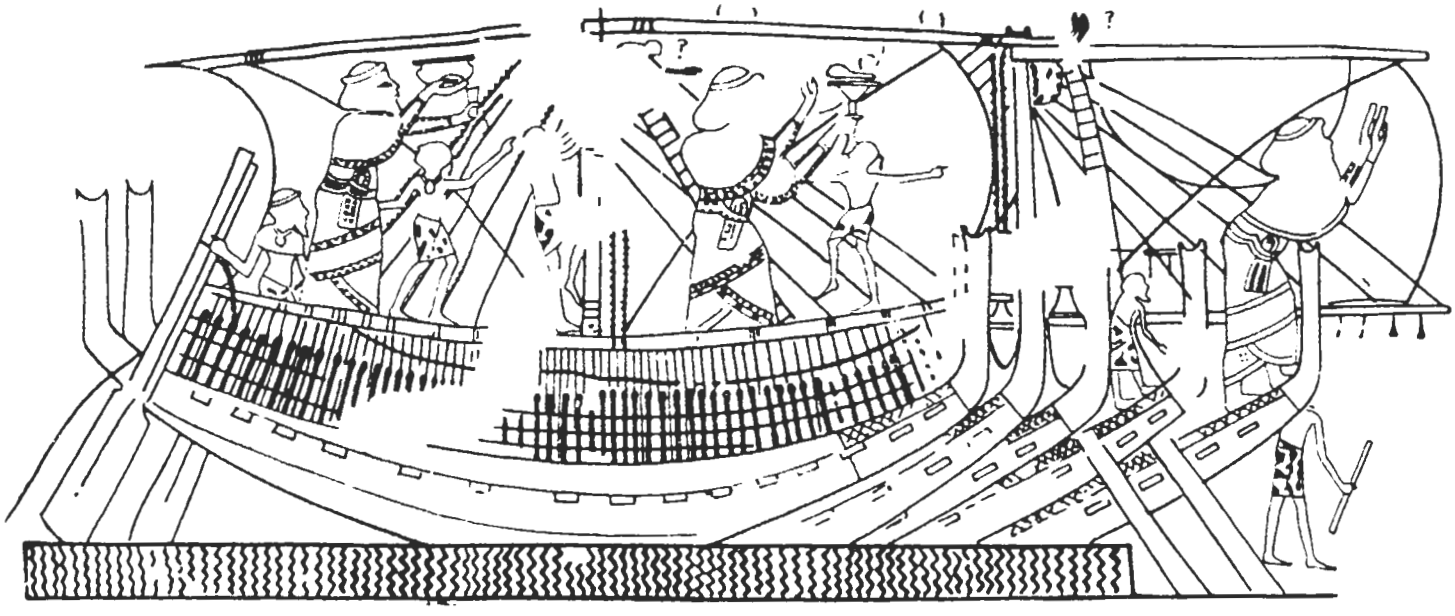

Figure 3.5. Detail of the ships at the upper center of the Kenamun scene (from Davies and Faulkner 1947: pl. 8)

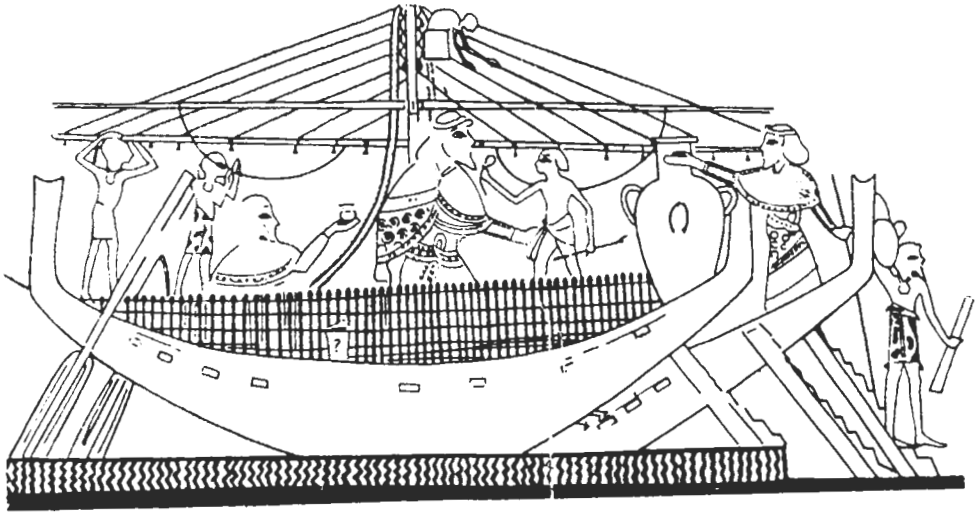

Figure 3.6. Detail of the ships at the lower center of the Kenamun scene (from Davies and Faulkner 1947: pl. 8)

nasty. If so, the artist(s) who painted the ships in Kenamun's tomb was at least once removed from his subject.[46]

The ships are depicted with crescentic hulls and with a particularly severe—perhaps exaggerated—sheer.[47] The vessels at the upper center have the most detailed hulls. The ship nearest the viewer has three strakes delineated with two butt joints: one between the stem finial and the hull, the other between two planks in the middle strake (Fig. 3.5). Butt joints are also visible between the stempost and the hull on the four other ships staggered behind it.

Some ships carry lacing along the sheer (Fig. 3.5). R. O. Faulkner believes this lacing ran the entire length of the ship, as in Sahure's seagoing ships.[48] But similar lacing, positioned at the extremities of the craft, are known from Middle Kingdom wooden ship models.[49] Therefore, this is best understood as an additional Egyptianizing element introduced by the artist, as, perhaps, are the single rows of through-beams (Figs. 3.5–6).

The stem- and sternposts are vertical with a slight external hollow. The posts' tops are flat or concave.[50] Because of Egyptian artistic conventions, it is not clear if they are portrayed frontally or in profile.[51] Vertical stemposts are known from New Kingdom Egypt on Hatshepsut's seagoing Punt ships as well as on river craft.[52] However, none of these have vertical sternposts. As noted above, vertical posts at stem and stern with straight outer and curving inner faces appear on Old Kingdom seagoing and cargo ships (Figs. 2.2–3, 5, 8, 9).

A screen runs the length of the ships at the sheer. The Uluburun ship seems to have had a wickerwork and post screen of this type.[53] Two rudders with short tillers are hung over the quarters.[54] There are no stanchions, but these must have existed on the actual ships to support the looms.

Säve-Söderbergh, Norman de Garis Davies, and Faulkner consider the ships in Kenamun's tomb to be Egyptian vessels.[55] This con-

Characteristics of Syro-Canaanite Seagoing Ships

The iconographic evidence allows the following general conclusions about Syro-Canaanite seagoing ships:

- In profile the hulls are crescentic. There is little evidence upon which to base a length-to-beam ratio, although at least two sources —Kenamun and Nebamun—portray a class of trading ships. This argues for a fairly beamy vessel. The Enkomi terra-cotta, the only known model that may represent a Syro-Canaanite seagoing ship, is too problematic for conclusions on hull ratios.
- The ships' stem- and sternposts lack decoration. They may be more or less identical, both vertically oriented (ships of Kenamun and Nebamun, the Enkomi model, and perhaps the Ugarit seal), or the stem may be vertical while the sternpost rises as a gentle curve (*mnš*-determinative, Hala Sultan Teke, and Tell Abu Hawam, in which the bow is lacking). Vertical posts on these ships have a vertical inner edge and a hollow external edge.
- Rudders were placed on the quarters. Both single (Nebamun) and double (Kenamun and Tel Abu Hawam) quarter rudders are represented. The steering oars are fixed on stanchions (Nebamun) and have a tiller (Kenamun and Nebamun), an arrangement identical to that on contemporaneous Egyptian seagoing ships and on some Nile craft.
- A high screen or open bulwark ran the entire length of the craft from stem to stern. This is clearly indicated on the ships of Kenamun, Nebamun, and on the *mnš*-determinative; it may be inferred in the schematic representations from Tell Abu Hawam, Dor, and Ugarit.

Figure 3.15. Terra-cotta ship model from Enkomi (surface find) (from Merrillees 1968: pl. 37: 1)

- The yard has downward curving ends in three (Nebamun, Tell Abu Hawam, and Ugarit) of the four illustrations that portray rigging. Apart from the yard, Syro-Canaanite craft seem to have used a similar rig, with boom and multiple lifts, as was common in Egypt. The two halyards were tied aft, serving as running backstays when the sail was raised, as was normal practice in Egypt.[83] Lateral cables took the place of shrouds.[84]
- Crow's nests appear first on Syrian ships (Kenamun and perhaps Nebamun). Thus, they seem to be a Syro-Canaanite invention.[85] Subsequently, the idea was borrowed by Egypt and the Sea Peoples (Figs. 2.37–44; 8.3–8, 10–12, 14). Rope ladders, if this is indeed what the Kenamun artists intended, appear in one scene only—and then disappear from sight until Classical times.[86]
- Oars appear on the ships depicted on seals from Tell el Dabᶜa (two) and Ugarit (five).

Discussion

The "Keftiu" Ship

In Thutmose III's annals describing the stockpiling of the Canaanite harbors during his ninth campaign (year thirty-four; ca. 1445 B.C.) we read: "Behold, all the harbors of his majesty were supplied with every good thing of that ⌜which⌝ [his] majesty received [in] Zahy (*Ḏ'-hy*) consisting of Keftyew ships, Byblos ships and Sektw (*Sk-tw*) ships of cedar laden with poles, and masts together with great trees for the ⌜_ _ _⌝ of his majesty."[87]

"Keftiu" ships appear in only one other Egyptian text, also dating to the reign of Thutmose III.[88] Several of these craft are being built or repaired at the royal dockyard of *Prw nfr*.[89] S. R. K. Glanville considers them to be a class foreign to Egypt, apparently of Aegean origin.[90] Säve-Söderbergh and E. Vermuele assume them to be a class of Egyptian-built seagoing ships.[91] The origins of this class may be inferred from the following considerations:

- The ships were received as tribute from Canaan, suggesting that they were indigenous to that region.
- There was a distinct Syro-Canaanite presence at *Prw nfr*. Syro-Canaanite shipwrights worked there, and the gods Baal and Astarte were worshipped there.[92] One official was named *šbj-bᶜl*, and a "chief workman" was named *Irṯ*—a name

CHAPTER 4

Cypriot Ships

Cyprus was being exploited by seafaring hunters ten thousand years ago; it had been settled by the eighth millennium and possibly as early as the ninth.[1] This colonization must have been carried out by means of water transport. From that time on, because of the island's geography, the sea played a significant part in the development of the Cypriot cultures. In the Late Bronze Age, the island flourished as a source of copper. Stone anchors, boat models, and perhaps texts all point to Cypriot seafarers playing a significant role in Mediterranean trade.

The Textual Evidence

Textual evidence for Cypriot Late Bronze Age seafaring depends on whether the term *Alashia* was the island's ancient name. If Alashia was Cyprus (or part of that island), then a considerable amount of textual evidence exists, particularly from Amarna and Ugarit, concerning Cypriot nautical activities.

The "war" over the identity of Alashia has been fought now for a century. Today, the scholarly world seems to lean toward the Alashia-Cyprus equation. Several venerable and vocal proponents persist, however, in locating Alashia in northern Syria or Cilicia.[2] The *nautical* evidence of Amarna text 114, though, requires that Alashia be located in Cyprus.[3]

Eight Amarna texts, sent to Egypt from Alashia, indicate close trade and diplomatic contacts between them.[4] In one, an Alashian has died in Egypt, and the pharaoh is asked to return his possessions.[5] An Alashian living in Egypt, even for a short time, is best understood as a merchant or trading agent. In another case, the ship may have actually belonged to the king of Alashia.[6]

The cordiality of the letters between the Alashian and Ugaritic kings indicates a very close, if not familial, relationship.[7] Numerous Ugaritic texts refer to Alashian traders. One of them, named Abiramu, received 660 units of oil.[8] Other texts refer to persons simply termed "the Alashian." An extensive list of the names of women and youths who were in several estates has the marginal note "the town of Alashia."[9] Presumably this is a list of the Alashian community at Ugarit.[10] The estate may have belonged to persons with Hurrian and Semitic names.[11] An Alashian ship's inventory, recorded at Ugarit, included fifteen talents of copper.[12] The Cypro-Minoan texts found at Ugarit also substantiate a Cypriot presence there.[13]

We lack references to Cypriot ships visiting the Aegean. The term *ku-pi-ri-jo* ("Cypriot"), however, appears in Linear B tablets at both Knossos and Pylos. At the former site, this appears to refer primarily to an ethnic used as a man's personal name.[14] At Knossos the term is used in connection with honey, oil, vases, wool, and the ingredients of salve.[15] There it seems to define an item's origin or, more likely, its ultimate destination.[16]

Cypro-Minoan signs found on some Late Helladic III and Late Minoan III pottery in the Aegean area—primarily at Tiryns and Crete—were incised after firing.[17] These marks seem to be part of a system for designating these items for export to Cyprus, perhaps by Cypriot traders situated in the Aegean.

Wenamun, shipwrecked on Alashia and with the locals about to kill him, tried to communicate with them: "Surely there is one among you who understands Egyptian. And one of them said: I understand."[18] Perhaps the Ala-

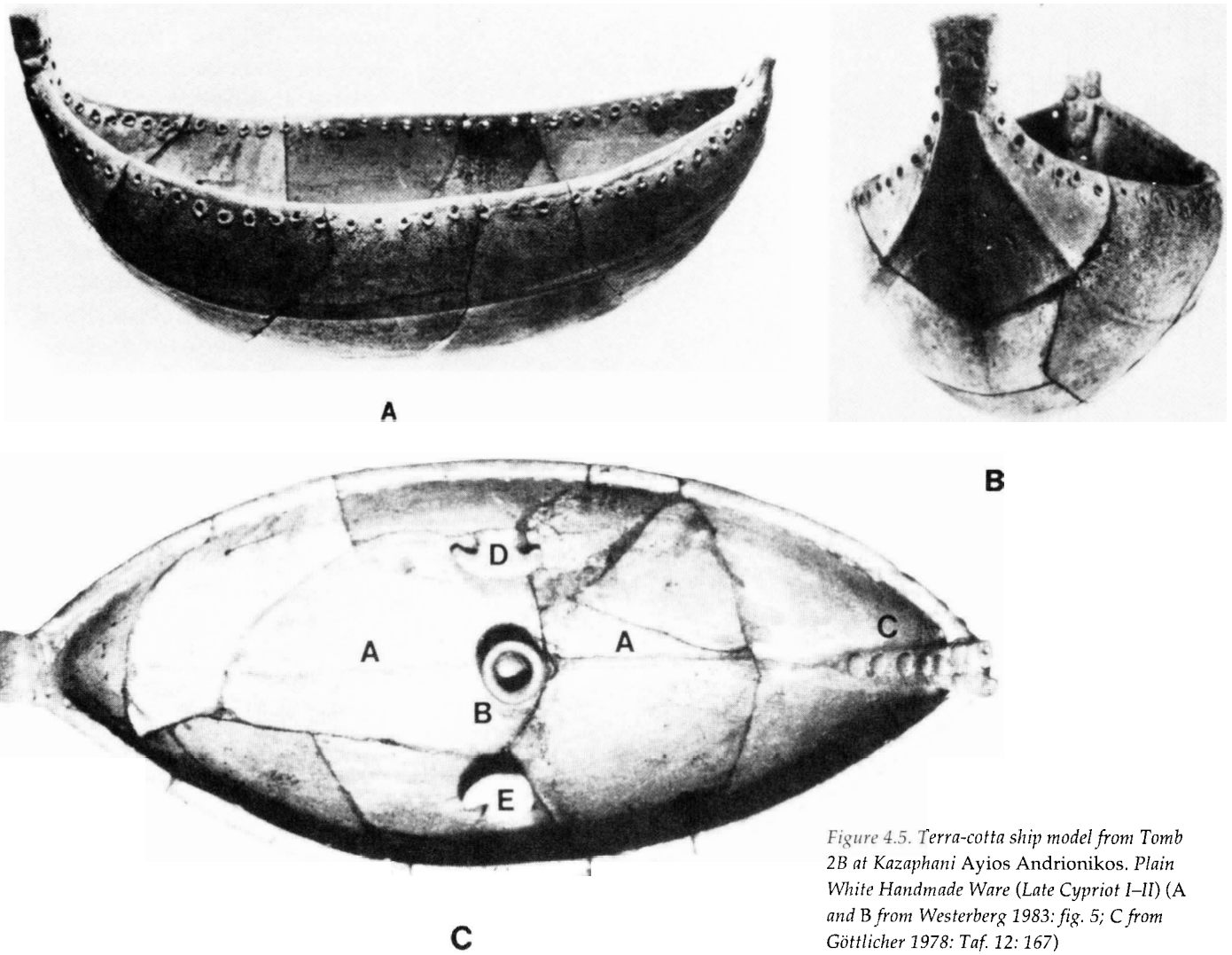

Figure 4.5. Terra-cotta ship model from Tomb 2B at Kazaphani Ayios Andrionikos. *Plain White Handmade Ware (Late Cypriot I–II)* (A *and* B *from Westerberg 1983: fig. 5; C from Göttlicher 1978: Taf. 12: 167*)

Figure 4.6. Terra-cotta ship model A–50 from Site A, Tomb 7, at Maroni Zarukas *(Late Cypriot I–II) (from Merrillees 1968: pl. 37: 2)*

CHAPTER 5

Early Ships of the Aegean

Aegean geography, with its many islands, numerous small natural harbors, and rugged topography, required early on that the cultures inhabiting its rocky shores develop seafaring skills, which were ingrained into their cultural heritage. Fortunately for us, the Aegean region, unlike some of the geographical areas discussed earlier, is exceptionally rich in iconographic materials depicting seagoing ships.[1]

The Archaeological Evidence

The earliest evidence for seafaring in the Aegean—and in the entire Mediterranean, for that matter—is flakes of obsidian originating on the island of Melos that were found in the strata of the Franchthi Cave, located in the southern Argolid.[2] These indicate that the inhabitants of the Greek mainland had the technical skills required to navigate the Aegean by the Upper Paleolithic or Mesolithic periods. Unfortunately, we know nothing about the craft in use at that time.[3]

Navigational skills, however, did not translate into patterns of settlement. Only later, after the introduction of agriculture in the Neolithic period, which allowed the immigrants to exploit islands with sparse resources, did settlement of the Aegean islands begin.[4] There is mounting evidence for Late Neolithic settlement on various Aegean islands and for the founding of Crete in the late eighth or early seventh millennium B.C., apparently as the result of a well-organized and concerted effort.[5] The Early Bronze Age, however, experienced the main thrust of Aegean settlement.

The Iconographic Evidence

Iconographic information on Aegean seafaring begins only in the third millennium. *Thus, the period separating the earliest evidence for seafaring from the earliest iconographic representations of seagoing craft is considerably longer than that separating our own time from the Early Bronze Age.* Two distinct types of ships can be defined during this period. The first is a variety of seagoing longship; the other seems to be a fairly small vessel with a cutwater bow and stern. Other types of craft may have existed, but if so, we have no known depictions of them.

Early Bronze Age Aegean Longships

LEAD MODELS FROM NAXOS. As might be expected from the preceding discussion, the earliest iconographic evidence for ships in the Aegean already shows considerable structural development. The clearest indication for the shape of these longships is three lead ship models from Naxos that date to the third millennium B.C. (Figs. 5.1–2).[6] Each of the models is constructed of three lengths of lead. The bow and keel are made from a rod of lead that was flattened by hammering the central two-thirds of its length to form a flat bottom. Two other flat strips form the sides of the hull. One extremity is raised and finishes in a vertical transom, while the other end is narrow and rises at an angle. The models are exceptionally narrow; the largest and best preserved has a beam/length ratio of 1:14. L. Casson believes these to be models of dugouts; L. Basch considers their prototypes to have

The pointed end of the "teardrop" finishes in a high post. The rounded end is apparently the terra-cotta equivalent of the stern transom on the Naxos models. The widest part of the hull is well astern of amidships.[19] A blunt horizontal projection extends abaft the stern.

ORCHOMENOS. Another ship of this sort is incised on an Early Helladic vase handle from Orchomenos (Fig. 5.11). Two vertical lines above the hull are probably accidental scratches and are not related to the craft.[20] The line of the keel is slightly longer than the top (sheer) line, forming the familiar horizontal projection. Sixteen short vertical strokes above the sheer are best interpreted as paddles.

PHYLAKOPI. None of the above representations show steering oars. However, the *curving* stern of a ship with a single steering oar appears on a sherd from Phylakopi (Fig. 5.12). A short tiller (?) extends *abaft* the steering oar. The stern projection is absent. Rows of parallel lines above and below the hull again apparently depict paddles.

TARXIEN. The longship class seems to have had a particularly wide area of use. Casson identifies a ship of this class on a stone from the megalithic temples of Tarxien on Malta (Fig. 5.13).[21] He believes that other graffiti at Tarxien represent merchant craft because of their dumpier proportions.

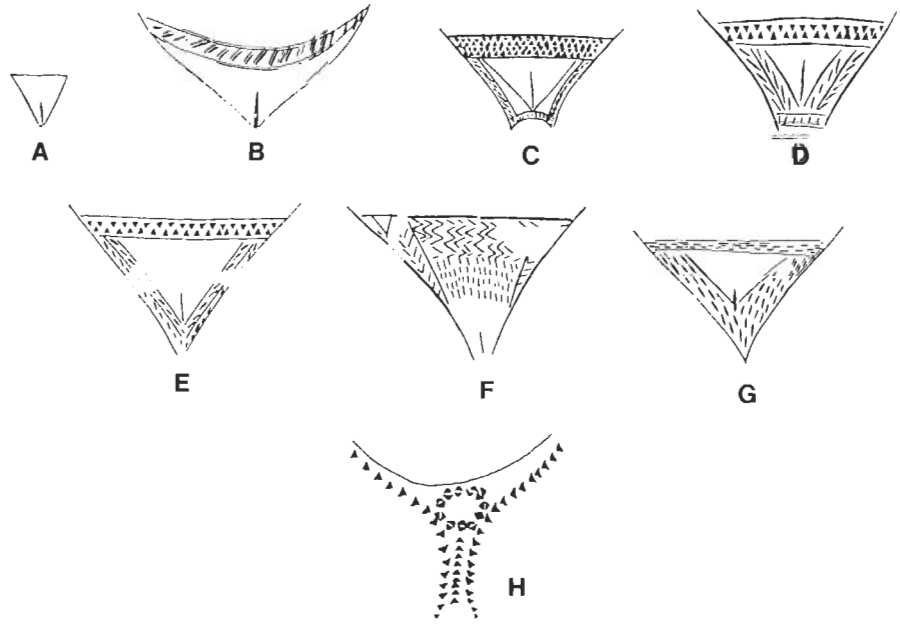

Figure 5.5. Genitalia appearing on Cycladic "frying pans" (Early Cycladic II) (from Coleman 1985: 196 ill. 4)

CHARACTERISTICS OF EARLY BRONZE AGE AEGEAN LONGSHIPS. It has been suggested that the ships depicted in the various iconographic mediums represent different sizes or even classes of longships.[22] Variations of craft probably did exist in the Early Bronze Age Aegean, just as there was a variety of ship types in the Oceanic region in the more recent past. The iconographic evidence, however, is not sufficiently clear to permit such differentiations. Variations may result from their expression in different mediums—incision on clay, metal/stone/terra-cotta models, and so on—which may significantly change the relative dimensions of the illustrations.[23]

An argument still persists among scholars as to which end of these ships represents the stern and which the bow.[24] There are two compelling arguments for identifying the high end as the stem. Firstly, the lower extremity of the Naxos lead models have a blunt, transom-like ending, strongly suggesting that this end was the stern. Secondly, the ships taking part in the waterborne procession depicted in the miniature frieze at Thera have similar horizontal projections at their sterns (Figs. 6.13–14). This device, unknown outside the Aegean, is so unusual that one may assume it represents the same device in both the Early Bronze Age depictions

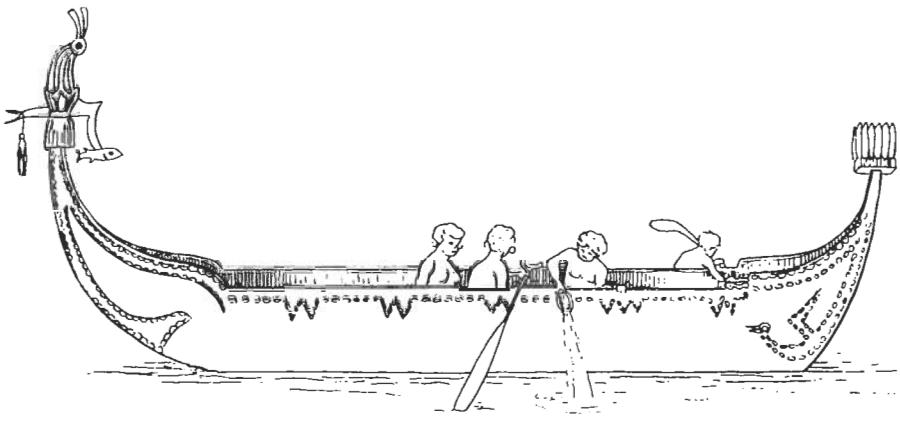

Figure 5.6. A Solima canoe from the Solomon Islands (after Haddon 1937: 88 fig. 59: b)

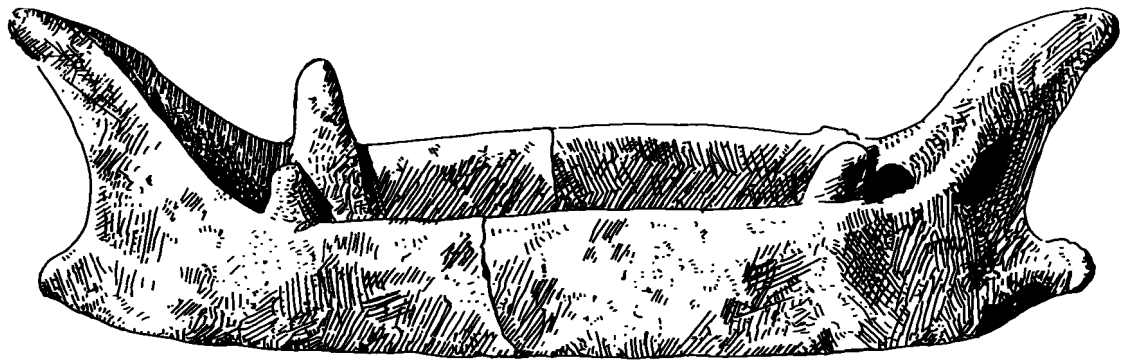

Figure 5.16. Ship model from Mochlos (third millennium) (after Göttlicher 1978: Taf. 24: 313)

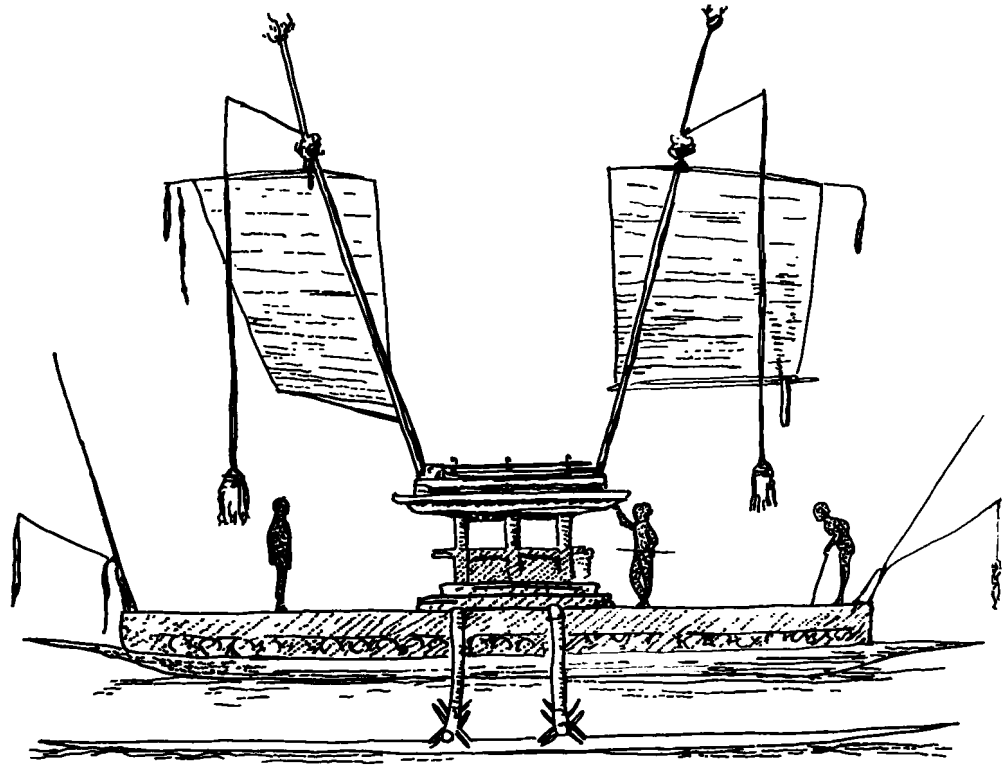

Figure 5.17. Two-masted canoe, Papua (after Haddon 1937: 297 fig. 172)

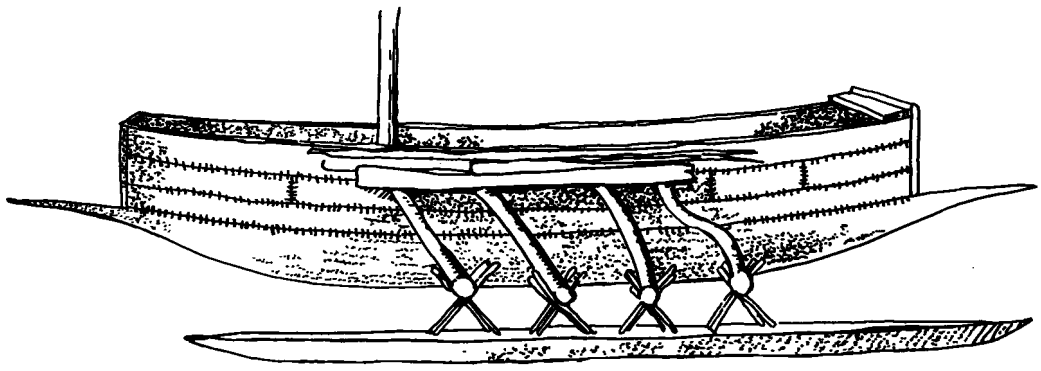

Figure 5.18. Canoe, New Hebrides (after Haddon 1937: 32 fig. 19)

CHAPTER 6

Minoan/Cycladic Ships

Of all the cultures that flourished around the shores of the eastern Mediterranean during the second millennium B.C., there is none as fascinating—or as enigmatic—as that of the Minoans. Evolving on Crete, these unique people were the quintessential explorers of the Bronze Age. They traded for tin in far-off Mari and presented their wares before the pharaohs. And artisans, schooled in Cretan art forms, decorated Asiatic and Egyptian palaces with Minoan motifs.

But what kinds of ships carried the Minoans on their seafaring journeys of exploration and trade? For decades after Sir Arthur Evans began his excavations at Knossos and discovered the Minoan culture, little was known about their ships. Although a considerable corpus of Minoan ship depictions existed, the quality and detail of these left much to be desired. Most of the evidence was derived from engravings on tiny seals and sealings. A handful of mainly rough and fragmentary models completed the repertoire. Minoan ships remained as enigmatic as the culture that created them.

Then, in 1972, while excavating at the site of Akrotiri on the volcanic island of Thera (Santorini) in the Cyclades, the Greek archaeologist Spyridon Marinatos revealed a well-preserved settlement that had been buried in volcanic ash when the island's volcano exploded, apparently ca. 1628 B.C.[1] One building, a two-storied structure, contained a miniature frieze, depicting in brilliant detail ships taking part in a waterborne race or procession and other nautical activities. The Cycladic ships in the scenes are identical—or at least similar in all discernible details—to vessels depicted in Minoan art.

The Miniature Frieze from Thera has considerably expanded our knowledge of Late Bronze Age Aegean ships and seafaring practices and requires us to study the previously known iconographic evidence for Minoan ships in light of its discovery. Because of the importance of the Theran material for interpreting Aegean seafaring, I have dealt in particular depth with various facets of it in this chapter.

The Textual Evidence

There is considerable and diverse evidence pertaining to the movement of Minoan seafarers and artisans in the eastern Mediterranean during the closing centuries of the Middle Bronze Age II and the beginning of the Late Bronze Age.

Mari

A tin inventory from Mari is the earliest textual evidence for Minoan contact with the Syro-Canaanite coast.[2] The text dates to the first half of Zimri-Lim's reign (ca. 1780–1760 B.C. according to the middle chronology). Among those receiving tin are a Caphtorite (Minoan) and a Carian, apparently from Caria on the western Turkish coast.[3] Ugarit was the port of entry for these Aegean merchants and supplied their dragoman. The fact that an Ugaritian interpreter could converse with Minoans suggests that this contact may have been stronger than the evidence at present allows. Interestingly, a Caphtorite and a Carian are also mentioned in later Ugaritic texts.[4]

The Cypro-Minoan Script

Intimate contacts between the Minoan culture and Cyprus are indicated by the consideration that the Cypro-Minoan script derives from a Minoan, not a Mycenaean, script.[5]

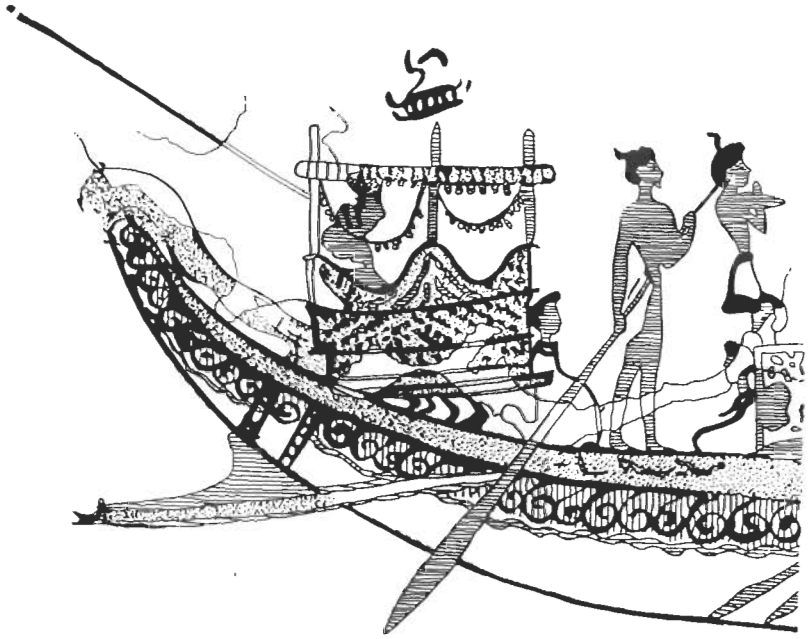

Figure 6.14. The processional ships carry a stylis*-like pole, a horizontal water-level projection, and a small cabin* (ikria) *at the stern (after Marinatos 1974: color pl. 9)*

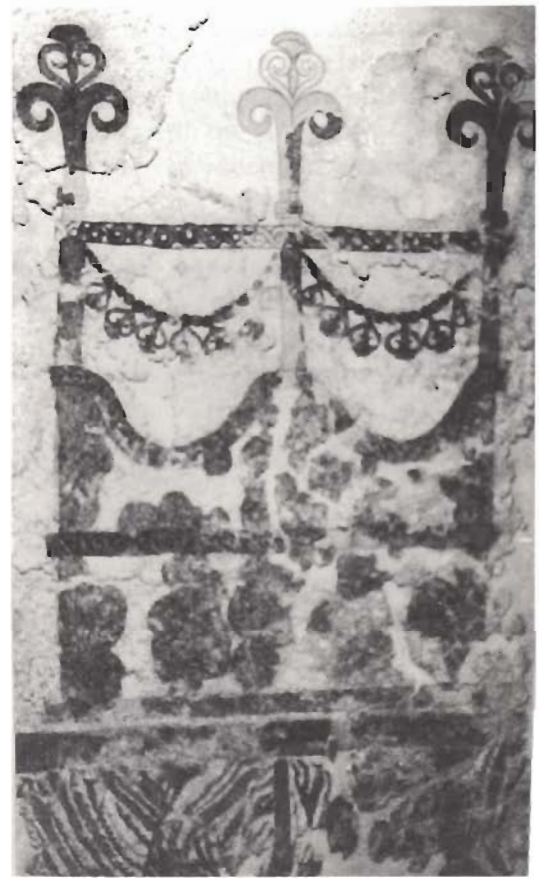

Figure 6.15. One of the eight painted ikria *in Room 4 of the West House (photo by the author; courtesy of the National Archaeological Museum, Athens)*

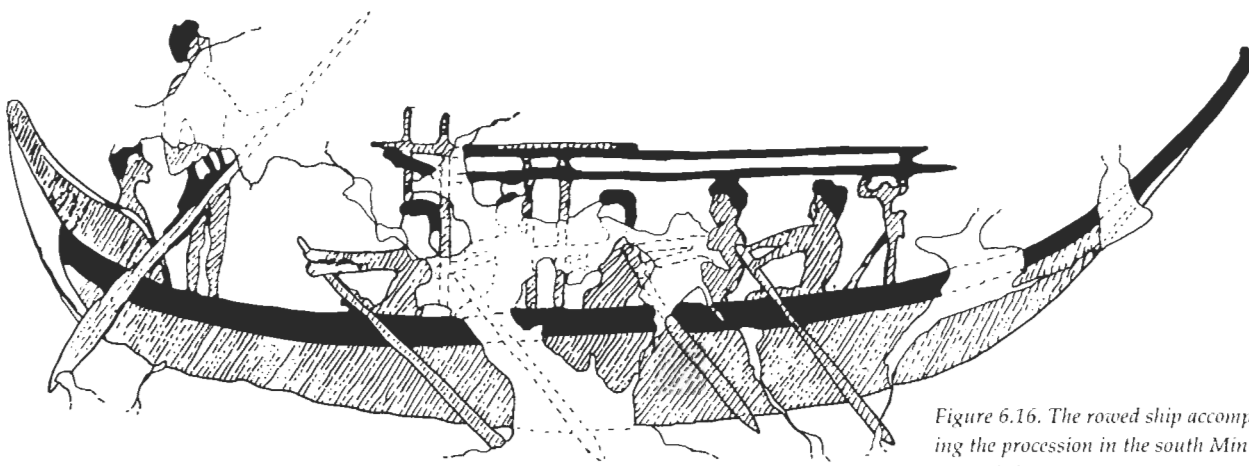

Figure 6.16. The rowed ship accompanying the procession in the south Miniature Frieze (after Doumas 1983: 121 fig. 20)

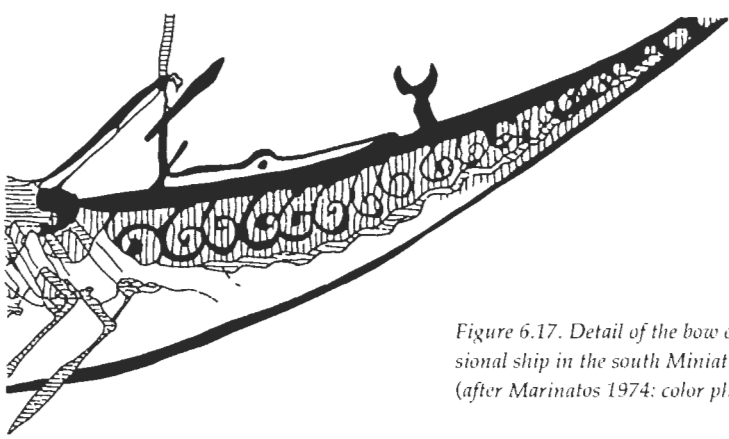

Figure 6.17. Detail of the bow of a processional ship in the south Miniature Frieze (after Marinatos 1974: color pl. 9)

S. Lloyd and J. Mellaart point out the possibility of Minoan elements in the plan and construction of the nineteenth-century B.C. palace at Beyçesultan.[22] If their hypothesis is correct, it suggests a possible presence there also of Minoan artisans during the Middle Bronze Age.

