

BOATS OF EGYPT BEFORE THE OLD KINGDOM

A Thesis

By

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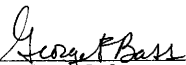
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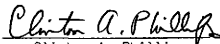
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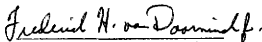
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ABSTRACT

Boats of Egypt Before the Old Kingdom (May 1987)

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The origin and early development of planked boats in Pre- and Early Dynastic Egypt is explored through an examination of representational art, the Predynastic environment, the development of tools and woodworking and direct archaeological evidence for early boats, including boat burials and surviving fragments. The use and range of early boats are examined through the archaeological evidence for trade within and beyond the Nile Valley. It is argued that the development of nautical technology in the Nile Valley was independent of external influences such as "Mesopotamian invaders," and that boatwrights of the Early Dynastic period used essentially the same techniques as their Old Kingdom counterparts. It is concluded that the Graeco-Roman practice of building ships with mortise-and-tenon joints was derived from techniques perfected in prehistoric Egypt.

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This thesis has taken more than two years to complete, and the list of people who have assisted me is almost endless. Thanks must go first of all to Dr. Frederick J. Van Doorninck, who provided early inspiration for the thesis in a series of seminar report assignments for his preclassical seafaring class in the fall of 1985. The thesis grew out of a term paper for that class, and a subsequent paper for J. Richard Steffy's class in the history of wooden ships. Dr. George F. Bass was most enthusiastic about the results of those papers, and encouraged me in choosing Predynastic Egyptian wooden boats as a thesis project. He was kind enough to urge that portions of the thesis be presented at a conference on maritime Egypt, which was held in Alexandria in June of this year.

A large number of scholars around the world provided information and assistance. Paul Lipke read a rough draft of what became the section on the Tarkhan planks, and was helpful in providing contacts in the Egyptian Antiquities Organization. Michael Hoffman provided the clue that resulted in my locating the planks in the Petrie Museum at University College, London. Barbara Adams, curator of the Petrie Museum, allowed me to examine the planks, and has been kind enough to change their labeling from "house timbers" to "boat timbers" as a result of this research.

Photographs were provided for this thesis by the British Museum, the Petrie Museum, the Badé Institute of Biblical Archaeology, Karl Marx University in Leipzig, the University of

Heidelberg, and the Archaeological Institute of the University of Zurich. M. Sguatamatti, conservator at the Zurich institute, provided photographs of boat models and boat pots belonging to both the university and private collectors.

Lech Krzyzaniak, director of the Archaeological Museum in Poznan, provided much useful information as well as a gratis copy of the symposium proceedings Origin and Early Development of Food Producing Cultures in North-Eastern Africa, a very interesting and useful book. Patrick F. O'Mara provided translations of First-Dynasty boat names, the earliest ever reported. The Committee of the Egypt Exploration Society was extremely cooperative in granting me permission to duplicate a large number of illustrations from its many publications; all EES illustrations are noted in Appendix 3.

Aleydis Van de Moortel assisted me in preparing grammatical French-language correspondence, and found for me the references to the full-sized boat models from Abu Roash during the course of her own thesis research in Holland. Lillian Ray, Patricia Fann, Beth Braznell and Luis Costa all read the thesis in its entirety, and prevented numerous errors from appearing. Clinton Phillips, whose duties as associate provost and dean of faculties at Texas A&M consume an immense amount of time, did me the great favor and honor to step in at the last minute and join my advisory committee.

Finally, a special thank-you must go to the the staff of Texas A&M University's Interlibrary Services department, without whom the research for this thesis would not have gotten very far at all.

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CHAPTER I
INTRODUCTION

It is ironic that even though no ancient Egyptian shipwreck has ever been found, Egypt has produced more Bronze Age nautical material than any other Mediterranean country. The Fourth Dynasty Cheops Boat and the four known Twelfth Dynasty Dashur boats are only the most famous and complete examples. Auguste Mariette found fragments of Old Kingdom funerary boats before 1883 (Perrot and Chipiez, 1883: 184), and boat fragments from First Dynasty burials (to be discussed below) were discovered at Helwan and Saqqara in the '30s, '40s and '50s. More recently, planks, frames and other possible remains from one or more large Middle Kingdom ships have been discovered at the pyramid of Sesostri I at Lisht by Dieter Arnold of the Metropolitan Museum of Art in New York City (Arnold and Cheryl Haldane, personal communication). At Wadi Gawasis on the Red Sea coast, planks with edge mortises have been found at a suspected Middle Kingdom port (Sayed, 1980: 156; Sayed, 1978: 69-71); they are believed to be planks meant for boats but scrapped for some reason. It is also generally conjectured that a second unopened boat grave at the Great Pyramid of Cheops at Ghiza contains another large boat. The practice of burying boats with the dead is documented in the First, Fourth and Twelfth dynasties, and it is not overly optimistic to believe that many more boat fragments and

This thesis follows The International Journal of Nautical Archaeology and Underwater Exploration in style and format.

Intact boats remain to be discovered in Egypt.

The prehistoric evolution of Egypt's nautical tradition is illustrated through the archaeological record more completely than that of any of its neighbors. Hundreds upon hundreds of petroglyphs, vase paintings and models illustrate 2,000 years or more of nautical development. Other types of representations are found on ivory reliefs, carved slate palettes and even painted textiles. In contrast to this, a recent compilation of several hundred Mesopotamian boat representations (Qualis, 1981: *passim*) turned up only 20 datable to or before the Uruk/Jamdat Nasr period, contemporaneous with Gerzean (3500-3100 B.C.) Egypt.

Egypt's cultural development, both materially and spiritually, was so dependent on boats that an examination of their remote origin is sure to tell us something about Egypt as a whole. The reverse of this is also true: by examining the entire culture, by casting our net as widely as possible, we can see how nautical technology affected and was affected by each component of the cultural system. The problems to be addressed here will include how Egypt's geography and fluctuations in rainfall and the level of the Nile during the Predynastic period affected nautical technology; at what point tool-making and woodworking skills became sophisticated enough to produce planked boats; when in Egypt's history we see trade beginning within and outside of the Nile Valley, and whether any of this trade can be assumed to have been water-borne; evidence of communication with, or even outright invasion by, people from outside the Nile Valley, and whether the boats of Dynastic Egypt

were based on prototypes from outside the area; the size of Pre- and Early Dynastic boats, and how they were constructed; when the sail was introduced, and why; and finally, how Egyptian nautical technology interacted with or contributed to Mediterranean boat- and shipbuilding as a whole.

This thesis is not meant to be a synthesis of the current state of knowledge of late prehistoric Egypt, but it is my intention to draw on as wide a variety of information as possible. The fact that nautical technology contributed so much to the fabric of pre- and early historic Egypt makes such eclecticism desirable, and the remoteness of the period makes it virtually mandatory.

CHAPTER II

CHRONOLOGY

Overall chronology is important to this study because I want to establish the order of appearance of the various boat types in Predynastic Egypt. The picture is clouded, unfortunately, by recent work that indicates that the traditional Badarian-Amratian-Gerzean sequence in Upper Egypt may not be as clear-cut as had been believed. The absolute and relative chronologies of the northern cultures such as the Fayum neolithic and Merimde Beni-Salaam, where the oldest boat model comes from (Raphael, 1947: 137), are even less clear. A general introduction to the chronological issues in late prehistoric Egyptian research will assist the reader in following the arguments to come.

The chronology of Predynastic Egypt is based on the sequence discovered by Petrie in Upper Egyptian graves at Naqada and Diospolis Parva, among other sites (Petrie, 1974b: 4) and the work done by Brunton and Caton-Thompson at Badari (Brunton and Caton-Thompson, 1928: I, 39). Petrie made arbitrary divisions ("sequence dates") based on pottery styles he found in the big Predynastic cemeteries and numbered them 30 through 80. Within these sequences, he noted two distinct cultural groups or "civilisations," one extending from c. S.D. 30 to S.D. 40, and the second from S.D. 40 through 60-63 (Petrie 1974b: 45). Since then, Petrie's "First Civilisation" has generally come to be called the Amratian period

after El-Amrah, and the "Second Civilization" has come to be called Gerzean after Gerzeh. Petrie believed that the First Dynasty began at S.D. 79 (Petrie, 1974b: 4) and termed the sequence dates between S.D. 63 and 79 the Late period or Semainean (Kantor, 1944: 110).

Petrie reserved sequence dates of less than 30 for future discoveries of older periods, and within seven years of the initial publication of Prehistoric Egypt, Brunton and Caton-Thompson filled the void with the "Badarian Civilization," said to be older than the Amratian or Gerzean. The sequence established was apparently verified by Caton-Thompson's exploration of the village site of Hemamleh, as yet the only well-stratified Predynastic Egyptian site. Caton-Thompson was able to verify that indeed the Badarian remains, characterized by "rippled" pottery (Brunton and Caton-Thompson, 1928: 74; Caton-Thompson and Whittle, 1975: 90) lay below the Amratian level which, in turn, lay below the Gerzean level (Hoffman, 1979: 141). A still earlier phase, called the "Tasian" culture, was tentatively recognized at Deir Tasa and Mostagedda by Brunton (Brunton, 1937: 32), but this phase is now generally regarded as indistinguishable from the Badarian period (Baumgartel, 1955: 20-21; Arckell and Ucko, 1965: 150).

This sequence date system has undergone a number of changes since its inception. Kantor has challenged the existence of a "Semainean" culture between the late Gerzean period and the unification of Egypt under the First Dynasty. Her arguments are persuasive and will not be repeated here, but are commended to the reader. In general, this thesis will accept S.D. 65 as the end of the Predynastic period.

The terminology of the sequence--Badarian, Amratian and Gerzean-- has also undergone revision, and it is common to see the latter two referred to respectively as Early and Middle Predynastic, or, after the system proposed by Kaiser in 1957, as Naqada I and Naqada II. Kaiser also identified a Naqada III, more or less equal to Petrie's Semainean. This period, though undoubtedly real, probably lasted a relatively short time (Arke11 and Ucko, 1965: 145) and thus does not justify an additional 14 sequence dates. In a detailed study Kaiser proposed a number of subdivisions of the Amratian and Gerzean periods, based on pottery and lithic styles (Kaiser, 1957: passim).