In Egypt, fragments of Minoan-style wall paintings have also been uncovered at Tell ed-Dab^{c}a.[23] These paintings, reportedly similar in style and execution to frescoes from Knossos and Thera, include images of bull-jumping.

The Iconographic Evidence

Minoans in the Theban Tombs

A unique form of graphic evidence concerning Minoan contacts with Egypt consists of tableaus of Aegeans depicted in the tombs of the nobles at Thebes.[24] A study of these Aegean figures and their wares, identified as inhabitants of "Keftiu" (= Caphtor) and the "Isles in the Midst of the Sea" in the accompanying inscriptions, indicates that their ships were arriving in Egypt during the reigns of Hatshepsut and Thutmose III, and perhaps earlier. The term *Isles in the Midst of the Sea* may have been the Minoan name for Crete and the surrounding islands as adopted in translation by the Egyptians.

Scenes of Minoans are discontinued in the Theban tombs after the opening years of Amenhotep

Figure 6.1. Minoans bringing their wares are depicted for the last time at Thebes, Egypt, in the tomb of Rechmire (Late Thutmose III; early Amenhotep II) (from Davies 1943: pls. 18–20)

Figure 6.5. The waterborne procession in the south Miniature Frieze (courtesy of the National Archaeological Museum, Athens)

tremors and were removed by the Therans before the settlement's final destruction.

The Miniature Frieze on the northern wall is also badly damaged. Spyridon Marinatos dealt with two elements within this tableau. The first is known as the "Meeting on the Hill," in which a group of men, some wearing robes and others wearing kilts, come together, possibly to worship at a hillside or peak sanctuary overlooking the sea (Fig. 6.6).[37] The second scene in the Miniature Frieze depicts parts of four ships and a row of soldiers who advance inland in single file (Fig. 6.7). To the left of the soldiers is a settlement in which the inhabitants seem totally oblivious to them.

These ships lack the decorative elements of the processional craft. It is not clear if the ships bear stern cabins (*ikria*) for the area above the sterns of all three is missing. The oars of one craft are awash in the surf, indicating that they were rowed, not paddled. Two ships have a garland or tassel hanging over the side of the bow. The bow device on one ship is similar to those depicted on the Kolona ships (Fig. 5.24:B).

Three naked dead bodies are floating in the water.[38] Unlike the scene on the "Siege Rhyton" from Shaft Grave IV at Mycenae, to which it has been compared, in the

paddled; five other diminutive crescentic boats are anchored in a bay near the city to the right (Fig. 6.24). Morgan notes that two craft with skeletal awnings depicted in a harbor above and to the right of the canoe, though portrayed on a much smaller scale, are of the same type (and size?) as the rowed ship.[65]

Ships on Minoan Seals

Ships appear on a wide variety of Minoan seals, beginning in the Early Minoan III period.[66] The ships depicted on tiny Minoan seals are often schematic, making it possible to interpret the various representations as different classes of craft.[67] The seals must now be correlated with the evidence from Thera.

TALISMANIC SEALS. A number of seals show the abstract bow of a boat with a bird ornament on the stem; behind this is an object constructed of two or three vertical poles with hatching between them (Fig. 6.25).[68] The motif undergoes a progressive abstraction during the series. This object is interpreted as masts and sails by Spyridon Marinatos, as deck awnings by R. W. Hutchinson, and as a type of pole sail by L. Basch.[69]

The identity is closer at hand, however. H. Van Effenterre identifies this construction as the stern *ikria*.[70] Indeed, in the more realistically portrayed seals, the device is too similar to the *ikria* on the Theran ships for this to be a coincidence (Figs. 6.15, 25: C–F). Furthermore, on a seal from Thebes, the device appears at the stern of the ship, the actual position of the *ikria* on the processional ships (Fig. 6.48). Thus, the seals portray two important elements—bird decorations and *ikria*—that at Thera are specifically connected with the water ceremony. Apparently, *contra* Basch, we are not seeing an entire ship on this seal type.[71]

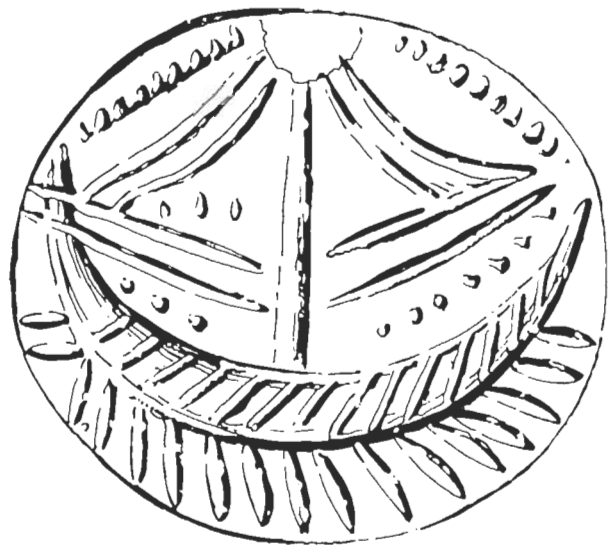

Figure 6.26. Ship with festooned lines depicted on a steatite lentoid seal (Late Minoan IIIB) (after PM II: 243 fig. 139)

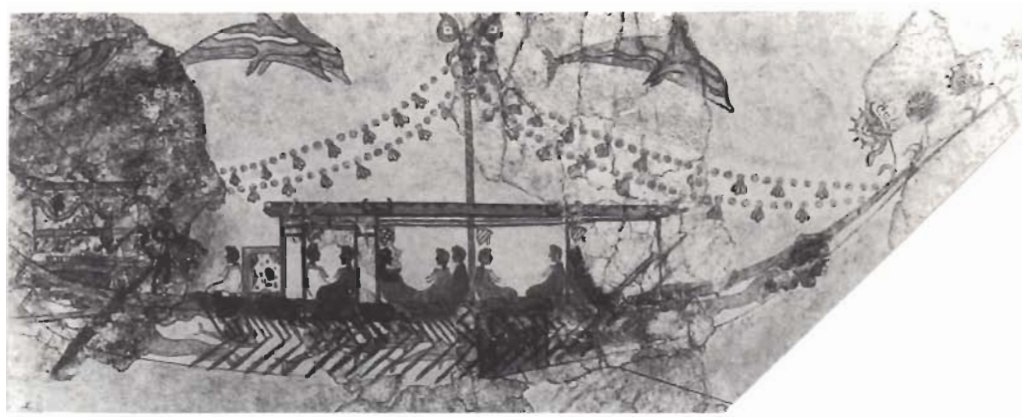

Figure 6.27. One of the ships in the procession has rows of garlands running from the mast to the bow and stern (from Doumas 1992: 75–76)

This variety of seal, termed "talismanic" by Evans, dates from the Middle Minoan III to the Late Minoan I periods and ceases to be made after the Mycenaean takeover of Crete.[72] Concerning the uses of this seal type, J. H. Betts notes:[73]

> In addition to its incidental artistic attractiveness as jewelry, the sealstone had two main functions as the personal symbol of its wearer. The one was sphragistic: the functional use of a seal to make a mark guaranteeing a document or product as authentic; the vast number of clay sealings from the Cretan and

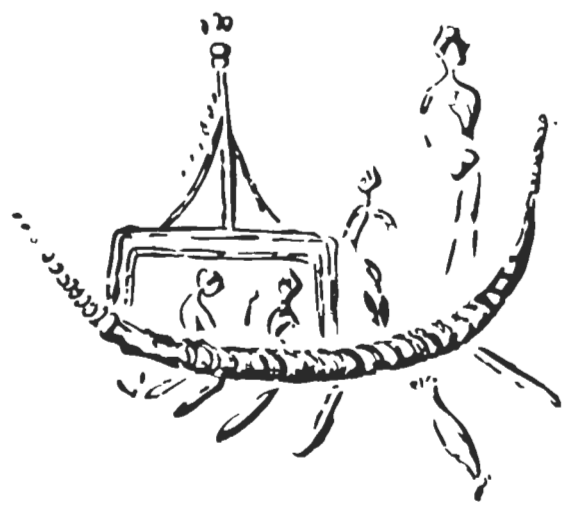

Figure 6.28. Minoan crescentic ship depicted on a gold ring from Tiryns (ca. 1300 B.C.) (after Casson 1995A: fig. 50)

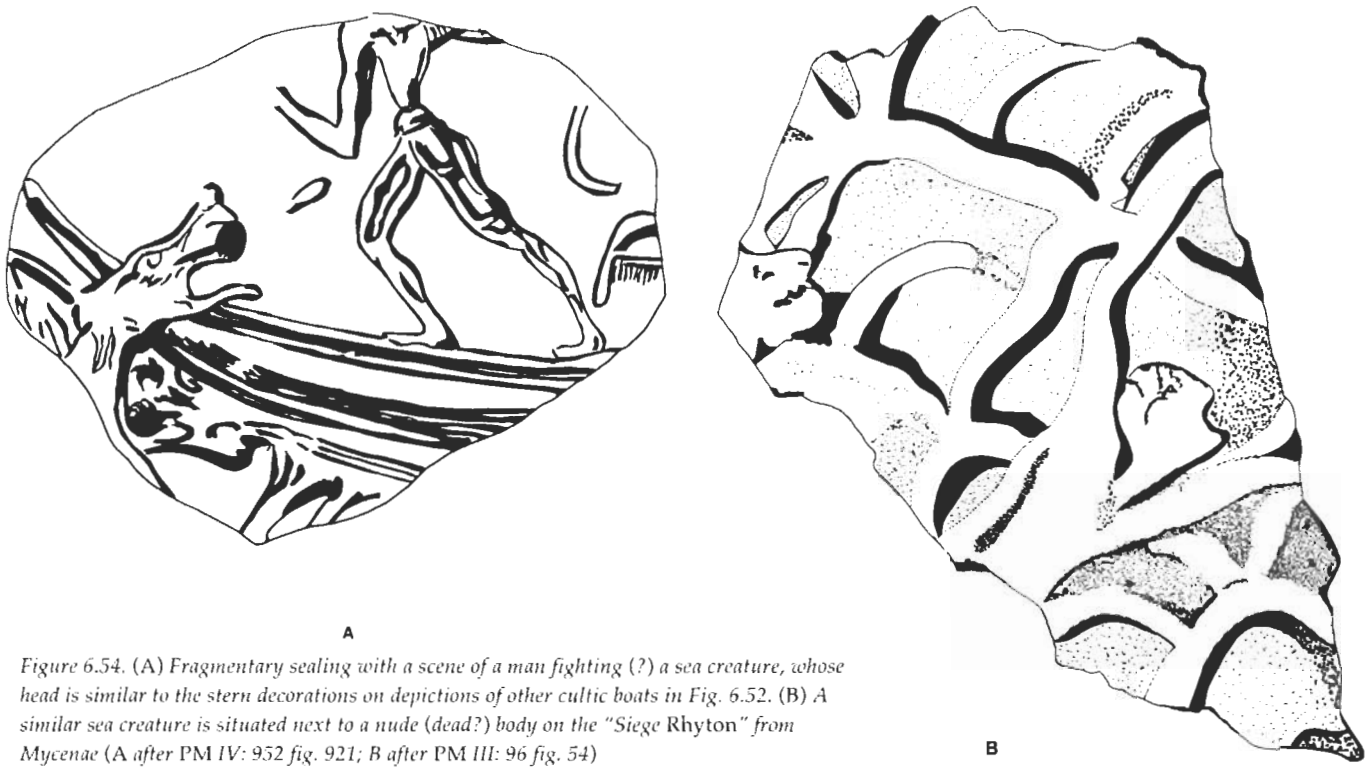

Figure 6.54. (A) *Fragmentary sealing with a scene of a man fighting (?) a sea creature, whose head is similar to the stern decorations on depictions of other cultic boats in Fig. 6.52.* (B) *A similar sea creature is situated next to a nude (dead?) body on the "Siege* Rhyton*" from Mycenae* (A *after* PM *IV: 952 fig. 921; B after* PM *III: 96 fig. 54*)

dess next to a man uprooting or shaking a sacred tree. An ivory inlay in the shape of a butterfly was found at Kato Zakro, and another butterfly is also engraved on a double ax.[134]

The vegetation cycle was a fundamental aspect of Minoan religion.[135] It appears that ships played a part in this cycle. Depictions of cultic boats and ships support this conclusion;[136] one boat has a cultic tree in it (Fig. 6.52: B). Boughs were a symbol of this cult. Perhaps this explains why they appear together with ships on the seals. At Thera, doves on the wing appear on the hull of the sailing ship accompanying the procession/race (Fig. 6.19). Interestingly, one scene relating to the tree cult portrays a flying dove in an identical manner (Fig. 6.53).[137]

HUMAN SACRIFICE AT THERA? A number of dead bodies float in the water on the north Miniature Frieze. The best known of these are the three discussed by Spyridon Marinatos (Fig. 6.7). Televantou notes the limbs of two additional bodies in the water on the north

Figure 6.55. Cult ship on Minoan seal from Makrygialos (Late Minoan IB) (after Basch 1987: 105: F–15)

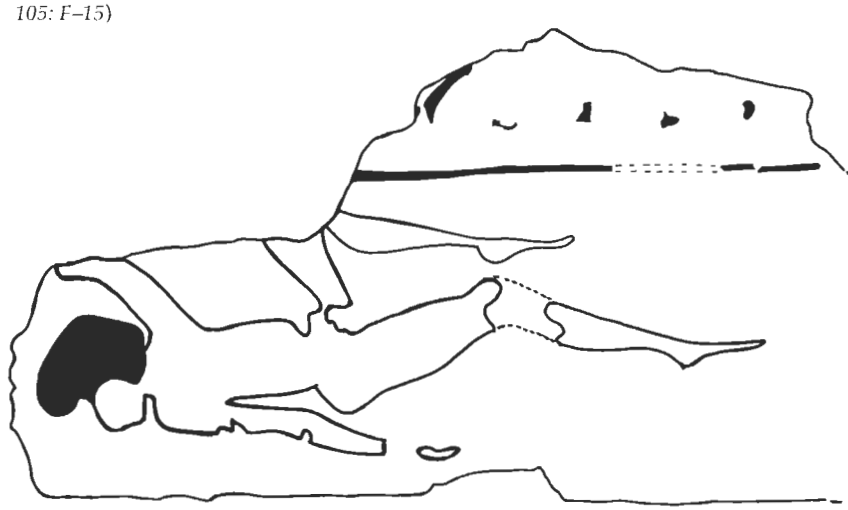

Figure 6.56. A dead body floats in the water of the miniature frieze (after Doumas 1992: 29)

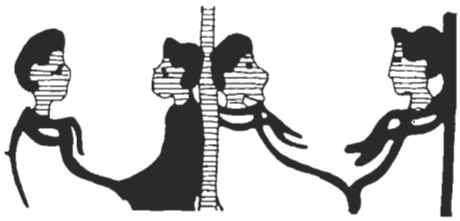

Figure 6.66. Detail of men wearing sacral knots in one of the processional ships (after Marinatos 1974: color pl. 9)

Figure 6.67. Sacral knot worn by a man in one of the processional ships (after Marinatos 1974: pl. 107)

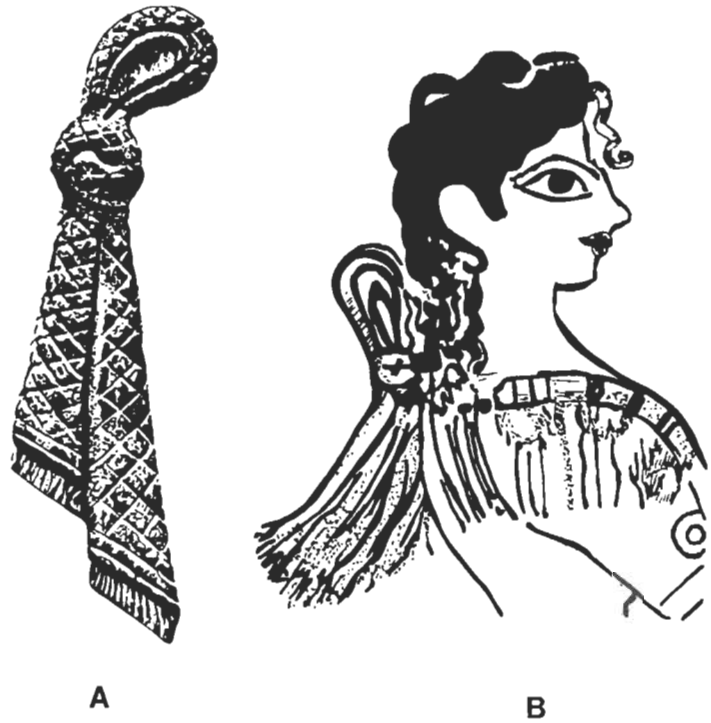

Figure 6.68. (A) Sacral knot made of ivory (Knossos); (B) "La Parisienne" with sacral knot (after PM I: 430 fig. 308, 433 fig. 311)

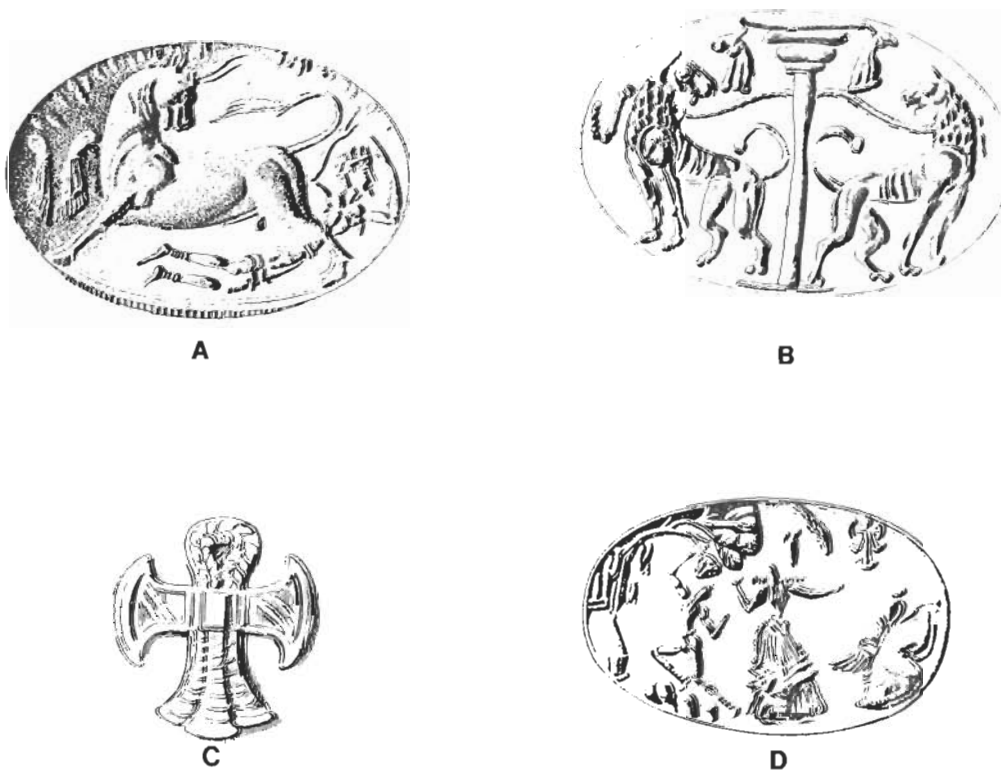

Figure 6.69. (A–B) Sacral knots in cult scenes; (C) small ivory relief of a combined sacral knot and double ax; (D) combined sacral knot and double-ax symbol in a cultic scene (from PM I: 432 fig. 310: a–b, d, c)

skin"[179] (Fig. 6.65). The same item, however, appears on the chests of seated figures in the ships and on at least two of the figures in the "Meeting on the Hill," none of whom wear animal skins (Figs. 6.6, 66–67).

This object, which appears repeatedly in Minoan art, is a sacral knot (Figs. 6.68–69). A knotted cloth, somewhat like a tie, it had two extremities with fringes hanging down and a knot looped into the fabric.[180] A sacral knot is also worn by "La Parisienne," who may represent a goddess—thus confirming the knot's cultic importance (Fig. 6.68: B). Elsewhere, it appears in combination with a cultic double ax (Fig. 6.69: C–D).

CULTIC GESTURE. A crewman standing forward of the helmsman at the stern of one of the proces-

CHAPTER 7

Mycenaean/ Achaean Ships

Beginning in the sixteenth century B.C., the energetic Mycenaean culture made its appearance on mainland Greece. Mycenaean pottery, found throughout the eastern Mediterranean, is a valuable tool for comparative dating. At the same time, this vast spread of what is, archaeologically, a highly visible commodity has significantly confused our understanding of the Mycenaean role in Late Bronze Age trade. This is particularly true of the thirteenth century, when Late Helladic IIIB pottery flooded the East. On the other hand, more attention must be given to the role of Mycenaean and Achaean ships and seafarers in coastal raiding, mercenary activities, and colonization.

The Textual Evidence

Linear B

The Mycenaeans used a form of archaic Greek that they recorded in a script termed Linear B.[1] Clay tablets written in Linear B are known primarily from large caches at Knossos, Pylos, and, to a far lesser degree, from Mycenae and Thebes. The repertoire of Linear B documents consists mainly of inventories and receipts kept by the palace bureaucracies. Linear B signs were also painted on jars. Although much about the world of the Linear B documents remains enigmatic, concentrated scholarly research in the decades since its decipherment has gleaned many insights into Mycenaean palace administration. But the documents are frustratingly telegraphic in nature.

Unlike other cultures in which clay tablets served as a principal form of documentation, most Linear B tablets were not intended for long-term recording; consequently, they were not kiln-baked. The tablets owe their survival to the same fires that hardened them while destroying the palaces in which they were stored. Thus, most Linear B documents appear to date to the last year, and possibly very near the time of destruction, of their find sites. Archival records meant for more permanent storage may have been recorded on materials that were more expensive, such as papyrus or animal skins, but unfortunately less durable than baked clay.[2]

There are many obstacles involved in defining the chronological and geographical distribution of the documents.[3] Differences may have existed among the various Mycenaean centers: practices in one palace may not be assumed to apply to the entire Mycenaean world concerning subjects on which documentation is limited, as in the case of seafaring. Indeed, as we shall see, the reasons for preparing these documents may have varied from one site to the next. The Linear B script apparently went out of use with the destruction of the Mycenaean palaces at the end of the Late Helladic IIIB or the very beginning of the IIIC.

THE PYLOS ROWER TABLETS. Three texts of the Pylos An series refer to "rowers" (*e-re-ta*).[4] In An 610 *e-re-ta* appears in the damaged heading, indicating that the document deals with oarsmen allocated from various communities or supplied by officials. The text records 569 or possibly 578 men, but four entries are missing; J. Chadwick suggests that originally about 600 men were enumerated.[5] These would have been sufficient to man a fleet of some twenty triaconters or twelve penteconters.

The text is badly damaged, but its pattern is understandable. The men are identified by locations. In two cases, groups of forty and twenty men respectively are

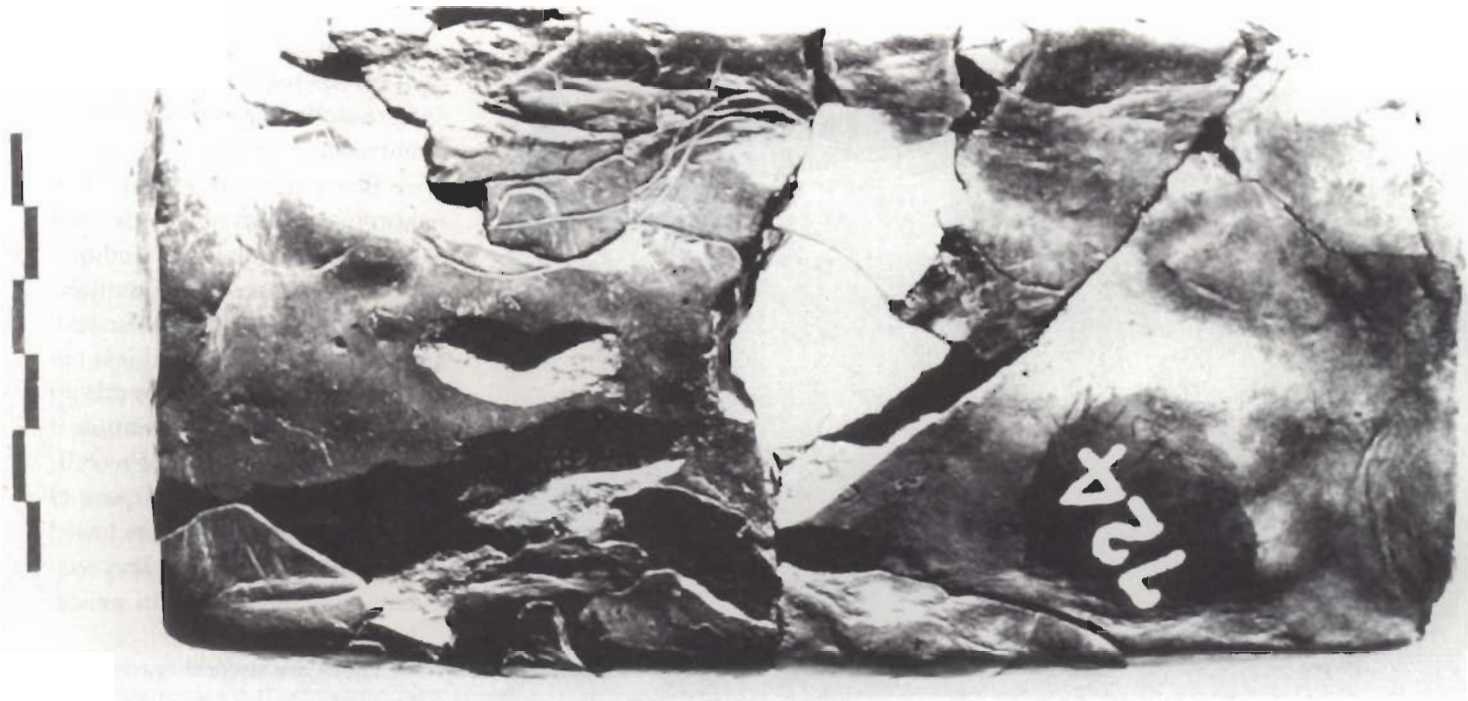

Figure 7.2. Linear B tablet PY An 724, verso (photo from the Archives of the Program in Aegean Scripts and Prehistory, courtesy of University of Cincinnati Archaeological Excavations)

cision on the part of the scribe (Hand one = the normally reliable "master scribe" at Pylos) in regard to formatting and the actual information he was recording on the tablet. The meanings of several key lexical items are not apparent, and the syntax of the text is confusing or ambiguous. However, it shares vocabulary and place names with PY An 1, and most of its general purpose can be understood. The scribe has written clearly identifiable place names in the first position of lines .1 (*ro-o-wa*), .9 (*a-ke-re-wa*), and .14 (*ri-jo*). Notice that the first and last of these occur in the same order on consecutive lines of PY An 1. These place names divide the tablet into sections. Line .1 informs the reader that "rowers are absent" at the site of *ro-o-wa* and line .4 specifies that one of these men is a "settler" who is "obligated to row." The subsequent lines continue providing evidence about missing rowers: lines .5–.6 record five men "obligated to row" and somehow associated with the important person *E-ke-ra$_2$-wo;* line .7 lists one man connected with the *ra-wa-ke-ta* or "military leader"; another man is described in line .8. The section pertaining to *a-ke-re-wa* lists individual men, at least one of whom is associated with the *e-qe-ta* or "followers," who seem to be high-level administrative officials. Line .14 might have listed the largest single group of missing rowers, ten or more, at the site of *ri-jo*.

On the reverse the scribe has drawn what appears to be a schematic image of a ship, comparable to a recently discovered ideogram on a tablet from Knossos.[9]

The ship incised on the back of An 724 is somewhat surprising (Figs. 7.2–3).[10] Abundant iconographical evidence indicates what Mycenaean oared ships looked like. This is not one of them. The ship has a crescentic hull, identical to the many images of Minoan and Cycladic vessels discussed in the previous chapter. A semicircular construction is located amidships, and boughlike items extend from the ship's right side (bow?). The central structure finds its closest parallel in the seven vessels depicted on a jug from Argos, while the boughs are reminiscent of bow devices on some Minoan cultic boats (Figs. 5.26; 6.52: A–C). The Argos ships are shown under oar or paddle.

Similarly, Linear B ideogram *259 has a crescentic profile (Fig. 7.4). The mast has a curving line on either side of it, perhaps representing a mast partner, central structure, or rigging. The joining of several document fragments has this ideogram following the word [. . .]-*re-ta*, perhaps to be reconstructed as *e-re-ta*, although this is not certain.[11]

The third and final document of the Pylos rower texts is fairly

rather like a ladder lying horizontally on its side:

Indeed, at times, an abbreviated image of a ship is expressed in its entirety by a horizontal ladder design alone, with oars and rigging added, as for example in the cases of a schematic graffito of a ship painted upside down inside a Mycenaean *larnax*, or a ship painted on a sherd from Phylakopi on Melos (Fig. 7.7, 23).[53] Clearly, to understand the depictions of Mycenaean ships, our first imperative is to determine the ancient artists' intentions in creating this horizontal ladder design.

To do this, we must begin with the most detailed and clearest depiction of a Late Helladic ship. This was discovered by F. Dakaronia at the site of Pyrgos Livonaton in central Greece, which has been identified as Homeric Kynos.[54] Excavations at this Late Helladic IIIC site have revealed a wealth of ship iconography, including ships painted on sherds and fragments of terracotta ship models. Warriors, armed and armored, stand on their decks and in their forecastles. One galley, Kynos A, is depicted in particular detail (Fig. 7.8: A). The ship is nearly complete. The only parts missing are the device topping the stem, the lower part of the stern, the end of the sternpost together with the blades of the single quarter rudder, and the two sternmost oars.

The ship faces left and is divided longitudinally into three horizontal areas (Fig. 7.8: B: BC, XB, and AX). Area CB is the ship's hull, from the keel/keel-plank to the sheer. Above this is a reserved

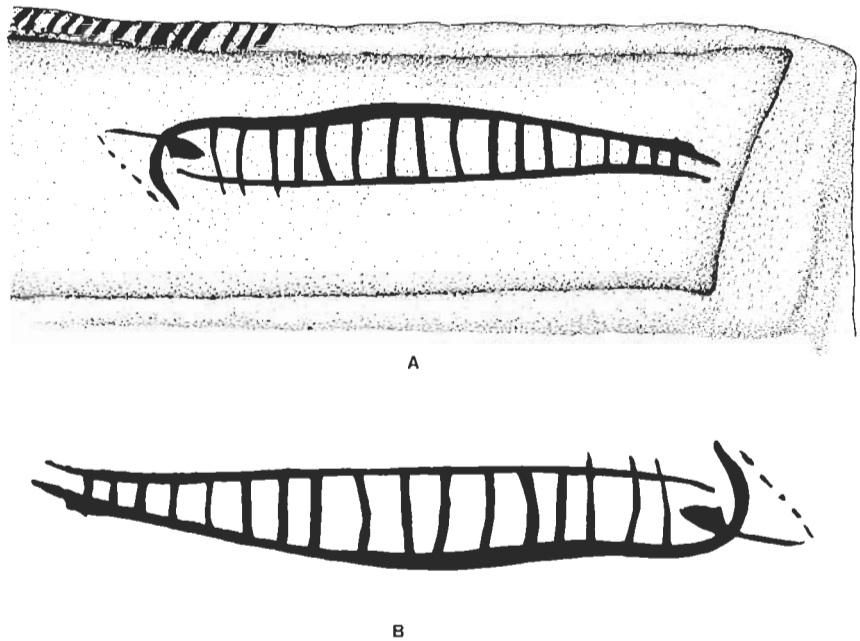

Figure 7.7. The element of the Mycenaean ship represented by the "horizontal ladder pattern" seems to have been so striking to the observer that, at times, sketches of Mycenaean ships consist of little else than this component, sometimes with oars and rigging added. One example of this is a ship painted upside-down inside a Late Minoan larnax (A). *Below, in* (B), *the ship is reversed (after Gray 1974: G47, Abb. 11)*

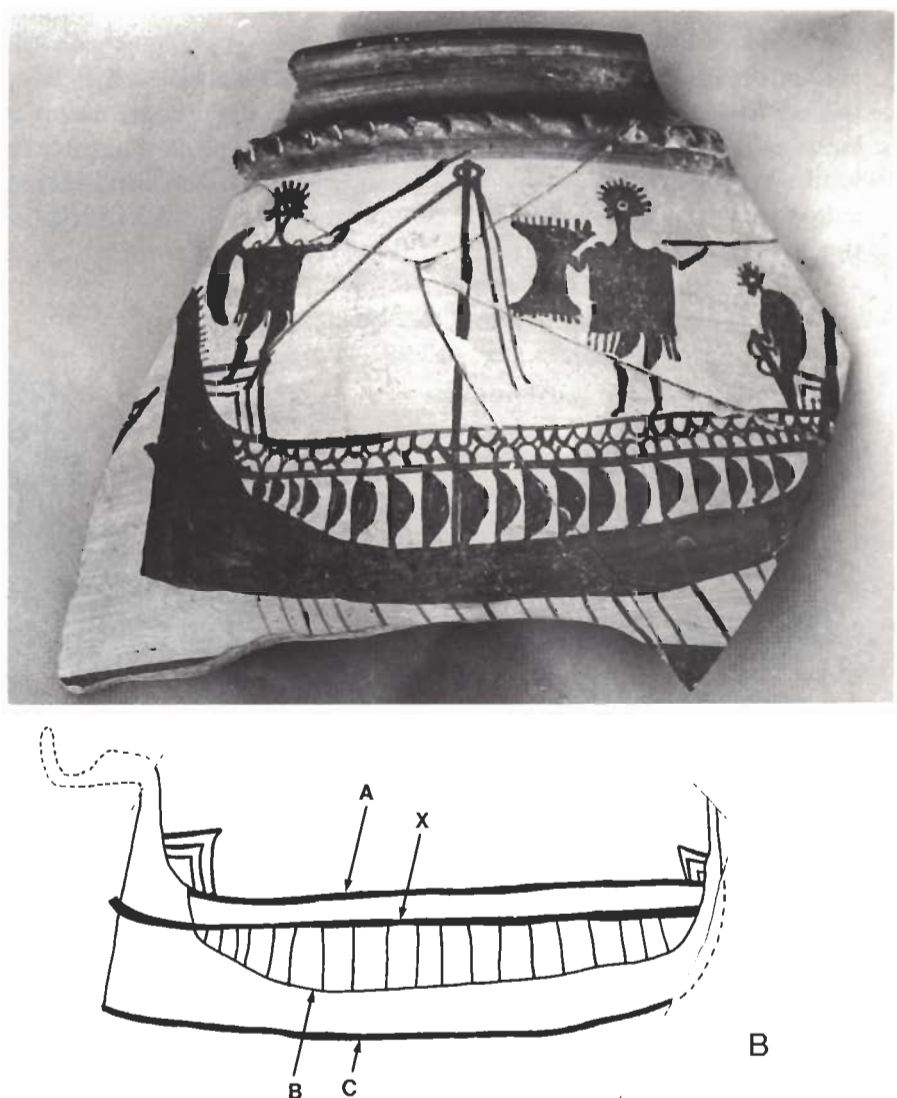

Figure 7.8. (A) *Kynos ship A. Late Helladic IIIC* (B) *Constructional details (photo A courtesy of F. Dakoronia; drawing B by the author.)*

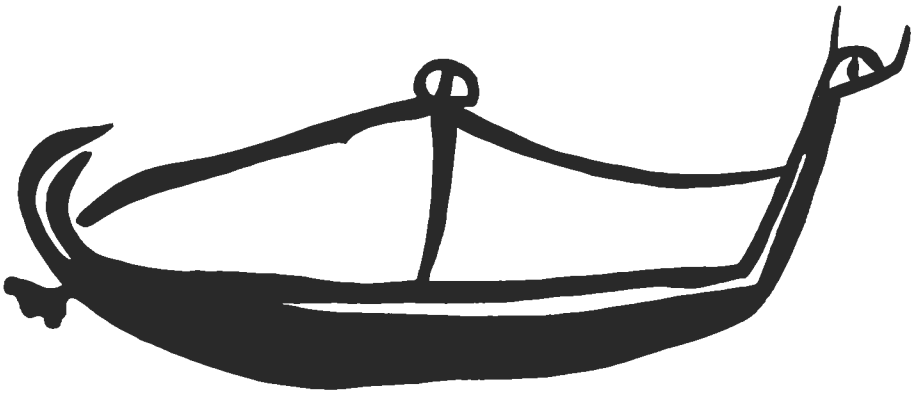

Figure 7.21. Ship painted on a stirrup jar from Skyros (Late Helladic IIIC) (after Hencken 1968A: 537 fig. 486)

zontal bow projection, precluding its use as a functional waterline ram. Basch identifies the stem device as a horse's head, a difficult interpretation because horse-head devices are otherwise unknown in Late Bronze Age Helladic ship iconography. Furthermore, the lines rising from the apparatus are paralleled on other bird-head devices (Fig. 8.61).[81]

The sternpost curves up and blends into the right side of the "frame" that surrounds the ship. A single steering oar stretches out horizontally behind the craft. Two horizontal lines at the top of the mast apparently represent the yard and the boom with the sail furled between them, while three sets of diagonal lines lead from the mast to the stem- and sternposts. This is similar to the rigging on some ships depicted on Late Minoan seals (Fig. 6.21). On these ships a broad sail, hung between a yard and a boom, is placed high up on the mast with two or three diagonal lines descending from the mast to both of the ship's extremities. Perhaps this is the Cretan equivalent of an "exploded view" of the rigging, with the lifts depicted *beneath* the boom.

Two vertical wavy lines rise from the quarter rudder, with two additional sets of three wavy lines located beneath the yard on either side of the sail. Beneath the ship are two birds (of prey?) with downcurving beaks, placed antithetically.[82] Between them stand a schematic palm tree and a flower.[83] Spirals fill the space in front of the ship. All of these elements had a numinous significance within the cultural milieu in which the scene was created. Taken together with the ship they form a statement, articulated in symbols and apparently addressing the theme of death and rebirth—a theme hardly surprising to find here, considering that the ship was painted on a *larnax*.[84] The Tragana ship, which appears on a tomb offering, bears an identical set of wavy lines rising from the quarter rudder, and a palm tree is painted in the metope on the *pyxis* (Fig. 7.17).

A ship painted on a Late Helladic IIIC stirrup jar found on Skyros has a long, narrow hull in profile (Fig. 7.21).[85] The stempost is elongated, raking forward and finishing in a bird-head device with a strongly recurving beak. This bow is closely paralleled by the posts of the Sea Peoples' galleys at Medinet Habu (Figs. 8.23, 35). A narrow, reserved line horizontally bisects the craft and continues up the stempost. A single quarter rudder, somewhat malformed, appears below the stern.

Although the ship is depicted without a sail, its mast cap consists of only two sheaves, indicating that its prototype carried the

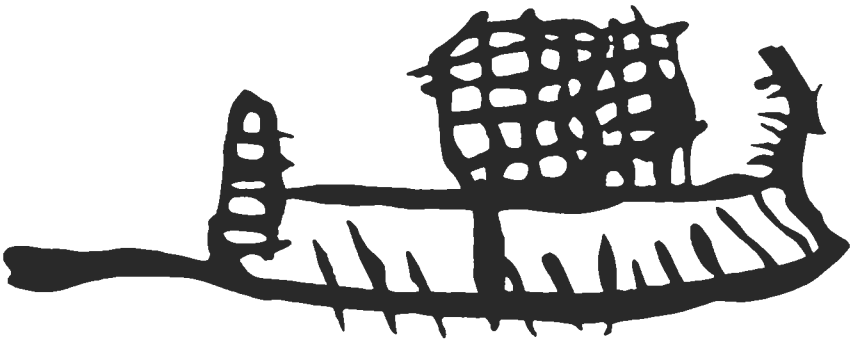

Figure 7.22. Ship depicted on a vase from Asine (Late Helladic IIIC) (after Casson 1995A: fig. 29)

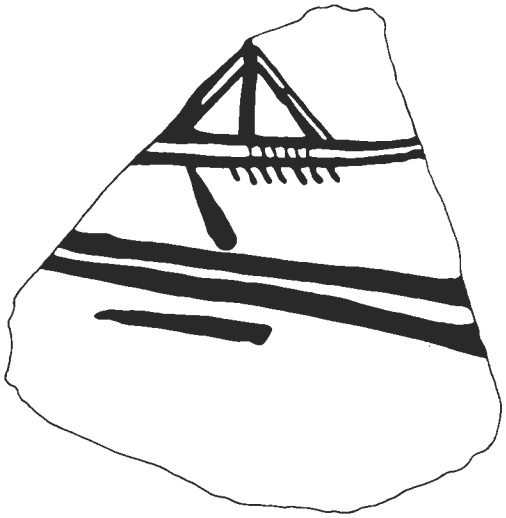

Figure 7.23. Oared galley painted on a sherd from Phylakopi (after Marinatos 1933: pl. 13: 13)

naean palaces carried out international trade.

Because absolutes are an unlikely condition when dealing with human behavior, it seems a reasonable assumption that Mycenaean ships (galleys?) on trading missions probably did, at least on occasion, voyage past Cyprus and visit the Syro-Canaanite mainland. Even if so, however, this seems to have had minimal impact on trade. Indeed, the Uluburun ship strongly suggests that international trade was remarkably complex and diversified. Bass and C. M. Pulak note a Mycenaean presence on board when the ship went down.[146] This presence may perhaps be indicative of one form of Mycenaean trading beyond the Aegean and Cyprus. As Late Bronze Age ships at times are known to have carried foreign nationals, perhaps Mycenaean merchants/representatives were sailing—and trading—on Cypriot or Syro-Canaanite ships.[147]

Characteristics of Mycenaean Oared Warships

Iconography supplies an important view of the general appearance of Mycenaean war galleys. We remain woefully ill-informed, however, concerning the manner in which these ships were constructed. We do not even know whether they employed mortise-and-tenon joinery or whether they were sewn.

At first glance, the Mycenaean/Achaean oared ships do seem to form a cohesive group. Although there is a general conformity of specific elements, the ships themselves exhibit considerable variety. This is in marked contrast to the seeming conformity of galleys depicted during the Late Geometric period. However, it is important to emphasize that much of the Late Geometric warship imagery was made by a single group of painters (the Dipylon school) at one location (Athens) over a period that is not likely to have lasted longer than six decades.[148] Thus, there is inherent here a conformity of both artistic convention and specific regional ship types (Athenian cataphracts and aphracts), which were being depicted during a relatively short period. Geometric ships of other regions of Greece also show a distinct cohesion, as noted in the vessels appearing on Boeotian fibula.[149]

In contrast, the situation is reversed concerning depictions of Mycenaean ships of the Late Helladic IIIB–IIIC. Images of these ships are spread out across the eastern Mediterranean from Pylos in the west to Enkomi in the east. Furthermore, they range chronologically over three centuries, and the "artists" who created these images in many cases seem to have been under few "conventions" other than their own artistic ability (or lack thereof).

In only a few cases can one reasonably argue that a single artist created more than one ship depiction: perhaps two of the Kynos ships (Figs. 7.8: A, 15); two ships from Phylakopi with the blade of the quarter rudder slanted toward the bow (Figs. 7.23–24 [?]); two ships depicted on the same krater from Enkomi (Fig. 7.28); and the five Hyria ships (Figs. 7.30–31). Indeed, the most noteworthy aspect of our catalogue of Mycenaean ships is the independence of styles in which they were created. To this must be added the consideration that the majority of these images were created during the tumultuous times of the Late Helladic IIIC, which was filled with upheavals that promoted insularity.

One can reasonably assume a certain amount of experimentation, innovation, and development in the ships of this period. All these variables, however, make it difficult to determine whether differences observed on these ships result from actual regional, or temporal, distinctions in ship construction or whether they are traceable simply to the artistic attitudes and capabilities of their creators.

Given the above considerations limiting the likelihood of commonality of depiction, the Mycenaean ship representations are actually remarkably similar to each other. As a group there emerges a cohesive picture of Mycenaean galley types. In general, the following observations may be noted concerning Mycenaean/Achaean oared ships:

- The most characteristic element shown is an open rowers' gallery intersected by vertical stanchions at regular intervals. This element sets Mycenaean ship portrayals apart from the ships of the other Late Bronze Age cultures, with the notable exception of the Sea Peoples' ships. The latter were either adapted from the Mycenaean war galley or actually belonged to bands of fleeing Mycenaeans/Achaeans who may have constituted a significant portion of the Sea People coalition.[150] Indeed, the depiction of an oared ship could be reduced to two horizontal lines connected by vertical stanchions and oars (Fig. 7.7, 23). Despite the abbreviated manner in which the artists painted the ships, their intentions are clear.
- Since the rowers' gallery was open, the oarsmen could be seen here at their oars, as in the case with Late Geometric ships. Thus, for example, the rowers' torsos are visible in a ship from Kynos (Fig. 7.8: A). As is clear from the manner in which the oars are arranged on another of the Kynos ships, by the twelfth century these ships could be rowed from the upper deck level (Fig. 7.16). This is significant because this manner of

APPENDIX: The Pylos Rower Tablets

Unless we accept that raising a fleet requiring six hundred rowers was a normal occurrence at Pylos, the rower tablets strongly suggest that something out of the ordinary—something exceptional—was taking place at Pylos just before its demise.[1] This impression is further strengthened by textual references to the collection (and scarcity) of metal to make weapons, the possibility of human sacrifice, and particularly the *o-ka* tablets, which refer to "watchers" who are guarding the coast.[2] To these considerations must be added one final and obvious one: soon after these tablets were written, the palace of Pylos was indeed destroyed.

Assuming for the moment that the rower tablets do indicate a state of crisis at Pylos in anticipation of a danger approaching from the sea—a view that is held by some but not all Linear B scholars—what purpose might the fleet of galleys have served?

The large numbers of men mentioned in An 610 and An 724 have been interpreted by some scholars as evidence of the mustering of a Pylian war fleet. Fleets of oared ships bring to mind thoughts of Troy, Salamis, and Actium, of battles and piracy. This equation of "oared ships" with "warships" seems so obvious that little consideration has been given to alternative reasons for the massing of oared ships.

There are other, nonmilitary, contexts where we might expect to find records of numerous rowers. For example, Hatshepsut seems to have required about a thousand rowers just for the towboats pulling her obelisk barge from Aswan to Karnak.[3] Many paddlers, or rowers, would have been required for flotillas taking part in pageants or races during cultic festivals, as at Thera (Figs. 6.46–47). And since trading was also done on merchant galleys, fleets of oared ships would have also required enlisting many rowers (Figs. 2.2, 11).[4]

Herodotus relates that the Phocaeans used penteconters in their voyages of exploration and trade.[5] In doing so, he emphasizes the commercial aspects of this extended navigation by his reference to Tartessus, the Biblical Tarshish, a site noted by Ezekiel for its metals.[6] Assyrian reliefs frequently depict Phoenician trading galleys (Fig. 7.6).[7] An Iron Age Cypriot terra-cotta model depicts a deep and round merchant galley with a row of oar-ports on either side of the hull.[8]

Oared ships could also be used in expeditions of colonization or for mass forced migrations when insurmountable forces threatened. In Classical times, penteconters were used to transport entire populations and their movables when danger threatened. Miltiades escaped from Tenedos before the approaching Phoenicians in five galleys (*trieres*) laden with his possessions.[9]

Undoubtedly, the most informative example of this phenomenon is Herodotus's description of the Phocaean escape from Ionia before the advancing Persian army: "The Phocaeans launched their fifty-oared ships, placed in them their children and women and all movable goods, besides the statues from the temples and all things therein dedicated save bronze or stonework or painting, and then themselves embarked and set sail for Chios; and the Persians took Phocaea, thus left uninhabited."[10]

Sennacherib describes a similar waterborne flight, this time from the viewpoint of the invader: "And Lulî, king of Sidon, was afraid to fight me (*lit.* feared my

CHAPTER 8

The Ships of the Sea Peoples

The Late Bronze Age ended in cataclysmic upheavals caused by mass migrations, at least some of which were seaborne. A variety of ethnic groups emerged that were collectively termed "Sea Peoples" by the literate cultures upon whom they preyed. Appearing first as sea raiders in the fourteenth century B.C., these groups were the Late Bronze Age equivalent of the Huns and the Vikings combined. By the late thirteenth century, their raids had been replaced by full-scale land and sea migrations. The Mycenaeans, the Hittites, and many of the Syro-Canaanite city-states fell before this onslaught, never to recover.

Only Egypt, protected by its peculiar geography and located at the southern end of the advance, was able to repulse the invaders—but at a terrible cost to itself. Ramses III managed to stop the approaching Sea Peoples in two major battles: one on land, the other on water. He claims to have later resettled them as mercenaries on Egypt's borders. More likely, after being repulsed by Egypt, they took advantage of her weakened position to resettle areas that they themselves had previously ravaged.[1] Ramses commemorated these battles graphically on his mortuary temple at Medinet Habu, near modern-day Luxor. His carved relief of the naval battle is an invaluable source of information on a type of vessel used by the Sea Peoples.

Other iconographic sources, mainly rough graffiti and terracotta models, supply additional information about these vessels and suggest that the Sea Peoples' vessel-type represented at Medinet Habu follows an Aegean tradition. Furthermore, the bird-head finials capping the ships' ends imply a distinct connection with religious beliefs prevalent in central Europe at the end of the Late Bronze Age and during the Iron Age.

The Textual Evidence

From their first appearance the Sea Peoples, like the Ahhiyawa, were described as raiders or mercenaries.[2] In this they followed an age-old Aegean tradition.[3]

After their settlement on the southern coast of Palestine in the twelfth century, the Sea Peoples appear to have become traders. Nowhere is there absolute proof for this view, but it may be inferred from the following considerations:

- On his outgoing voyage from Egypt, Wenamun's ship put in at Dor, which belonged to the Sekel/Sikila. Had this Sea Peoples' group been engaged in brigandage at that time, it is unlikely that the ship would have stopped there.
- In fact, Dor of the Sekel/Sikila appears to have been a "safe haven." Wenamun had no trouble in presenting his case before Beder, the Sikila prince.[4] Indeed, when Wenamun later "liberated" thirty *deben* of silver from a ship off Tyre, apparently belonging to the Sikila, he was clearly acting outside the law.[5]

Important information concerning the tactics used by the Sea Peoples in their seagoing ships and the organization of their fleets has been uncovered at Ugarit. There, texts dating to the very last days of Ugarit were found. These documents include maritime aspects of the deteriorating political situation caused by the advance of the Sea Peoples.[6] Two of the tablets are of particular interest.

One document is a copy of a dispatch sent by the king of Ugarit to the king of Alashia. In it, the Alashian ruler is informed that cities belonging to Ugarit have been

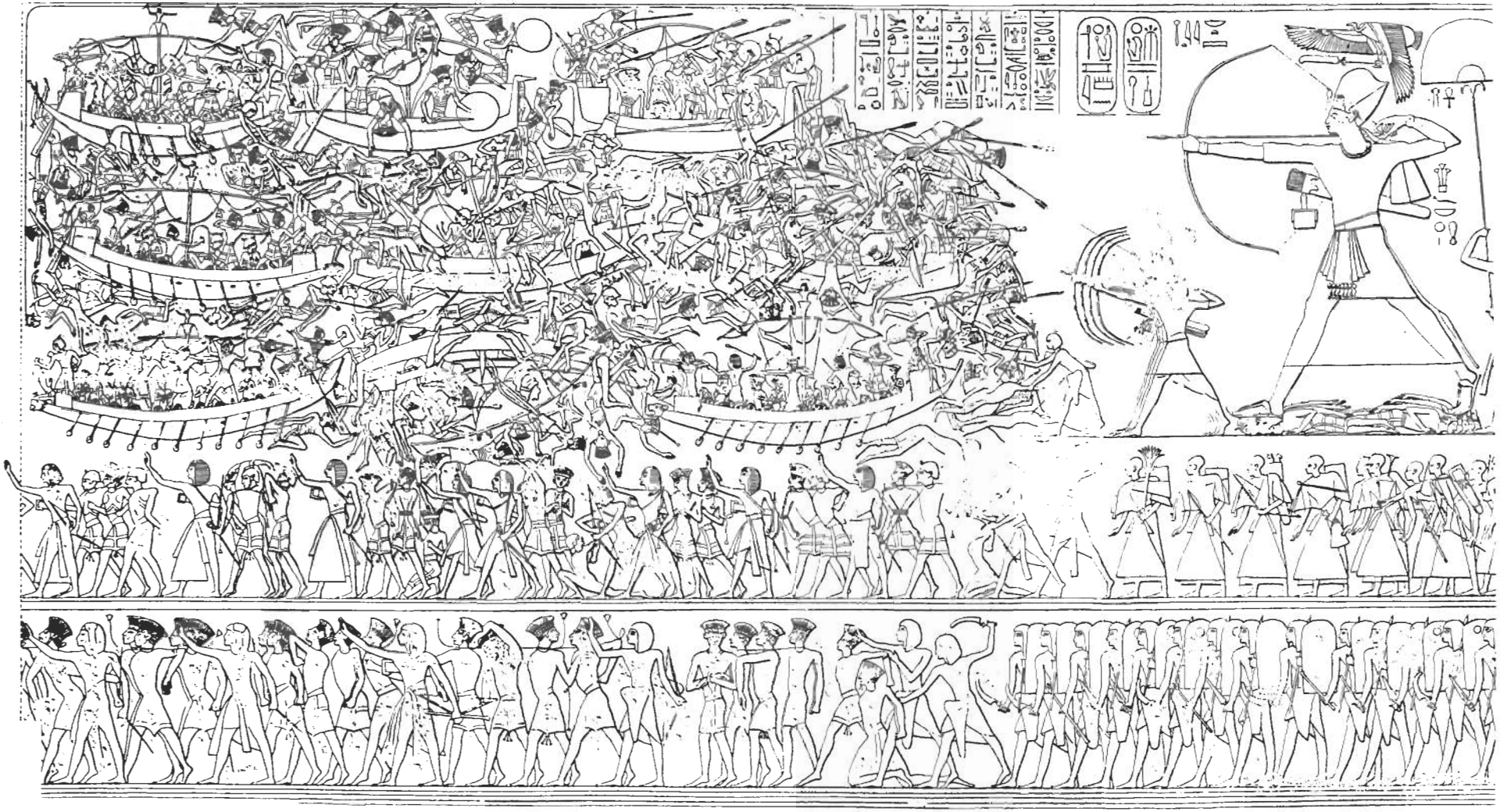

Figure 8.1. The naval battle depicted at Medinet Habu (from Nelson et al. *1930: pl. 37* [*H. H. Nelson* et al., Medinet Habu *I:* Earlier Historical Records of Ramses III, *University of Chicago. Introduction*
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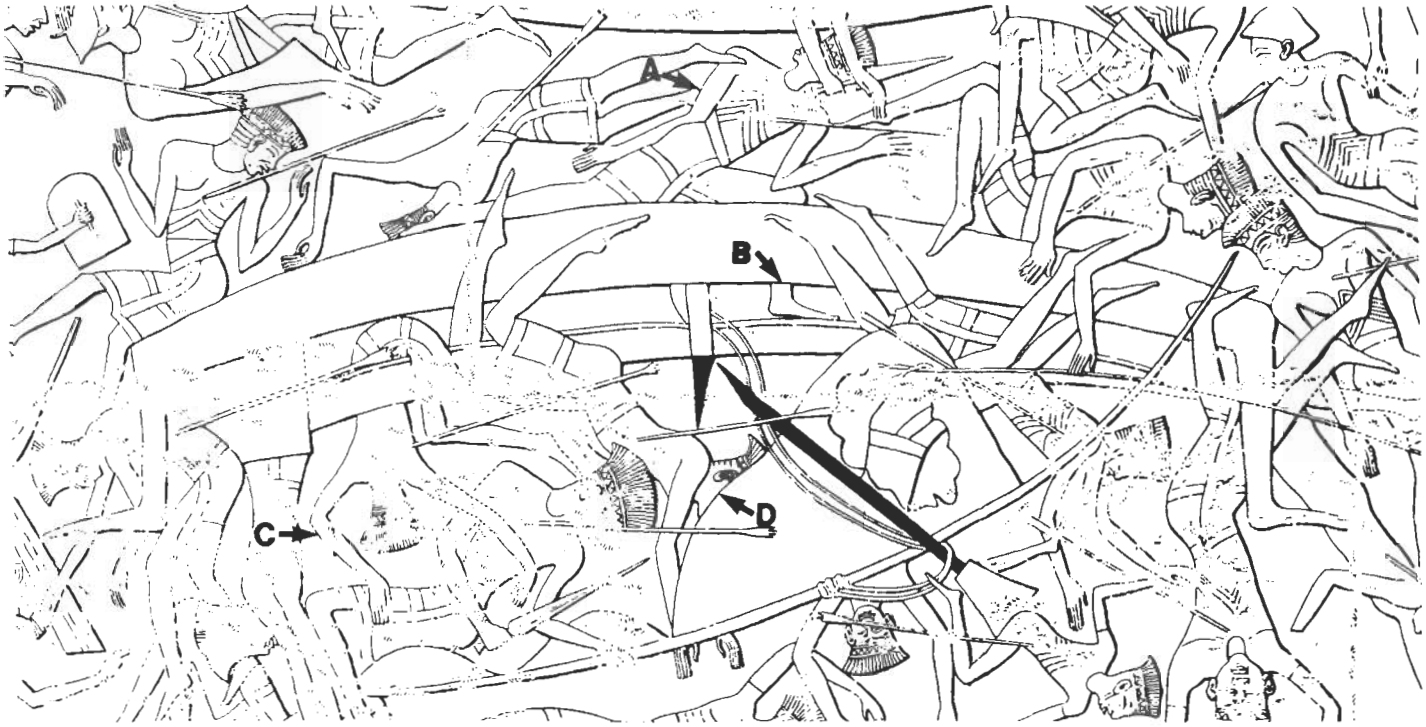


Figure 8.14. Ship N. 3 (detail from Nelson et al. 1930: pl. 39 [*H. H. Nelson et al.*, Medinet Habu *I:* Earlier Historical Records of Ramses III, *University of Chicago. Introduction © 1930 by the University of Chicago, all rights reserved. Published June, 1930*])

ships are not represented consistently. Presumably, the same detail may have been applied in paint in some cases and carved (and painted) in others.

Sadly, many details of the ships have been lost, along with the paint. The relief that remains is only the skeleton of the original work. Furthermore, plaster was used extensively to cover up defects in the masonry and to make corrections (Fig. 2.36: B–D).[26] In some cases, only the original draft of the design is left. The final draft had been carved into plaster that has long since disappeared.

There are numerous "disappearing" elements. Note, for example, that on ship N. 2 the brails appear on the left side of the mast only and that the bird head at the stern of ship N. 5 is eyeless while the head capping the stem has a carved eye (Figs. 8.8, 12).[27]

The quarter rudders on the invaders' ships now lack tillers; originally they did have tillers, which were represented in paint only and have long since vanished. This is evident from the manner in which the helmsman of ship N. 4 grasps the loom of his quarter rudder in his right hand while his left hand is clenched around a now nonexistent tiller (Fig. 8.9). Compare this to the two-handed manner in which the helmsmen on the Egyptian craft are maneuvering their steering oars. All four hold the tiller with their left hand; two also hold the loom with their right hand.

The Sea Peoples' craft have gently curving hulls ending in nearly

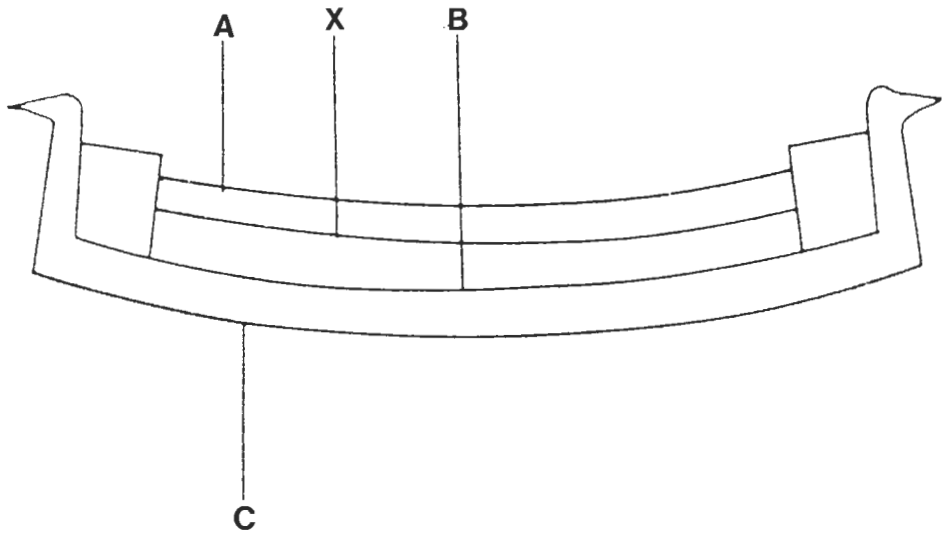


Figure 8.15. The horizontal lines on ship N. 3 (drawn by the author)

ing over the screen, the upper body of the former is placed in an impossible manner, leaning over the line that represents the sheerline and the screen. To best understand correctly what the Egyptian artist(s) had in mind when portraying a ship, therefore, it is important to have several independent clues corroborating the same details. Happily, such is the case in N.3. The bodies disappear behind the screen and then reappear on the other side in proper perspective. The method used here by the artist to display the three bodies woven around elements of the vessel's structure on ship N. 3 is not unique in Egyptian art, although it is exceedingly rare.

Another example of a human figure disappearing behind an object and then reappearing, as do the bodies in ship N. 3, exists in the Fifth Dynasty mastaba of Tí at Saqqara, where a plank is being

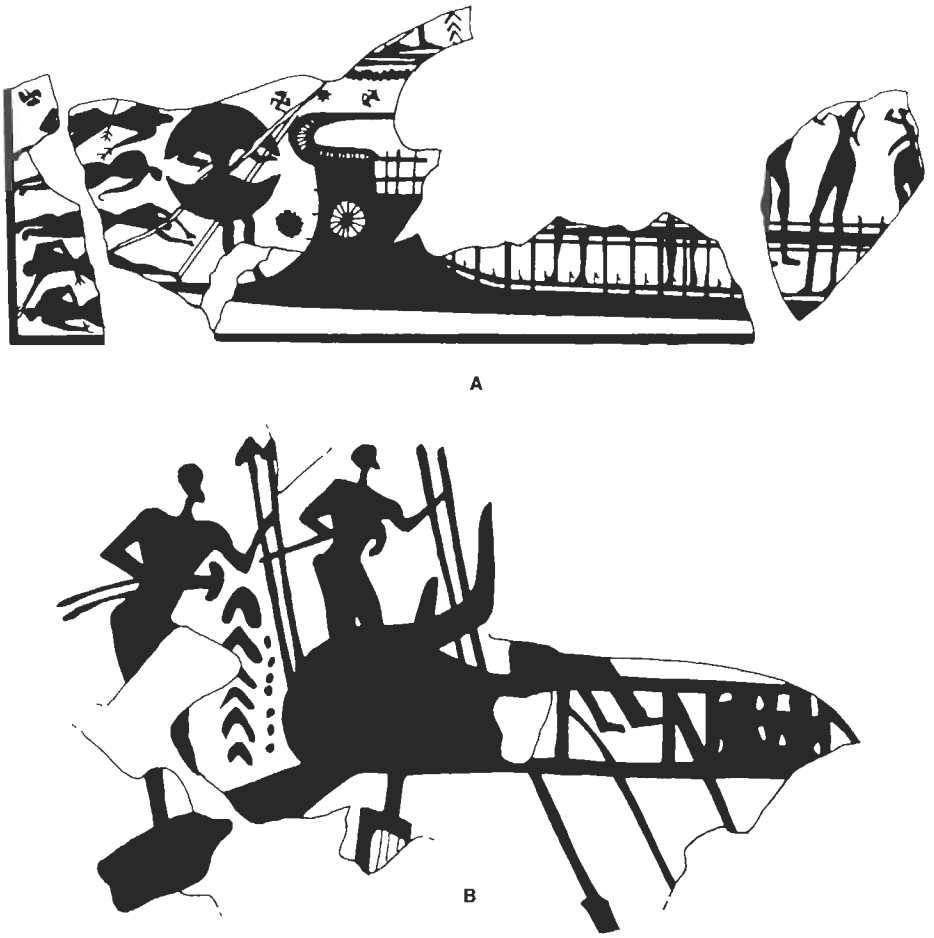
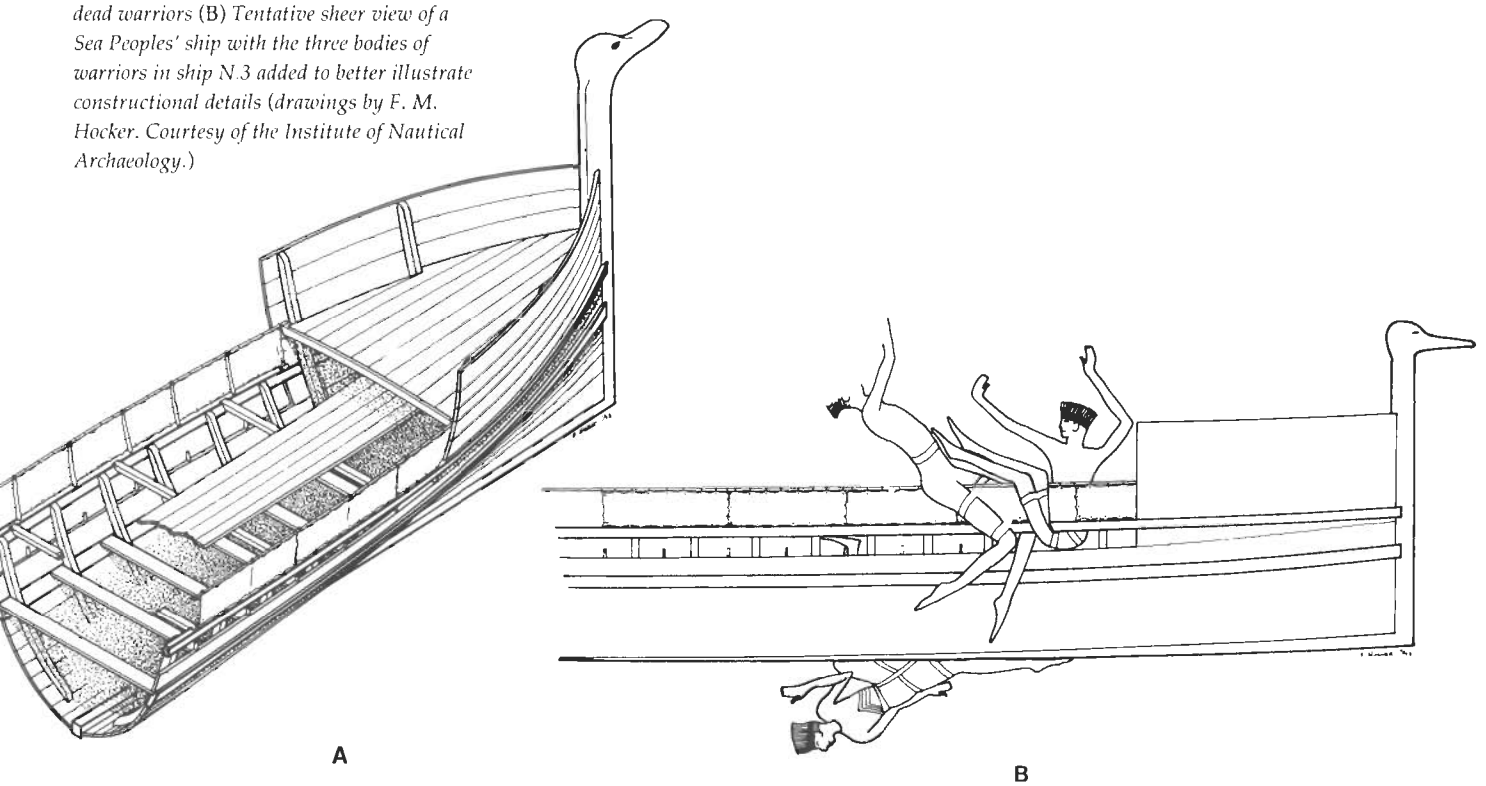


Figure 8.17. The deck structure of Greek Geometric galleys: (A) *figures stand on the rowers' benches in an area that is not covered by a deck;* (B) *the legs of a figure sitting at deck level appear through a "window" of the open rowers' gallery (A after Morrison and Williams 1968: pl. 1e* [*Geom. 2*] *and Casson 1995A: fig. 68; B after Morrison and Williams 1968: pl. 7b* [*Geom. 38*])

Figure 8.18. (below) (A) *Tentative isometric reconstruction of a Sea Peoples' ship depicting the main elements of the ship's architecture as indicated by the bodies of the dead warriors* (B) *Tentative sheer view of a Sea Peoples' ship with the three bodies of warriors in ship N.3 added to better illustrate constructional details (drawings by F. M. Hocker. Courtesy of the Institute of Nautical Archaeology.)*



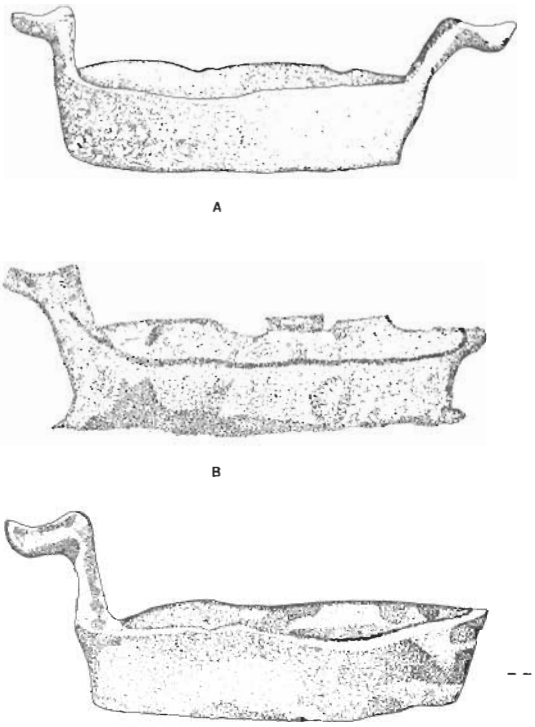


Figure 8.31. Terra-cotta ship models of the Villanovan culture bearing bird's-head insignia facing outward at stem and stern (A) or at stem alone (B and C) (first half of first millennium B.C.) (from Göttlicher 1978: Taf. 35: 460 [after Montelius], 461 and 469)

Figure 8.32. "Bird boat" painted on a krater sherd from Tiryns (Late Helladic IIIC) (after Bouzek 1985: 177 fig. 88: 6)

Figure 8.33. Duck-headed papyrus raft. Tomb of Ipy (T. 217), Ramses II (from Davies 1927: 30; ©, the Metropolitan Museum of Art, New York)

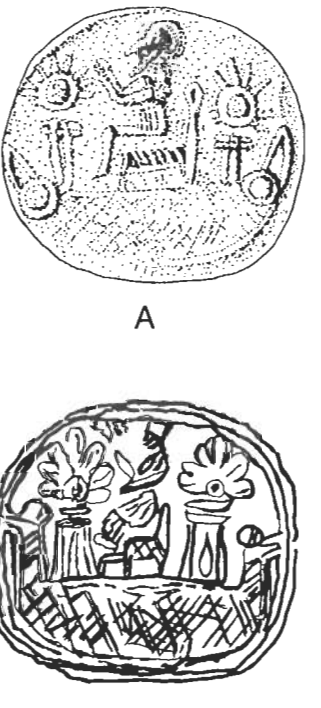


Figure 8.34. (A) Seal with a deity in a boat with bird-head ornaments (Irbid); (B) seal of Elishama, son of Gedalyahu, with motif similar to A (A after Culican 1970: 29 fig. 1: d; B after Tushingham 1971: 23)

Figure 8.35. Crested or horned bird-head device on the stem of the Skyros ship depiction (Late Helladic IIIC) (after Sandars 1985: 130)