The northern cultures in the Fayum, at Merimde Beni-Salaam and the earlier phases of El-Omari, probably predate the Predynastic of Upper Egypt. The Fayum cultures settled on the banks of Lake Moeris in a depression west of the Nile (Casini, 1984: 203; Arke11 and Ucko, 1965: 145). No copper has been found in a neolithic Fayum site (Arke11 and Ucko, 1965: 150), while metal has been found in all phases of Predynastic Upper Egypt. Close parallels were noted between the lithic assemblages of the Fayum sites and Merimde Beni-Salaam on the western fringe of the Delta (Caton-Thompson and Gardner, 1934: 92). The earliest phase of Omari, on the east bank of the Nile just south of Cairo, is said to be slightly later, contemporaneous with the Badarian in Upper Egypt.

The absolute age of these cultures is yet to be established with certainty. Petrie's original calculation of the ages of the various upper Egyptian cultures was c. 8000-10,000 B.C. for S.D. 30 and c. 5500 B.C. for the beginning of the First Dynasty (Petrie, 1974b: 5).

By 1939, Petrie had revised his thinking and proposed a date of 7500 B.C. for the beginning of the Badarian and some time after 4300 B.C. (Petrie, 1939: vii-viii) for unification.

But even in the early 1920s, scholars were calling for a much lower chronology. Albright (1920: 97) argued for a date for the founding of the First Dynasty at c. 2950 B.C. This was based on ingenious speculation and interpretations of Mesopotamian texts which are no longer accepted, but came surprisingly close to the currently accepted figure. Breasted (1919: 31) came to the conclusion that unification must have occurred after 4000 B.C. by extrapolating coincidences between the Egyptians' sacred and profane calendars back into remote antiquity (Breasted, 1919: 31-33). These dates were all obviously based on speculation, and by 1944, a more conservative Helen Kantor wrote a seminal article on the late Gerzean period without ever once proposing an absolute date for the Predynastic era.

Fortunately, the situation has been clarified by radiocarbon and thermoluminescent dating, which have, if nothing else, shown that the lower chronology is correct. But dates still vary widely, and contradictory results are often obtained.

In 1971, Derricourt published a set of dates for Merimde that ranged from 6250 radio carbon years B.P. (c. 4300 B.C., uncalibrated) to 4700 radio carbon years B.P. Fayum A dates fell in approximately the same range, a range corroborated by a single date from a stick in the British Museum from a Fayum A site dated to 5388 plus or minus 45 uncalibrated radiocarbon years B.P. (Barker,

Burleigh and Meeks, 1971: 166).

Dates for the Badarian period vary widely, depending on how they were obtained. Badarian sherds from the stratified site of Badari were put in the proper sequence with the thermoluminescence technique but surprisingly old dates were obtained for the oldest Badarian pottery: 5580 B.C., plus or minus 420 years for a sherd of rough ware from the 6.5 foot (1.9 m) level (Caton-Thompson and Whittle, 1975: 97). A decorated-ware sherd from the 2.5 foot level yielded a date of 3775 B.C., plus or minus 330 years, apparently an Amratian date. In a confusing lapse, Derricourt's 1971 article listed three dates from samples from Naqada which were described as being of "Naqada II" date but with Amratian sequence dates--that is, sequence dates in the 30s. Those dates, uncalibrated, are 5744 B.P. plus or minus 300 for a sample culturally dated to S.D. 34-38; 5619 B.P. plus or minus 280 for a sample culturally dated to S.D. 36-46; and 5577 B.P. plus or minus 300 for a sample culturally dated to S.D. 34-38. These dates yield calibrated calendar dates of about 4450 B.C. (Derricourt, 1971: 279) according to the MASCA table (Ralph, Michaeli and Han, 1973: passim). However, Derricourt was pessimistic about getting accurate radiocarbon dates for the Badarian or Amratian periods (Derricourt, 1971: 289).

In a provocative 1984 article, T.R. Hays proposed a much lower date for at least some "Badarian" cultures. According to Hays, a charcoal sample associated with a Badarian burial at El Khattara yielded a date of 4810 B.P. plus or minus 80, or between 3400 and 3470 on the MASCA calibration (T.R. Hays, 1984: 72). A second

"Badarian" sample from El Khattara, yielded a date of 3130 plus or minus 30 radiocarbon years B.C., or 3715 plus or minus 25 calendar years B.C. according to the MASCA calibration (T.R. Hays, 1984: 72). Hays' results are naturally controversial, and need not necessarily be accepted at face value. For one thing, the charcoal sample came from above the burial, and Hays presents no reasons why he considers the two to be related. On the other hand, his site yielded no white cross-lined pottery, the typical Amratian type, or light-colored pottery, characteristic of the Gerzean. A "few" rippled sherds, characteristic of the Badarian, were found, but the bulk of the El Khattara pottery is a brown "rough" ware, which Hays did not describe. Williams (1982: passim) described a brown rough ware at Sedment he thought similar to pottery from Lower Egyptian sites like Omari and Maadi and datable to some time before the Gerzean period. However, since Hays provided no profile drawings or photographs, it is impossible for us to compare the two. Finally, Hays says that the tool typology at El Khattara is similar to that of the later Gerzean.

Other contradictions in date and type occur in the Amratian, for which Hays cited three radiocarbon dates from undescribed samples at Naqada as yielding an average calendar date of 4514 B.C., plus or minus 145 years, according to the MASCA calibration. Lower dates were suggested by Braidwood in 1957 (Arkell and Ucko, 1965: 151). Dates of 3800 B.C. and 3600 B.C. were given by samples of human hair and skin which, after having spent 50 years in London, may have been incapable of giving reliable dates. Arkell and Ucko did not specify

whether these dates are corrected or not. Hoffman treats the Amratian period as being, in round terms, between 4000 and 3500 B.C. (Hoffman, 1979: 16).

Derricourt published two dates for Hor-Aha, variously considered to be the first (Emery 1961: 37) or second (O'Mara, 1979: 138) king of the First Dynasty: 4300 radiocarbon years B.P. and 4500 radiocarbon years B.P. The lower of these two dates yields a calibrated date of c. 3300 B.C., plus or minus 65 years. F.A. Hassan (1980), on the other hand, prefers a still lower date, arguing that averaged calibrated radiocarbon dates suggest a date of c. 3100 for Aha.

A nice illustration of the relevance of all this to our problem is British Museum vase 53881 (fig. 1). This vase is made in the white cross-lined style, which is typically Amratian and usually dated to between 4000 B.C. and 3500 B.C. (Hoffman, 1979: 16). But it has a sickle-shaped boat drawn on it that is identical in style to the boat representations on the later decorated ware, which according to Petrie do not begin until S.D. 45 (Petrie 1974b: 18). With this in mind, we must either believe that the sickle-shaped boats were fully developed in the Amratian period, or else agree with Scharff that pottery styles are not always a reliable guide to date, and that the culture that produced white cross-lined pottery continued into the Gerzean period (Scharff, 1928: 263). Personally, in view of the radiocarbon evidence which suggests that the Badarian-Amratian-Gerzean sequence is not a pat solution to our problem, I am inclined toward the latter view. Unfortunately, this

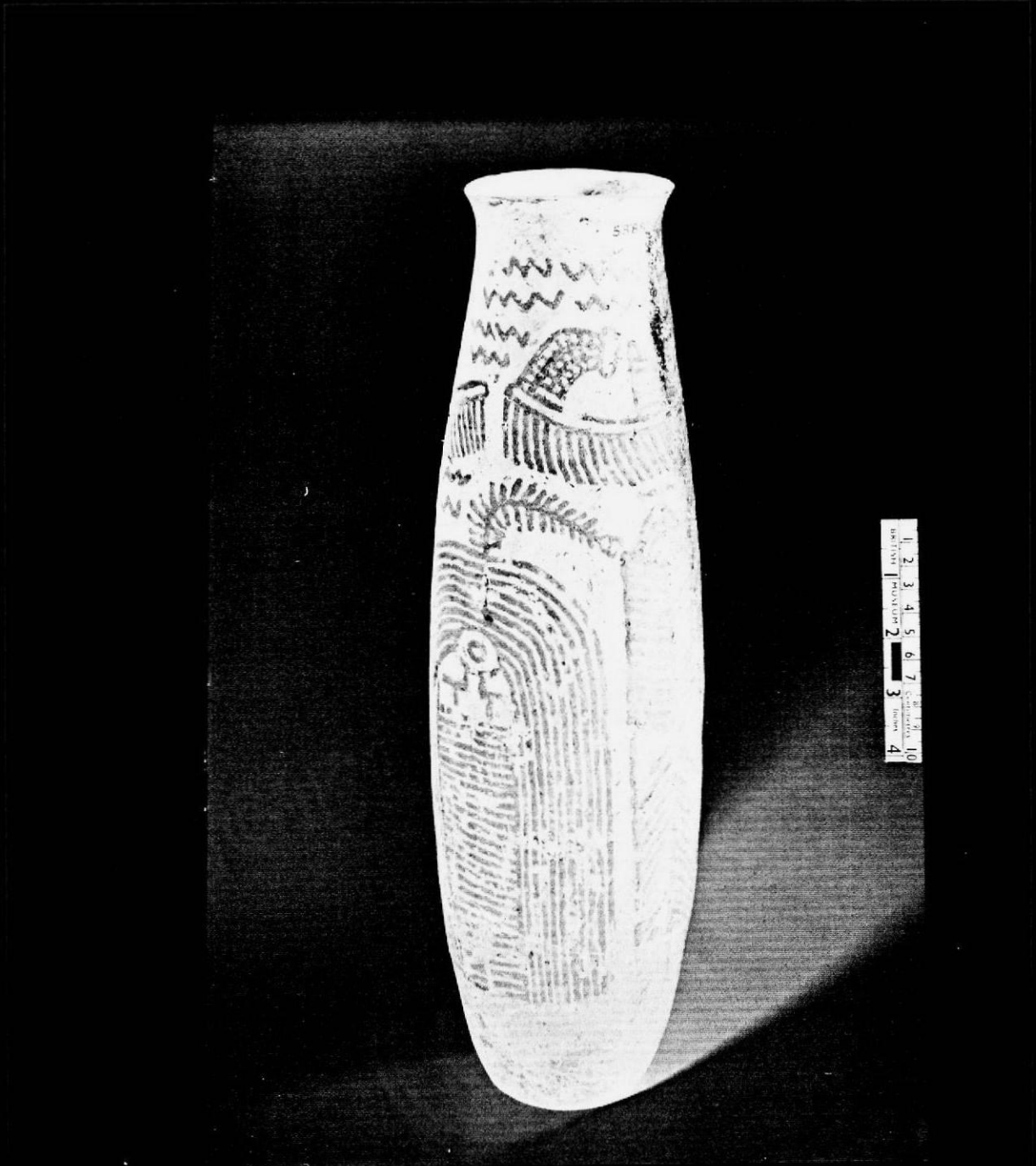


Figure 1. BM 53881, a white cross-lined vase with typical Gerzean sickle-shaped boat. Photo courtesy of the British Museum.

makes unprovenanced objects doubly difficult to date--and with those unprovenanced objects, there is the ever-present threat of forgeries.