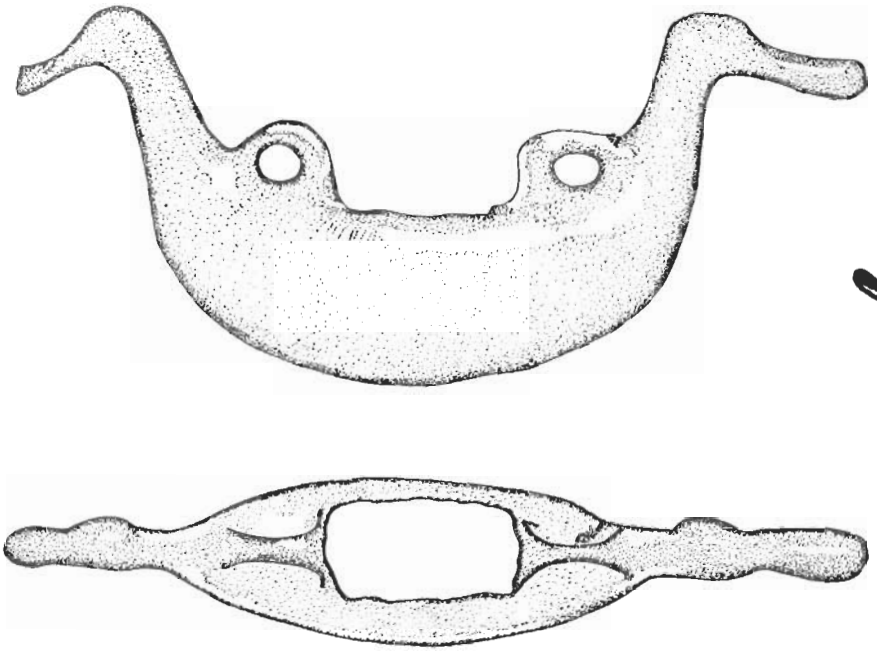


Figure 8.26. Bronze "bird-boat" ornament from the Somes River at Satu Mare in northern Rumania (European Bronze D [?]) (after Göttlicher 1978: Taf. 33: 439)

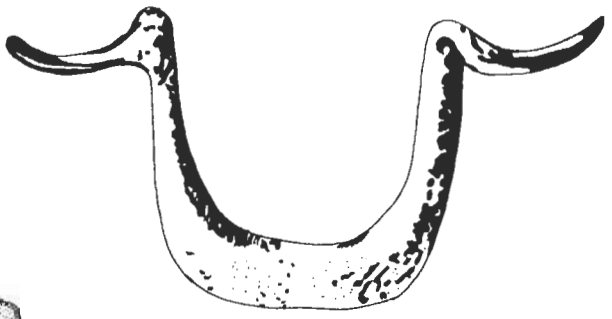


Figure 8.27. Bronze "bird-boat" ornament from Velem St. Vid in Hungary (European Bronze D [?]) (after Göttlicher 1978: Taf. 34: 440)

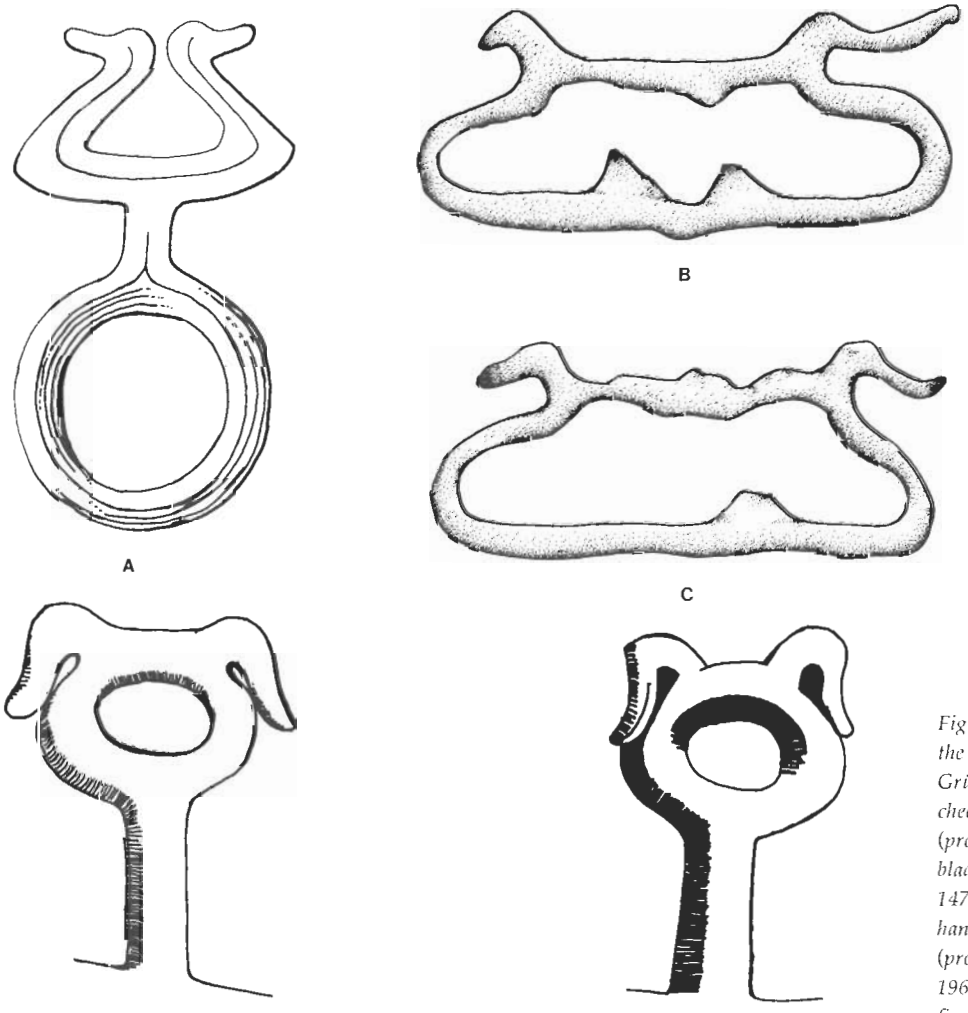


Figure 8.28. Double-headed "bird boats" in the round: (A) *on an ornament from Grünwald, Bavaria (Halstatt A1);* (B–C) *cheekpieces from Impiccato, Grave 39 (probably Villanovan I);* (D) *lunate razor-blade handle from Selciatello Sopra, Grave 147 (Villanovan IC);* (E) *lunate razor-blade handle from Selciatello Sopra, Grave 38 (probably Villanovan II) (after Hencken 1968A: 516 fig. 478: f [after Kossack], 236 fig. 214: b, 105 fig. 92: b, 247 fig. 226 [after Pernier])*

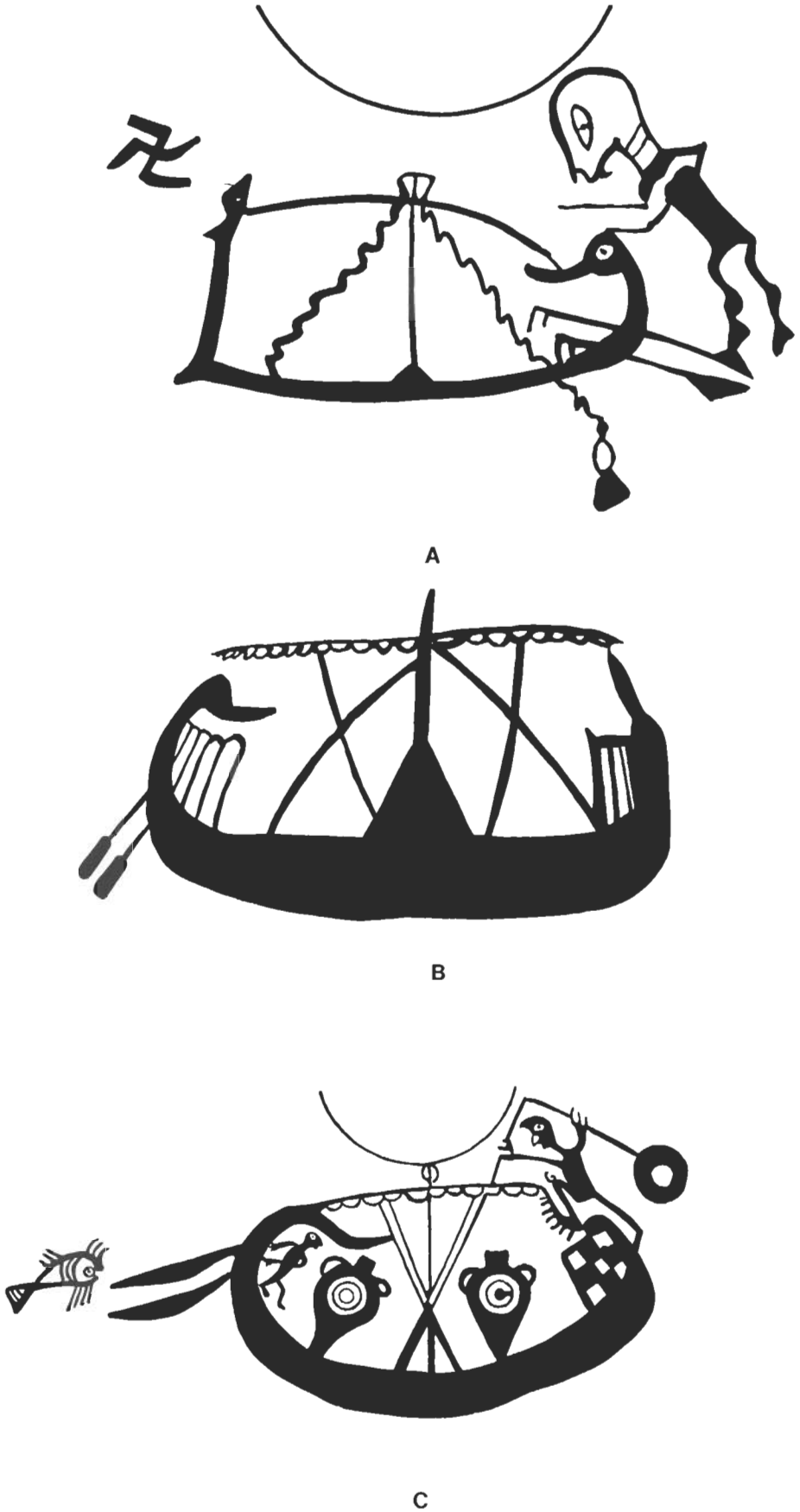


Figure 8.41. Ships depicted on three Cypriot jugs from the seventh century B.C. *illustrate the progressive transformation of a naturalistic bird head* (A) *to a stylized* (B) *and then abstract* (C) *sternpost device (after Karageorghis and des Gagniers 1974: 122–23 nos. 11: 2, 3, 1)*

on a Late Helladic IIIC krater fragment from Tiryns may portray a bird boat, although the painter may not have been aware of what he was depicting (Fig. 8.32).

Finally, a possible indication of the influence that the beliefs of the newly arrived Sea Peoples' mercenaries had on the Egyptians during the Ramesside period is found in the tomb of Ipy. Here he is depicted hunting birds from a papyrus raft with a bird-head stem decoration (Fig. 8.33). Craft similar to bird boats that appear on two Syro-Palestinian seals of Iron Age date portray a god in a boat (Fig. 8.34).[56]

Several Late Helladic IIIC ship depictions have another element that may be related to European cult iconography. The Skyros ship's bird-head device has a vertical projection rising from the back of its head (Fig. 8.35).[57] A similar projection exists on one of the two drawings given by S. Marinatos for a stem ornament on a ship depiction from Phylakopi, on the island of Melos (Fig. 8.36: A). In the second portrayal, the stem ends in a bird head with an extremely upturned beak identical to the beak of the Skyros ship's stem device (Fig. 8.36: B).[58] This "projection" may represent either horns or a crest on the bird's head. Horned birds and "animal-birds" are known from later European art (Figs. 8.37–38); bird heads with crests appear in Villanovan art (Figs. 8.39–40).[59]

The key to understanding the different forms—varying from naturalistic to abstract—in which bird-head devices may be depicted in the Mediterranean itself is to be found on ships portrayed on three Cypriot jugs dating to the seventh century B.C. (Fig. 8.41). On the first ship, A, a naturalistically depicted bird-head ornament, complete with eye, caps the stern and faces inboard. In ship B, the bird's eye

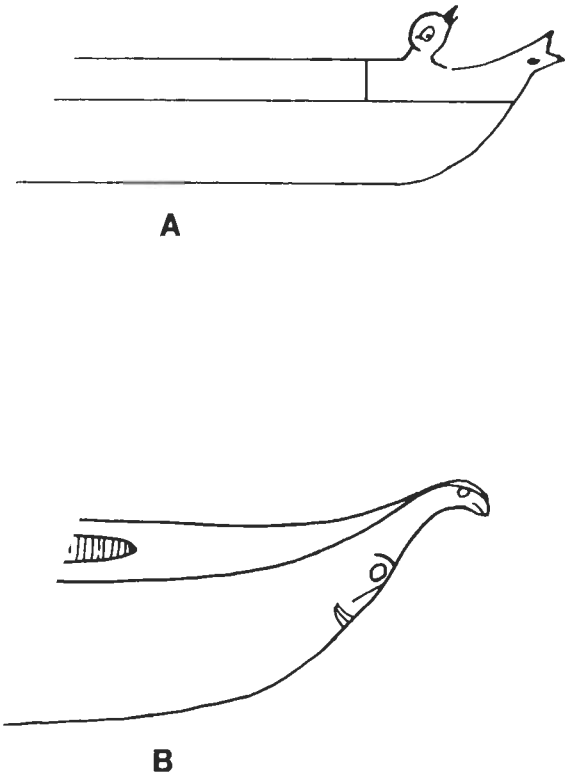


Figure 8.45. (A) *Bird-head decorations on a small canoe from Papua;* (B) *bow of a seagoing outrigger canoe* (nimbembew) (*southwestern Maleluka, New Hebrides*) (*after Haddon 1937: 316 fig. 179: a, 22 fig. 12*)

beak becomes the center of attention. The bird's head itself virtually disappears, as, for example, on the Fortetsa ships, as well as on a ship painted on a krater from Dirmil, Turkey (Fig. 8.49: A–B).[66] This continues a propensity to recurve the device's beak, a feature that had already become visible in the twelfth century B.C. The Fortetsa devices find their closest parallels on a ship depiction from Kynos (Fig. 7.16; 8.61: C). In Figure 8.49: A, the Kynos devices are placed on either side of the Fortetsa ship for comparison.[67]

Homer, in describing his warships, uses the adjective *κορωνίς*, which most probably means "having curved extremities." There is a very similar word, however, which is the name of a seabird: *κορώνη*. It is quite possible that this is a deliberate play on the two similar words and that *κορωνίς* is intended to imply "having curved extremities that are bird-shaped."[68]

This term accurately describes the stylized / abstract bird-head devices, facing inboard from both the stem- and sternposts, that were popular in the Geometric period. In these ornaments, emphasis was placed on the bird's beak. The devices on the warship-shaped firedogs from Argos are indeed sufficiently naturalistic that the birds' heads and beaks may be differentiated (Fig. 8.50: A). In other Geometric ship representations, the head-beak has become one continuous curve (Fig. 8.50: B–C). Compare these to the abstract bird-head device capping the stern of the ship in Figure 8.41: C. A naturalistic, regenerating phase of a bird-head stem ornament appears on depictions of galleys dated to the last quarter of the eighth century B.C. (Fig. 8.51).

The stem device on these ships is usually portrayed horizontally and faces backward, toward the stern. A slight angle may differentiate the "head" from the beak (Fig. 8.52: D). More often, the device appears as one continuous compound curve. At times the stem ornament is shown in outline and filled with a hatched decoration (Figs. 8.50: B, 52: C).[69] Earlier, this motif appeared on a device from Kynos (Fig. 8.61: D). The stem device on one Geometric galley is interesting in that it begins in an inward-facing abstract bird head but then recurves, copying the neck and head of the long-necked bird that stands in front of it (Fig. 8.52: C). This phenomenon is repeated later on an Archaic bronze fibula (Fig. 8.43).

By the eighth century, the water bird-head device had ceased to be solely a Helladic tradition. A Phoenician warship, portrayed in a relief from Karatepe, has an inboard-facing bird head as a stern

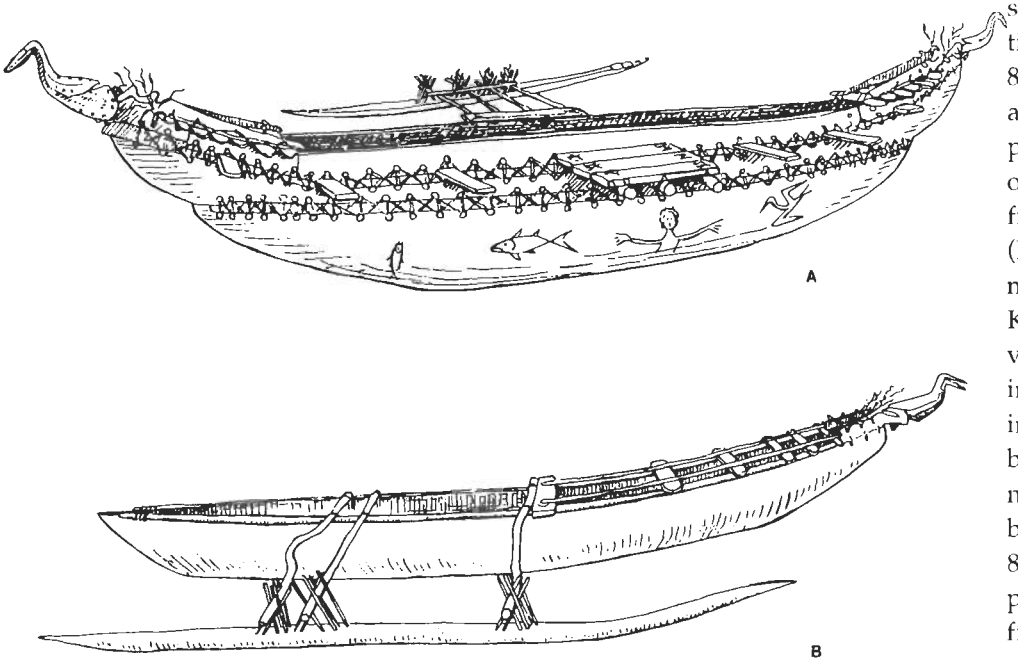


Figure 8.46. Canoes of Atchin, New Hebrides: (*A*) *large seagoing canoe with ordinary, single-beaked* solub e res *figurehead;* (*B*) *coastal canoe with double bird-head* solub wok wak *figurehead* (*after Haddon 1937: 27 fig. 15: b, a*)

Figure 8.56. (right) (A) *Bird-head stern decorations on Greek warships (ca. 530–480 B.C.);* (B) *stern of an Archaic galley on an ivory plaque from the Temple of Artemis Orthia in Sparta (ca. 650–600 B.C.);* (C–D) *stern decoration on archaic Attic black-figure* (C) *volute krater and* (D) *hydria (ca. 600–550 B.C.)* (A *after Casson 1995A: fig. 90;* B–D *after Morrison and Williams 1968: pls. 10: d, 11: a, d*)

lower edges of the beak and head of the bird-head devices. These items appear first in the thirteenth century on the Gazi ship (Fig. 8.61: A). In the twelfth century they appear on the ship depictions from Tragana and Kynos (Fig. 8.61: B–E). Similarly, in the Enkomi ship the protuberances are found on the inner face of the stem (Fig. 8.42: A). Horizontal lines, apparently representative of the same items, are painted on the stems of terra-cotta models portraying Helladic galleys (Figs. 7.22, 45, 48). In the seventh century B.C., an identical set of protuberances appears on the lower edge of an inboard-facing bird-head device with a highly recurved, vertical beak (Figs. 8.41: C, 62).

Because of the small size of the depictions, the protuberances comprise little more than lines or dots. Thus, their identity remains uncertain. Perhaps they represent rows of tiny bird-head ornaments affixed to the decorative devices surmounting the posts similar to the one nestling in the crook of a stern ornament on a Greek fifth-century galley (Fig. 8.59: A).

Why multiply the bird's beak? This is best understood as a strengthening of the device's protective

Figure 8.57. (right) *Sixth-century B.C. stern decorations on Archaic galleys in the form of a bird's head develop into an inward-curving stern volute* (A–D *ca. 550–530 B.C.;* E–H *ca. 530–510 B.C.;* I *ca. 510 B.C.*) (*after Morrison and Williams 1968: pls. 14: g, 13, 14: b, a; 17: d, c, a, e; 18: d*)

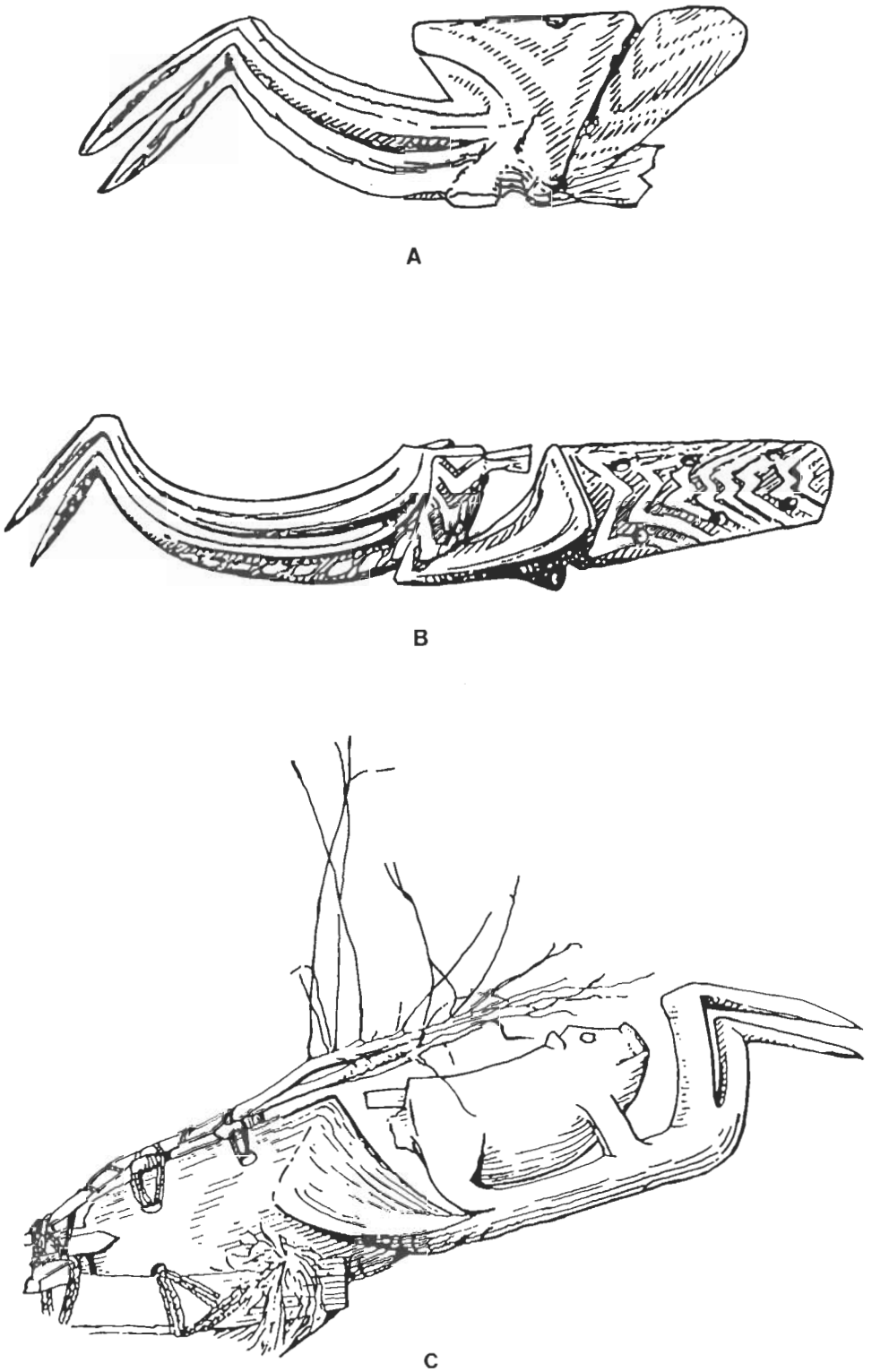


Figure 8.63. (*A*) *Single-beaked* solub e res *figurehead;* (*B*) *double bird-head* solub wok-wak *figurehead;* (*C*) Solub wok-wak *figurehead with a pig* (*after Haddon 1937: 28 fig. 16: a–c*)

bird figurehead (*solub e res*), to which anyone has the right without payment, the slit, representing the mouth of the beak, ends at the first bend [Fig. 8.63: A]. A figurehead in which the slit is continued down the neck is called *solub wok-wak* [Fig. 8.63: B–C] and the right to this has to be bought from someone already possessing one. When a man gets on in years he feels the need of something superior to a plain *solub wok-wak* on his everyday canoe. He then goes to one whose figurehead is decorated with a pig or other figure and after having arranged a price one of the parties to the negotiation will make a copy of it. There is a third type (*solub war*) which resembles the *solub wok-wak* except that the tip of the under beak is reflected over the upper beak, doubtless to represent a deformed boar's tusk, hence its name.

In the *solub wok-wak* the single bird head of the *solub e res* has evolved into two separate bird heads. The multiplication of the beak enhances the value of the *solub wok-wak*. A similar phenomenon may have taken place in the ancient Mediterranean.

Clearly, these bird-head images were not attached to ships because they were considered aesthetically beautiful but instead for the magical properties with which they were thought to invest the craft.[75] The multiplication of the bird's beak may have been perceived as strengthening the protective magic of the device's deity.

What significance did the ubiquitous bird-head device, in its many forms, have for the ancient mariner? J. Hornell, in discussing the tutelary deity of Indian ships, describes most clearly the basic need that primitive man felt for a protective presence to guard his craft:

APPENDIX: Homer's νηυσὶ κορωνίσιν

BY JOHN R. LENZ

Shelley Wachsmann makes the interesting suggestion that Homer's phrase "beaked (?)" ships describes the abstract bird-head devices he himself has detected at the stems and sterns of ships of the Bronze Age, the Geometric, and other periods. This depends on the meaning of the adjective *κορωνίς* used of ships in formulae such as *παρα νηυσὶ κορωνίσι(ν)*. A standard etymology derives this adjective from the noun *κορώνη*, a seabird, perhaps a shearwater, with reference to its curved beak.[1]

Homer applies the adjective *κορωνίς* only to ships.[2] The noun *κορώνη*, from which it probably derives, has two distinct meanings: either (A) a seabird or a crow,[3] or (B) a curved extremity of various types. Both senses occur in Homer. Of type B, Homer has a door handle and the golden tip of a bow.[4] Other, later usages of this type include the tip of a plow-pole, any tip, a crown, or a culmination of a festival.[5] Aratus once uses *κορώνη* to describe a ship's stern.[6]

The Greek lexicon considers the latter-named (type B) uses of *κορώνη* as secondary, derived from the similarity of each of these objects to a bird's curved beak.[7] If Homer's *κορωνίς* likewise derives independently from *κορώνη* (A), this would support Wachsmann's idea that the ships' curved devices themselves originated as birds' beaks.

However, *κορώνη* (A) and (B) must be dissociated etymologically. Both Latin and Greek show two distinct roots, *kor/cor*, one (A) meaning "crow" and another (B) "curved." Words for "horn" often exhibit a root *kor/cor*, as well.[8] I classify related Greek and Latin words as in Table 1.

Since a crow's beak is not markedly curved, Indo-European words for "crow" probably reflect the onomatopoeic root *kor*. The English "crowbar" preserves the sense of "bent" and has no connection with the bird.

Where does Homer's adjective *κορωνίς*, used of ships, fit in? If derived from the noun *κορώνη* (B), it should mean curved—but how? The objects called *κορώνη* (B) always represent curved extremities, added onto something that

TABLE 1

A	B	C
"crow"	"curved"	"horn"
κόραξ	*κυρτός* ("convex")	*κέρας, κεραΐς*
κορώνη (A)	*κορώνη* (B)	*κορωνίς*[9]
corvus	*κορωνίς*	*κορωνός*[10]
cornix	*curvus*	*κόρυμβα*(?)[11]
	corona	*κορώνιος*[12]
		cornu
		cervus.

APPENDIX: Additional Evidence

In recent years, additional depictions of ships of Aegean Bronze Age tradition have come to the attention of scholars. These are valuable contributions to our corpus of ship representations.

Ashkelon, Israel

A sherd uncovered at Ashkelon bears a ship's post ending in a bird-head device (Fig. 8A.1).[1] Although found in a fill, the sherd's fabric is typical of Late Helladic IIIC 1b ware found at Ashkelon and is believed to have been made at the site. The painting on the sherd is a fragment of a larger scene that originally must have contained at least one ship.

The post—it is not possible to determine whether this is a stem or sternpost, or whether it faces inboard or outboard—essentially is horizontal at its extremity. The bird-head device capping the sternpost is formed by a simple circle, with the eye represented by a central dot. The beak continues the curving lower line of the post. Theoretically at least, this could also represent the head and neck of a device in the shape of a bird, as on the ship depictions from Tragana and Enkomi as well as on Geometric period ships (Figs. 7.17, 28: A; 8.42–43). The latter possibility seems unlikely, however, judging from its size relative to the preserved legs of a man standing upon it.

The post is decorated with single zigzag lines along its upper and lower edges. Similar ornamentation appears on the vertical bow of the Tragana ship (wavy and zigzag lines are also shown rising skyward from this ship's steering oar), on a terra-cotta ship model from Tiryns, on three Cypriot ship *askoi*, as well as on a fourth *askos* from the Athenian Acropolis, and on the bird-head device from Maroni (Figs. 7.17, 45, 48: A–B, 49; 8.48).

The muscular legs of a man standing on the post have been preserved up to thigh level. The figure's legs are slightly bent at the knees and, assuming a frontal view, the heel of his left foot is planted forward, on top of the bird-head device, while his right foot is placed behind it, on the post. The left foot has a line rising vertically from it near the toe. If the artist's intention was to depict footwear curving at the toe—known from the Aegean as well as Asia Minor—that attempt was unsuccessful.[2] Behind the figure's legs is another curving line, which may perhaps represent either the curving profile of a shield (compare Figs. 7.8: A, 15) or the arm of a bow (compare Fig. 7.16).[3]

Warriors are often depicted on Aegean ships standing in the fore and sterncastles adjacent to the posts. Such is the case at Medinet Habu on ships N.1–2, 4 and 5 (Figs.

Figure 8A.1. Late Helladic IIIC 1b sherd from Ashkelon depicting a bird-head post ornament with the lower portions of the legs of a man who is standing on it (drawing by P. Sibella. Courtesy of L. E. Stager and the Leon Levy Expedition to Ashkelon)

CHAPTER 9

Shipwrecks

The development of SCUBA following World War II introduced a new dimension into the study of ancient seafaring. For the first time, archaeologists were able to go underwater and study the remains of ancient shipwrecks, their cargoes, and their accoutrements on the seabed. Even though Bronze Age shipwrecks remain rare, nautical archaeology has revealed and clarified aspects of ancient ships and their purposes to an astounding degree. Two articulated shipwrecks in particular, found off the southern coast of Turkey at Cape Gelidonya and Uluburun, have contributed immensely to our understanding. At the same time, they have raised many new questions. The known Bronze Age Mediterranean sites are summarized below by country and in chronological order.[1]

Shipwreck Sites

Greece

DOKOS. In 1975 P. Throckmorton discovered quantities of Early Helladic pottery adjacent to the southern side of Cape Myti Komeni at the northeast corner of the Bay of Skindos on the island of Dokos.[2] During a 1977 survey, three distinct concentrations of pottery dating to a late phase of the Early Helladic II period were found at depths ranging from eight to twenty-six meters.

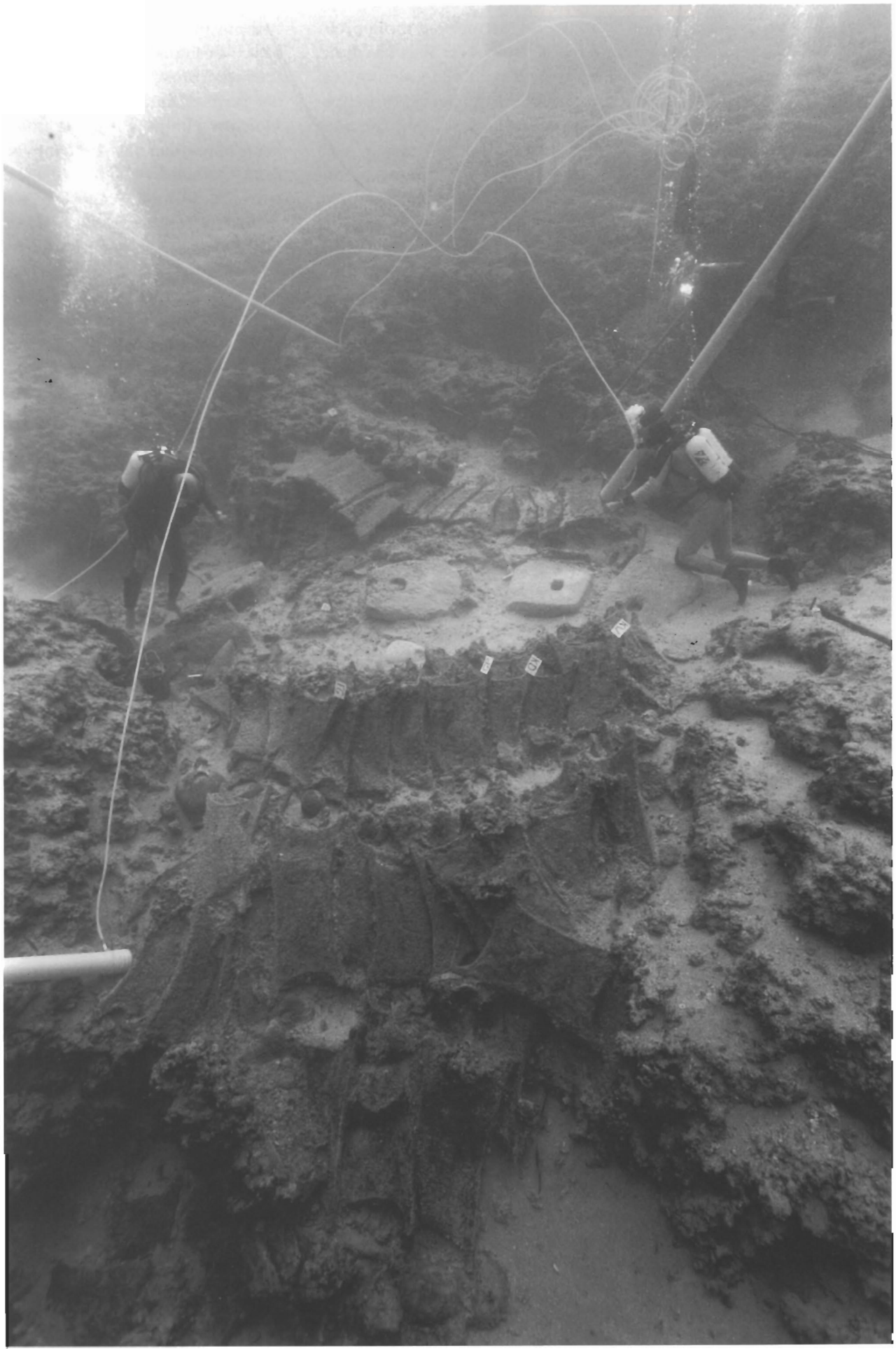
Vessel shapes found at Dokos include jugs, bowls, amphoras, cups, jars, *askoi*, and *pithoi*, along with supports for household clay spits, braziers, and clay hearths. Cycladic elements have been noted in the pottery. The site also contained grinding stones and fragments of a lead bar (ingot?) that may also be related to this complex. Bowls, amphoras, and spouted sauceboats in a variety of shapes and sizes predominate at the site. Apparently cultic in nature, these terra-cotta vessels are believed to have originated in Attica. Interestingly, Dokos is located on the presumed sea route between south Euboea and the Saronic and Argolid gulfs, one end of which is at Lerna.

To date, no timber has been reported from this site, raising the question of whether this is indeed a shipwreck. Furthermore, additional Early Helladic pottery was recovered from offshore on the *northern* side of Cape Myti Komeni. It is difficult to interpret the concentrations of pottery on both sides of the cape as resulting from a single shipwreck. Complete excavation and publication of the Dokos site will hopefully supply answers to this and other questions.

CAPE IRIA. A collection of pottery, primarily of Cypriot origin and dating to the end of the thirteenth century B.C., was located at Cape Iria, south of Asine, in the Argolid Gulf.[3] First surveyed in 1974 by Throckmorton and a team of Greek divers, the site, which is located at a depth of seventeen to twenty-five meters and over a length of thirty meters, contained three *pithoi* and many pottery sherds. Most of the sherds belong to coarse-ware domestic types: *pithoi*, amphoras, deep basins, a pitcher, and a Mycenaean stirrup jar. The Cypriot ceramics raised from the Cape Iria site may constitute one of the largest assemblages of Late Cypriot transport containers found to date in the Aegean region. A stone anchor was discovered near the site at a depth of six meters.[4]

Turkey

SHEYTAN DERESI. In 1973 a Bronze Age wreck site was found at a depth of thirty-three meters off



Aspects of Maritime Activity

CHAPTER 10

Ship Construction

The single most important aspect of seafaring is the ability to build vessels capable of withstanding the rigors of sea travel, with its waves, storms, and other dangers. The little we know about the actual construction of Bronze Age seagoing ships comes from the meager remains of fragmentary seagoing hulls—little more than bits and pieces of timber—found on the Mediterranean's seabed as well as on land in Egypt.

There is, however, much ancillary information: Nile ships found interred in various forms of burial, or reuse of their dismembered timbers; documents dealing with the construction and repair of ships and records of dockyards; and wall reliefs depicting scenes of ship construction.

Although this information is valuable, it is important to emphasize that most of it comes from Egypt and relates primarily to craft that plied the quiet waters of the Nile rather than to seagoing ships. Thus, the data can teach us about local Egyptian traditions but are of lesser value in interpreting deep-water vessels.