However, despite occasional anomalies and contradictions, Petrie's dating system does work fairly well and the sequence it produces is corroborated to a considerable extent by radiocarbon dates (Derricourt, 1971: 289). Further corroboration of the sequence dating system has come from a computer program recently developed to sort and typologically arrange material from unstratified sites. This program has been used on material from the cemeteries of Armant, El Amrah and El Mahasnah, and preliminary results suggest an "encouraging" correspondence with sequence dating (Kemp, 1982: 7-8).

For the chronology of the Naqada III and Early Dynastic periods, we have the luxury of written sources to supplement archaeological evidence. But here again, there are problems. Finds are often associated with the tombs of First Dynasty kings at Saqqara or Abydos; these include boat graves with which we will be very concerned below. But the sequence of the kings is cast into doubt by the fact that names of monarchs found in the archaeological record rarely coincide with the names that are preserved in Dynastic Egyptian annals. Indeed, Patrick O'Mara has gone so far as to suggest that the divisions of the kings of a unified Egypt before the Old Kingdom into dynasties is largely fictitious, as are most of the names preserved in the later king lists, particularly the list of the Ptolemaic priest Manetho. The mathematical and philological details of O'Mara's arguments are out of place here. The thrust of

his thesis is that the name Menes is a corruption datable at the earliest to the 19th Dynasty (O'Mara 1980: 3; O'Mara, 1979: 146), built on a form of the name Samti, another name for Den or Udimu whose funerary boat may still exist (Emery, 1955: 500; 1958: 42 and elsewhere). O'Mara goes on to suggest that the unification of Egypt was not a discreet event brought about by a single conqueror, but a gradual merging of the two lands (O'Mara, 1979: 152). Wildung (1984: 269) concurs in this. O'Mara (1979: 200) believes that unification was finalized under Samti-Den, who is sixth king of the archaeological list, counting the Predynastic King Scorpion.

Traditional Egyptology, however, accepts the existence of Menes, if not agreeing on whether he is to be identified as Narmer or Aha of the archaeological list. The best evidence is wooden labels found at Naqada (Fig. 2) and Abydos (Fig. 3) by De Morgan and Petrie, respectively, which include the hieroglyph for the game-board, men, in conjunction with the name Aha. Emery (1939: 5) accepted the identification of Aha with Menes on this basis. But even as early as 1899, Amelineau had questioned the validity of reading the single sign men as "Menes," which in all later texts was used in combination with various other hieroglyphs to spell the name. In two 1906 articles, Legge disputed the identification of Aha with Menes, but not the existence of Menes himself. In particular, Legge argued that the game-board sign on the labels is in the wrong place to denote the king's name (Legge, 1906b: 15) and noted the possibility that the men sign had been completely misidentified (Legge, 1906a: 254). Evidence for Narmer as Menes comes from the fact that his

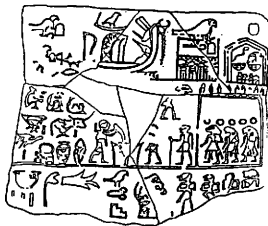


Figure 2. The Naqada label. Emery, 1961: 50.

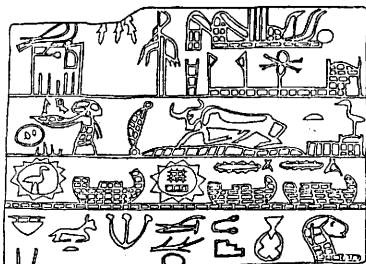


Figure 3. The "Menes" label from Abydos. Petrie, 1901a: pl. III.A5.

tombs have been dated to before those of Aha (Petrie, 1901a: 7-8), and the Narmer Palette, a slate palette found at Hierakonpolis (Hoffman, 1982: 145) which shows Narmer in the act of subduing lower Egypt (Fig. 4.a) and then wearing the unified crown of both kingdoms while he inspects executed prisoners (Fig. 4.b). Though Petrie initially identified Aha with Menes, he later came to accept an identification with Narmer (Emery 1939: 4).

Most current writers have avoided the question of the existence of a literal Menes, and have split on the question of whether Narmer is to be regarded as a Pre- or Early Dynastic king. Hassan regards Narmer as the first king of the First Dynasty (F. Hassan, 1980: 203); Hoffman ascribes Narmer to Petrie's 0 Dynasty (Naqada III) (Hoffman, 1979: 270).

According to F. Hassan (1980: 204), average calibrated radiocarbon dates for finds associated with the archaeological king list yield consistent dates at about the expected period: 3100 B.C. plus or minus 120 years for Aha, 3080 plus or minus 120 for Uadjf, 3000 plus or minus 120 years for Den, and 2925 plus or minus 120 years for Ka, with the Second Dynasty beginning at 2875 B.C. plus or minus 110. Derricourt (1971: 279) presents uncalibrated dates of 2350 plus or minus 65 and 2550 plus or minus 60 B.C. for Aha, which yield a calendar date of about 2920 B.C. on the MASCA table. Samples from the First Dynasty cemetery at Tarkhan, which will be discussed below, tested at between 2210 plus or minus 110 and 2360 plus or minus 90 uncalibrated radiocarbon years B.C., which yield MASCA-calibrated calendar dates of about 2630 B.C. to 2920 B.C.



A

Figure 4. The Narmer Palette. A--Narmer, as king of Upper Egypt, smites a Lower Egyptian.

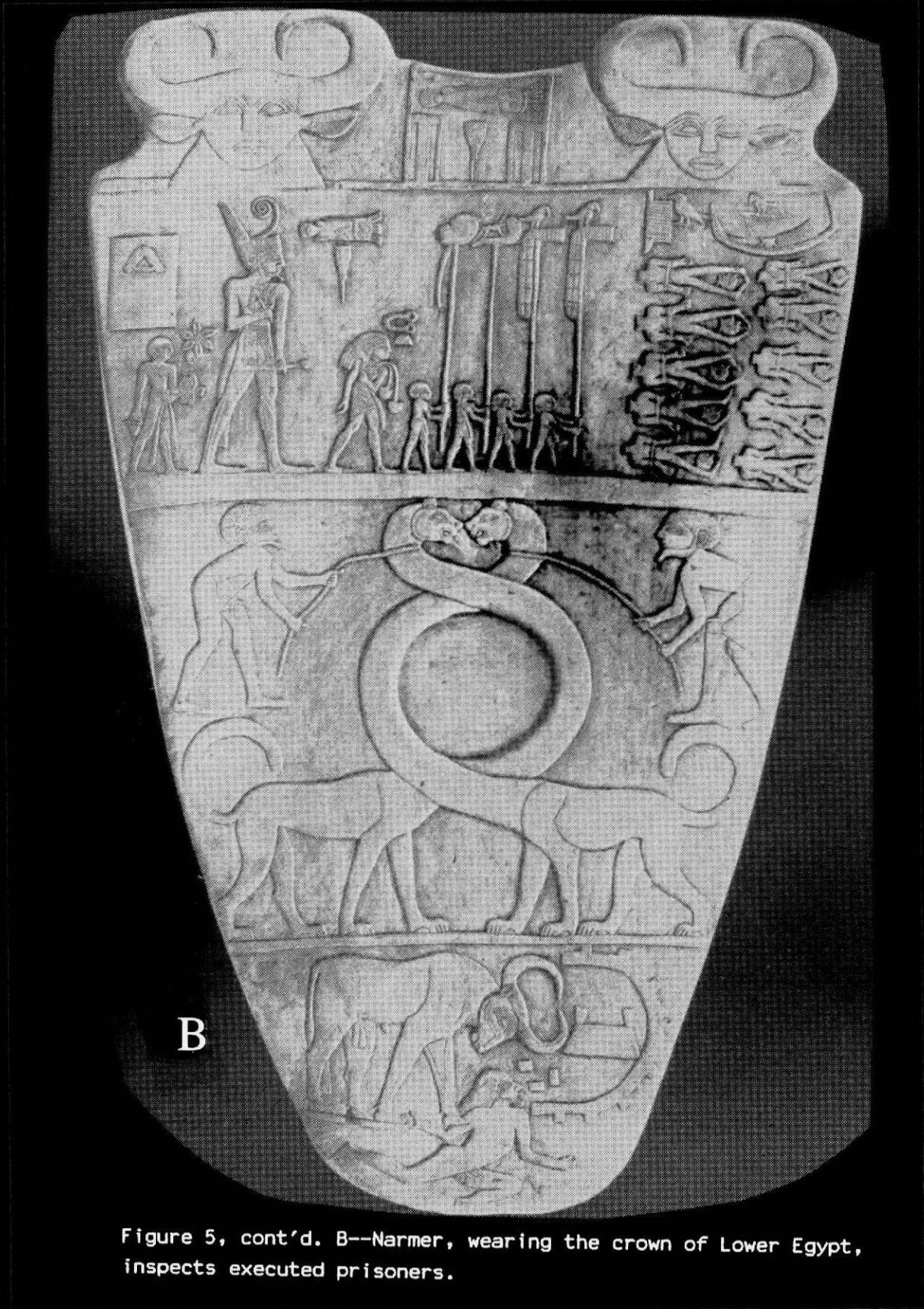


Figure 5, cont'd. B--Narmer, wearing the crown of Lower Egypt, inspects executed prisoners.