Primary Materials

Hull Remains of Seagoing Ships

WADI GAWASIS. Several wood fragments with mortise scars were found at the Middle Kingdom Red Sea port of Wadi Gawasis.[1] One of the timbers is cedar (*Cedrus* sp.) and has been radiocarbon dated to ca. 1975 B.C.[2] These fragments may be remnants of a ship-assembly operation that were subsequently used as firewood since some pieces are charred. The largest fragment is 38 centimeters long, 14 centimeters wide, and 12 centimeters thick. It has three rectangular mortises along one edge that measure 6 centimeters long, 2.5 centimeters wide, and 4 centimeters deep (Fig. 10.1).

Assuming the plank edge has not been abraded, these mortises are exceptionally shallow for ships built using the Egyptian unpegged mortise-and-tenon technique. The normal depth of mortises on the Dashur boats, for example, is 12–13 centimeters.[3] Tenons of the Cheops ship were 10 centimeters long by 7 centimeters wide and 1.5 centimeters thick.[4] This suggests a mortise depth of 5–6 centimeters. Therefore, the mortises in these fragments were probably used to

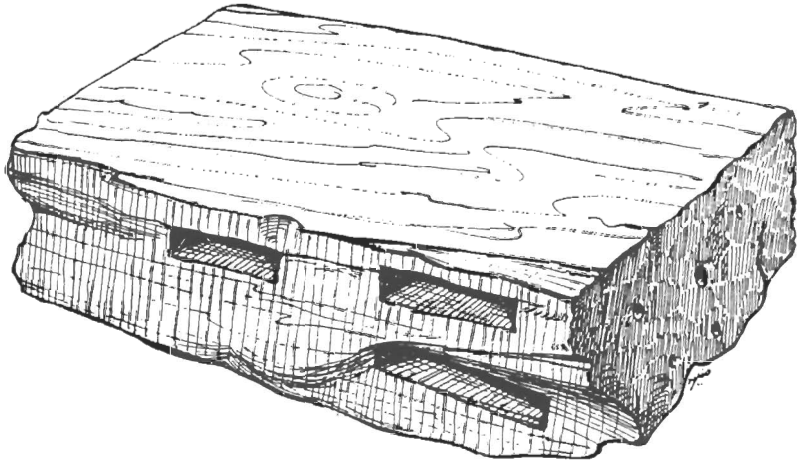
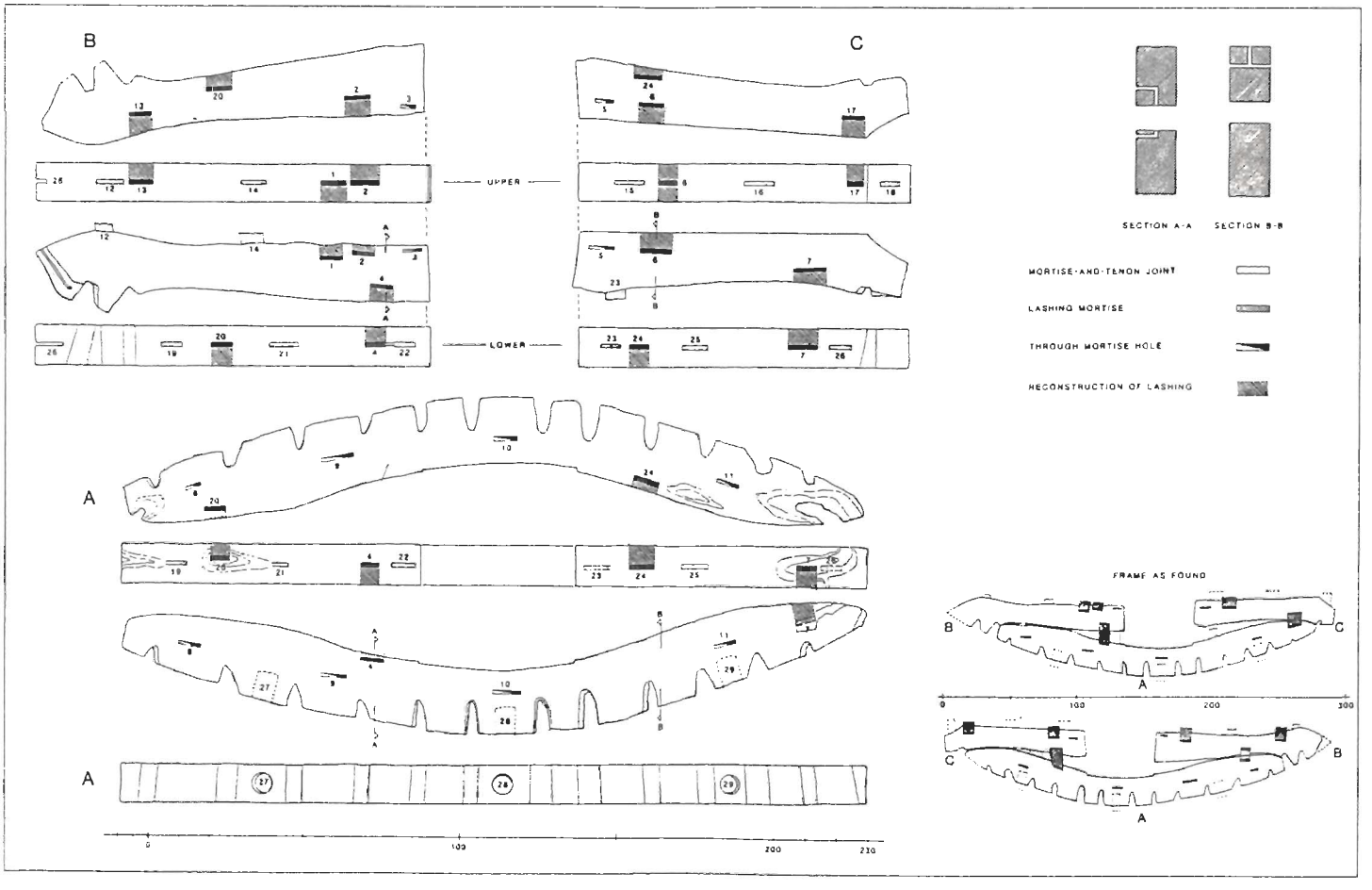


Figure 10.1. Mortised block of cedarwood, apparently a leftover from ship construction at Mersa Gawasis (Twelfth Dynasty) (from Sayed 1980: 157 fig. 3)

A



B

Figure 10.6. Three-piece boat frame found at Lisht (Sesostris I) (A from an Egyptian Expedition photo, courtesy Metropolitan Museum of Art, New York; B from Haldane 1992A: pl. 132; Lisht frame © C. Haldane, after a Metropolitan Museum of Art drawing)

Figure 10.8. The Carnegie Dashur boat, view from the bow (Sesostris III) (from Patch and Haldane 1990: 33 fig. 18 [Accession 1842–1]; photo by M. O. McNaugher, used by permission)

closely the construction of this hull resembles the description of Egyptian shipbuilding given by Herodotus, with which the Mataria hull was roughly contemporaneous.

The Textual Evidence

The following documents pertain to the construction and repair of ships. They present numerous problems in interpretation, particularly in the many technical terms, the exact meaning of which continues to elude us.

Egypt

PAPYRUS REISNER II. This papyrus, which dates to a period of three and a half years during the reign of Sesostris I, deals mainly with details of carpentry and the recasting of metal tools for use in the royal dockyard of This.[54]

B.M. 10056. Timber issued to several superintendent craftsmen over a period of eight months in the royal dockyard of *Prw nfr* is recorded in this document.[55] *Prw nfr* was apparently the chief port and naval shipyard under Thutmose III.[56] S. R. K. Glanville suggests that *Prw nfr* was located near Memphis or at el Badreshein. It may have owed its origins to the urgent need for sea transports for Thutmose's many Syro-Canaanite campaigns.[57] The text refers to timber being delivered "from a lake near the magazine."[58] C. D. Jarrett-Bell notes that this passage may mean that the Egyptians kept their logs in water to season until they were required.[59] The text often records the purposes for which the timber is issued.

In his conclusions, Glanville turns to G. S. Laird Clowes to make sense of the various entries in the text vis-à-vis their contribution to our understanding of ancient shipbuilding.[60] Clowes gathers all references to one particular ship, an *imu*, named *Payeh*. He includes all entries referring to timber supplied to Tity, the workman who is building the boat, as well as to "the boat of Tity." Clowes notes:

> It seems to me that the only items on which we can build with security are the three big issues:
>
> 12 pieces of *wnḏ* of 161 cubits run and 13.5 cubits average length, before the 13th day of the first month of Inundation.
>
> 12 pieces of *ḫst.t* of 258 cubits run and 21.5 cubits average length, on the 13th day of the first month of Inundation.
>
> 60 pieces of *iswt* of 848 1/2 cubits run and about 14 cubits average length on the 17th day of the first month of winter, i.e. more than 4 months later.
>
> Considering the large quantities of *iswt* issued and *the late date of this issue* it seems highly probable that *iswt* represents the outer skin planking of the vessel *which is of necessity put on last* and which involves great superficies.[61]

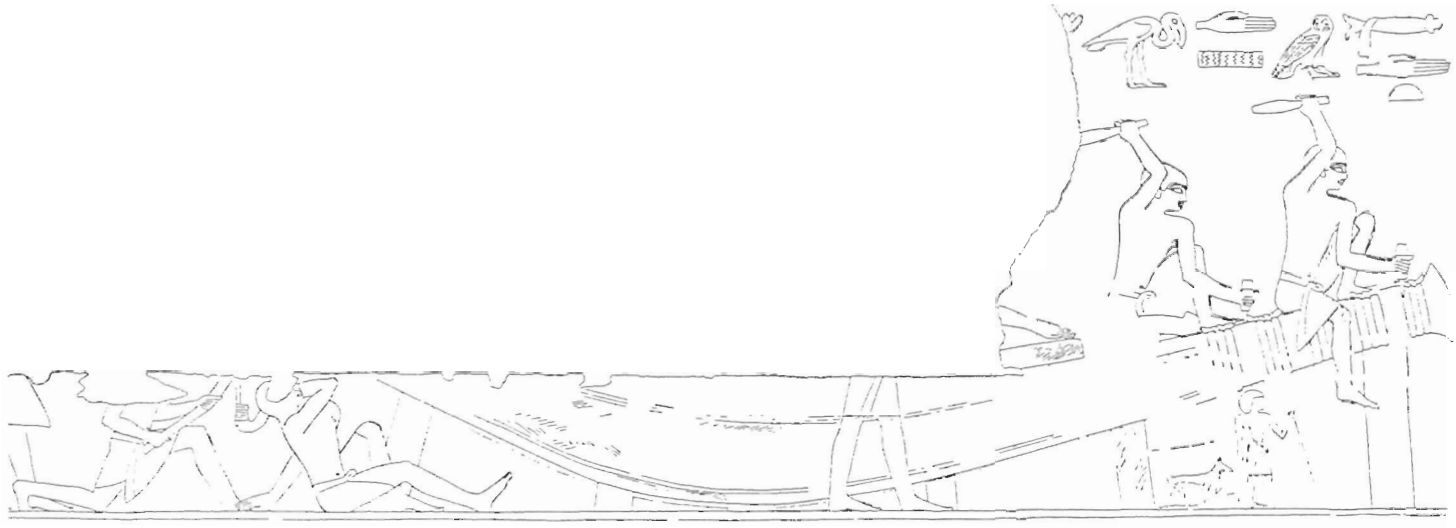
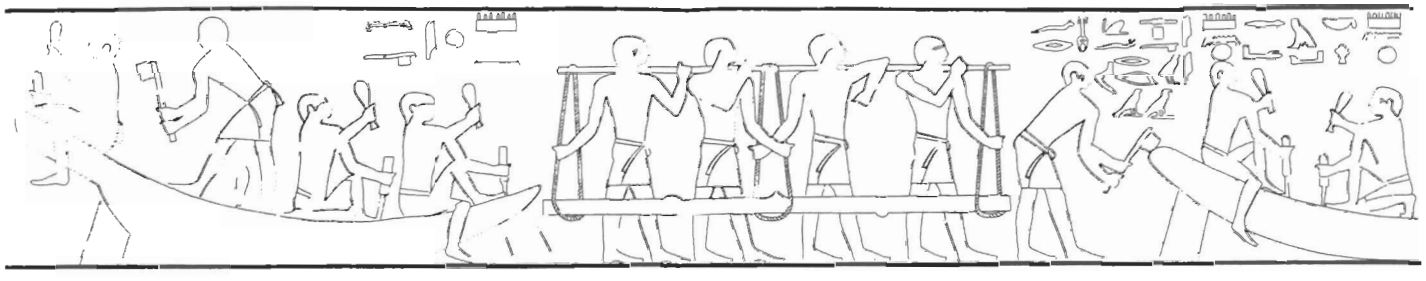


Figure 10.21. Hull 5 (detail from Wild 1953: pl. 128, © IFAO)

Figure 10.22. Ship-construction scene from the tomb of Khnumhotep at Beni Hassan (Twelfth Dynasty) (after Newberry 1893: pl. 29)



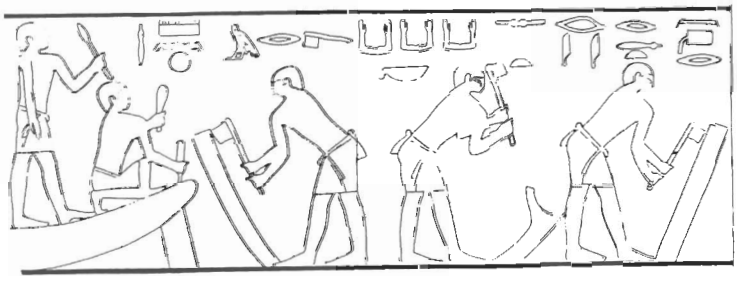


Figure 10.23. Register depicting shipbuilding in the tomb of Abba at Deir el Gebrawi (Sixth Dynasty) (from Davies 1902 (I): pls. 15–16)

period. It strongly suggests that the technique depicted there was foreign and only introduced into Egypt late in Pharaonic times.

Undefined Construction

TOMB OF IPY. Ipy's funerary boat, resting on its sled, receives its finishing touches from four workmen (T. 217, Ramses II) (Figs. 10.26–27).[132] It is possible that these are artisans instead of shipwrights and that Ipy's funerary boat was actually a large model, like those found at Lisht. The workman at left is pounding the papyrus umbel into place on top of the sternpost with a wide-headed mallet held upside down. The hands of the man at center are missing in a lacuna. A third workman pounds a staple into the front of the sled with a wide-headed mallet, again held upside down. A fourth artisan saws the lower part of the papyrus umbel with a handsaw. One-handed saws are uncommon in ship construction scenes (Fig. 10.20).

Discussion

Lashed Construction and the Transportation of Ships Overland

The ships used by the Egyptians on the Punt and Sinai runs were almost certainly of lashed construction, even in New Kingdom times. The Egyptian Red Sea coast is an extremely harsh, treeless area. R. O. Faulkner assumes that the ships on the Punt run in the New Kingdom were built at Thebes and then reached the Red Sea via a canal that was excavated in Wadi Tumilat.[133] P. E. Newberry, noting that there is no evidence for such a canal, was the first to suggest that ships on the Punt run were lashed.[134] As they were termed *Kbn* ships, he thought that they were built at Byblos and transported in sections overland to the Red Sea port where they were rebuilt. However, the Wadi Gawasis inscriptions indicate that the vessels were constructed on the Nile.[135]

On Antefoker's stele at Wadi Gawasis, the ships he had built for the Punt run were termed "ships of (?) the dockyards of Koptos"; concerning their construction, however, Antefoker notes: "Lo, the herald Ameni son of Menthotpe was on the shore of the Great Green building these ships."[136] This must mean that the ships had been built originally on the Nile before being hauled overland and reassembled on the shores of the Red Sea.[137] Several other Egyptian sources refer to the overland route from Koptos through the Wadi Hammamat to the Red Sea, over which all nautical voyages to Punt or southern Sinai had to pass.[138] Presumably, these were also transversely lashed ships that could be taken apart for transport across the Eastern Desert.

Henu, an official who served Mentuhotep Sankhekere (Eleventh Dynasty), describes the building of a ship destined for Punt on the shore of the Red Sea:[139]

> [My lord, life, prosperity], health! sent me to dispatch a ship to Punt to bring for him fresh myrrh from the sheiks over the Red Land, by reason of the fear of him in the highlands. Then I went forth from Koptos upon the road, which his majesty commanded me. . . .
>
> I went forth with an army of 3,000 men. I made the road a river, and the Red Land (desert) a stretch of field, for I gave a leathern bottle, a carrying pole (*sṯs*), 2 jars of water and 20 loaves to each one among them every day. The asses were laden with sandals ⌜___ ___ ___ ___⌝.
>
> Now I made 12 wells in the bush, and two wells in Idehet (*Yd³ht*), 20 ⌜square⌝ cubits in one, and 31 ⌜square⌝ cubits in the other. I made another in Iheteb (*Y³htb*), 20 by 20 cubits on each side ⌜___ ___ ___ ___⌝.
>
> Then I reached the (Red) Sea; then I made this ship, and I dispatched it with everything, when I had made for it a great oblation of cattle, bulls and ibexes.[140]
>
> Now, after my return from the (Red) Sea, I executed the command of his majesty, and I brought for him all the gifts, which I had found in the regions of God's-Land. I returned through the ⌜valley⌝ of Hammamat, I brought for him august blocks for statues belonging to the temple. Never was brought down the like thereof for the king's court; never was done the like of this by any king's-confidant sent out since the time of the god.

Henu's three-thousand–man expedition can only be explained if they were needed as porters to transport the ship's precut timbers from Koptos to the Red Sea shore.

Khenty-khety-wer, an official under Amenemhet II, raised a stele in Wadi Gasus, in commemoration of a nautical expedition to Punt. The stele depicts Amenemhet II drinking to Min of Koptos, while below Khenty-khety-wer raises his arms in worship. An accompanying inscription states:

> Giving divine praise and laudation to Horus ⌜_____⌝, to Min of Coptos, by the hereditary prince, count, wearer of the royal seal, the master of the judgement-hall Khentkhetwer (*Ḫnt-ḫt-wr*) after his arrival in safety from Punt; his army being with him, prosperous and healthy; and his ships having landed at Sewew (*Ś³ww*). Year 28.[141]

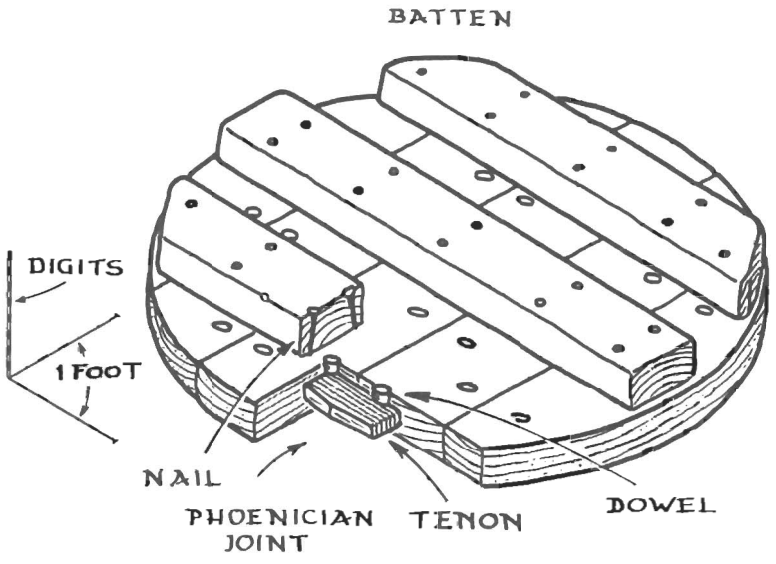


Figure 10.30. Schematic reconstruction of Cato's oil-press disk (orbis olearium) *with "Phoenician joints" (courtesy A. W. Sleeswyk)*

tween planks. Such stitching has been found in the sixth Century ships at Bon Porté, with a peg in every stitch hole. This type of stitching cannot be effective without pegs.[155]

Note that the structural concept of this form of sewn construction is identical to that of pegged mortise-and-tenon joinery. In the former, the internal side of the rope stitching acts as a tenon held in place by pegs. At times, wooden dowels in mortises are used to hold the planks in position.[156]

In classical antiquity sewn, or lashed, vessels were considered ancient. Perhaps this type of "pegged-sewn construction with tenons" considerably predates the sixth century B.C. in the Mediterranean, and perhaps pegged mortise-and-tenon joinery evolved from it when someone pegged the tenons and did away with the ligatures.

Pegged mortise-and-tenon joinery is preferable to pegged sewing because sewn ships must be oiled and repaired repeatedly. Thus, by doing basically the same amount of cutting and drilling, the shipwright created a much more economical craft. This reconstruction of events might also explain the Mediterranean tradition of driving the locking pegs *from inside the hull* (Fig. 10.25).[157] Alternatively, this phenomenon may have occurred because by driving the pegs from inside the hull, the smaller grain-end is presented to the water.[158]

Where, then, might pegged mortise-and-tenon joinery on seagoing ships have originated? As we have seen, it does not seem to have been an Egyptian innovation. The evolution of ship construction was a slow process. The knowledge of a type of joinery in a culture's carpentry repertoire does not imply *a priori* that it was used for shipbuilding in that country. Indeed, in Egypt there is no correlation between the knowledge of pegged mortise-and-tenon joinery in carpentry and its use in shipbuilding. If Qaha's artist depicted *pegged* mortise-and-tenon joinery, then this form of fabrication appears in Egypt at a time when there is evidence for strong Syro-Canaanite influence on Egyptian ship construction.[159] Might the Egyptians have inherited this tradition from Syro-Canaanite shipwrights?

The earliest recorded evidence for pegged mortise-and-tenon joinery on the Syro-Canaanite littoral is a Middle Bronze II table found in Tomb H–6 at Jericho (Figs. 10.28–29).[160] If the ships Thutmose III built near Byblos were made of pegged mortise-and-tenon joinery instead of lashed, it would explain why they were not taken apart for the difficult haul overland.

There is another clue that points in this direction. The Romans termed pegged mortise-and-tenon joinery "Phoenician joints," perhaps because they adopted this form of construction from their Punic (West Phoenician) foes (Fig. 10.30).[161]

These considerations, although admittedly far from conclusive, suggest an early Syro-Canaanite connection with pegged mortise-and-tenon joinery construction on seagoing ships.

Keels on Seagoing Ships in the Late Bronze Age

As we have seen, Hatshepsut's Punt ships strongly resemble a type of hull commonly known from Eighteenth Dynasty models of Nile traveling ships.[162] Was this latter class of boat used for deep-water seafaring during the Eighteenth Dynasty and later? Indeed, Landström has suggested that these ships had actual keels.[163]

A model patterned after this ship variety found at Byblos raises the interesting possibility that such vessels were frequenting that port (Figs. 3.16–17).[164] It may be argued that this model could have been a local copy of an Egyptian wooden model that somehow found its way to Byblos.[165] This, however, is unlikely since all the wooden Egyptian models of this ship type known to date have hulls made out of solid blocks of wood. *The artisan who created this model must*

APPENDIX: Did Hatshepsut's Punt Ships Have Keels?

BY FREDERICK M. HOCKER

The question has been raised of whether several representations of watercraft from the New Kingdom depict vessels with keels. If so, these are the earliest indications of a major advance in ship construction. Earlier Egyptian vessels seem to have relied on a keel plank, central strake, or, as the Cheops barge shows, a broad, heavy bottom made up of three relatively wide, thick strakes. Evidence for the development of the keel in the rest of the eastern Mediterranean basin is lacking until the late fourteenth century B.C. and the Uluburun wreck. This site provides archaeological evidence of a keel, or keel-like member, in an isolated bit of hull remains thought to lie at the original centerline of the ship (Fig. 10.2).[1] This keel is a heavy beam of substantial molded depth, part of which projects upward, above the inboard face of the garboards, as do the central strakes of the Dashur boats. The difference in thickness between the Dashur central strake and garboards is in some places negligible, however.[2]

In order to determine whether the structure represented on the relief of Hatshepsut's Punt ships at Deir el Bahri, on models from the tombs of Amenhotep II and Tutankhamen, and on the Byblos model are in fact keels, two questions must be answered:

- What defines a keel?
- Can the represented structures function in this way?

I would define a keel as a centerline timber, outboard of the frames, of sufficient cross-sectional area and attachment to the rest of the hull to offer significant longitudinal strength and stiffness to the vessel. Normally, this means a beam at least as deep as it is wide, fastened to either the garboards, the frames, or both. Timbers of substantially greater breadth than depth are generally called keel planks, since they may offer a point of attachment for other timbers (such as posts and frames) but do not possess enough rigidity on their own to qualify as keels. Between keels and keel planks is a gray area, where breadth exceeds depth but depth is still considerably greater than planking thickness. Keels normally project below the exterior surface of the planking and provide resistance to lateral motion (leeway) in addition to strength, but this is not always the case.

In the case of the Hatshepsut ships, the artist has shown a line that apparently delineates the join between the round, planked portion of the hull and the flat blade of the stem- sternpost. This line, similar to a rabbet line or bearding line, continues down to the waterline in many cases but gradually approaches the line representing the exterior limit of the hull. The impression is of a keel projecting below the planking at the ends but disappearing toward amidships. This interpretation is more or less confirmed by carved models from the tombs of Amenhotep II and Tutankhamen, in which the blade of the stem- sternpost continues to protrude below the planking near the ends but gradually disappears amidships. A similar effect can be seen in medieval cogs, in which the hooks, the backbone timbers at the ends, extend below the planking but the keel plank projects very little.

It would be hard to deny that the Punt ships of Hatshepsut have some sort of backbone structure that includes a centerline member of substantial depth, at least at the ends. I suspect that this timber is also quite robust amidships but that it projects inboard, like the upper portion of the Uluburun keel and the keel-like timber seen

CHAPTER 11

Propulsion

Before the introduction of motorized water transport in the nineteenth century, seagoing ships were propelled by manpower or by using the inherent energy of the weather. Once man learned to harness the wind, it became a significant form of ship propulsion. Even with today's modern technology, "turbo sails" are being considered to harness wind power and to cut fuel costs on motorized transport.[1] The ability—or lack thereof—to utilize wind power had a profound influence on sea routes and navigation in antiquity.

Paddles and Oars

The earliest seagoing vessels were paddled: rowing was a later development. The first evidence for the rowing of seagoing ships appears on those of Sahure and Unas (Figs. 2.2–3, 5, 7). Paddling, however, continued into the latter part of the Bronze Age on small craft and in cultic use (Figs. 6.13, 23: A, 24, 42).[2]

The rowing of Hatshepsut's Punt ships has attracted scholarly attention. G. A. Ballard argues that Hatshepsut's vessels were rowed with long sweeps because the oarsmen are standing up to pull on their oars (Figs. 2.15, 18).[3] He theorizes that the men stood near the ships' longitudinal median line but were foreshortened by the Egyptian artist.

C. D. Jarrett-Bell used the four positions depicted at Deir el Bahri in the scenes of the voyage to Punt, a procession on the Nile, and the moving of the obelisk barge to reconstruct a single entire stroke.[4] At the beginning of the stroke the oarsmen sit leaning forward, with their oars at a forty-degree angle from the vertical (Fig. 11.1: A). In the next stage they are still sitting and leaning forward, but with their oars now at an angle of twenty-eight degrees (Fig. 11.1: B). They then stand up and lean backward with the oars at a fifteen-degree angle (Figs. 2.25; 11.1: C). In the final phase the oarsmen stand erect, with the inboard arm pressed across the chest and the oar at a nine-degree angle (Fig. 11.1: D). Jarrett-Bell concludes that the oars were turned sideways on the return stroke and never left the water, resulting in a short, choppy stroke.[5]

One advantage of this kind of stroke is that it gives additional room inboard, which is an important consideration if the cargo was

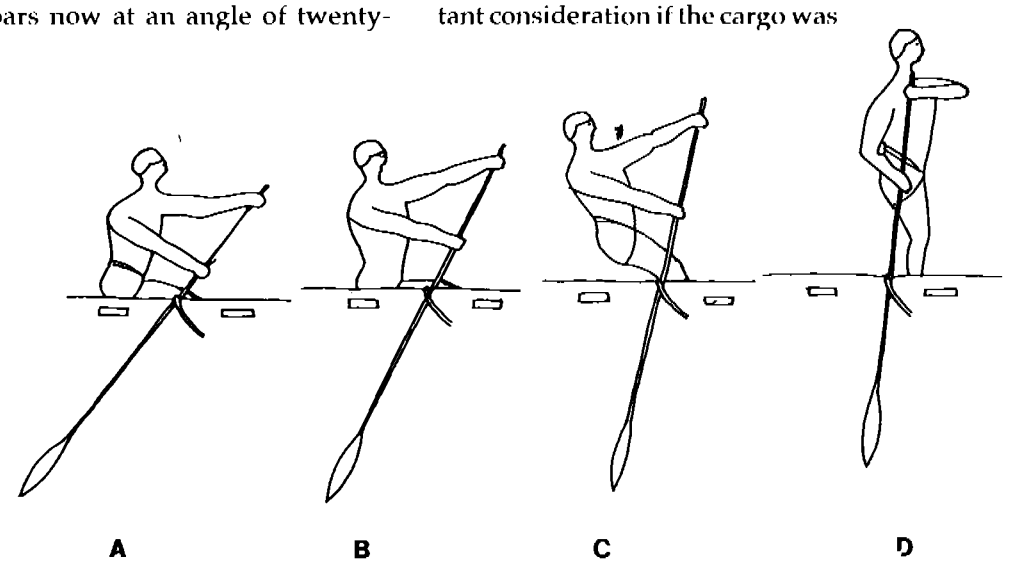


Figure 11.1. The four positions of oarsmen in the Deir el Bahri reliefs (after Jarrett-Bell 1930: 12 fig. 1)

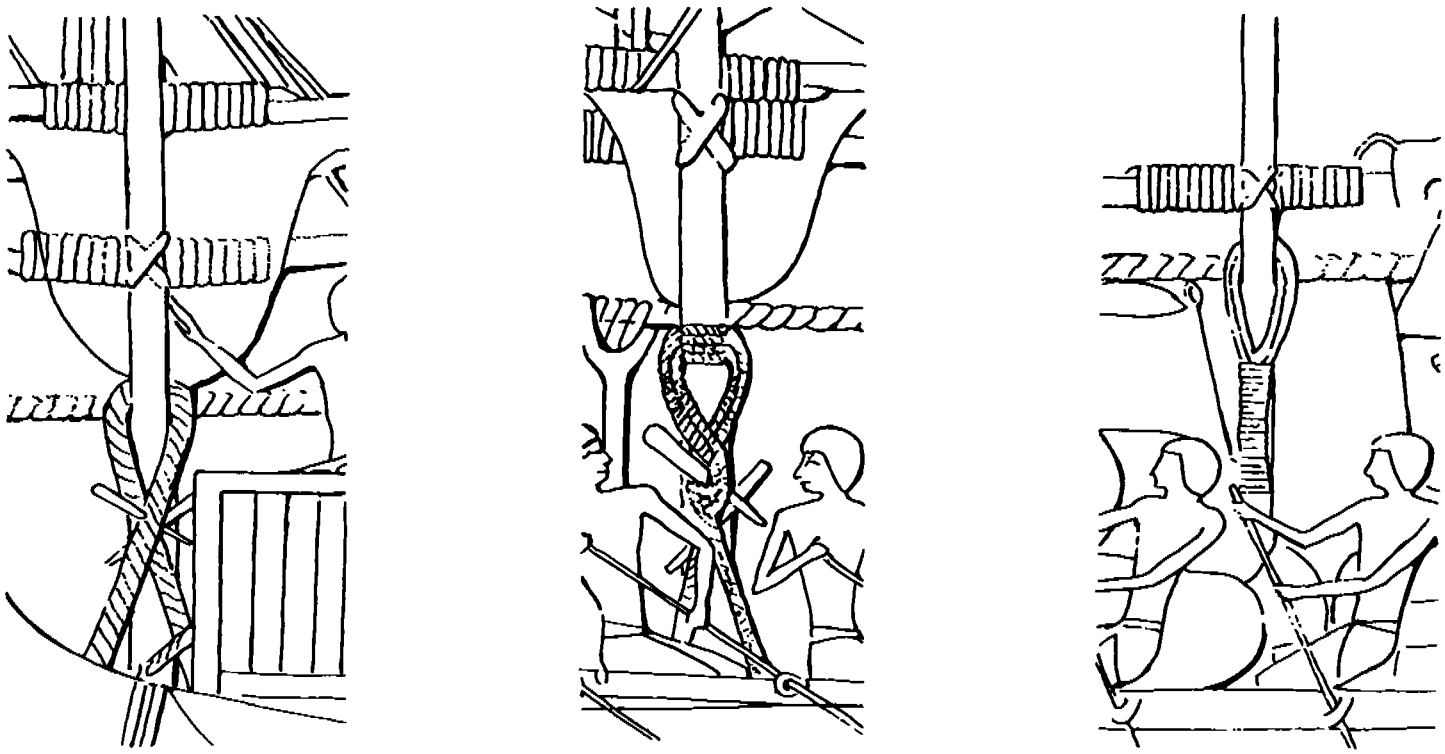


Figure 11.4. Detail of massive cables wrapped around the masts of three of Hatshepsut's Punt ships (after Naville 1898: pls. 72, 75)

down. There is a natural progression from these lateral cables to those appearing on various depictions of Late Bronze Age seagoing ships.

- Fragments of a painted relief from the Eleventh Dynasty temple at Deir el Bahri bear ships' parts on which cables are held in place with thick belaying pins and connected to the hull. This is accomplished by means of a U-shaped apparatus that is identical to ones used to hold down the lateral lashings on the ships of Unas (Figs. 2.5, 7; 11.5).[17] Since the cables on the Eleventh Dynasty ships are not tensed by twisting, they may represent an experimental method of tightening the cable, perhaps something akin to a Spanish windlass. This experiment apparently was not successful, for the device does not appear again.
- If Faulkner's theory was correct, as the truss was tightened it would have moved down the mast, taking on a characteristic V-shape with its center at the mast and its high ends at the two nearest crutches: /‾‾‾\/‾‾‾\. The Egyptian artists would have shown this as the normal shape of the truss, but they invariably portrayed the hogging truss as a horizontal line from stem to stern: /‾‾‾‾‾‾‾‾‾\. Either the artists did not include the tightening staves in the relief (although they existed on the actual ships) or the hogging truss was being tightened in another way.
- Similar lashings appear on the mast of Kenamun's Syro-Canaanite ships, which do not carry hogging trusses (Fig. 3.4).

What purpose, then, did these cables serve? Normally, a mast requires shrouds to support it laterally. Shrouds are not depicted at Deir el Bahri or on Kenamun's ships.[18] This is apparently neither accidental nor due to artistic conventions. Indeed, shrouds would have been extremely difficult to use with a boom-footed rig. Perhaps the massive cables supported the mast laterally, in place of shrouds.

Cypriot models give additional evidence for lateral cables. The Kazaphani model is perforated amidships by a circular maststep (Fig. 4.5: C: B); on either side of this is a molded hook-shaped object (Fig. 4.5: C: D–E). Model A50 from Maroni *Zarukas* has horizontal convex ledges with vertical piercing located amidships on either side of the hull's interior (Fig. 4.7: B–C). These may have served the same function as the hooks in the Kazaphani model. These hooks and lateral-pierced projections perhaps represent some form of internal structure used to attach such lateral cables to the ship's hull. The lateral cables were better suited to the bipod and tripod masts on which they originally evolved. But with the introduction

CHAPTER 12

Anchors

Anchors are to a ship what brakes are to a car; and just as a car needs brakes, a seagoing ship must carry some form of anchoring device. In the eastern Mediterranean during the Bronze Age, these consisted of pierced stones. Through the ages, anchors were left on the sea bottom where, as a result of modern underwater archaeological exploration and sport diving, they are now being discovered in large numbers in some parts of the Mediterranean.

The British researcher Honor Frost first brought attention to the significance of the pierced stones that litter the Mediterranean seabed and are also found on Levantine land sites.[1] She pointed out that by studying anchors on stratified land sites, anchors of diagnostic shape—found out of archaeological context on the sea floor—can be dated and their nationality defined.

The study of anchors is important to nautical archaeology for several reasons. An anchor on the seabed assumes the passing of a ship.[2] Thus, if the anchor type belonging to a specific nationality can be defined, then finding a trail of that kind of anchor in the sea must signify a route used by ships of that nation.

Similarly, anchors of definable origins found in foreign precincts are a valuable indication of direct sea contact. Perhaps the most important contribution of the study of anchors is the theoretical possibility of identifying the home port of a wreck based on the typology of its stone anchors.[3] Finally, since anchors are the main security for a storm-tossed ship, they have always had a cultic significance. Stone anchors found in cultic contexts can teach us about ancient religious practices.

Numerous anchor sites exist under the Mediterranean in areas that modern shipping would normally avoid.[4] Apparently, these anchorages were necessary for ships that could not sail into the wind and, therefore, were forced to wait for following winds.

Frost defines three varieties of pierced stone anchors:[5]

- "Sand-anchors" are small, flat stones with additional holes for taking wooden pieces that function like the arms of the later wooden and metal anchors. The stone's weight is minimal and is not an anchoring factor. These anchors are particularly suited for grasping a sandy bottom.
- "Weight-anchors" have a single hole for the hawser; they anchor a craft solely by their weight. These anchors may tend to drag on a flat and sandy bottom.
- "Composite-anchors" are heavier than sand-anchors but like them have additional piercings for one or two wooden "arms." These anchors hold the bottom with their weight and arms.

All datable Early Bronze Age anchors are weight-anchors.[6] Composite- and weight-anchors are found together in Middle Bronze and Late Bronze Age contexts at Ugarit and Kition. Thus, the weight-anchor preceded the composite-anchor but continued in use alongside it. G. Käpitan suggests a progression of stone anchors originating from amorphous stones lashed to a rope and developing into pierced stones (Fig. 12.1).