These last dates suggest that if anything, the chronology should be lowered a bit, but the evidence is far from conclusive.

The terminology of the late Predynastic and Early Dynastic period is somewhat confusing and deserves some discussion. The period of transition between the Gerzean period and the First Dynasty has been described variously as Late Predynastic, Semainean, Dynasty Zero, Naqada III and Protodynastic. The post-unification period has been labeled the Protodynastic period, the Archaic period and the Early Dynastic period. The term Protodynastic has been subject to a confusing variety of definitions: Hoffman (1982: 142) and Mond and Myers (1937: 6, n. 1) appear to regard it as only the last phase in the transition from the Predynastic to the Dynastic; others regard it as being that transitional period plus the Early Dynastic period (Massouliard, 1949: xi); still others regard it as being synonymous with the Early Dynastic or Archaic period (Brunton, 1927: 10). Finally, it is controversial whether the Third Dynasty should be placed in the Old Kingdom or the Early Dynastic period.

For the remainder of this thesis, we will speak of the Neolithic, Badarian, Amratian, Gerzean, Naqada III and Early Dynastic periods. For convenience, we will adopt Hoffman's dates of 5000 B.C. for the Badarian, 4000 B.C. for the Amratian, 3500 B.C. for the Gerzean and 3100 B.C. for the First Dynasty, with Naqada III considered a period of only one or two generations before unification. The Early Dynastic period will comprise the first two dynasties. Kings will be referred to by their archaeologically-documented names, the later king lists being considered suspect. Narmer will be considered to

CHAPTER III
THE ENVIRONMENT

It is generally believed that from 5000 to 3000 B.C. northeast Africa was experiencing the neolithic subpluvial, a period of relatively heavy rainfall preceding the dessication of historic times (Mohammed-Ali, 1982: 1,654; Hoffman, 1971: 59). The period of increased rainfall corresponds to the rise of relatively advanced cultures in the Nile valley and the germination of technologies that came to fruition under the pharaonic state. The end of the subpluvial between 3000 and 2500 B.C. saw the unification of Egypt under the First Dynasty and the establishment of a civilization that was to last for millennia.

In terms of boat construction, a wetter environment meant that more boat building material--reeds and wood--was available than is available now. In terms of boat use, it meant at times a higher, faster Nile for the crews to contend with. But the extent of the increased moisture is still controversial, and it is hard to disagree with the observation that even "at the best of times, the Sahara appears never to have been other than semiarid" (Harlan, De Wet and Stemler, 1976: 76).

Evidence for a wet phase during the 2,000 years of the upper Egyptian Predynastic period comes from graphic evidence, primarily petroglyphs, of fauna that are at home in a climate wetter than the current one in Egypt; from palaeontological and palaeobotanical

evidence of those fauna and flora; and of geoarchaeological evidence for changes in river and lake levels or increased rain run-off.

Corrected radiocarbon dates for increased lake volume in the Fayum and increased water discharge in the Nile cluster between c. 5000 and c. 2800 B.C. (Butzer, 1976: 31, fig. 5). Butzer's analysis in 1976 of the record of Nile heights, perhaps an indirect measure of rainfall, indicated relatively high floods throughout the Badarian and Amratian periods (c. 5000-3700 B.C.), a temporary drop in the level of the floods, then a second episode of higher floods culminating about 3000 B.C. (Butzer, 1976: 13). "Submaxima" were recorded at 4500, 3750 and 3000 B.C. (Butzer, 1976: 32). Trigger has proposed a maximum flood level in the mid-fourth millennium B.C. as much as 10 meters above the modern inundations (Trigger, 1965: 3), a situation more connected with rains at the source of the Nile than in Egypt (Trigger, 1965: 28). This general picture is confirmed in F. Hassan (1984: 59), who nevertheless admits only that the climate was "perhaps not as hyperdry as it is today." Hassan notes that only about 10 mm of water annually is necessary to increase the amount of available vegetation where water is collected by wadis, an observation concurred in by Hoffman. According to Hoffman, any increased rainfall permitted floodplain flora to grow in the low desert, a phenomenon it is possible to observe today after higher-than-average rainfalls (Hoffman, 1980: 242). Hoffman argued that increased rainfall, collected by the Great Wadi at Hierakonpolis, was responsible for the concentration of population

there beginning in the Amratian period.

That increased rainfall during the Predynastic period, however slight it may have been, led to an increase in the amount of wood available would appear to be proven by the numerous finds of ancient tree stumps in the desert where no large trees grow today. Mond and Meyers noted many stumps in the vicinity of Arment during their excavations there in the late '30s. They wrote that the existence of trees well above the modern cultivation levels was first noted by Brunton at Qau (Badari). Wood samples they attempted to identify were described as sycamore or acacia, though Mond and Myers admitted that the wood was in poor condition and that identification was difficult. The date of the trees was problematic. They assumed that they were Badarian, but could only confidently conclude that the trees were Predynastic. Mond and Meyers questioned their workmen, who told them that such tree remains were to be found in all parts of the Nile valley (Mond and Meyers, 1937: 7).

Hoffman (1971: 59) found tamarisk lumps in the Great Wadi at Hierakonpolis in areas now empty of vegetation. He reconstructed the average annual rainfall there at about 50 mm a year, and argued that this was sufficient to sustain tamarisk forests or groves. In fact, it has recently been suggested that even Egypt's current timberless state is due far more to human and animal depredation than to the modern climate. Alessandra Nibbi (1984: 288) pointed out that stands of trees in the modern Egyptian desert must represent survivals from earlier times. Nibbi discussed finds of pine pollen in the Nile delta, and other Mediterranean tree types in Algeria after the

Neolithic period. She pointed to oak and pine forests in Palestine and juniper stands in the northern Sinai, as well as the existence of tree roots and stumps in the Egyptian deserts, to (obliquely) suggest that Dynastic Egypt had far more wood than modern Egypt (1984: 290-291).

A large number of wood types have been found at Predynastic sites in Egypt, but the most common are sycamore and acacia, as indicated above by the stumps from Armant. Some 20 different varieties of these woods are present in the Nile valley (Nibbi, 1984: 288). A third extremely common wood type is tamarisk. Fragments of tamarisk "hamper" coffins were found in "Tasian" or early Badarian graves at Mostagedda (Brunton, 1937: 33), and tamarisk and acacia fragments were found in slightly later graves at the same site (Brunton, 1937: 58-59). As mentioned above, Hoffman found stumps of burned tamarisk in the Great Wadi at Hierakonpolis.

The common Egyptian acacia, Acacia nilotica, is today a smallish tree that grows no higher than 9 meters (Goor and Barney, 1976: 359). A closely related species, Acacia arabica, can grow somewhat larger, up to 12 m high (Goor and Barney, 1976: 354). Ethnographic evidence, however, indicates that at least in modern times few acacias reach maximum height due to early harvest (Clark, 1920: 46). Classical texts refer to acacia beams of up to 12 cubits, or about 5.5 m (Meiggs, 1982: 59, 478). Medieval Arab literature indicates that acacias were "hard as iron" and very tall (Fahmy, 1966: 77). This would contradict modern assumptions (Casson, 1971: 11; 1964, 21) that only short lengths could be obtained from acacias.

Modern tamarisks are often smaller than acacias (Goor and Barney, 1976: 448-449). Many never attain tree height, but are only tall shrubs. On the other hand, Tamarix aphylla can grow as tall as 15 m. The tree is often crooked, but some varieties have a straight trunk as long as 8 m. Tamarix gallica L. is a smaller tree, reaching a maximum height of 9 m.

Plane and sycamore have been reported in Old Kingdom burials at Tarkhan (Petrie and Mackay, 1915: 23), but Lucas (1962: 439) doubted the identification of plane on the grounds that plane is not a native Egyptian tree.

A tree called the perseae (Minusops schimper!) was reported by Theophrastus to have been used in historic times in Egypt, and the balanos (Balinites aegyptiaca) was said to be strong enough to use in shipbuilding (Meiggs, 1982: 59). Meiggs describes the balanos as a tall, thick tree; Goor and Barney (1976: 370), on the other hand, describe it as a smallish evergreen usually reaching no more than seven meters in height. This tree needs at least 250 mm of rain a year, but can live in dryer areas if groundwater is available. Balinites and Minusops have been reported in few if any Pre- or Early Dynastic sites, but it seems logical that they would have been available then since they existed later.

Theophrastus also reported the use of date palm (Phoenix dactylifera) fibers for cables and planks for roofing. The wood of the daum palm (Hyphoene thebaica) is much harder and more compact, and was used to make the feet of couches by the Persians (Meiggs, 1982: 59). The daum palm is native only to upper Egypt (Lucas, 1962:

444). Palms of unspecified species were used during the medieval period for shipbuilding (Fahmy, 1966: 77-78), and the ubiquitous palms no doubt had uses in the Predynastic era as well.

Theophrastus listed the carob Ceratonia siliqua L. as an Egyptian tree (Meiggs, 1982: 59). This is also a small, crooked evergreen that can grow up to 8 m (Goor and Barney, 1976: 382).

A very important wood from the perspective of early shipbuilding practices was the sidder (Ziziphus spina-christi). Though the tree is not large enough to have provided planks, its wood is extremely hard (Lucas, 1962: 391) and was used to make the tenons in the Cheops boat (Lipke, 1984: 25). The earliest known use of sidder wood comes from a Third Dynasty coffin (Meiggs, 1982: 59) but its earlier use seems likely, in view of the fact that few Early Dynastic tenons have been analyzed for wood type. Sidder fruit has been found in storage bins at an Early Dynastic site in Nubia (Piotrovsky, 1967: 130), so this tree was certainly being used.