In this chapter the various kinds of evidence (textual, iconographic, and archaeological) for stone anchors and their facsimiles will be discussed. The archaeological evidence is organized in geographical order. This is followed by an overview of stone anchors found on Mediterranean wrecks. Finally, several aspects of anchor study are discussed.

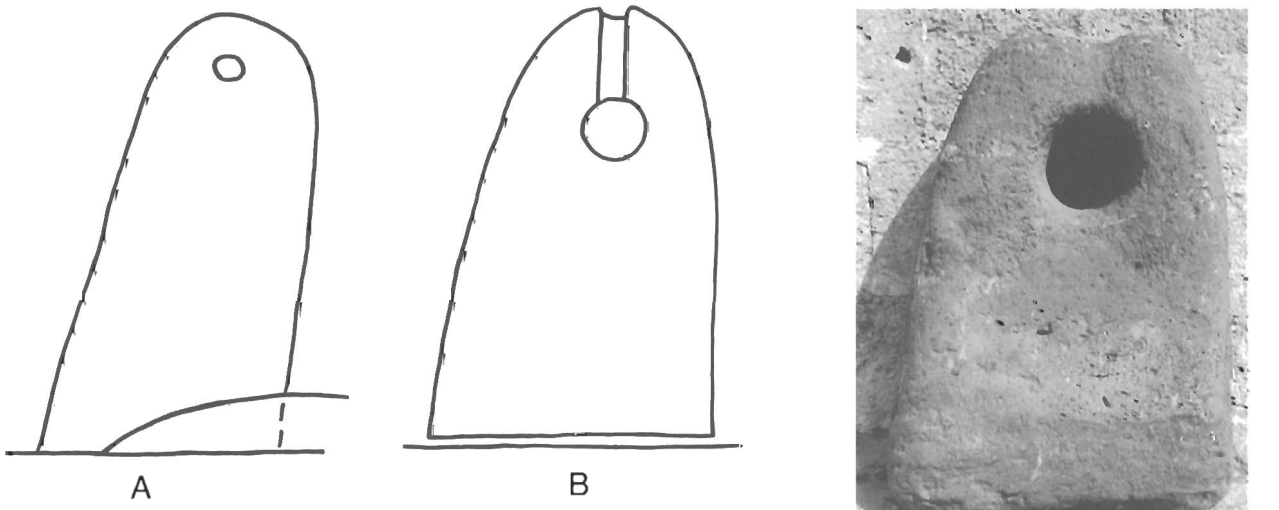


Figure 12.3. Asymmetrical stone anchors: (A) the anchor depicted at the bow of one of Unas's seagoing ships is asymmetrical when placed on a horizontal line; (B) asymmetrical anchor from Mersa Gawasis (Twelfth Dynasty); (C) asymmetrical anchor found underwater in the ancient harbor of Dor (A after photo by the author; B after Sayed 1977: 164 fig. 6; C, photo by the author; courtesy Israel Antiquities Authority)

G. Davies identifies this as an anchor cable.[20] The use of stone anchors on the Nile might explain the function of enigmatic objects, usually called "bowsprits," that appear on Middle Kingdom ship models; these may have been fairleads for an anchor rope.[21]

C. Boreux interprets another Old Kingdom scene from the mastaba of Akhihotep-heri as depicting a man raising a stone anchor at the stern of a Nile boat.[22] Basch suggests that this scene portrays a water pitcher being lowered into the river to be filled.[23] It is difficult to determine which of these two interpretations is correct. In New Kingdom images, crew members are normally shown dipping their containers into the river while bending over the caprails.[24] No ropes are used.

Iron anchors are recorded on the Nile by the third century A.D., and on the Nile today, ships carry iron anchors.[25]

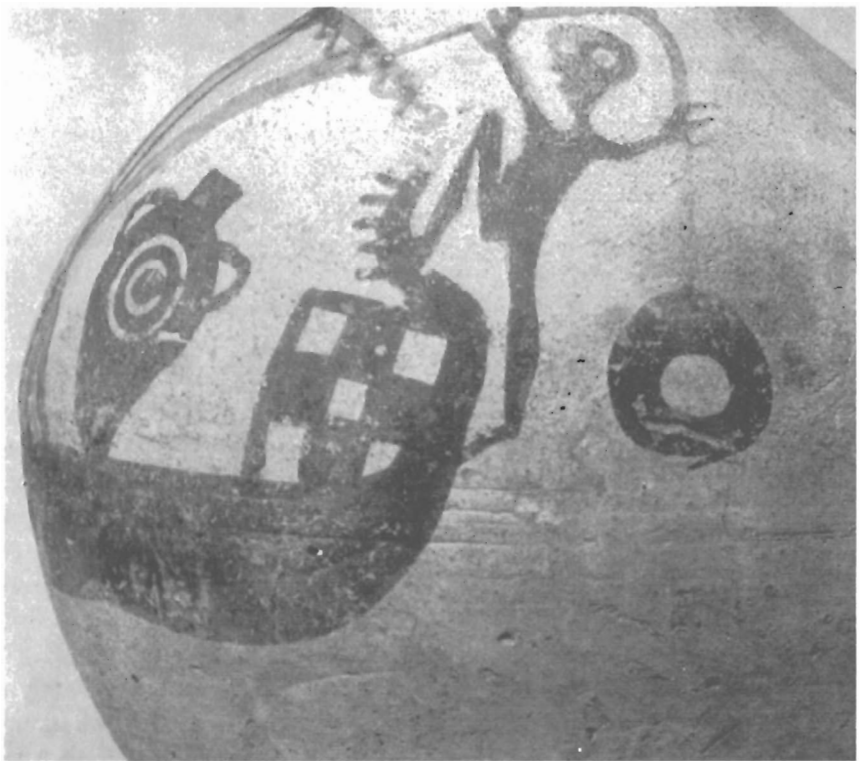


Figure 12.4. The raising of a round stone anchor is depicted on a seventh-century B.C. jug from Cyprus (from Frost 1963B: monochrome pl. 7 [opp. p. 54])

The Archaeological Evidence

Egypt

The earliest datable Egyptian anchors belong to the Fifth Dynasty.[26] An anchor in the mastaba of Kehotep at Abusir acted as the lintel of the false door (Fig. 12.6: A).[27] The anchor's base carries the following inscription: "The sole friend, the beloved in the presence of [pharaoh's name erased], Kehotep." Other stone anchors have been reported from the mastabas of Mereruka and Ptahhotep as well as in

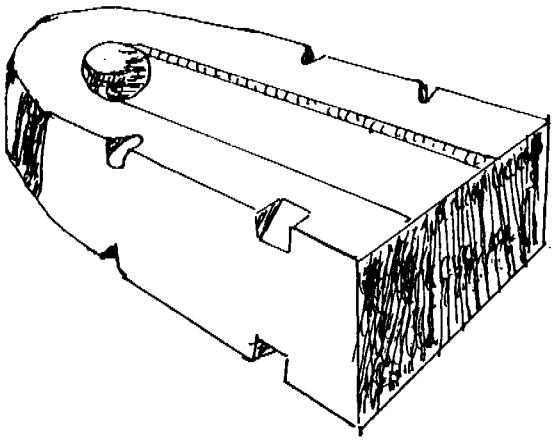


Figure 12.12. Anchor that formed the pedestal of Antefoker's stele from Wadi Gawasis (Sesostris I). The groove on the anchor's upper surface was cut to position the stele more firmly. The anchor lacks the typically Egyptian basal rope-hole but has four notches cut on its sides (from Sayed 1980: 155 fig. 2)

virtually impossible to identify a stone anchor as specifically Egyptian unless it came from a clearly Egyptian context or had a basal hole. Without a basal hole these anchors are indistinguishable from many found along the Levantine coast, most of which are presumably of local origin.

Of much later date are five distinctive stone anchors from the region of Alexandria: these are shaped like isosceles triangles with one or two holes at their bottom side.[38] At the apex of each of the anchors is a thin, rectangular piercing cut through the narrow side of the anchors, placing them at a ninety-degree angle to the lower holes. The upper slots appear to be better fitted for the insertion of a wooden stock than for directly attaching the hawser. The unbroken anchors vary from 51 to 161 kilograms. The largest anchor, which is broken, has a calculated weight of 185 kilograms. Three of the anchors are from Ras el Soda, where a small temple to Isis existed during the Roman period. Apparently the anchor group is to be dated to that period.

Although controlled at times by Egypt in the Bronze Age, the region of Mersa Matruh was within the cultural realm of Libya.[39] A. Nibbi reports about three hundred pierced stones found along a short stretch of coast at Mersa Matruh.[40] At present, it is not clear what connection, if any, these stones have with Bates' Island. Most of the stones weigh under 12 kilograms, suggesting that they were used as fishnet weights instead of anchors. One rectangular limestone block illustrated by Nibbi has a median groove and wear at its two narrow ends; it may have served as the stone sinker of a killick, or perhaps the stock of a wooden anchor.[41]

Israel

SHFIFONIM. The earliest anchor-shaped artifacts in Israel are found at land sites around the Sea of Galilee (in Hebrew, Yam Kinneret). In the excavations of Tel Beit Yerah (Khirbet Kerak), two phases of an Early Bronze Age gate were uncovered. A large basalt monolith belonging to the earlier phase was found standing upright on a stone plinth outside the gate (Fig. 12.13: A).[42] The monolith was unusual in that it had a large biconical piercing in its upper extremity (Fig. 12.13: B–C). Bar Adon termed it in Hebrew a *shfifon* (pl. *shfifonim*).[43] The *shfifon* found by Bar Adon was interesting in another respect. Although it was well cut in its upper area, its lower extremity was left unfinished, suggesting that it was meant to be placed in the ground.

Since Bar Adon's discovery, many more *shfifonim* have been found around the Sea of Galilee. The majority come from fields and were discovered singly or in groups, out of archaeological context. They now grace the gardens and museums of the local kibbutzes.

Shfifonim may be divided into several types:

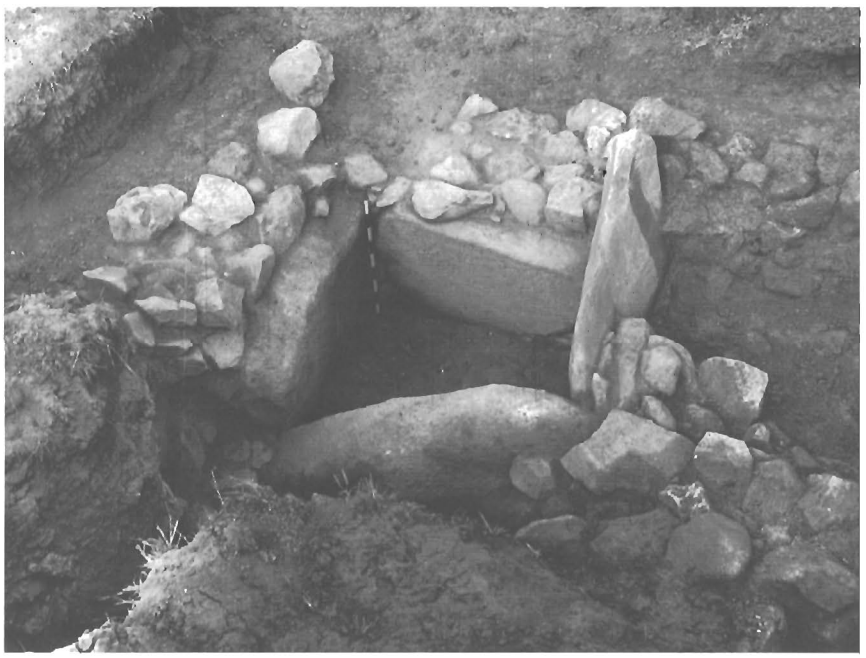
- Some of them have the upper area well prepared, usually in the shape of a trapezoid, while the lower extremity is left unworked (Fig. 12.14). On occasion, the natural shape of the stone is used; the base, however, is differentiated from the upper part.
- Other *shfifonim* reveal no significant difference between their top and bottom parts (Fig. 12.15). They come in varying, generally amorphous, shapes: some tend toward a pointed apex.
- A third subtype of particular interest includes *shfifonim* that were abandoned before their holes were completed. Examples of this phenomenon are rare; only three having blind holes have been recorded. One of these was found in situ in secondary use in an Early Bronze Age II stratum at Tel Beit Yerah (Fig. 12.14: A [lower left]).[44] A second example is now located in Kibbutz Beit Zera (Fig. 12.16). A third specimen, with cup marks on its surface, lies outside the local museum at Kibbutz Shaar ha-Golan.[45] There is also a single example of a *shfifon* with a second hole drilled into it, beneath its original, broken hole (Fig. 12.17).

The *shfifonim* are perhaps best understood as "dummy" anchors: they appear to have been intended to represent anchors and had some at present, unknown, cultic significance.[46] That they were meant to represent stone anchors is implied from their limited topographical range (adjacent to the shores of the Kinneret) and their general stone-anchor shape (particularly the biconical hole).

That they may have had a cultic significance is suggested by the following considerations:

- Although the *shfifonim* seem to

A



B

Figure 12.18. (A) A shfifon *in secondary use serves as a monolithic cover on the Middle Bronze Age I built tomb excavated at Kibbutz Degania "A" in 1971. The hole had been plugged with a stone in antiquity. (B) The same tomb after removal of the* shfifon *and monolithic stele that formed the tomb's roof. A second shfifon served as the tomb's southern wall (photos courtesy of M. Kochavi)*

the ship's (stern?) starboard and port anchors. R. R. Stieglitz identifies the quarter-rudder pictographs as the Egyptian hieroglyph *ym* and the anchors as Egyptian. This classification has been generally accepted.[58]

The identification of these anchors as Egyptian is questionable, in my view. Many stone anchors found in Israeli waters, presumably of Syro-Canaanite origin, are rectangular with a rounded top, similar to the two Megadim anchors discussed here. The Megadim anchors lack the attributes that define Egyptian anchors—particularly the L-shaped notch. The only reason to claim that they are Egyptian is the quarter-rudder pictograph on each. This is, however, only a single symbol, not a hieroglyphic inscription: anyone could have made the signs of a ship's quarter rudder without being Egyptian, or without even intending to represent an Egyptian hieroglyph.[59]

The same ship that left the "quarter-rudder" anchors may have left behind an additional pair of inscribed anchors at Megadim.[60] One anchor bears an hourglass-like symbol (Fig. 12.22: B). The companion anchor, which is identical in shape to the "quarter-rudder" anchors, is an ashlar block doing secondary duty as an anchor. It bears part of an Egyptian relief on one of its narrow sides (Fig. 12.22: A, C). Presumably the stone had been removed from a building in Egypt, although even this is not definite.[61] The relief does not make the anchor itself Egyptian; it lacks the L-shaped notch and apical groove, and its shape is compatible with a Syro-Canaanite origin.

Several other stone anchors from the Mediterranean coast of Israel bear signs. One anchor, found in the sea near Dor, has an

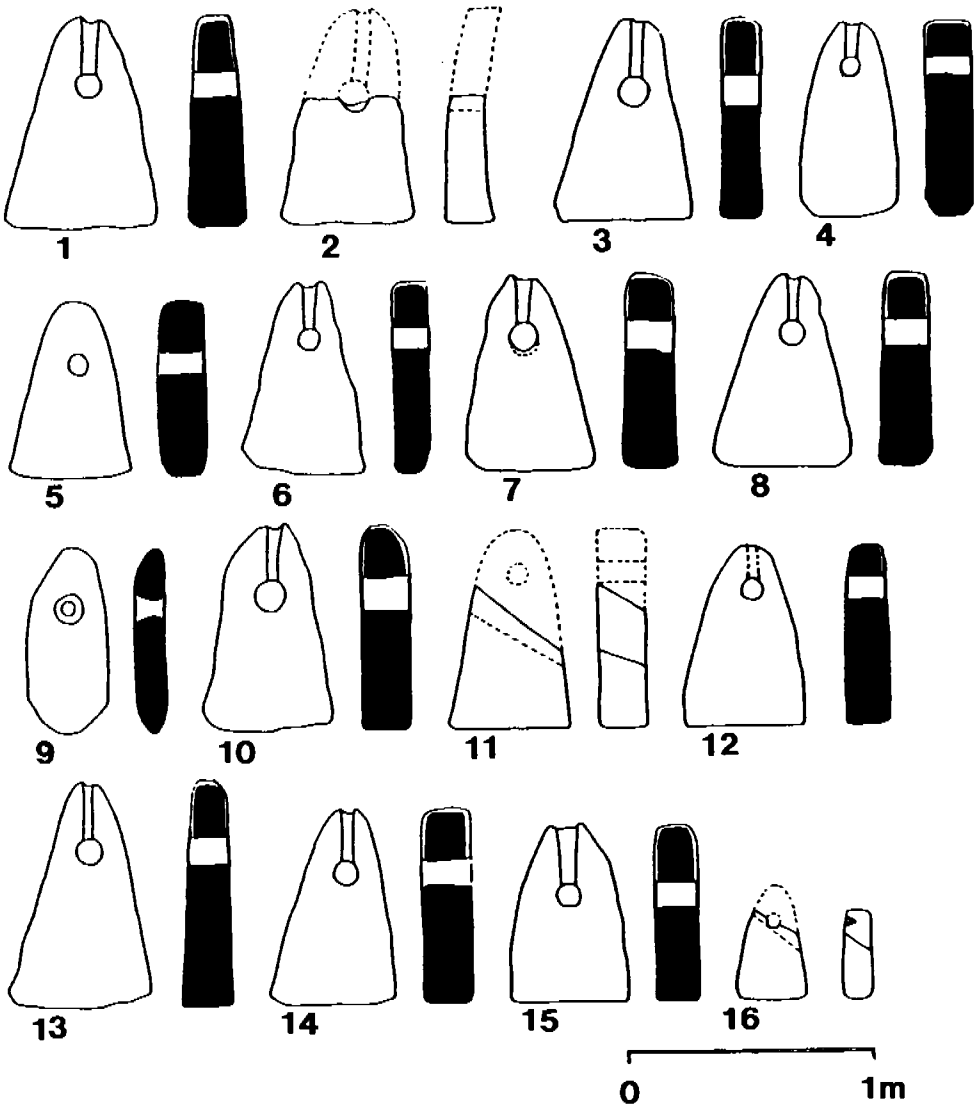


Figure 12.29. The Naveh Yam anchors (after Galili 1987: 167 fig. 1)

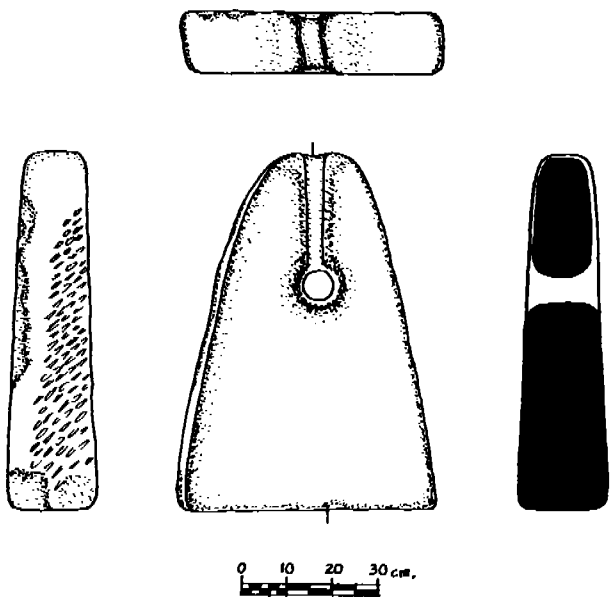


Figure 12.30. "Byblian" anchor found between the islands of Hofami and Tafat at Dor (drawing by L. T. Perry; courtesy Israel Antiquities Authority)

worked: this, along with their find spot, indicates to Frost that these were in themselves offerings. She suggests that the number of anchors may reveal the complement of anchors carried by a single ship.

Three more anchors, dated to the twenty-third through twenty-first centuries B.C., were also found in the enclosure (Fig. 12.28: 17–18, 22). Nine other anchors were discovered in secondary use in later strata (Fig. 12.28: 10–16, 19–20).

With the exception of one undated anchor, all those found at Byblos are weight-anchors. Frost defines the typical Byblos anchor shape as a tall, equilateral stone slab with one apical hole; above the hole is a well-defined rope groove. The hawser hole is round and biconical: the latter attribute is best illustrated in an unfinished anchor with a blind hole (Fig. 12.28: 11). The anchors are of medium size at Byblos; here, the gigantism of the Ugarit and Kition anchors is lacking.[78] The largest anchors at Byblos are calculated to weigh about 250 kilograms. The similarity between Byblian and Egyptian anchors may result from Egyptian influence at Byblos.[79]

Interestingly, at Byblos itself the "Byblian" anchor is not in the majority. Only six of the large-size anchors have the characteristic triangular shape (Fig. 12.28: 1, 3–4, 15–16, 18). Perhaps anchors were normally contributed to the temple by nonlocal seafarers, as, for example, must be the case of the Egyptian anchor found at Byblos (Fig. 12.28: 21).

Most "Byblian" anchors known to date come from off the Israeli Mediterranean coast.[80] A group of fifteen stone anchors of Frost's Byblian type was found at Naveh Yam (Fig. 12.29); another was found south of Dor, between the islands of Ḥofami and Tafat at the entrance to Tantura Lagoon (Figs.

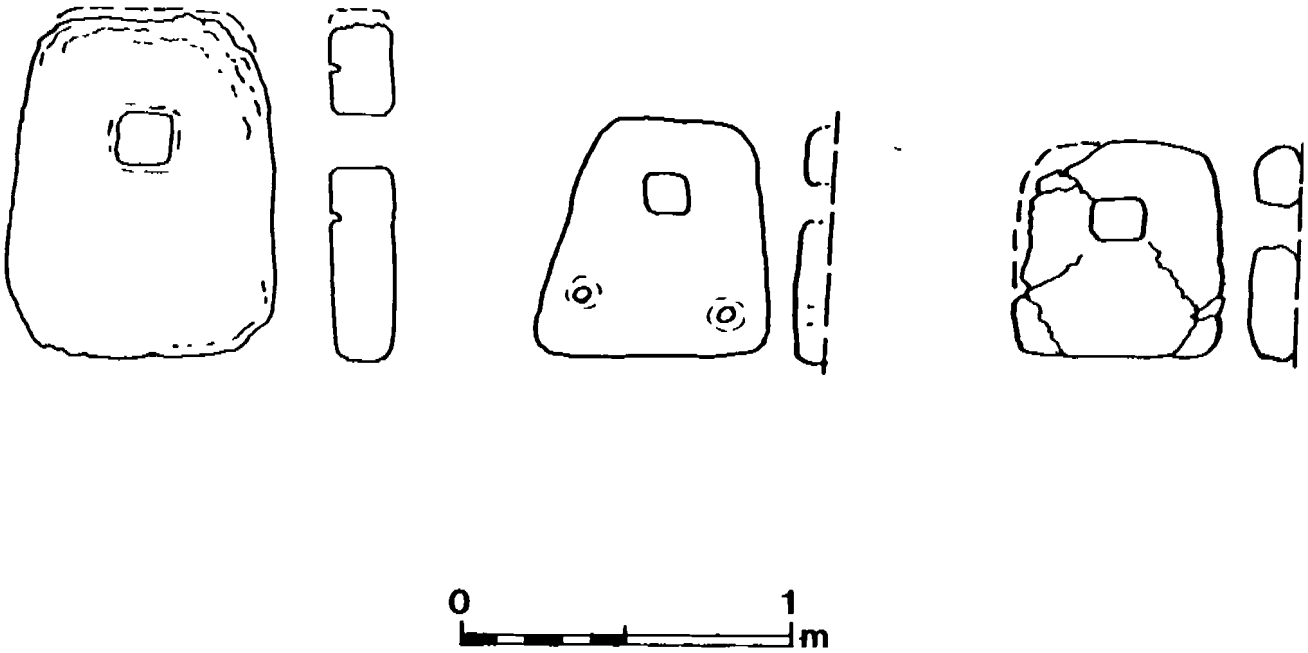


Figure 12.55. Stone anchors from Kition with square hawser-holes (from Frost 1986C: 312 fig. 12: 15, 317 fig. 14: 2, 310 fig. 4)

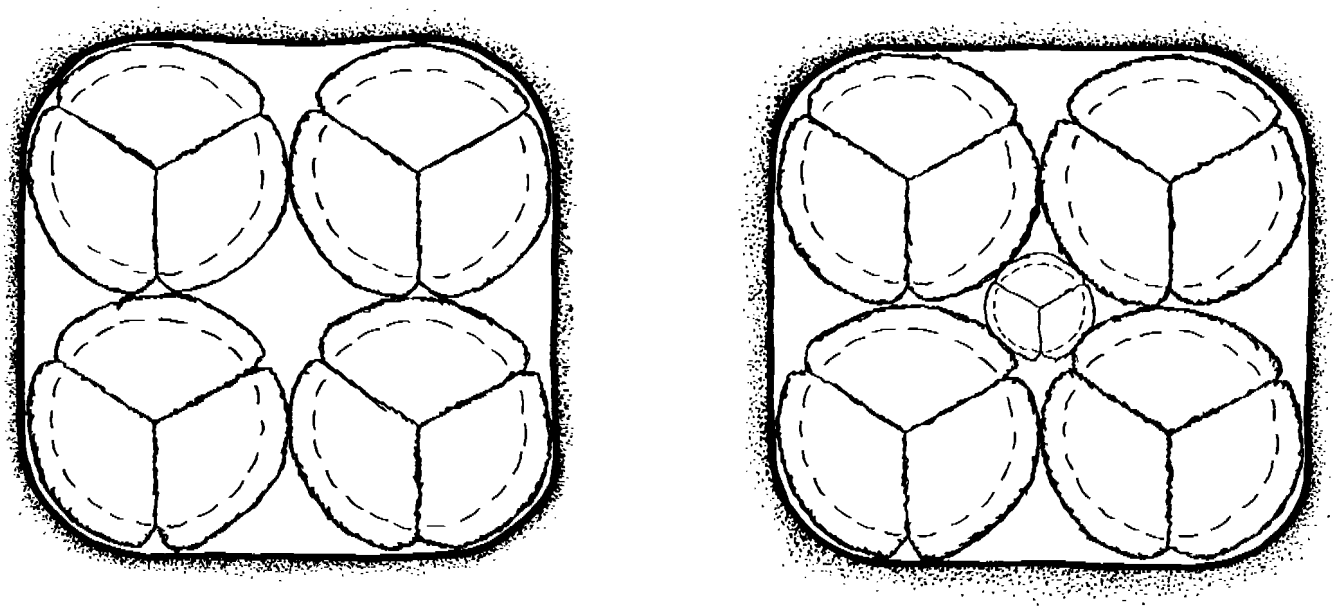


Figure 12.56. A square rope-hole suggests that it was intended for four (A) *or even five* (B) *smaller cables instead of one large cable (drawn by the author)*

CHAPTER 13

Navigation

The sailing season in antiquity was normally limited to the summer months, between March and November, when northwesterly winds prevail in the eastern Mediterranean.[1] This had a profound effect on the sailing routes plied during the Bronze Age, for the boom-footed square rig then in use was intended primarily for sailing with a following wind. Although it was possible to travel a direct path from Europe to Africa, the return voyage had to be made following the Levantine coastline.

Sea Routes

The following Mediterranean sea routes are documented in the Bronze Age:

Egypt/Syro-Canaanite Coast (Fig. 13.1: A)

Evidence, discussed above, indicates the intense use of the sea route along the Syro-Canaanite coast between Ugarit and Egypt as early as the Late Uruk period.[2] These include voyages to and from Egypt and intercity contacts, particularly by Syro-Canaanite and Egyptian ships.

Cilicia/North Syrian Coast (Fig. 13.1: B)

Ugarit carried on an active maritime trade with Ura (c), which was the main Mediterranean port for the Hittite kingdom. Ura was probably located in Cilicia, perhaps near modern Silifke, or about sixty kilometers to the west in the region of Aydincik.[3]

Syro-Canaanite Coast/Cyprus/Egypt (Fig. 13.1: C–D)

In *EA* 114, Rib-Addi, the embattled king of Byblos, reports that he is under land and coastal siege by his enemy, Aziru, who has taken control of the sea routes.[4] Toward the end of the letter, Rib-Addi emphasizes his isolation by bringing the following action to the pharaoh's attention:

> *Under the circumstances*
> *it goes very badly with me.*
> *Here is the other,*
> *Amanmasha.*
> *Ask him if I did not send him*
> *(via) Alashia to thee.*[5]

W. L. Moran, in his commentary to this text, notes that the order of the words emphasizes the place name, Alashia.[6] Amanmasha is presumably the same Egyptian official who had been previously stationed at Byblos.[7] Y. L. Holmes notes that Rib-Addi is saying that because of the difficult situation, he considered it necessary to send Amanmasha to Egypt by a route other than the normal coastal route between Byblos and Egypt.[8]

Now if Alashia is located north of Byblos on the North Syrian coast or in Cilicia as some scholars contend, then Rib-Addi's actions are incomprehensible. Not only would Amanmasha be sailing in the wrong direction, but this would also require him to sail along the Syrian coast—precisely the area that was under Aziru's control and which Rib-Addi would have wished Amanmasha to avoid at all costs.

If Alashia is located in Cyprus, however, then Rib-Addi's actions are clear and make perfect sense. To avoid Aziru's ships that lurked along the coast, Amanmasha's vessel would have sailed across the open sea from Byblos to Cyprus (Fig. 13.1: C). From there, with the aid of the predominantly northwestern wind, Amanmasha would have then sailed safely across the

in Cyprus and then on to Acco.

G. F. Bass notes that the east to west transit of this route is evidenced by the shipwrecks and find-sites of single oxhide ingots at Side in the Bay of Antalya (Fig. 13.1: d), Cape Gelidonya (e), Uluburun (f), and Deveboynu Burnu (Cape Krio) (g).[19] He suggests that these sites mean that the route hugged the coast. Another possibility is that they represent craft that had been blown off course from a route that kept farther away from the coast to avoid its dangers.[20]

There was the ever-present problem of shore-based pirates. And with primitive and unreliable anchors, a lack of good rope-hauling machinery, and a rig of limited maneuverability that made being caught against a lee shore in any kind of weather a very dangerous experience, the Bronze Age seafarer probably deemed the coast something to be avoided. This consideration is emphasized by the quantities of ancient ships that wrecked on the Mediterranean's shores.

The Aegean (*Fig. 13.3*)

A topographical list on the base of a statue in the forecourt of Amenhotep III's mortuary temple at Kom el Hetan contains a list of Aegean place names.[21] Amenhotep's name appears in the center of the base's front side above a *sm3* sign with two Syro-Canaanites bound to it. To its right are two place names:

1) Keftiu 2) Tinay

To the left of the *sm3* sign are three additional names. Nine more names, and part of a tenth, appear on the base's left side. They are:

1) Amnisos
2) Phaistos
3) Kydonia
4) Mycenae
5) Tegai
6) Messenia
7) Nauplia
8) Kythera
9) Ilios
10) Knossos
11) Amnisos
12) Lyktos

R. S. Merrillees theorizes that the lack of any apparent geographical order in the list makes it of limited historical significance.[22] When the sites are plotted on a map, however, a different picture emerges. The list begins with a cruise around Crete (1–3) and then describes a trip along mainland Greece (4–7). It then visits Kythera (8) and perhaps describes a visit to the Asiatic coast (9).[23] The list finally returns to Crete (10–12), repeating Amnisos (1 and 11).

Although somewhat confused, these names appear to be based on an itinerary of a clockwise circuit of the Aegean.[24] Only in this manner is the double appearance of Amnisos understandable. The list is not derived from a pilot, as several of the sites are inland.

The earliest sea routes in the Aegean may have followed seasonal fish migrations.[25]

Aegean/Egypt
(*Fig. 13.1: F* [*1*])

The appearance of Minoans in the Theban tomb wall paintings requires *at the very least* two separate visits to Egypt by Minoan envoys during the combined reigns of Hatshepsut and Thutmose III.[26] There may have been more visits by Minoans, perhaps many more —but for these, evidence is lacking.

More recently, the discovery of fragments of Minoan-style wall paintings (some of a religious na-

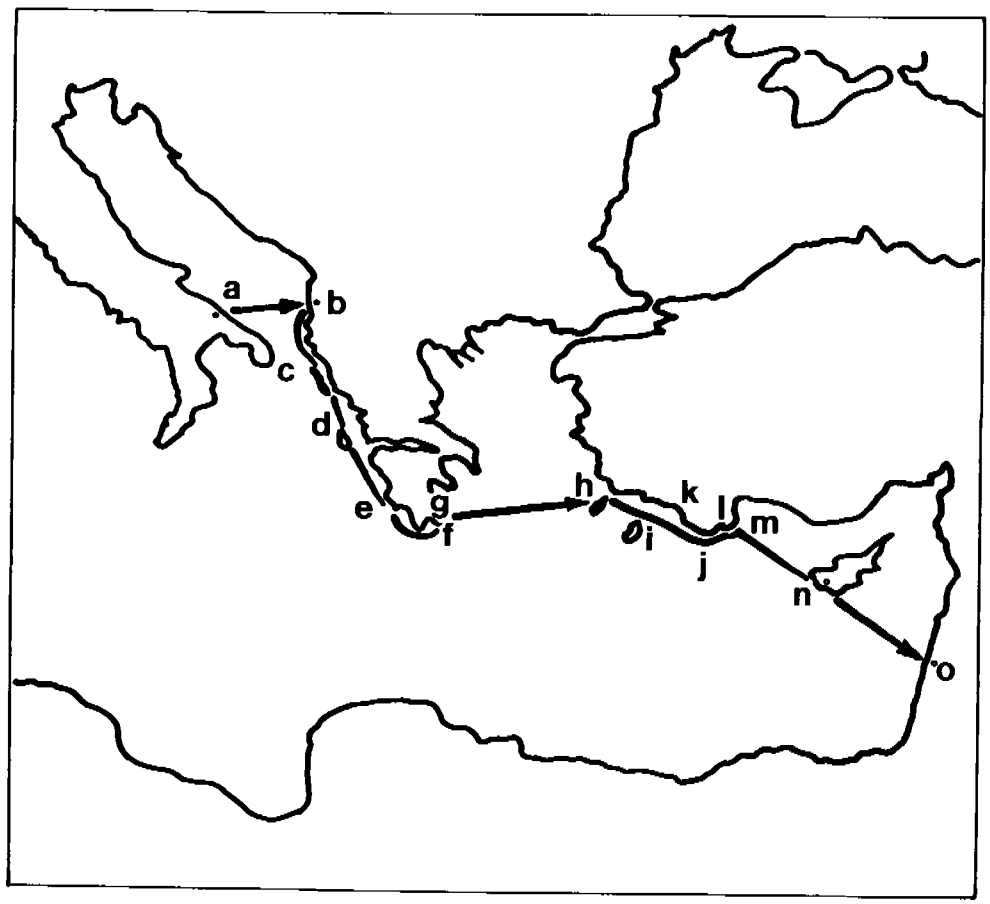


Figure 13.2. The route of Abbot Nikolás from Italy to Acco in the mid-twelfth century A.D. included the following sites: (a) *Bari,* (b) *Durazzo,* (c) *Corfu,* (d) *Cephalonia,* (e) *Sapienza,* (f) *Cape Malea,* (g) *Martin Carabo,* (h) *Kos,* (i) *Rhodes,* (j) *Kastellorizon,* (k) *Palara,* (l) *Myra,* (m) *Cape Gelidonya,* (n) *Paphos,* (o) *Acco* (*after Gelsinger 1972: 158 fig. 1*)

not necessarily indicate early trade contacts: a strong argument can be made for them being brought as "antique" trinkets that arrived in the Aegean during the Middle Minoan III–Late III periods.[35]

Homer supplies us with the earlier literary reference to the open-sea route from Crete to Egypt. Odysseus relates:

> We embarked and set sail from broad Crete, with the North Wind blowing fresh and fair, and ran on easily as if down stream. No harm came to any of my ships, but free from scathe and from disease we sat, and the helmsman guided the ships.
>
> On the fifth day we came to fair-flowing Aegyptus, and in the river Aegyptus I moored my curved ships.[36]

Elsewhere, Odysseus calls this route "a far voyage."[37] Classical references describe a three- to four-day crossing from Crete to Egypt.[38]

Although such goods were rare in the Aegean, the Uluburun ship was laden with Cypriot pottery when she went down.[39] Bass and C. M. Pulak suggest that this cargo was not meant for the Aegean region but that the ship may have been on a counterclockwise circuit of the eastern Mediterranean, a trade route previously proposed by Vercoutter.[40]

After dropping off its main cargo in the Aegean, the ship would have continued across the Mediterranean, possibly reaching land at the Libyan port of Mersa Matruh, the only natural harbor between Alexandria and Tobruk, before continuing on to Egypt (Fig. 13.1: F [2]).[41] Excavations at the Late Bronze Age site on Bates' Island near Mersa Matruh revealed Egyptian, Palestinian, Minoan, and Mycenaean sherds—but primarily Cypriot pottery.[42] This pottery dates to the Eighteenth Dynasty. The excavator suggests that Bates' Island served primarily as a way-station for ships to take on supplies arriving from the Aegean.