Even during prehistoric times, pine, cedar and cypress (or perhaps juniper) were finding their way to Egypt. Fragments of these non-Egyptian woods were identified in Brunton and Caton-Thompson's excavations at Badari, some perhaps datable to the Amratian period. Pieces of pine and a cedar species were found in a pot in grave 3165, dated to S.D. 37-47. Cypress or juniper was found in a grave dated to SD 58-60 (Brunton and Caton-Thompson, 1928: 62). These fragments were not drawn or described, but they were not apparently very large. Until large pieces are found, it would be hazardous to explain this wood as the result of a specific timber trade in the

Amratian/early Gerzean period. Nibbi's observation above of pine pollen from the Delta may be relevant, but it is the nature of pollen to be carried long distances by the wind. To date, no other foreign wood has been identified at a Predynastic site, but very little wood has been analyzed.

The other boatbuilding material used in Predynastic, Dynastic and even modern Egypt is the reed. An expanded flood plain and more rain would seem to imply that reeds were even more available in the prehistoric period than they are now. Krzyzaniak (1977: 30) proposes thickets of papyrus and lotus in the shallow arms of the Nile in the fourth millennium, and even in the first part of this century there was no apparent shortage of reeds for boatbuilding material. Twentieth-century travelers have noted reed boats as far south as Nubia (Breasted, 1917: 174ff), in Behneseh in middle Egypt (Anonymous, 1917: 255) and as far north as Cairo (Hornblower, 1931: 53ff), though wild papyrus is said to be nearly extinct today (Landstrom 1970: 17).

It has generally been assumed (Baumgartel, 1955: 49; Herodotus II: 4, 99) that the Delta in the Predynastic period was an uninhabitable swamp. Even Butzer, who disputed this view (1976: 25), was pessimistic about the possibility of finding archaeological sites in the Delta, since, he believed, any such sites would probably be buried under at least 10 meters of alluvium. However, the discovery of a late Gerzean-Early Dynastic site at Minshat Abu Omar in the eastern Delta (Wildung, 1984: 265ff) has forced a re-evaluation of any such harsh judgment.

The currently available climatic information seems to show that Predynastic Egyptian boatwrights had plenty of materials from which to choose. Lengths of acacia of perhaps 5.5 m could be had, and lengths of tamarisk of more than 6 m. Reeds were used throughout Egyptian history.

CHAPTER IV
TOOLS AND WOODWORKING

The development of Egyptian woodworking skills can be traced through surviving fragments of worked wood and through the more permanent tools the prehistoric carpenters made for themselves. Although wood worked with the kinds of skills needed for boatbuilding appears relatively late (see below), tools possibly suitable for woodworking were being made and manufactured at least as early as the Neolithic period. It is therefore difficult to specify the earliest date at which planked boats could have been built; but I will argue that the technology to build them had certainly developed by the late Amratian period.

Stone axes and adzes appeared in Egypt beginning with the settlers in the Fayum; but these tools are generally quite small, and some of the adzes may have been amuletic. Sizes of the tools found in the Fayum by Caton-Thompson vary from 3.1 cm long to 8.1 cm long; all thicknesses are less than 3.8 cm. Adzes are somewhat smaller--two illustrated examples (Caton-Thompson and Gardner's pl. IX.15 and pl. XXXIV.3) are less than 5 cm long and less than half 1.2 cm thick. That these latter tools were designed to be adzes, however, seems certain, as several of them have chamfered blades (Caton-Thompson and Gardner, 1934a: 28). Axes were made of chert, dolerite or basalt, limestone and flint (Caton-Thompson and Gardner, 1934a: 25-26).

According to Caton-Thompson, tools from Merimde are similar to those from Fayum A, and adzes from the two sites are indistinguishable (Caton-Thompson and Gardner, 1934: 92). In fact, adzes are known from many Neolithic sites in northern Africa, including Khartoum in the Sudan and throughout the Tenere region in Niger, north of Lake Chad. These true adzes must have been used for woodworking, according to Arkeil and Ucko (1965: 149).

No axes, adzes or planes were identified at Badarian levels at Badari, although a number of tools, i.e., those illustrated on Brunton and Caton-Thompson's pl. LXXVIII.7, 13, appear similar to other so-called axes. No dimensions are given, but from the scale photographs these seem to be a maximum of 10 cm long. Brunton illustrated some "axes" or "celts" from Mostagedda. He referred to no adzes or chisels, but the lithics are not particularly well presented.

For the later Predynastic sites, Armant is among the best documented from the point of view of its lithic technology. Mond and Myers (1937a: 207) considered flaked axes to be the type tool of the settlement. Most of the axes were meant to be hafted, and at least one specimen had two cutting edges. Sizes varied from about 5 cm long (their pl. LXII.18) to about 10 cm long (their pl. LXII. 16, 17). Armant also produced stone chisels, such as those illustrated in their plates LVIII.44 or LXV.38. These tools are few in number and had their best parallels in surface or disturbed layers at both the Fayum and Merimde (Mond and Myers, 1937a: 214). Also identified were "planes," thin sheets of tabular flint which

seemed to be designed for scraping and planing rough surfaces. This tool is known from Naqada and Mostagedda, but the only datable link was said to be with the Fayum B phase, earlier than the Fayum A (although believed to be later at the time of Mond and Myers' description). In general, Mond and Myers (1937a: 229) claimed that the greater part of their datable tool types belonged to the late Amratian or early Gerzean period. Stratigraphically, the great majority of their axes and adzes came from the highest levels of the Amnat settlement (Mond and Myers, 1937a: 224a).

Stone tools continued to be made and used into the Dynastic period in Egypt. Petrie discovered several flint adzes in grave 7324 at Badari, dated to the First Dynasty (Brunton, 1927: 14). But in general, the Dynastic Egyptians appear not to have buried their less remarkable tools with the dead (Mond and Myers, 1937a: 230).

It should be noted that it is not conclusively demonstrated in the older publications that tools identified as axes, adzes, chisels or planes were used for the purposes these names imply. As pointed out by Emery (1961: 216), complicated wood joinery is not attested to before the late Gerzean period, when copper tools became more widely available. It is possible to make seaworthy planked boats without metal tools, but it is reasonable to assume that improving tools facilitated advances in construction and joinery in general, and boatbuilding in particular.

Copper ore exists in two areas of modern Egypt, Sinaï and the eastern desert (Lucas, 1962: 156). Old copper works exist at Magharah and at Serabit el-Khadim, both in the southeast portion of

the peninsula and about 19 km apart. Great slag heaps and smelting scraps have been found at Magharah, dating to the Old Kingdom and later. At least one inscription dating to the First Dynasty has been found there (Gardiner and Peet, 1917: pl. 1). The copper workings in the eastern desert are at Wadi Araba, near the Gulf of Suez; at Gebel Atawi, about the latitude of Luxor, but closer to the Red Sea than the Nile; and at numerous other locations (Lucas, 1962: 156-63).

The use of copper ore (malachite) is attested to from the Badarian period on (Lucas, 1962: 155; Hoffman, 1979: 207). Brunton found copper beads in Badarian graves at Mostagedda (Brunton, 1937: 51), but no copper tools in any "Tasian" or Badarian graves. Whether the earliest-used metallic copper was of native metal or of smelted ore is controversial. Farag, a metallurgist, has taken the former view (1981: 17) as has Hoffman and many others. Lucas, on the other hand, pointed out that Predynastic Egyptians used malachite as a cosmetic possibly even before metallic copper appeared and that malachite is "easily" convertible to metal. He concluded that "the conditions in Egypt were therefore particularly favourable for the early discovery of copper by smelting the ore, and there is no need to postulate the occurrence and use of the native metal" (Lucas, 1962: 201).

Small decorative copper items were fairly common in the Amratian period, such as a pin found in a grave dated to S.D. 30 at Diospolis Parva (Petrie, 1901b: 24). By the late Amratian period, copper was used for tools and weapons. A small harpoon was dated to S.D. 34-38

(Petrie, 1901b: 24); small woodworking chisels also appeared at S.D. 38 (Petrie, 1901b: 24; 1974c: 19 and pl. XXII.45, 46). The two chisels from Tools and Weapons (Petrie, 1974c) are from Naqada graves 63 and 297. These are small "graving" tools, pointed at each end and apparently held in the middle. Those illustrated are about 10 cm long and very thin.

Large axes are known from Egypt somewhat later. The oldest was found at El Matmar in Middle Egypt by Guy Brunton and dated to the early Gerzean period (Carpenter, 1932: 625). This axe, which weighs 3 pounds 7 ounces (1.5 kg), contains manganese. Thus Lucas assumed it to be made of copper from Maghara in the Sinai, since Maghara is also near manganese deposits. Another early axe from a camp site in Nubia was tentatively dated to S.D. 63 from its context but said to resemble Early Dynastic axes (Petrie, 1974b: 26). Though there were possible double-bladed stone axes at Armant, the metal double axe is absent from Predynastic Egypt.

Adzes appeared early as well. Small examples, four to five inches long and quite thin, are dated by Petrie only to some time before S.D. 60; after this time, adzes eight to nine inches long are known from Naqada, Ballas and other sites (Petrie, 1974c: 16 and pl. XV). However, a wooden model of an adze as large as this is known from grave B202 at El-Amrah (Randall-Maciver and Mace, 1902: 17). This grave is dated to before S.D. 41 so it does not seem implausible to suggest large metal adzes this early.

Perhaps also appearing early was the drill. Possible stone drill bits date to the Palaeolithic in Egypt (Massouard, 1949: 20).

Reisner identified tools similar to Petrie's small chisels as "chisels or drills" (Lythogoe, 1965: 106) at Naga-ed-Der. On the other hand, he also argued that the bow drill only dates from the First Dynasty (Reisner 1936: 348). Childe, however, suggested a very early date for the invention of the bow drill (1953: 190). The bow is certainly depicted frequently in Predynastic art.

By the First Dynasty, the chisel had evolved into a battleship-shaped mortising chisel, a type that continued into the Late Bronze Age when it apparently was an export item (Pulak, 1987.) The small chisels continued to be produced, as well as heavy types up to 30 cm long (Emery, 1961: 219). The saw also appeared in Egypt during the First Dynasty. Because copper is relatively soft and subject to buckling (Goodman, 1964: 111), the Egyptians and all other ancient peoples employed the pull saw, unlike the modern spring-steel tool which cuts during the push stroke. Blades ranged from 13 cm to 40 cm long and usually did not have teeth along their full length (Emery, 1961: 219). According to Emery (1961: 216), the Egyptians had by the Early Dynastic period developed every type of metal tool they would use in their subsequent history with the exception of the plane, which was introduced by the Romans.

CARPENTRY AND JOINERY

Our oldest examples of Egyptian carpentry and joinery are from the late Amratian/early Gerzean period, coinciding roughly with the

earliest appearance of copper woodworking tools. The earliest-known Egyptian planks come from graves at Badari and El Mahasnah. In tomb H 23 of the latter site, dated to S.D. 36-43, the skeleton was found resting on a plank about 5 cm thick (Massouliard, 1949: 137). A grave of S.D. 38-44 at Badari was roofed with planks, whose dimensions are not given (Brunton and Caton-Thompson, 1928: 53). From this point on, planks appear not infrequently in the richer graves (Petrie, 1974a: 9), either as roofing material or as "proto-coffins" (Reisner, 1936: 345). Planks possibly dating from the late Amratian/early Gerzean periods were found in Class 2 graves at El Amrah, used as barriers to prevent rubble from falling in on the body (Randall-MacIver and Mace, 1902: 33). Grave U 10 at Abydos included four boards around the body, but with no sign of a lid or bottom (Peet, 1914: 15). This same situation existed in two other graves; Peet believed that the boards had not been joined at the corners (Peet, 1914: 18). Ayrton and Loat (1911: 7) also found it impossible to determine how or whether these frames were joined. Some graves in the Predynastic cemetery at Abydos had wooden roofs, as did Predynastic graves at Naqada and Ballas (Petrie, 1974a: 25).

Despite their apparent lack of saws, Gerzean Egyptians seem to have been adept at cutting planks to almost any desired dimensions. Planks from Gerzean graves at El Amrah measured 0.5 inches (1.27 cm) thick and five feet (1.52 m) long (Randall-MacIver and Mace, 1902: 33). At El Mahasna, planks from graves vary from 0.5 inches (1.27 cm) to two inches (five cm) in thickness, and were found with a breadth as great as one foot (30.5 cm) (Ayrton and Loat, 1911: 6-7).

A plank from a wood-lined grave at Naga-ed-Der measured 210 cm long, 5.5 cm thick and 30 cm wide (Lythgoe, 1965: 205).

Examples of Gerzean joinery are fragmentary, but where preserved and recorded show some advanced skills. A box or enclosure from Naga-ed-Der was described in some detail:

In the northern half the grave construction was well preserved, consisting of a wooden framework, with twig or slat construction both over and under the burial.

No means of fastening them together was evident. As far as preserved the sides of the frame were 11 cm high and 3.5 cm thick. Width of the box averaged 75 cm. At the northwest corner ... the end board ... is 4.5 cm thick, cut out to a depth of 3 cm to allow the west side board to be mortised in. No nails or other fastenings were found.

... On clearing the twig layers the manner of fastening the wooden framework at the corners was found to consist of a hole 2.5 cm in diameter bored through both ends and side pieces where they crossed, and fragments of cord lying in them showed the corners had been lashed together (Lythgoe, 1965: 170).

In other boxes, corners were mitered (Lythgoe, 1965: 337, 347).


By the Naqada III/Early Dynastic period, full-fledged coffins were being built, and the mortise-and-tenon joint was being employed. A coffin from El Amrah, dated by its excavators to the ambiguous "protodynastic" period, was put together with planks "bolted together with wooden dowels (tenons) one and a quarter inches wide" (Randall-Maciver and Mace, 1902: 33). Petrie found bed frames with carved bull's feet at Diospolis Parva, in grave H 56, dated to S.D. 72 and at Naqada (Petrie, 1974a: 25) in grave 3, dated to S.D. 66 (Massouliard, 1949: 198). Though those beds are not fully described, bull's foot beds from the First Dynasty show complex

mortise-and-tenoning and lashing (Fig. 5).

As implied by the increase in the number of tool types, examples of Early Dynastic woodwork show very advanced techniques, including, by the Third Dynasty, the use of plywood (Meiggs, 1982: 297).

Perhaps most interesting for the student of nautical technology is the fact that the pegged mortise-and-tenon joint was in existence in the Early Dynastic period, though apparently many centuries before its first use in ship construction. In Tomb 3504 at Saqqara, Emery found furniture that was tenoned together; the tenons include a number with holes for retaining pegs (Emery, 1949: 21, 45 and 47).

In a few, the pegs were still in place (Fig. 6; Emery, 1949: 49,

50). The ancient Egyptian word for cutting a mortise, menkh, written with the hieroglyph , is not attested to before the Old

Kingdom (Lallemant, 1923: 88), and Hilda Petrie's 1927 collection of Early Dynastic hieroglyphs does not include anything comparable; but the technique certainly existed in the Early Dynastic period, and its antiquity is perhaps indicated by the fact that Egyptians referred to tenons as the "teeth of Osiris" (Montet, 1925: 339).

By the First Dynasty, large wooden structures were being built out of imported wood (Childe, 1953: 89). Dimensions of some timbers from First Dynasty royal tombs Abydos include: in the tomb of Ka, floor beams 10 to 13 inches by nine inches (25.4-33 cm by 22.9 cm) in section, and, judging from the scale drawings, more than 4.6 m long (Petrie, 1900: 15 and pl. LXVII); from the tomb of Azab

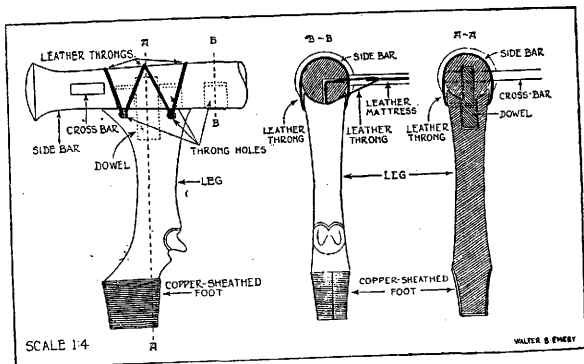


Figure 5. Detail of Early Dynastic bull's-foot bed construction. Emery, 1939: fig. 46.

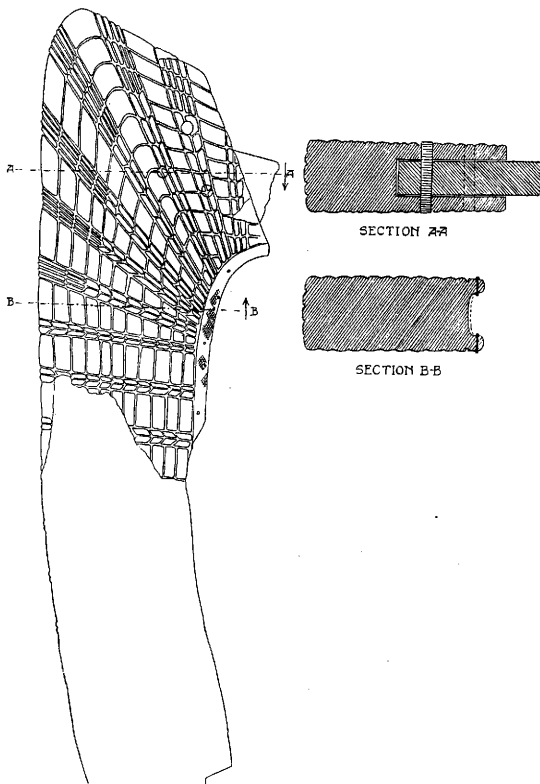


Figure 6. Early Dynastic chair fragment, with pegged mortise-and-tenon joint in situ. Emery, 1954: fig. 42.

(Merpaba), a post 4 by 17 inches (10.2 cm by 43.2 cm) (Petrie, 1900: 12); from the tomb of Zet, beams 20 feet long (6.1 m) were postulated for the roof (Petrie, 1900: 9). Floor planks for the same tomb were 2 to 2.5 inches (5 to 6 cm) thick.

All this clearly indicates that the manufacture and use of planks was well known to Egyptians in the earliest part of the Gerzean period or possibly the late Amratian period, and that their knowledge of carpentry and joinery advanced steadily in the 500 years up to the First Dynasty, when large wooden boats certainly existed (see below). Other than the stone tools described above, we have no direct knowledge of woodworking before the late Amratian/early Gerzean period. Coffins beginning in the "Tasian" or early Badarian period were mere "hampers" of twigs (Brunton, 1937: 33). Planks conceivably could have been manufactured before the early Gerzean period but may have been too valuable to bury with the dead. It is impossible to judge whether the lack of planks in graves before the end of the Amratian period is indicative of a lack of the ability to make them or simply of the particular funerary customs of the periods in question.

THE TARKHAN PLANKS

Aside from the fragments of coffins, beds and large buildings described above, one extremely interesting set of planks were recovered from First Dynasty graves at Tarkhan. These planks were described by Petrie as having come from portable wooden houses, but

at least three of them appear to be the remains of one or more boats of the First Dynasty.

The cemetery of Tarkhan was described in 1913 as being about 37 miles (59.2 km) south of Cairo. The name Tarkhan was adopted by Petrie to describe the provenience of the Early Dynastic remains of the area; Old Kingdom remains were described in a volume entitled Heliopolis, Kaffr Ammar and Shurafa (Petrie and Mackay, 1915), although both assemblages were in the same general vicinity (Petrie, Wainwright and Gardiner, 1913: 1).

The eight wooden pieces dealt with here are on permanent display in the Petrie Museum at University College, London. Several of them are previously unpublished. Three others illustrated in Petrie's 1913 Tarkhan I and Memphis V (hereafter abbreviated as Tarkhan) are said to be at the University of Manchester or in the Metropolitan Museum of Art in New York City (Rosalind Hall, personal communication). A fourth piece is as yet unlocated.