A Late Bronze Age ship wishing to return to Cyprus from Egypt without following the Syro-Canaanite coast could, theoretically, sail from the Nile Delta to Mersa Matruh and from there directly to Cyprus (Fig. 13.1?). The sailing direction from Mersa Matruh to the western end of Cyprus is northeast by east; thus, this route lies nine points off the predominant northwest wind. Although feasible in theory, there is no evidence that ships plied this course in the Bronze Age. The return voyage from Egypt across the Mediterranean to Cyprus was possible using a (brailed) square rig, as is illustrated by the later voyage of the *Isis*.[43]

Navigational Techniques

"They looked at the sky . . . they looked at the land," wrote the Shipwrecked Sailor of his drowned companions.[44] Seafarers in antiquity must have had a working knowledge of navigational techniques and meteorology. Lacking it could prove fatal. When King Solomon built ships for the run to Ophir, he wisely manned them with Tyrian seafarers who "were familiar with the sea."[45] Interestingly, when Jehoshaphat later built "ships of Tarshish" to repeat Solomon's feat (without Phoenician experts), the ships were wrecked at Etzion Gever.[46]

Information on seafaring navigational techniques of the Bronze Age is limited. With the notable exception of sounding weights, I am unaware of nautical navigational instruments surviving in the archaeological record of any of the Bronze Age cultures that peopled the eastern Mediterranean. This does not necessarily imply a lack of navigational knowledge, however: highly developed navigational systems may have existed without leaving any archaeological trace, beyond evidence for the open-sea voyages themselves.

Ancient navigation was an art—not a science. It depended on a vast and intimate knowledge of position-finding factors that were entirely committed to memory.[47] This is admirably illustrated by Pacific navigation. Despite the impressive results of native Oceanic navigation, no position-finding instruments were ever taken aboard ship.[48] The only navigational aids were stick charts, and these were used only as mnemonic devices that were not taken to sea.[49] Theoretically, a similar situation may have existed in the Bronze Age Mediterranean.

Navigational knowledge is usually a well-guarded secret, shared only by a select cadre of navigators. In Oceania, for example, navigational lore was restricted to a privileged few.[50] This may result in the loss of navigational techniques, as was almost the case in Oceania until the work of modern investigators.[51]

It is possible that during the Late Bronze Age, also, navigational techniques were kept secret and may have been lost during times of unrest and turbulence. The Minoans had the navigational knowledge required to use the open-sea route to Egypt. Perhaps the ability to navigate southward across the Mediterranean was lost for a time when the autonomous Minoan culture fell and was never acquired by the Mycenaeans. This is one possible reason for the apparent cessation of direct trade links between the Aegean and Egypt at the end of the Late Minoan IB period.[52]

CHAPTER 14

Sea Trade

Although the mechanics of Bronze Age sea trade are beyond the scope of this study, this chapter will focus primarily on Late Bronze Age cargoes as typified by the Uluburun and Cape Gelidonya shipwrecks. These supply us with an extraordinarily intimate view of the diversity of the commodities traded. This information is complemented by documentary and iconographic evidence of "invisible" materials that are unlikely to survive long periods under the sea.

Ships, as well as timber for shipbuilding, were in themselves significant items of trade. Indeed, the importation of ready-made timber from the Syro-Canaanite coast to Egypt may have had a profound influence on Egyptian shipbuilding.

Shipwrecks

Uluburun

Since final publication of the Uluburun wreck is being completed at the time of writing, any description of its cargo must remain preliminary, based on the detailed field reports published to date.[1] Nevertheless, these allow an intimate and fascinating view of the cargo of what is presumably a relatively large class of Late Bronze Age merchantman (Fig. 14.1).[2] Other finds hint at aspects of shipboard life for the crew—and perhaps the passengers.

The ship is believed to have carried at least fifteen tons of cargo.[3] This calculation does not include the additional weight of the stone ballast, the long-perished organic cargo, and the approximately four tons of stone anchors.[4]

Raw materials. The Uluburun wreck carried a main cargo of raw materials. The heaviest portion of the cargo consisted of copper and *tin* ingots in a variety of oxhide, bun, and other forms, some of which at present are unique to Uluburun.[5] This is the earliest appearance of tin ingots of oxhide shape. G. F. Bass had previously identified white, oxhide-shaped ingots portrayed in Theban tombs as tin.[6]

The ship carried a total of 317 copper oxhide ingots. This is more oxhide ingots than are presently known from the entire Near East![7] The weight of these ingots alone is calculated at a stunning ten tons.[8]

Lead isotope analysis has been carried out on four of the Uluburun oxhide ingots, five bun ingots, and one slab ingot.[9] With the exception of one of the bun ingots, all were made of Cypriot copper. Interestingly, similar analysis of Late Minoan/Late Helladic III bronzes suggests Lavrion as a primary source of copper in mainland Greece and Crete.[10] Although too few objects have been examined to date to reach any definite conclusions, this research does raise the question of where the Uluburun ship was to deliver its copper cargo.

The oxhide ingots were stacked in overlapping rows, in a manner reminiscent of roof shingles.[11] Each stack contained from eight to eleven ingots, all of which were placed with the mold (smooth) side facing downward. This may have facilitated a better grip and left the marks on the ingots visible.

Interestingly, to date no lead ingots have been uncovered at Uluburun, nor were any found at Gelidonya. Apparently, during the Late Bronze Age the Aegean was not importing its lead from the East.[12]

Some, if not all, of the gold jewelry was being carried as scrap, intended for remelting. This included a lump of molten gold, an entire gold ring and a fragment of a second ring, and part of a gold

Discussion

Terebinth Resin

In a monograph dealing with the meaning of *sntr*, V. Loret concludes that this is the Egyptian term for terebinth resin, commonly used in Egypt as incense.[82] Terebinth resin was also employed in antiquity as an astringent in aromatic ointments.[83]

Although a species of *sntr* tree grew indigenously in Egypt (and the resin was also imported into Egypt from Punt and Nubia), the primary source for *sntr* resin was the Syro-Canaanite coast. In the tomb of Rechmire, six jars labeled *sntr* are depicted, together with jars of olive oil and salve (*sft*) and a basket of lapis lazuli, in the bottom row of the display of Syro-Canaanite tribute/trade (Fig. 14.2: A).[84]

Large quantities of *sntr* are recorded in Thutmose III's annals.[85] The total liquid volume of *sntr* received by Thutmose is recorded for five of the years covered by his annals: year twenty-four, 12,345 liters; year thirty-three, 12,420 liters; year thirty-four, 10,395 liters; year thirty-five, (only) 1,260 liters; year thirty-eight, 9,840 liters. These imports average 9,250 liters per year. If this average held true for all twenty of the years that Thutmose was active in Asia, then Egypt would have imported some 185,000 liters of *sntr* during that time.

J. L. Melena tentatively identifies *ki-ta-no* recorded in Linear B inventories as pistachio nuts (*Pistachia terebinthus*).[86] The word is written, however, with a symbol suggesting that it was an aromatic or a condiment; Bass, in consideration of the resin found on the Uluburun shipwreck, equates *ki-ta-no* with terebinth resin.[87] Over 18,400 liters of *ki-ta-no* are recorded at Knossos.[88]

These quantities of *sntr* in the Egyptian, and *ki-ta-no* in the Linear B, documents place into historical perspective the 1.5 tons of resin carried by the Uluburun ship. Indeed, Thutmose III's annals for year thirty-five may refer to a single shipment of resin, of approximately the amount on board the Uluburun ship.

If intended for off-loading in an Aegean port, however, the terebinth resin may have been destined, at least in part, for a purpose other than incense or perfume. In this regard, the "Admonitions of Ipu-wer" contains a fascinating comment: "No one really sails north to [Byb]los today. What shall we do for cedar for our mummies? Priests were buried *with* their produce, and [nobles] were embalmed with the oil therof as far away as Keftiu, (but) they come no (longer)."[89] Ipu-wer seems to be saying that resins that had previously been imported from Byblos on the Syro-Canaanite coast to Egypt for use in the mummification process were used for embalming in Keftiu (i.e., Crete and/or the Aegean world).

Although there is no evidence for mummification in the Late Bronze Age Aegean, the following points suggest that some form of embalming (that is, the immersing of a cadaver in preservative liquids) may have been practiced:[90]

- Resin is one of the main ingredients required in mummification as practiced by the ancient Egyptians. Herodotus and Diodorus describe "cedar oil" used in the mummification process.[91] This was either injected into the body or used to anoint it.[92] However, this oil was almost certainly derived from the juniper tree and not from the true cedar.[93] Terebinth resin was not normally used for mummification in New Kingdom Egypt.[94]
- There are a number of striking similarities between the Cult of the Dead in Egypt and in Crete.[95] These suggest that the Minoan culture, and through it perhaps the Mycenaean also, was profoundly influenced in its religious beliefs and practices by its contact with Egypt. M. P. Nilsson, in discussing the Greek concept of the "Land of the Blessed," notes, "Its varying features are derived from the Minoan Age and agree so closely with Egyptian conceptions that it seems probable that an intimate connexion may be supposed with Egyptian belief in this case."[96] Thus, embalming—a considerably simplified form of the complex Egyptian practice for preserving the bodies of the dead—may have been included among the burial beliefs and customs adopted or adapted from the Egyptians by the Minoans and transmitted through them to the Mycenaeans also.[97]
- *Pithos* burials became widespread throughout the Aegean world during the Middle Bronze Age: these would have been suitable for immersing a body in a preservative liquid.[98] Clay coffins began to replace storage jars at Knossos toward the end of the Middle Minoan period. Some containers were lined with plaster, perhaps to render them less porous.
- Minoan signet rings depicting cult scenes sometimes show large *pithoi* like those used in the burials (Figs. 6.53, 69: D).[99] A. W. Persson suggests that these represent some rite of mourning for the dead god before his joyful resurrection.[100] This may be related to the Greek myth in which Glaukos, the son of Minos, dies by falling into a jar of honey—but is revived by means of an herb revealed by a snake.[101] Persson proposes that this myth, along with many other later references, may be reminiscent of a time when the dead were embalmed in Crete, although he assumes that the embalming was done in honey.

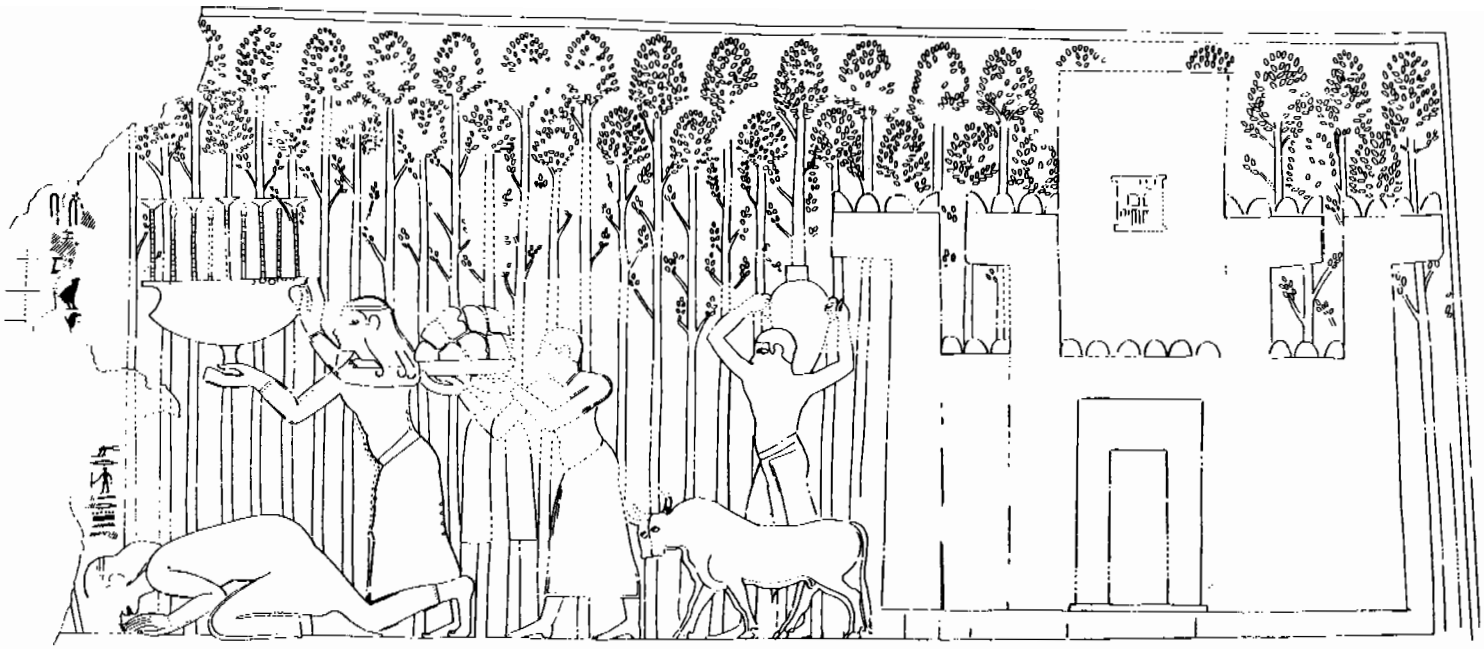


Figure 14.3. Lebanese forest depicted in a scene of foreign tribute in the tomb of Amenmose (T. 42) (Thutmose III–Amenhotep II) (from Davies and Davies 1933: pl. 36; courtesy of the Committee of the Egypt Exploration Society)

highland of God's Land. They reached as far as the forest-preserve."[119]

The "gifts" that Senufer brought for the goddess of Byblos, whom the Egyptians equated with Hathor, were actually a polite statement for payment of the timber.[120] Indeed, even during the Late Bronze Age when Asia was under Egyptian dominance, Egypt apparently paid dearly for its timber. This is evident from the following exchange between Tjekkerbaal and Wenamun:

> He [Tjekkerbaal] responded saying to me: On what sort of business have you come? And I told him: It is in quest of lumber for the great and noble barge of Amon-Re, King of the Gods, that I have come. What your father did and / what your father's father did, you will also do. So I said to him. And he said to me: They did in fact supply it. You have but to pay me for supplying it, and I will supply it. Actu-

Figure 14.4. Lebanese princes cut down trees for the pharaoh. Karnak: exterior of the north wall of the grand hall (Seti I) (after Wreszinski II: 35)

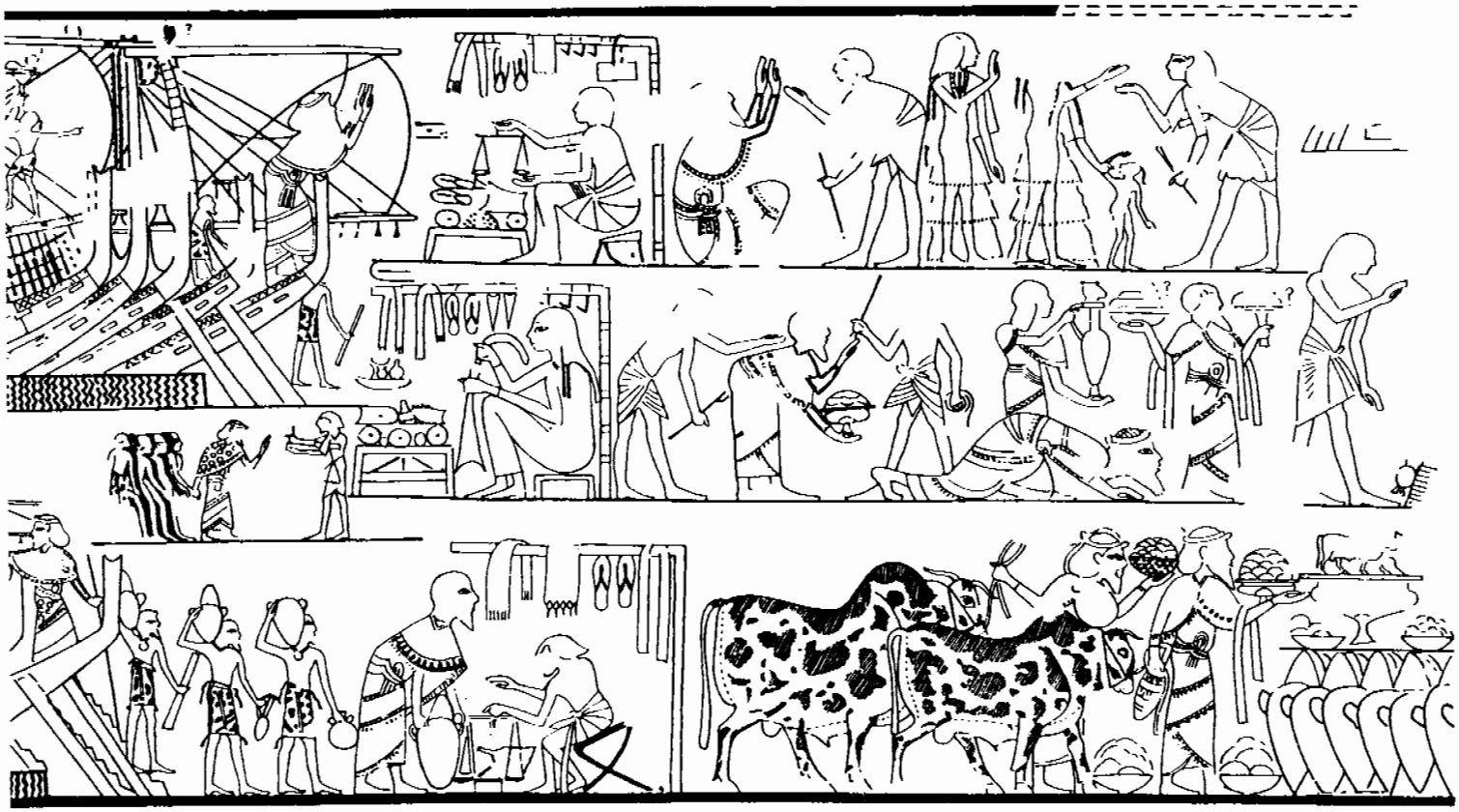


Figure 14.6. Harbor scene from the tomb of Kenamun (T. 162) at Thebes (Amenhotep III) (from Davies and Faulkner 1947: pl. 8)

Convoys of Trading Ships

Merchant ships on occasion traveled in convoys for protection. The two Syro-Canaanite ships captured by Thutmose III mentioned previously may have been together when taken. Similarly, Rib-Addi complains that Iapa Addi has robbed two of his ships; Abimilki, the king of Tyre, writes that the "man of Sidon" has abandoned that city in a convoy of two Egyptian (?) ships.[143] Elsewhere we hear of three Byblian ships that have succeeded in running the blockade imposed on that city by Arwad.[144] Tjekkerbaal tells Wenamun of a convoy consisting of six Egyptian (?) ships.[145]

Iconographic representations are less trustworthy in this regard. Do the five ships represented at Deir el Bahri shown on the outgoing and return voyages from Punt indicate the actual number of craft taking part in the voyage, or are they simply an artistic convenience showing various stages in a trip that was undertaken by a single craft?[146] Similarly, all the ships in Kenamun's painting are presumably based on a single master source from a copybook. The number of ships portrayed, therefore, lacks significance.[147]

Apart from the major sea powers, there must have been a variety of smaller peoples involved in maritime affairs. One such group that has been virtually ignored but is visible in the texts is the Carians.[148] The occasional appearance of Grey Minyan Ware in Crete, Cyprus, and Syria may reveal some (as yet undefined) maritime contact with this ethnic group.[149]

CHAPTER 15

War and Piracy at Sea

War and piracy in antiquity are so closely linked that it is not always clear when an enemy action denotes an act of war or one of piracy. Although classical tradition held that Minos was the first to fight a battle with a fleet, there is evidence for several nautical battles that took place in the latter part of the Late Bronze Age.[1]

War

A poorly preserved reference on a stele of Ramses II from Tanis refers to a successful battle against Shardanu ships in the open sea.[2] Shuppiluliuma II, the last Hittite king, mentions *three* sea battles in which he bested an Alashian fleet: "My father [. . .] I mobilized and I, Shuppiluliuma II, the Great King, immediately [crossed / reached (?)] the sea. The ships of Alašiya met me in the sea three times for battle, and I smote them; and I seized the ships and set fire to them in the sea."[3]

The land-locked Hittite empire lacked a fleet; Shuppiluliuma may have pressed into service ships of the North Syrian and Cilician maritime cities.[4] The kiln texts from Ugarit indicate that Alashia was its ally, and hence a friend of the Hittites; this seems to be at variance with Shuppiluliuma's sea battles.[5] Apparently, either the Alashian fleet did not belong to the indigenous population but to the enemies in the Ugaritic texts, or Alashia had switched allegiance.[6]

Ramses III's relief at Medinet Habu is the only complete Late Bronze Age iconographic representation of a sea battle. Early in the battle, the Egyptians took advantage of the superiority of their long-range composite bows and slings over the Sea Peoples' medium-range throwing spears.[7] In this way, the Egyptians could disable the crews of the enemy craft while staying out of range of their opponents' weapons. Once the enemy had been neutralized, the Egyptian ships closed the distance. The only specifically nautical weapon portrayed is a four-armed grapnel.[8]

How was the grapnel used in the battle? To understand this, we must remember that Egyptian art is "aspective."[9] This permits—in fact, often requires—parts of the same subject to be represented as seen from different directions. The Egyptian artist wished to draw the subject in its clearest, most universal manner. Thus a human face is always depicted in profile, but the eye is drawn frontally; a table may be portrayed in profile while the necklaces that are actually *on* it are drawn as seen from *above* it; bovines are portrayed in profile, but their horns are almost always shown frontally.[10]

In like manner, the Medinet Habu artists depicted the ships from two different viewpoints. The ships are always drawn in profile, but the mast in each case is portrayed frontally.[11] Thus, the Sea Peoples' ships seem to be upright in the water, when in fact the angles of their masts prove that they are listing at varying degrees. Indeed, the ships are in the process of capsizing.[12] The following phases of this capsizing operation are depicted:

- Ships E. 1 and N. 1, signifying the beginning of the battle, are portrayed facing each other (Figs. 2.35–36: A; 8.3, 10). The mast of N. 1 is upright, ninety degrees from the horizontal. An Egyptian, standing amidships before the mast, has thrown a grapnel into the rigging of the enemy mast (Figs. 8.10: B; 15.1). It would have been illogical and quite impossible for him to have thrown the grappling hook from amidships, if the

ships had been facing each other as portrayed. The ships must have been *parallel* in the water. Presumably, once the archers had incapacitated the enemy, the Egyptian ships came alongside the Sea Peoples' craft, allowing the grapnels to be thrown into the enemy rigging.

- There then follow three renditions of the Sea Peoples' ship with the masts placed at varying angles. These represent the increasing angle of the hull's list (Figs. 8.4, 6–8, 11–12 [ships N. 2, N. 4, and N. 5]). To emphasize the slant of the deck, the fighters in the ships are shown in unusual poses: falling forward and backward, hanging onto the mast, and lying on the side of the hull. To add to the impression of confusion, ships N. 2 and N. 5 are shown listing *lengthwise* also.
- In the final phase, the invaders' ship has capsized (Figs. 8.5, 14; 15.2). Ship N. 3's mast is broken and is floating away at an angle. Although the mast is probably meant to be floating on the water (zero degrees), interestingly, this angle (forty to forty-two degrees) is the most acute of the series. Here again the grapnel's rope, although not the grapnel itself, appears. In this case, however, the rope is connected to the bow of the opposing Egyptian ship. This suggests that once the grapnel had caught in the enemy rigging, the Egyptians maneuvered their ships perpendicular to the enemy and then backwatered—causing the rival craft to capsize.

The following table and figures 15.3–4 illustrate the ships' varying lists based on the angle of the mast to the horizon. Since some of the ships are listing lengthwise, the angles of the masts to the hulls' profiles are also supplied. They are virtually identical.

Angle of List of the Sea Peoples' Ships

	N. 1	N. 2	N. 4	N. 5	N. 3
°/horizon	90	73.5	64.5	47	40
°/profile	90	78.5	65	56	42

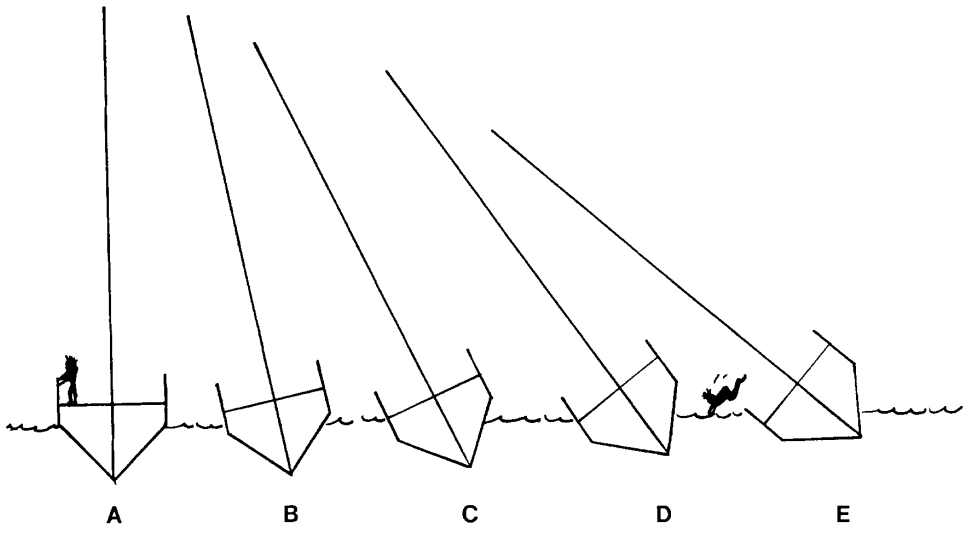


Figure 15.3. Progressive list of Sea Peoples' ships based on the angle of the mast to the profiles of these ships. The mast of N. 4 is reversed left to right. The angle of N. 3 is based on the upper part of the broken mast: (A) *N. 1 (90°),* (B) *N. 2 (78.5°),* (C) *N. 4 (65°),* (D) *N. 5 (56°),* (E) *N. 3 (42°) (drawn by the author)*

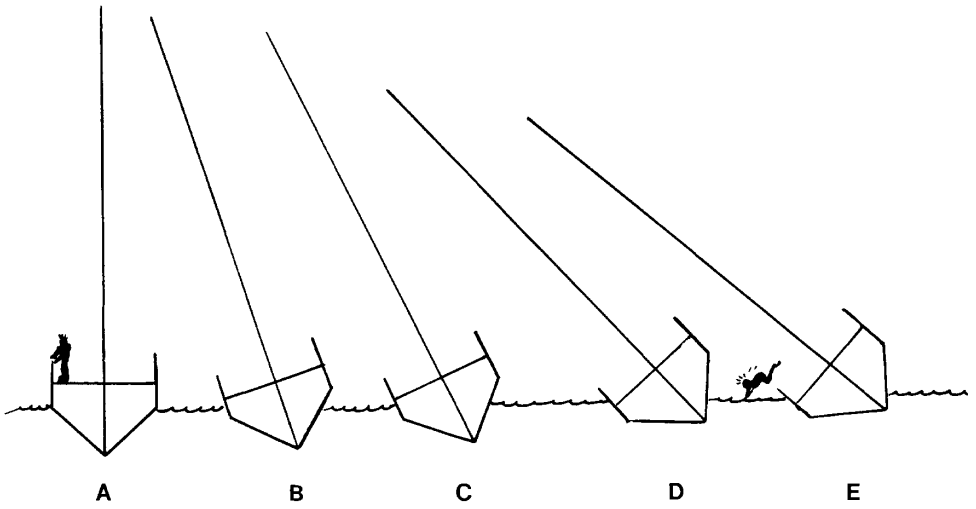


Figure 15.4. Progressive list of Sea Peoples' ships based on the angle of the mast to the horizon. The mast of N. 4 is reversed left to right. The angle of N. 3 is based on the upper part of the broken mast: (A) *N. 1 (90°),* (B) *N. 2 (73.5°),* (C) *N. 4 (64.5°),* (D) *N. 5 (47°),* (E) *N. 3 (42°) (drawn by the author)*

CHAPTER 16

Sea Laws

Maritime mercantile endeavors cannot flourish without a code of law. Although evidence for nautical laws in the Late Bronze Age is limited, a code of maritime conduct apparently existed, at least along the Syro-Canaanite coast and Cyprus.

Shipwreck

One Ugaritic text implies a law dealing with shipwrecks. Here the king of Tyre informs the king of Ugarit that while en route to Egypt, one of the latter's ships had been partially wrecked in a storm. Its cargo was seized by an enigmatic figure termed the *rb-tmtt*—literally, "lord of killing."[1] The Tyrian assures his peer that all is in hand. He had taken the cargo back from the *rb-tmtt*, and the ship is now anchored at Tyre.[2]

The conduct of the king of Tyre is best understood in light of a treaty from the seventh century B.C. between the Assyrian king Esarhaddon and Baal I, a later ruler of Tyre.[3] One condition of the treaty states: "If a ship of Baal or of the people of Tyre is shipwrecked off (the coast of) the land of the Philistines or anywhere on the borders of Assyrian territory, everything that is on the ship belongs to Esarhaddon, king of Assyria, but one must not do any harm to any person on board ship, they should *li*[*st*] their names and inform the king of Assyria."[4]

The Bronze Age Tyrian king appears to have been following a similar ruling. The later treaty must have drawn the clause from an accepted maritime law that was already ancient when the treaty was written.

Willful Shipwreck

A fascinating text from Ugarit discusses a court case that was judged by Pudehepa, the mother dowager of the Hittite king, Tudkhaliya IV.[5] The case was between an Ugaritian and a person named Shukku. From the terminology of the text, it is clear that the ship and the cargo belonged to the man of Ugarit. Thus, Shukku was charged with willfully wrecking the ship after the harbor master swore to this.

Two interpretations have been given for this case. F. C. Fensham likens it to a law in the Code of Hammurabi that deals with the responsibility of the ship's captain to the merchant who hires the ship.[6] The law requires the captain to compensate the merchant for the ship and the cargo if the ship is wrecked because of negligence.[7] This same principle appears in the earlier Law of Eshnunna, where a stipulation protects both the ship's owner and merchants for cargoes carried by a negligent ship captain.

In relating these earlier laws to the Ugaritic case, Fensham notes that it can only be understood in the light of Mesopotamian law. The "man of Ugarit" was probably the owner of the ship and perhaps also of its cargo. Shukku was apparently the ship's captain. This is interesting because the name is Hittite, and Hittites are not generally thought to have engaged in seafaring. This may also explain why the case was judged before the Hittite king instead of the Ugaritic ruler. Perhaps Shukku was one of the merchants of Ura mentioned in other Ugaritic texts.[8]

Lacking maritime laws of their own, the Hittites apparently depended on legal practices that were used throughout the Near East. Fensham emphasizes that the decision was seemingly made on the basis of a legal principle from the Mesopotamian Middle Bronze Age generally accepted in Late

very morning and went to where the prince was, and I said to him: I have been robbed in your harbor. Now it is you who are the prince of this land, and it is you who are its investigator. Search for my money!"[19]

Beder's response to this allegation is illuminating: "And he said to me, 'Are you serious, or are you ⌜fabricating⌝? Look here, I cannot comprehend this protestation that you have made to me. If it were a thief belonging to my land who boarded your freighter and stole your money, I would repay it to you from my own storehouse until / your thief, whatever his name, has been found. Actually, as for the thief who has robbed you, he belongs to you and he belongs to your freighter. Spend a few days here visiting me that I may search for him.'"[20]

As Beder's reply indicates, custom required that if the theft had been perpetrated by one of a visiting ship's crew members, then the case fell under the jurisdiction of the ship's captain, not the port authorities.[21] Beder was gracious in offering to look for the culprit, even though this was not his responsibility.

Indeed, it is curious that Wenamun had not asked for intervention from Mengebet, the Syrian captain of the ship on which he was traveling.[22] Perhaps he did so, but to no avail. The Rhodian Sea Law that came much later contains the following stipulation that may clarify the situation: "If a passenger comes on board and has gold or something else, let him deposit it with the captain. If he does not deposit it and says 'I have lost gold or silver,' no effect is to be given to what he says. But the captain and the sailors, all those on board together are to take an oath."[23]

The existence of a similar stipulation in effect along the Levantine coast in the eleventh century B.C. would explain the behavior of both Wenamun and Beder. Given Wenamun's later actions in trying to hide his "travelling idol" from others, it is not unreasonable to assume that instead of entrusting his gold and silver to the ship's captain during the voyage to Dor, Wenamun had guarded his valuables himself.[24] If so, and if a form of the above condition did apply, then Mengebet would have borne no responsibility for a theft that took place on board his ship. In that case, Wenamun would have had no recourse but to try his luck with the local port authority, Beder, who correctly rebuffed him.

The evidence for maritime laws in the Late Bronze Age along the Levant is admittedly limited. However, the actions of the seafarers discussed above make sense only if we assume that some form of maritime law did exist. Since no text of a written code has been found to date, it is possible that the laws were not codified but instead formed an oral doctrine of accepted conduct.

CHAPTER 17

Conclusions

In the eastern Mediterranean during the Bronze Age, international maritime ventures were undertaken by a variety of peoples who had developed or absorbed to varying degrees the knowledge required to build and use seagoing ships. However, based on its own specific needs and capabilities, each culture seems to have developed its own—perhaps unique—relationship with the sea.

Egypt's interests in the Mediterranean were concentrated on the political and economic subjugation of the Syro-Canaanite coast. The Egyptians do not appear to have been explorers. They were content to ply three main routes: in the Mediterranean to the Syro-Canaanite coast and in the Red Sea to Punt and to the southwest coast of Sinai. There is no concrete evidence at present to indicate that Egyptian ships sailed any farther during the Bronze Age.

Egypt's Mediterranean seafaring ended with the demise of its domination in Asia. Already evident in the tale of Wenamun, this trend was to continue into later times, when the Egyptians hired Phoenicians to do their seafaring for them. A main incentive for the Egyptians to venture out into the Mediterranean was the need for high-quality wood for ship construction and other purposes. Such wood was unavailable in the Nile valley during the Pharaonic period but common in Lebanon. This was apparently the primary, although certainly not the only, reason for Egypt's early trade connections with Byblos.

Egypt entered the New Kingdom period using a developed version of a seagoing ship that had been evolving for over a millennium, and perhaps much longer. These vessels appear in a state of change at Deir el Bahri. They probably had a protean, evolving keel and were likely to have been one of the types of ships on which the Egyptians voyaged into the Mediterranean. The adoption of foreign construction techniques seems to have received a strong impetus under Thutmose III, a result of his need for reliable transports to support Egypt's Asiatic conquests.

Egypt's ventures into the Red Sea required an incredible amount of effort even before the sea voyage itself began. The ships were built on the Nile, dismantled, hauled overland through the Eastern Desert, and rebuilt on the shores of the Red Sea. The near "assembly kit" organization of the Cheops ships illustrates how this might have been accomplished. This process emphasizes the incredible (to our modern minds) value placed by the ancient Egyptians on the commodities available in Sinai and Punt. This effort expended in mercantile contacts in the Red Sea with Punt is paralleled in the later trading practices of Solomon and Hiram with the equally elusive land of Ophir.

The excavations at Wadi Gawasis have made a valuable contribution to understanding Egyptian seafaring practices in the Red Sea. Yet much still remains unclear. Of particular interest would be the future investigation of the pharaonic port identified by W. F. Albright near Abu Zneima on the southwest coast of in Sinai.

The Syro-Canaanite littoral supplies the clearest picture of a corporate trading power that played a significant—perhaps primary—part in Late Bronze Age maritime shipping, particularly during the fourteenth to thirteenth centuries. There are repeated references to ships with valuable cargoes. Syro-Canaanite ships sailed to Egypt, Cyprus, Cilicia, and the Aegean. The smattering of evidence for a

terebinth resin, valued as incense or perhaps for use in embalming. Wood was a major trade item, particularly for timber-starved Egypt. Much of this wood was ready for use, a fact that may have been an influence (although perhaps not a primary one) on Egyptian shipwrights in adopting Syro-Canaanite shipbuilding techniques.

Besides the cultures discussed above, many smaller ethnic groups were probably active in trade, although they are now undefinable in the archaeological/historical record.

The waterline ram had not been introduced as a nautical weapon during the Bronze Age. Thus, ships used for military or piratical purposes served primarily as rapid transports for deploying land troops. In marine battles, vessels served mainly as mobile firing platforms, not unlike chariots in contemporaneous land-based warfare. The only specifically nautical weapon was the grapnel, used in capsizing enemy craft after the defenders had been incapacitated by long- or medium-range weapons. Ships were also used successfully during sieges against coastal cities. Techniques for combating various forms of piracy and coastal marauding included "early warning systems" and intelligence reports traded among allies.

It appears that marine affairs were circumscribed by a recognized code of laws that existed at least along the coast of the Levant. This was a prerequisite of maritime trading, since only with a set of laws could the nautical merchant travel with a reasonable amount of safety.

Although trade in luxury items, easily identifiable in the archaeological record, stops at the beginning of the Iron Age, it is unlikely that trade, travel, or transport by ships on the sea lanes ceased during that time. Ugarit was destroyed ca. 1187 B.C. Wenamun, visiting the Levantine coast a scant century later, found a vibrant panoply of trading communities there. These consisted of a lively mixture of newly arrived immigrants and descendants of Syro-Canaanite traders who were, as Wenamun walked among them, evolving into the Phoenician culture.

Much has been written concerning the overlordship of the seas during the Late Bronze Age: of Minoan thalassocracies and Egyptian hegemonies, of Mycenaean and Syro-Canaanite trading empires. But these are viewpoints imported into the past instead of perceptions of actual past realities. The seafaring world of the Bronze Age was far richer, more diversified, and more complex than that. Its main attribute was a multiplicity of interactions by a panoply of peoples.

Of this world, and of the ships that made it possible, in truth, we know very little.

APPENDIX: Texts from Ugarit Pertaining to Seafaring

BY J. HOFTIJZER AND W. H. VAN SOLDT

This appendix contains revised translations of the most significant documents pertaining to nautical matters found at Ugarit. This city-state, located slightly north of Latakia on the Syrian coast, was a major entrepôt during the Late Bronze Age (Fig. 13.1: b). Until the end of that period, Ugarit belonged to the Egyptian sphere of influence, as demonstrated by the diplomatic correspondence from Amarna (*EA* 1: 39; 45: 35; 89: 51; 98: 9; 126: 6; 151: 55). About 1330 B.C., Ugarit came under Hittite suzerainty.

Political stability in Syria guaranteed Ugarit's prosperity through trade after the reign of its king, Niqmaddu II, and particularly after the brief rule of his son Arkhalba (on the absolute chronology for reigns of the kings of Ugarit, see van Soldt 1991: 44–46). Following the peace treaty between Egypt and Hatti, quantities of Egyptian goods once more found their way to the city.

This relatively peaceful period lasted for over a century but came to an abrupt end at the beginning of the twelfth century B.C. with the invasion of the Sea Peoples. This attack spelled sudden annihilation for most of the Syro-Canaanite coastal cities, including Ugarit (Liverani 1995). Several letters, which must date to the last tumultuous days of Ugarit, give a vivid account of these times (see below, *RS* 34.129, *RS* 20.18, *RS* L.1, and *RS* 20.238). The tablets reveal that the threat that ultimately destroyed Ugarit came from the sea.

Ugarit's palace had five archives. Three were administrative, containing mostly lists of landowners, persons who received rations or paid taxes, and so on. These documents had titles—such as "balance," "list," "food rations," or "provisions"—followed by the persons' names to whom they applied. The lists are laconic: often, even the type of administrative action intended is unclear. In the "central archive" and the "southern archive" were kept, respectively, the tablets regulating the transfer of land inside Ugarit and those pertaining to Ugarit's foreign relations.

The documents were written in the Ugaritic and Akkadian languages. Ugaritic, a cognate to Hebrew, is a branch of West Semitic that was written with an alphabetic script of thirty cuneiform signs. Normally, as with Akkadian, Ugaritic was inscribed on moist clay tablets that were baked afterwards. The prefect (*Sākinu* in Ugaritic) was the most important person after the king and was responsible for the city-state's day-to-day management (see below, *RS* 34.129). Directly under the prefect, various overseers, including an "overseer of the harbor" and an "overseer of the seamen," were responsible for administration (see below, *RS* 17.133).

To judge from the texts, Ugarit seems to have had a simple social structure. Two groups are distinguished: "people of the king," employed by the palace; and free citizens, called "sons of Ugarit." This two-part division is apparent everywhere in the palace administration, which always distinguishes between the guilds on the one hand and the towns and villages on the other. Mainly concentrated in the city of Ugarit itself, the guilds consisted of specialized craftsmen who were gold- and silversmiths, scribes, soldiers, priests, house builders, shipbuilders, cartwrights, and bowmakers, among others.

The population in the towns and villages apparently represented the nonspecialized segment of society: the farmers and the

4. The words *mlk ʿlm* (l. 9) are often considered as the translation of a title of the god Osiris, with whom Amenhotep III was identified (Gaál 1974; Pardee 1988: 89–90 n. 48). The corresponding Egyptian title, however, was only applied to Amenhotep III after his death (Radwan 1973). One would not expect a reference to the identification of the deceased king with Osiris in a letter that is concerned with matters of trade and shipping. At that time the pharaoh was the overlord of the Ugaritic king, so it is possible to explain the words *nmry mlk ʿlm* as an acknowledgment of the pharaoh's overlordship. In the Hebrew Bible, a comparable formula is used to express the power of the Lord (Jeremiah 10:10, Psalms 10:16). Furthermore, *mlk ʿlm* was used in Ugarit as an epithet of the god Rapi'u (*KTU* 1.108: 1, 19, 20), who is identified with Baal. In *KTU* 1.2 iv 10, *mlk ʿlm* indicates the everlasting kingship of Baal. Comparable formulae are also used in the Bible to acknowledge the power of the Judean king (Psalm 45:7, see also Psalms 21:5, 61:8; I Chronicles 17:14).

5. The reading *yšiḫr* in l. 11 (Pardee 1987: 205) seems preferable. For the interpretation, cf. Tropper 1990: 23–24.

6. In l. 20 the reading *atn* is accepted, although the reading *ttn* is also possible (Pardee 1987: 209).

7. The rest of the tablet is too damaged to allow any certain restoration. The addresser is clearly writing concerning trade and ships. Concerning the problems of reading the beginning of the last line, see Pardee's (1987: 209) commentary.

KTU 2.46
Supply seagoing vessels

Virolleaud 1965: 87–88; Astour 1965: 255; Sasson 1966: 134; Hoftijzer 1983: 97. Found in the kiln.

1–3 The message of *Pgn*:[1] To the king of Ugarit speak:

4–5 May you be well. May the gods protect [and] preserve you.

6–9 Here with me it is well. Is it well there with my son in every respect? Answer me, please.

9–25 Whereas my son has sent to me tablets about food[2] often and over and over again,[3] let my son supply [send] here[4] seagoing vessels[5] . . . [. . .].

[The rest is too uncertain to be translated.]

Notes

1. This is probably a translation of a letter (however, cf. Millard 1995: 120) addressed to the king of Ugarit from a foreign ruler on the Mediterranean coast, perhaps the king of Alashia (= Cyprus), with whom the last king of Ugarit had friendly relations (Astour 1965: 255). Concerning these relations, see e.g. Astour 1981: 28.

2. The "tablets about food" refer to a letter in which the king of Ugarit asked for food supplies, see *KTU* 2.39 above.

3. The interpretation of l. 11 (*midy wgbny*) remains uncertain. I follow here the clause division proposed by Pardee (1975B: 354; 1976: 248). It is possible to translate ll. 9–11, "Whereas my son has sent tablets about food, with me there is plenty and abundance" (Dietrich, Loretz, and Sanmartín 1973: 96; Tropper 1994B: 479).

4. For the interpretation of *hnkt* in l. 12 as "here," see Hartmann and Hoftijzer 1971; Renfroe 1992: 116 (contra Gordon 1965: no. 787: *hnk* = "levy," *hnkt* = plural; Rainey 1966: 261; 1971: 160; Cunchillos 1983: 161–62, *hnk* and *hnkt* are demonstrative pronouns; see also Dijkstra and de Moor 1975: 207 n. 294); Tropper 1990: 35: *hnkt* = "really."

At the time that this letter to send ships was written, Ugarit was experiencing a shortage of vessels (Hoftijzer 1979: 384–85; see below, *KTU* 2.47 and *RS* 20. 238), which gives the addresser's kind offer a sardonic twist.

5. I leave the difficult *yšrn* in l. 14 untranslated. Dijkstra and de Moor's (1975: 207) proposed translation, "to despatch" or "to stow," is less probable, for it assumes that the food was to be sent from Ugarit to Alashia.

KTU 2.47
A request for 150 ships

Virolleaud 1965: 88–89; Sasson 1966: 133; Heltzer 1979: 252; Hoftijzer 1983: 97–98. Found in the kiln.

1–11 The message of Yadinu to the king, his lord.[1] Protect your country.[2] Will, please, supply ships, will supply 150 ships . . .[3] and 400 Apiru[4] and the king [rest too damaged to be translated].

12–21 And the king who governs in his homeland[5] to Yadinu the servant of the king, whom he has made commander of his army.[6] Let the dynasty not go to ruin.[7] The border patrol[8] has taken *kwsʿt*,[9] let your army . . . border.

Notes

1. This tablet contains summaries of two letters: one from Yadinu to the king of Ugarit, and the other from the king to Yadinu. All the obligatory polite formulae are absent in Yadinu's "letter." Also, note the "and" at the beginning of l. 12. On the peculiar style of this document, see Kaiser 1970: 14.

The addresser is a military commander serving the Ugaritic king (cf. l. 15). Against Lambrou-Phillipson 1993: 165, who sees him as a minor official placed in charge of the king's children who knew nothing about naval matters.

2. The use of an imperative in l. 2 is not indicative of a rude or impolite style. The translation "guardian of your house/country" is less probable (contra Lambrou-Phillipson 1993: 164).

3. The manner in which the re-

(Dietrich, Loretz, and Sanmartín 1975B: 164). Huehnergard's (1987: 186) emendation of *mṯṯm* to *mṯ‹ḫ›ṯm* "ship's cloths" is unnecessary.

3. For this interpretation see Huehnergard 1987: 181. The other interpretations seem less convincing: ("anchor") Heltzer 1982: 189 n. 9; ("supply" or "shipment") Xella 1982: 33; ("beak") Sanmartín 1988B: 272–73.

4. The literal meaning of the term *mṣpt ḫrk* is possibly "covering of the opening." *ṣpt* is derived from the root *ṣpy* "to lay over." Other interpretations seem less likely: (*mṣpt* = cloth) Dietrich, Loretz, and Sanmartín 1975B: 164; (*mṣpt* to be derived from the root *ṣpy* "to look out" = "crow's-nest," *ḫrk* = grill) Xella 1982: 33; (*mṣpt* derived from root *ṣpy* "to look out, to watch," and *ḫrk* = starting?, setting in motion?) Sivan 1984: 245, 223; (*mṣpt ḫrk* = top consisting of bars) Sanmartín 1988B: 272 n. 34. See also Heltzer's (1982: 189 n. 10) remarks.

5. For this interpretation see Huehnergard 1987: 139–40. Xella's (1982: 34) equation of this term with a "gang-plank" seems less likely. See also Heltzer's (1982: 189 n. 13) remarks. The word apparently refers to the mast cap, to which the rigging is attached.

The Akkadian Texts (Miscellaneous Texts)

RS 16.238 + 254
If his ship comes back from Crete . . .

Published as *PRU* 3: 107. See Linder 1970: 50–54; Miller 1980: 291–92. From the central archive of the palace.

(dynastic seal)

1–6 From this day on, Ammishtamru, son of Niqmepa, king of Ugarit, has exempted[1] Sinarānu son of Siginu; he is clear as the Sun is clear.[2]

7–9 Neither his grain, nor his beer, nor his oil will enter the palace (as tax). His ship is free (from claims).

10–15 If his ship comes (back) from Crete,[3] he will bring his present to the king and the herald[4] will not come near his house.

15–17 Sinarā(nu) is dedicated to the king, ... [5] (ruling)

18–20 May Baʿlu, lord of Mount Ḫazi,[6] destroy whoever contests any of these words.[7]

21–22 The . . . s[8] belong to his sons' sons forever.

Notes

1. It is difficult to translate the verb *zakû*, "to be clean, free," in such a way that the literal meaning is preserved in every instance. The wordplay with the "bright Sun" is especially hard to reproduce. I have therefore translated the occurrences of *zakû* according to their contexts.

2. See note 1. I take *za-ka-at* as a stative and not as an adjective. Support comes from the alphabetic text *RS* 15.125 (*KTU* 2.19): 2′-3′: *km.špš d brt*, "like the Sun who is clear," and the syllabic text *RS* 16.267: 5 (*PRU* 3: 110). See Huehnergard 1989: 188 n. 366; van Soldt 1991: 460 n. 200.

3. The text has kur DUGUD-*ri*, to be read *māt Kapturi*. The sign DUGUD stands for the Akkadian *kabtu*, "heavy" or "important," but is used here as a kind of rebus writing for *kaptu-*. For similar spellings, see van Soldt 1991: 244 n. 9; 1990: 324–25. The interpretation of Kapturu as Crete follows the traditional view.

4. I follow the CAD s.v. *nāgiru* 1b–2′. The passage has been discussed by Kestemont (1977: 195).

5. The last line is broken at both beginning and end. I venture no translation. See provisionally Nougayrol, *PRU* 3: 108. According to my collation, his readings and translations are possible.

6. Mount Ḫazi corresponds to Ṣapānu of the alphabetic texts and classical Mons Casius. It is identified with modern Jebel el-ʿAqra.

7. For a discussion of this line, see Huehnergard 1989: 137 n. 61; van Soldt 1991: 408 n. 18.

8. The first word of this line probably refers to the rights acquired by Sinarānu. It is intended to ensure that these rights will be transferred to his sons after his demise. For this type of clause, see Kienast, *RlA* 5, 535, §20.

RS 17.133
A court case

Verdict by letter from the Hittite king (probably Tudkhaliya IV).[1] Published as *PRU* 4: 118. For the seal of Queen Pudukhepa, see *Ugaritica* 3: 13 fig. 16, 18 fig. 23. See Linder 1970: 47–50. From the southern archive of the palace.

(bilingual seal of Pudukhepa)

1–3 Thus says His Majesty.[2] Speak to Ammishtamru:[3] (ruling)

4–8 When the man from Ugarit and Shukku appeared for a legal decision before His Majesty,[2] Shukku spoke as follows:

8–9 "His ship has been wrecked in the harbor."[4]

9–11 And the man from Ugarit spoke as follows:

11–12 "Shukku has wrecked my ship *intentionally*."[5]

13–15 His Majesty has rendered them the following verdict:

15–22 "Let the overseer of the seamen of Ugarit take an oath,[6] and let Shukku (thereupon) pay an indemnity for his ship (and) any belongings of his that were in his ship." (ruling)

Notes

1. Nougayrol, *PRU* 4: 118. Otten (1975: 26) leaves the matter of the identity of the king undecided.

2. Literally, "My Sun."

3. King of Ugarit.

4. Probably the harbor of Ugarit, ancient Maʾḫadu, modern Minet el Beida. See, in general, Astour 1970.

5. The text has *a-na da-a-ni*. CAD s.v. *danānu* s. 2 takes this as an or-

3. The reading of the name is not certain.

4. Interpreted as "The Sidonian" by Malbran-Labat. Note, however, that the name of the city of Sidon is always spelled Ṣidunu at Ugarit.

5. Unless the person comes from outside Ugarit (as, for example, from Emar), the name cannot be read Dū-abi. Zu'abu was probably responsible either for all the aforementioned ships or just for the ship of Ṣidanayu.

6. For the spelling, see *KTU* 4.655:2, *krws*.

Correspondence Concerning a Seaborne Invasion

RS 34.129
Report of an abduction

Letter from the Hittite king to the prefect of Ugarit. Published as *RSO* 7, no. 12. Photo: *Ugaritica* 7: pl. 11. See Dietrich and Loretz 1978; 1982–85: 508; Lehmann 1979; Rainey in Wachsmann 1982: 304 n. 1. See above, pp. 128–30, 164. Unstratified.

1–4 Thus says His Majesty,[1] the Great King. Speak to the prefect: (ruling)

5–14 Now, (there) with you, the king your lord is (still too) young. He knows nothing. And I, His Majesty, had issued him an order concerning Ibnadušu, whom the people from Šikala[2]—who live on ships—had abducted. (ruling)

15–30 Herewith I send Nirga'ili, who is *kartappu* with me, to you. And you, send Ibnadušu, whom the people from Šikala had abducted, to me. I will question him about the land Šikala,[3] and afterwards he may leave for Ugarit again. (ruling)

Notes

1. Literally, "(My) Sun."

2. See, in general, Lehmann 1979.

3. Note the difference in spelling.

RS *20.18*
A report on enemy movement

Letter from Eshuwara, chief prefect of Alashia, to the king of Ugarit. Published as *Ugaritica* 5: no. 22 and fig. 31. Berger 1969: 217; Linder 1970: 63–66; Dietrich and Loretz 1982–85: 509; Steiner 1989: 408–409. From the house of Rapʾānu.

1–4 Thus says Eshuwara, the chief prefect of Alashiya. Speak to the king of Ugarit: (ruling)

5–6 May you and your country be well. (ruling)

7–13 As for the matter concerning those enemies: (it was) the people from your country (and) your own ships (who) did this![1] And (it was) the people from your country (who) committed these transgression(s).[2] (ruling)

14–15 So do not *be angry* with me![3] (ruling)

16–24 But now, (the) twenty enemy ships—even before they would reach the mountain (shore)[4]—have not stayed around but have quickly moved on, and where they have *pitched camp* we do not know.[5]

25–28 I am writing you to inform and protect you. Be aware! (ruling)

Notes

1. This translation is more or less prompted by lines 12-13. The sender of the letter seems to refer to a previous confrontation during which the people from Ugarit may have suffered damage. The *-ma* in line 9 points to a contrast with the enemies in line 7.

2. The word *iteqtu* is not known from other sources.

3. I tentatively take the form *te-ze-em-me* as a mistake for *tezenne* (from *zenû*). The same interpretation was followed by von Soden, *AHw* s.v. *zemû*.

4. The translation is tentative. Read perhaps in line 19: *it-ta[l-k]a-ni-me*. See *Ugaritica* 5: photo, fig. 31.

5. The reading of the verb in line 23 is difficult. I follow Nougayrol, who read *it-ta-dú-ú*. The sign TU can be defended on the basis of the copy and the photo. However, unless the form refers to the enemies in general, the masculine plural would remain unexplained. Therefore, one could also consider a reading *it-ta-la-ka*[!], "(And where) they are heading." For LA with two horizontals at the beginning, see line 20. Only one horizontal is found in lines 3, 15, 18, 24.

RS *L.1*
Make preparations

Letter from the king (of Alashia) to Ammurapi, king of Ugarit. Published as *Ugaritica* 5: no. 23 and fig. 29. See Berger 1969: 219; Linder 1970: 69–72; Dietrich and Loretz 1982–85: 510; Yamada 1992. From the house of Rapʾānu (?).

1–4 Thus says the king.[1] Speak to Ammurapi, king of Ugarit: (ruling)

5–7 May you be well! May the gods keep you in good health! (ruling)

8–14 Concerning what you wrote to me: "They have spotted enemy ships at sea"; if they have indeed spotted ships, make yourself as strong as possible.

14–21 Now, where are your own troops (and) chariotry stationed? Are they not stationed with you? If not, who will deliver you from the enemy *forces*?[2]

22–28 Surround your towns with walls; bring troops and chariotry inside. (Then) wait at full strength for the enemy. (ruling)

Notes

1. *RS* 20.238 is an answer to this letter. Yamada 1992: 437–39 claims that the king of Carchemish is the sender of the letter. However, the subject matters in *RS* L.1 and *RS* 20.238 are very similar, despite Yamada's reservations. I therefore follow Nougayrol, who identified the "king" with the king of Alashiya.

2. The translation is based on a

NOTES

Chapter 1: Introduction

1. See below, pp. 177–97.
2. I follow the chronology outlined in Kitchen 1987.
3. Davies 1930: 29.
4. Tzalas's (1990) delightful description of the many changes introduced by a church artist who "faithfully" depicted the *Kyrenia II* replica during a voyage to Cyprus is a warning to those who would take ship iconography at face value.

Chapter 2: Egyptian Ships

1. Faulkner 1964: 126, 261; Jones 1988: 216 no. 40, 226 no. 101 (*nᶜ i* and *šȝs*).
2. Boreux 1925: 3; Casson 1995A: 3–4; Clarke and Engelbach 1990: fig. 41. Basch (1987: 51–52) notes the existence of coracles in the delta region and assumes them to be of high antiquity. On evidence for Predynastic vessels, see Vinson 1987. Recently a fleet of twelve Predynastic vessels has been discovered at Abydos (see below, p. 218).
3. Hornell 1970: 49.
4. Breasted 1917. Clarke (1920: 51, 42 fig. 13) describes a reed raft called *ramus*. On ancient Egyptian reed rafts, see Boreux 1925: 175–234; Servin 1948; Casson 1995A: 11–13.
5. Edgerton 1922–23: 133.
6. Säve-Söderbergh 1946: 31–70.
7. Nibbi 1975A, 1975B, 1979, 1984, and other publications. This is not the place to discuss Nibbi's theories beyond noting that the evidence is overwhelmingly against her. Concerning the meaning of the term the *Great Green Sea*, see Kitchen 1978: 170–71; 1983: 78. The appearance of this term on the Antefoker stele at Wadi Gawasis on the shores of the Red Sea definitively confirms that the term means "sea" (Sayed 1977: 170 and n. 18; 1983: 29).
8. *ANET*³: 227.
9. Montet 1928: 271. Frankfort (1926: 83–84) suggests that a Protodynastic temple may have existed at Byblos. On the earlier contacts between Egypt and Mesopotamian colonies established in North Syria during the Late Uruk period, see below, p. 41.
10. *ANET*³: 228. Uni was sent five times to quell insurrections in the "Land of the Sand-Dwellers." On the geopolitical background to these events, see Redford 1992: 48–55.
11. *BAR* I: §315: d; *ANET*³: 228 nos. 10–11; Aharoni 1979: 135–37.
12. *BAR* I: §465.
13. Redford 1992: 78–80.
14. *LAE*: 50–56. For a recent discussion of this text, see Baines 1990 and the additional bibliography there.
15. Faulkner 1940: 4.
16. The regular cubit was .45 meter long (thus the ship would be 54 meters long and 18 meters in beam). The royal cubit was slightly longer (.525 meter). This would give the ship a length of 63 meters and a beam of 21 meters. See Gardiner 1969: 199: § 266: 2; *EM*, s.v. measurements (*midot*).
17. Janssen 1961: 7.
18. Säve-Söderbergh 1946: 78.
19. Redford 1992: 66.
20. See below, p. 308,
21. *BAR* I: §464: d; Säve-Söderbergh 1946: 34.
22. *BAR* II: §454, 460: c.
23. Säve-Söderbergh 1946: 35.
24. *ANET*³: 239.
25. Säve-Söderbergh 1946: 36; *BAR* II: §472, 483, 492, 510, 519, and 535. See below, pp. 51–52.
26. *ANET*³: 243.
27. *EA* 155: 69–70. Säve-Söderbergh 1946: 68; Katzenstein 1973: 43.
28. *EA* 153: 9–14.
29. *EA* 129: 50, 132: 53–55.
30. Byblos: *EA* 105: 83–84, 127: 17–19; Ṣumur: *EA* 67: 10–13; Ugarit: Rainey 1967: 88–89.

166. Marinatos 1974: 25–26 pls. 52, 54, 55: a, color pls. 2, 4; Doumas 1992: 86–95.
167. Shaw 1980; 1982.
168. Morgan (1988: 166, 31 fig. 16) notes that these dress lines appear twice on Late Minoan IB marine-style pottery, although they are missing on Late Minoan IA or earlier pottery.
169. Boardman 1970: 106 pl. 196; Betts 1973: 328.
170. Basch 1987: 129–30 figs. 264–65.
171. The stone receptacle dates to the Late Minoan I and comes from the cave of Hermes Kranaios at Patsos (Warren 1966). These objects are thought to be libation tables or lamp holders. The ship is crescentic and lacks rigging. It has a thick mast in the center and a lunate (or horns of consecration) at one extremity.
172. See also Morgan 1988: 93–101.
173. Marinatos 1974: pl. 101, color pl. 7; Morgan 1988: 93–96.
174. Long 1974: pl. 19 fig. 52; Sakellarakis 1979: 113.
175. Evans 1900–1901: 20.
176. Nilsson 1950: 158–60.
177. Marinatos 1993: 135–37.
178. Demargne 1964: 173 fig. 234; Hood 1978: 145 fig. 138. A similar dress is worn by a figure on a seal (Nilsson 1950: 156 fig. 62, 160–62 fig. 66).
179. Marinatos 1974: 46.
180. Nilsson 1950: 162–64; Alexiou n.d.: 92–93.
181. Marinatos 1974: 49; Iakovides 1981. Note that a man in the stern of a fishing boat in the tomb of Ipy at Thebes (perhaps depicted in the act of clapping) holds his hands in a somewhat similar manner, but in this case the right hand is outstretched (Fig. 6.70). This similarity is probably fortuitous.
182. Morgan 1988: 97 fig. 62, 117–82.
183. Buchholz and Karageorghis 1973: 101 n. 1224, 373 fig. 1224: a–d.

Chapter 7: Mycenaean / Achaean Ships

1. Ventris and Chadwick 1973; Chadwick 1976. On the decipherment of Linear B, see Chadwick 1958; 1987B: 12–21. For a thoughtful historical study of the Mycenaeans and their world, see Thomas 1993.
2. The Minoan seals found at Kato Zakro by Hogarth were apparently used to seal parchment documents (Weingarten 1982).
3. See Palaima 1991A for a comprehensive commentary of references to seafaring in the Linear B tablets.
4. Ventris and Chadwick 1973: 183–88; Chadwick 1973A: 430–32; 1976: 173; Palmer 1963: 129–32; Bennett and Olivier 1973: 43, 50, 54; Lindgren 1973 (I): 163–64; (II): 49–50.
5. Chadwick 1987A: 77.
6. *E-ke-ra$_2$-wo*: Ventris and Chadwick 1973: 265; Chadwick 1976: 71; Lindgren 1973 (I): 46; (II): 50, 84, 135, 150, 153–55, 187, 197, 209. *We-da-ne-u*: Ventris and Chadwick 1973: 186–87, 200, 279; Lindgren 1973 (I): 127–28; (II): 37–38, 50–51, 84, 134–36, 152, 154, 161–62, 179, 185–88, 197, 210.
7. Chadwick 1973: 431; Palmer 1963: 90–91, 131, 136–37; Palaima 1991: 286. See Lindgren 1973 on: *ki-ti-ta* (I): 170–71; (II): 82–83; *me-ta-ki-ti-ta* (I): 174; (II): 82, 97; *po-si-ke-te-re* (I): 180; (II): 124; *po-ku-ta* (I): 179; (II): 118–19.
8. Chadwick 1987A: 76.
9. Professor T. G. Palaima, personal communication (May 20, 1991). I thank Professor Palaima for his comments on An 724 and An 1 and for his translation of An 1 quoted on p. 126.
10. Bennett et al. 1989: 230–31; Palaima 1991A: 286–87.
11. Palaima 1991A: 286 pl. 63: a.
12. Killen 1983.
13. On a possible explanation for the reality reflected in the rower tablets, see below, pp. 159–61.
14. Palaima 1991A: 301–304.
15. Chadwick 1973B; Killen and Olivier 1989: 340—V(5) 756 + 7806; 342—V(5) 1002 + 5766 + 7650, V(5) 1003 + 5958, V(5) 1004, V(5) 1005 + 7530 + 7567 + fr., V(5) 1043, 7709 + fr.; 344—V(5) 1583 + 7747 + 7887 + frr.; 346—V(5) 7577 + 7734, V(5) 7670 + 7746; 347—V(5) 7964; Palaima 1991A: 286, 304–308.
16. Ventris and Chadwick 1973: 574; Palmer 1963: 448.
17. See Casson 1995A: 300.
18. *KN* V 756 and V 1002. Palaima (1991: 286, 304–308) presents a revised listing of the V(5) series and reviews their interpretation. He concludes that they may refer to nautical affairs if Chadwick's interpretation of the word *po-ti-ro* is correct.
19. Casson 1995A: 346 n. 10, 350–54.
20. Palaima 1991A: 284.
21. See above, p. 10.
22. See above, p. 11.
23. Palaima 1991A: 280–84.
24. Chadwick 1988: 79–84, 91–93. See also Ventris and Chadwick 1973: 156, 159; Chadwick 1973A: 417; 1976: 80–81; Vermeule 1983: 142; Palaima 1991A: 279–80.
25. *Odyssey* IX: 39–43.
26. Wainwright 1939: 151; Gurney 1990: 38–45; Garstang and Gurney 1959: 81; Immerwahr 1960: 4; Vermeule 1964: 272; 1983; Desborough 1964: 218–20; 1972; Smith 1965: 33; Huxley 1968: 15–25; Page 1976: 1–40; Iakovides 1973: 189–90; Güterbock 1983; 1984; Wood 1985: 175, 179–85; Hallager 1988: 93; Hansen 1994: 214.
27. See below, p. 130.
28. Lloyd 1967: 80–81; Macqueen 1968: 179–85; 1986: 39–41; Mellaart 1968; Hooker 1976: 128–31; Muhly 1974. See also Dickinson 1994: 253, 306.
29. Güterbock 1983: 133–34, 138; 1984: 116, 119. Of interest in this regard is a Mycenaean sword, discovered at Hatussa, bearing a dedicatory inscription of Tudkhaliya II (Hansen 1994).

15. Ormerod 1978: 74–77.
16. *LAE*: 145.
17. Ashburner 1909: cxlv–cxlvi.
18. Ormerod 1978: 62–63.
19. *LAE*: 144.
20. Ibid.
21. Compare the Rhodian Sea Law 3: 3–4 (Ashburner 1909: 81–84).
22. *LAE:* 143.
23. Rhodian Sea Law 3: 13 (Ashburner 1909: 94).
24. *LAE:* 145 and above, p. 40.

Chapter 17: Conclusions

1. Liverani 1987: 70.

GLOSSARY OF NAUTICAL TERMS

BY FREDERICK M. HOCKER

abaft (prep.): behind.

aft (adv.): toward the stern.

amidships (adv.): in the middle of the vessel, midway between bow and stern or at the widest part of the vessel.

aphlaston (n.): curving ornament at the head of the sternpost; such an ornament is typical of Classical warships.

apical rope groove (n.): groove found at the apex of a stone anchor, used to seat the anchor rope.

astern (adv. or prep.): behind the vessel.

athwartships (adv.): lying or running in a direction across the vessel, at a right angle to the centerline.

backstay (n.): a stay (q.v.) running aft from the head of the mast to provide longitudinal support to the mast. The stay can be belayed on the centerline, often by attachment to the sternpost, or it can lead to one side. If the latter, there are normally pairs of backstays to balance the lateral stress.

baldachin (n.): a simple canopy, normally consisting of a curved roof supported on four pillars, typically found on Egyptian craft, where they are often used to shelter important persons. The baldachin may be fixed or portable.

ballast (n.): dense material, typically stone, placed low in the hold of a vessel to lower the center of gravity and increase stability.

batten (n.): thin strip of wood or fiber placed against the inner surface of planking at a seam, either to cushion seam ligatures or to act as caulking.

beam (n.): (1) width of a vessel amidships or at the widest point. Extreme beam is the overall width to the outside of planking, wales, rubrails, and so on, while molded beam is the width to the inside surface of the planking. (2) A transverse timber, straight or crowned, fastened at its ends to the sides of the hull: beams can act as thwarts or support decks.

beam shelf (n.): a stringer (q.v.) that supports the ends of deck beams.

belaying pin (n.): wooden pin for the temporary attachment of the free end of an element of the running rigging.

bireme (n.): a rowed vessel with two banks of oars on each side. In ancient biremes, the two banks were set at different levels.

boom (n.): spar used to spread the foot of a sail.

boom-footed rig (n.): type of square rig, common on certain ships of the Bronze Age, in which the foot of the sail is attached to a boom.

bow (n.): the end of the vessel toward the normal direction of travel; the "front" end.

bow patch (n.): circular, spoked device seen on the upper hull at the bow of Geometric ship representations.

brace (n.): element of the running rigging (q.v.) attached to the yardarm (q.v.) to adjust the angle of a square sail to the wind. They are used in pairs, one on each yardarm.

brail (or brailing line) (n.): line used to gather up a sail. In ancient square rigs, a number of brails were used to control the shape of the sail and trim it to suit the point of sail and existing wind conditions.

brailing fairlead (n.): ring, grommet, eye, or loop attached to the yard or sail to guide a brailing line.

bulwarks (n.): the topsides above the deck: may consist of a planked continuation of the side or may be only lightly planked or open.

butt end (n.): squared, unscarfed end of a timber, such as a plank or beam.

butt joint (n.): joint between the ends of two members in which neither member is scarfed or notched to receive the other; the timbers meet at butt ends.

caprail (n.): a railing atop the sheerstrake or bulwarks, normally defining the upper edge of the side of the vessel.

carling (n.): a longitudinal timber fixed to the beams but not to the sides of the vessel. It may be continuous or consist of short pieces between adjacent beams.

through the sides of the vessel so that the ends are visible from outboard. This is often done in an attempt to fasten the beam securely to the side by notching it over a wale.

thwart (n.): a simple seat, consisting of a board set athwartships. In some vessels, the thwart may also act as a beam (q.v.) if properly fastened to the sides.

tiller (n.): a straight or curved piece fixed at an angle to the head of the rudder to give the helmsman leverage or to allow him to steer when the rudder head is out of normal reach.

toggle (n.): a short wooden bar, often with swelled ends, seized or spliced into the end of a rope to allow another rope, with a loop in its end, to be rapidly attached.

transom (n.): (1) a transverse timber in the stern, crossing the inner face of the sternpost assembly and holding the sides together. Sometimes called a transom timber to distinguish it from the flat, transverse plane forming the sterns of some vessels. (2) A flat, transverse plane forming the stern of the vessel.

treenail (n.): a wooden peg of substantial size used to fasten together two members, such as a plank and a frame.

trieres (n.): Greek oared warship rowed by three groups of oarsmen, probably set at three levels.

truck (n.): a sheave (q.v.), slot, or ring in the head of the mast to take a line for raising and lowering something. See mast cap.

truss (n.): an element designed to exert tension in a structure and provide it with rigidity. In ancient ships, rope trusses were sometimes run between the ends of the hull, either to compress the entire hull and thus increase its strength and rigidity through preloading or to pull the ends up and reduce hogging. See hogging truss.

truss girdle (n.): a girdle of ropes around a hull to hold the hull together or to provide a point of attachment for a truss.

tumble-home (n.): hull shape in which the upper parts of the hull lean inward, toward the centerline.

V-shaped lashing mortise (n.): a lashing mortise (q.v.) in which both ends of the mortise exit the same surface of the plank.

wale (n.): an exceptionally heavy strake.

waterline (n.): the imaginary line on the hull that marks the level of the water surface when the vessel is afloat. Some vessels have a waterline painted on or inscribed in the hull.

webbing (n.): a woven or plaited strap used in place of several turns of lashing in some ancient Egyptian hulls, such as the one at Lisht.

wind rose (n.): a diagram of geographic directions in which a series of points corresponds to the origins of known, prevailing winds. Common wind roses in the West are derived from ancient wind systems that divided the compass into eight or twelve points.

windlass (n.): a mechanical device for multiplying human force in hauling in ropes. It consists of a horizontal barrel of circular or polygonal section set in a fixed mounting, which is turned by bars set in holes in the barrel.

woolding (n.): a binding used to hold together a mast of composite construction.

yard (n.): a spar set athwartships on a mast to support a square sail.

yardarm (n.): the end of the yard, outboard of the sail, where controlling lines such as braces (q.v.) are attached.

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AAAS = *Annales archéologiques arabes syriennes*

AASOR = *Annual of the American Schools of Oriental Research*

ABSA = *Annual of the British School at Athens*

ACTA[2] = *Acta of the Second International Colloquium on Aegean Prehistory: "The First Arrival of Indo-European Elements in Greece."* (Athens, April 5–11, 1971). Athens. 1972.

AE = *Archaeologika Ephemeris*

AEg = *Ancient Egypt*

AF = *Altorientalische Forschungen*

AfO = *Archiv für Orientforschungen*

AHw = *Akkadisches Handwörterbuch*. W. von Soden. Wiesbaden. 1958–81.

AJA = *American Journal of Archeology*

AJBA = *Australian Journal of Biblical Archaeology*

AJSLL = *American Journal of Semitic Languages and Literatures*

AMM = Aegean Maritime Museum. *Motion* (Olympic Airways magazine). (May 1990): 80–109.

ANE = *The Aegean and the Near East: Studies Presented to Hetty Goldman*. S. S. Weinberg, ed. Locust Valley. 1956.

ANEP = *The Ancient Near East in Pictures Relating to the Old Testament*. 2d ed. J. B. Pritchard, ed. Princeton. 1969.

ANET[3] = *Ancient Near Eastern Texts Relating to the Old Testament*.(3d ed. with supp.). J. B. Pritchard, ed. Princeton. 1969.

ANET Suppl. = *The Ancient Near East: Supplementary Texts and Pictures Relating to the Old Testament*. J. B. Pritchard, ed. Princeton. 1969.

AO = *Analecta Orientalia*

AOAT = *Alter Orient und Altes Testament*

APATP = *American Philological Association: Transactions and Proceedings*

ARAB = *Ancient Records of Assyria and Babylonia* I–II. Reprint. D. D. Luckenbill, ed. New York. 1968.

AS = *Anatolian Studies*

ASAE = *Annales du service des antiquités de l'Égypte*

ASP = *American Studies in Papyrology*

AuOr = *Aulor Orientalis*

AV = *Archaeologica Viva*

AW = *Archaeology under Water*. K. Muckelroy, ed. New York. 1980.

BA = *Biblical Archaeologist*

BAR = *Ancient Records of Egypt* I–V. J. H. Breasted, ed. Chicago. 1906–1907. (1988 reprint.)

BARIS = *BAR International Series*

BASOR = *Bulletin of the American Schools of Oriental Research*

BASP = *Bulletin of the American Society of Papyrologists*

BASPR = *Bulletin of the American School of Prehistoric Research*

BATM = *Bronze Age Trade in the Mediterranean*. N. H. Gale, ed. (*SIMA* 90). Jonsered. 1991.

BCCSP = *Bollettino del Centro Camuno di Studi Preisorici*

BCH = *Bulletin de correspondance hellénique*

BibAR = *Biblical Archaeology Review*

BICS = *Bulletin of the Institute of Classical Studies of the University of London*

BIFAO = *Bulletin de l'institut français d'archéologie orientale*

BiOr = *Bibliotheca Orientalis*

BMMA = *Bulletin of the Metropolitan Museum of Art*

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*CAH** = *The Cambridge Ancient History*[3]: I: 1. Cambridge. 1970.

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TvA = *Teva va Aretz.* (English series.)

TUAT = *Texte aus der Umwelt des Alten Testaments*

UC,OIC = *The University of Chicago, Oriental Institute Communications*

UC,OIP = *The University of Chicago, Oriental Institute Publications*

UF = *Ugarit–Forschungen*

UR = *Ugarit in Retrospect: Fifty Years of Ugarit and Ugaritic.* G. D. Young, ed. Winona Lake. 1981.

UT = *Ugaritic Textbook.* (*AO* 38). C. H. Gordon. Rome. 1965.

VS = *Valcamonica Symposium* (Actes du Symposium International d'Art Préhistorique, Capo di Ponte [Edizioni del Centro]). 1970.

WA = *World Archaeology*

WO = *Die Welt des Orients*

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ZA = *Zeitschrift für assyriologie*

ZÄSA = *Zeitschrift für ägyptische Sprachen und Altertumskunde*

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INDEX