All planks were found by Petrie in graves. Some were used as parts of coffins, others were used as roofing material for the tombs. It is not clear in most cases which pieces performed which function, or from which grave the individual pieces came. The information given in Tarkhan is as follows: the plank illustrated on Tarkhan pl. IX.4 (Fig. 7) was said to come from the bottom of a coffin in Grave 3, dated to S.D. 79 (Tarkhan: 9). S.D. 79 was considered to be First Dynasty, contemporaneous with the reign of Aha. This plank is not part of the University College collection. All (remaining?) planks in pl. IX are then described as having

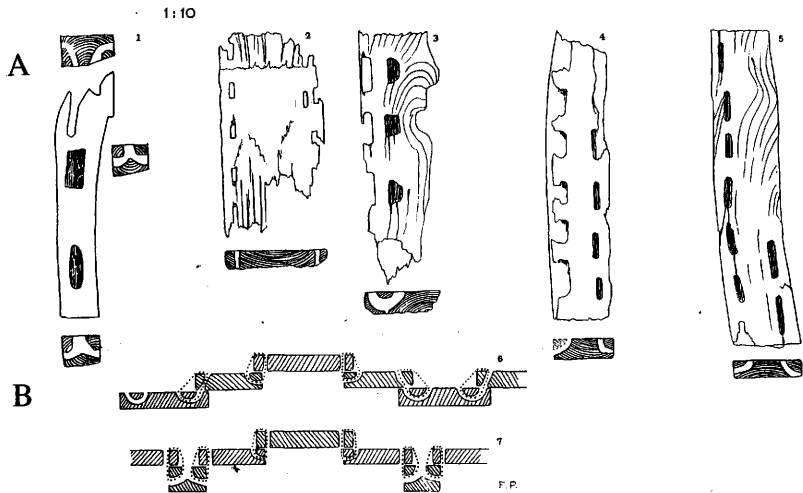


Figure 7. The Tarkhan Planks. A--Five of the planks. Plank 1 is UC 17156; plank 3 is UC 17157; the others are unlocated. B--Petrie's lashing scheme. *Tarkhan*: pl. IX.

come from the roof of chambers D and E of Grave 158. This grave is assigned to S.D. 81, or the reign of any of three First Dynasty "kings," Mer-neit, Den or Azab. The name Mer-neit has long been recognized as that of a woman (Kaplan, 1979: 23ff); the name Azab, the king after Den, is more often given as Merbapa.

The two planks illustrated in a photograph in Tarkhan pl. X (Fig. 8) are unprovenienced. The University College designations for all the planks, by which they will be referred to below, are: On Tarkhan pl. IX, plank 1 is UC 17156; plank 2 is not part of the University College collection; plank 3 is UC 17157; plank 4 is not part of the University College collection; plank 5 is not part of the University College collection. On Tarkhan pl. X (Fig. 8), the larger plank is UC 17166; the smaller plank is not part of the collection. In addition, the Petrie Museum possesses the following planks which were not illustrated in Tarkhan: UC 17158, UC 17159, UC 17161 and UC 17162. I have not determined the exact provenience of these planks, but perusal of Petrie's notes, still preserved at the museum, may eventually shed light on the question. The planks will first be described in numerical order. Then conclusions that may be reached in the light of Dynastic and later Egyptian carpentry and boatbuilding techniques will be discussed.

UC 17156 (Fig. 9) is one of the more robust pieces in the collection, and one of only two to show conspicuous curvature (the other is UC17162). Its overall length is about 65.6 cm; its height as shown in the orientation presented in the illustration is 11.2 cm, and its thickness is 6.4 cm (all measurements presented here



Figure 8. UC 17166 (right) and unlocated similar plank. Tarkhan: pl. X.4).

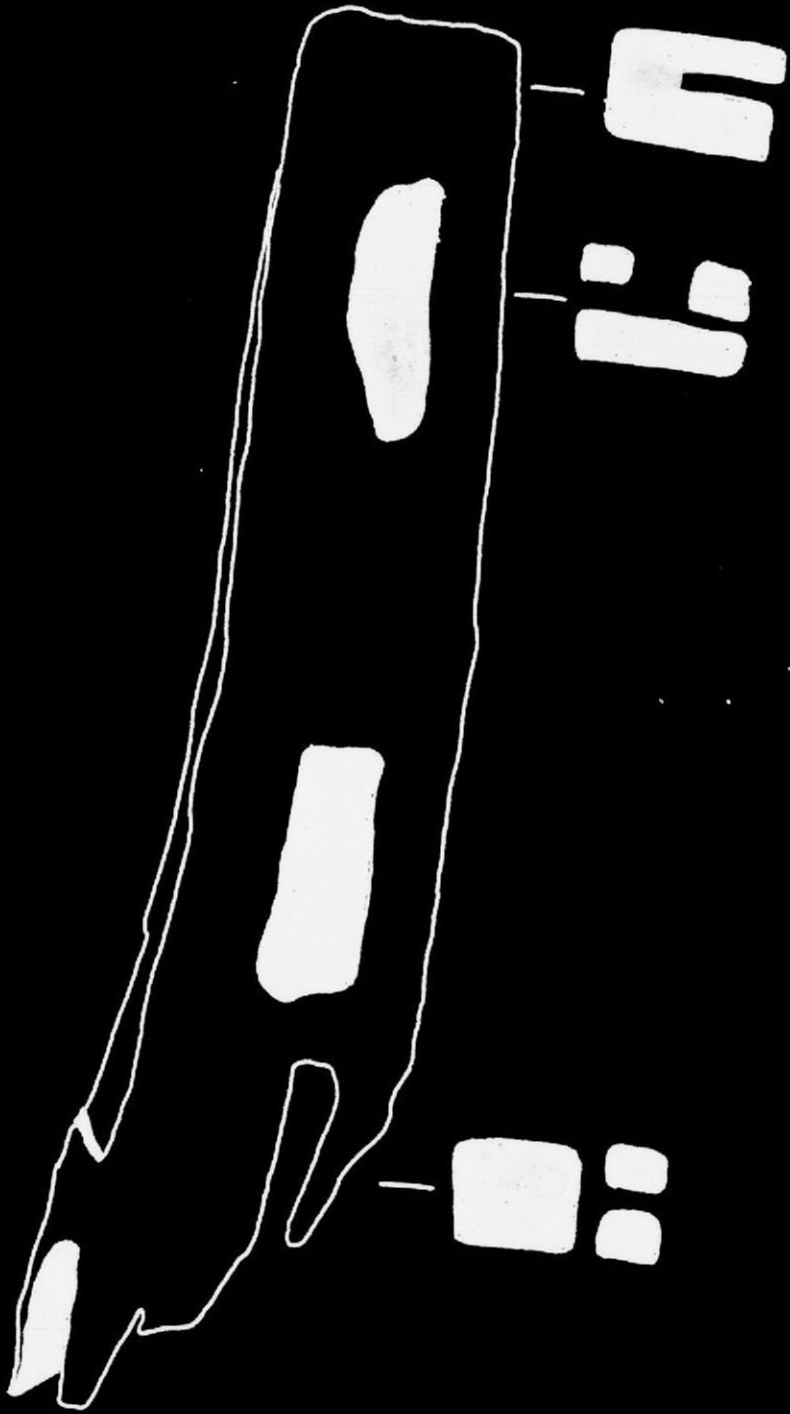


Figure 9. UC 17156. Photo by the author.

should be understood to be approximations). UC 17156 and UC 17162 are also the only two pieces to have what will be called here three-way lashing holes: holes that enter three faces of the timber. The preserved portion of UC 17156 includes at least portions of four sets of three-way lashing holes, two of which have remained intact. The dimensions of the complete lashing hole assembly at left in the illustration are: for the hole visible in the illustration, 11.75 cm by 4.8 cm; for the upper hole, 12.9 cm by 2.8 cm; for the lower hole, 10.9 cm by 2.3 cm. The depth of the hole is about 3.3 cm. The measurements of the lashing hole group at right are: for the hole facing forward, 11.8 cm by 3.6 cm; for the top hole, 11.5 cm by 2.8 cm; for the bottom hole, 19 cm by 2.3 cm. The center-to-center distances between the forward-facing lashing holes is about 27 cm. The two incomplete lashing hole assemblies at extreme left were not measured. The upper surface, just above the point where the upward curvature begins, is deliberately notched.

The lashing hole assembly at extreme right includes one peculiarity: the lower opening of the hole extends all the way to the end of the plank, forming a notch (Fig. 10). This does not seem to be a split or flaw resulting from the passage of time. All surfaces of this plank, with the exception of the obviously broken left end, are intact. The only obvious tool marks are possible chisel blows in the upper, forward edge. The wood has not been identified, but seems to be a light, soft wood of a sandy-orange color. Unlike most of the planks in the Petrie collection, it is not coated in wax.

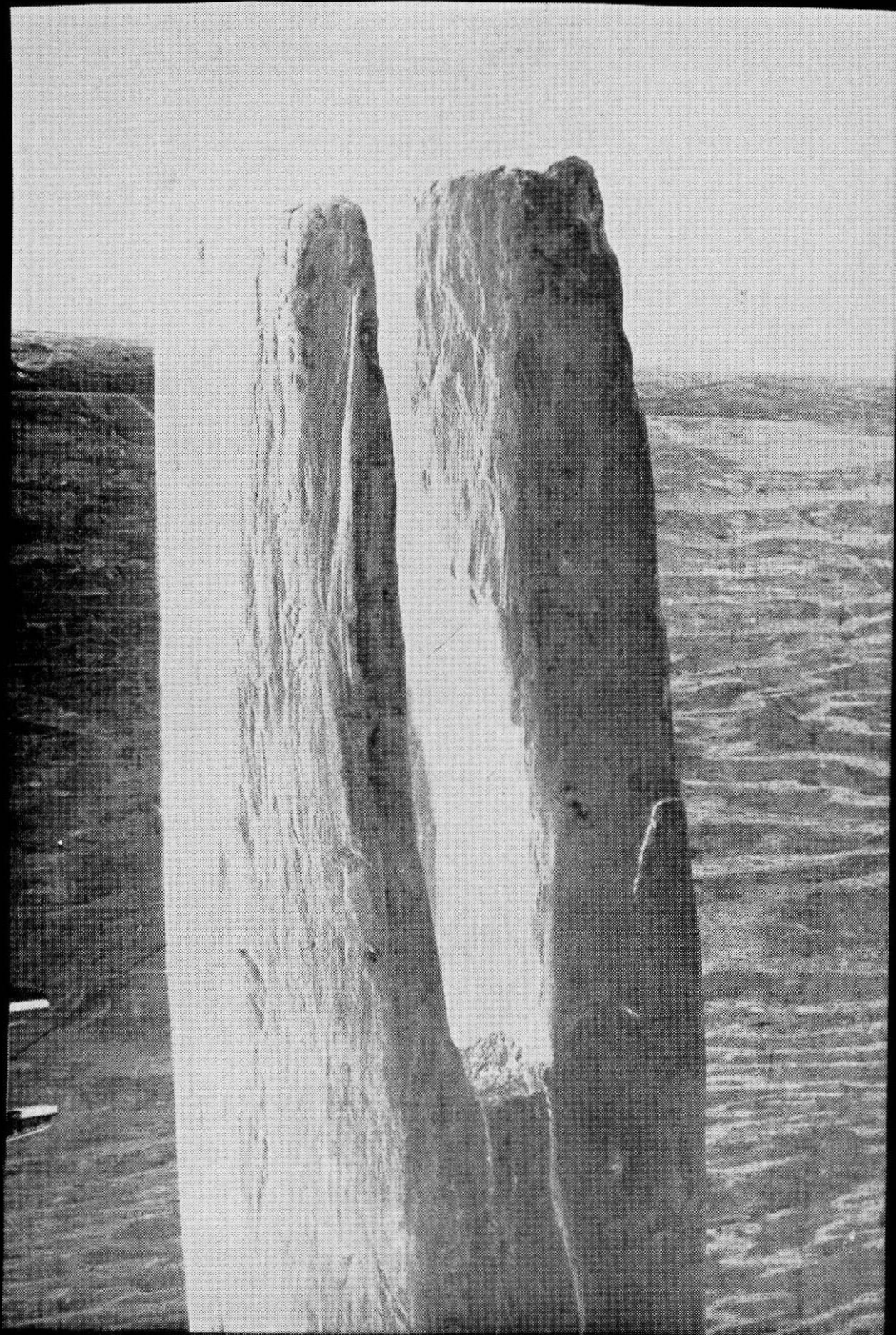


Figure 10. Notch in UC 17156. Photo by the author.

UC 17157 (Fig. 11) is badly broken, but appears to have been one of the thicker planks. Its maximum preserved dimensions are 65 cm long, 19.7 cm wide and 5.3 cm thick. This plank has apparently suffered damage since it was drawn for Tarkhan (Fig. 7.3): most of the third lashing hole from the top is now broken away. This plank is one of the only two in the collection (along with UC 17166, and probably also including the unlocated smaller plank in Tarkhan pl. X) to exhibit V-shaped lashing holes, a point whose significance will be considered below. However, these holes are oddly made, one opening of the V being fairly rectilinear and the other being amorphous. The dimensions of the one completely preserved hole are: for the more rectilinear opening, 11.2 cm by 2.4 cm; for the amorphous opening, 7.4 cm by 5.3 cm. The hole is about 4.5 cm deep. The second lashing hole from the top is preserved only in its more amorphous opening, which measures about 7.6 cm by 4.8 cm. The rectilinear opening is mostly broken away. For the third hole from the top, visible in the Tarkhan plate, the modern damage is too great to allow measurement.

As is indicated by the drawing in Fig. 7.3, (Tarkhan: pl. IX.3), there is a small hole in the bottom of the V in the uppermost hole. This could be interpreted as a three-way hole, but the lower opening is much smaller than the two upper openings, and there is not an opening in the corresponding location in the bottom of the second lashing hole (though admittedly, much of that edge of the plank is broken away). Petrie's section drawing of the plank is inaccurate in the respect that the wood separating the two openings

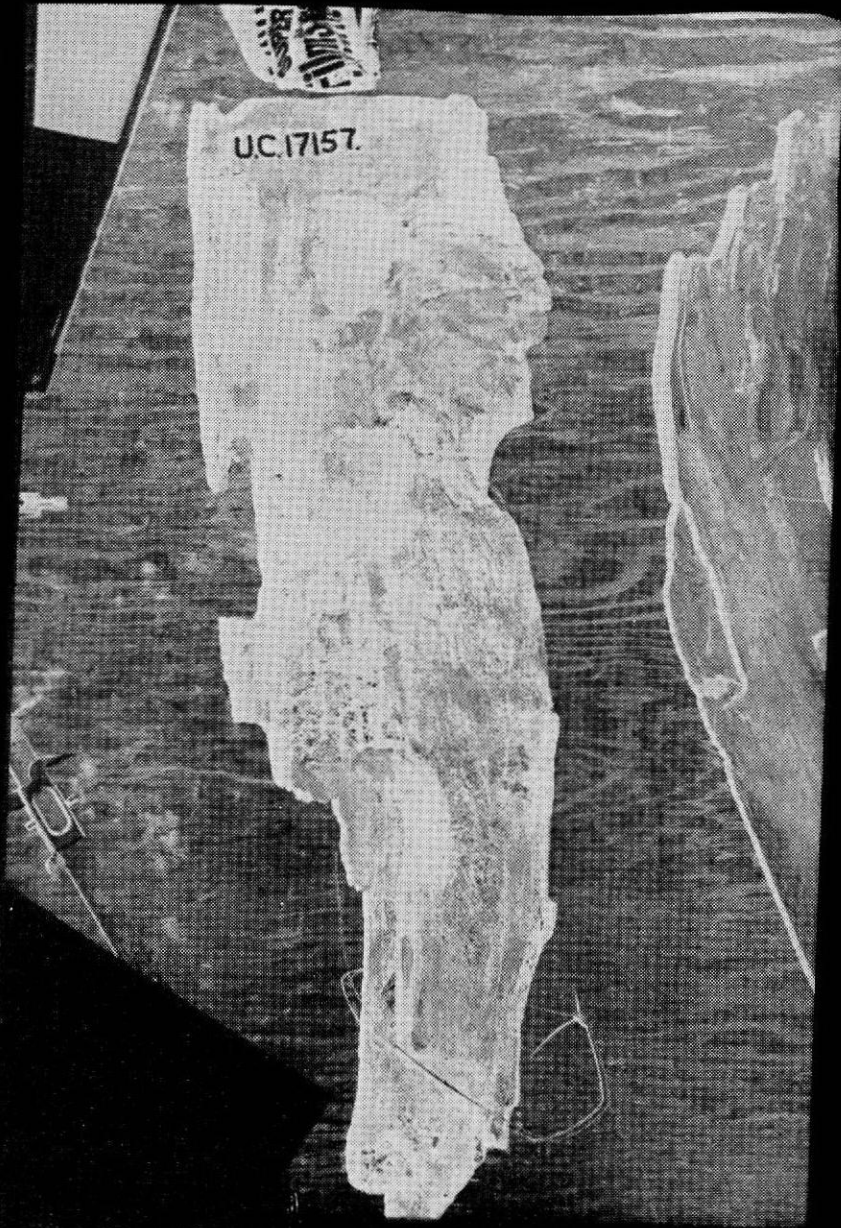


Figure 11. UC 17157. Photo by the author.

of the hole comes to a sharp edge inside the lashing hole, rather than being rounded as the drawing indicates. The bottom surface of the hole, however, is indeed rounded.

This plank is very thickly coated with wax, and no tool marks were apparent to me. Where wood is visible, it seems about the same color and texture as UC 17156.

UC 17158 (Fig. 12) is about 50.3 cm long, 15.8 cm wide at its maximum width, and about 3.5 cm thick. This previously unpublished plank has five holes in it, all simple perforations. Four are along the left of the plank as illustrated here; the other, lowermost is offset to the right. The plank appears to be preserved along its full length. The left edge seems intact, the right edge is problematic. From top to bottom, the measurements of the five holes are: 2.8 cm by 1.7 cm; 3.7 cm by 1.4 cm; 2.9 cm by 1.75 cm; 3.3 cm by 1.7 cm; and 4.2 cm by 1.2 cm. The third and fifth holes (counting from the top) have unidentified lashing material remaining in them. The center-to-center spacing of the holes varies from 9.5 cm to 11 cm. The plank is apparently not coated with wax, and seems to be a slightly darker color than UC 17156.

UC 17159 (Fig. 13) is 101 cm long, 12.5 cm wide and about 2.9 cm thick. This plank also seems to be preserved along its full length, and along its right edge. The left edge is largely broken away. Along the right edge are 13 intact lashing holes, varying from 0.8 cm to 1.1 cm wide and 1.95 to 4.5 cm long. They all perforate the plank. Four holes of similarly varying dimensions are preserved along the upper left edge. This board is fully coated with wax, so



Figure 12. UC 17158. Photo by the author.



Figure 13. UC 17159. Photo by the author.

its color and texture were difficult to judge. A few possible adze marks were noted on the side not shown in the present illustration.

UC 17160 (Fig. 14) is similar to UC 17159 in most respects. It is 102 cm long, 15.5 cm wide and about 2.7 cm thick. Its lashing holes are also primarily of the simple perforation type. Along the edge shown at right are 10 holes, whose dimensions vary from 0.8 cm to 1.5 cm wide and 2.1 cm to 3.45 cm long. Their center-to-center spacing varies from 7.7 cm to 10.5 cm. For the 11 fully- or partially-preserved holes at left, dimensions are similar. One hole, the third from the bottom at left, has the remains of lashing material in it.

This board has one peculiarity, however, which distinguishes it from UC 17159: the third hole from the top at right is joined by a mortise cut in the edge, effectively making a small three-way lashing hole (Fig. 15). The mortise, however, is noticeably wider than the lashing perforation. Whether this mortise was intended for a lashing or for a tenon is impossible to say, without parallel pieces found as part of intact objects. The perforations seem to have been made with two chisel blows at one end, but only one at the other, with the exception of the broken hole fifth from the bottom left. The plank is coated with wax, but some wood is exposed and this appears to be a sandy red color. The board is also somewhat curved, but this could be due to warpage as much as deliberate design.

UC 17161 (Fig. 16), probably from a piece similar to the preceding two, is badly broken. Its maximum length is 49.2 cm;

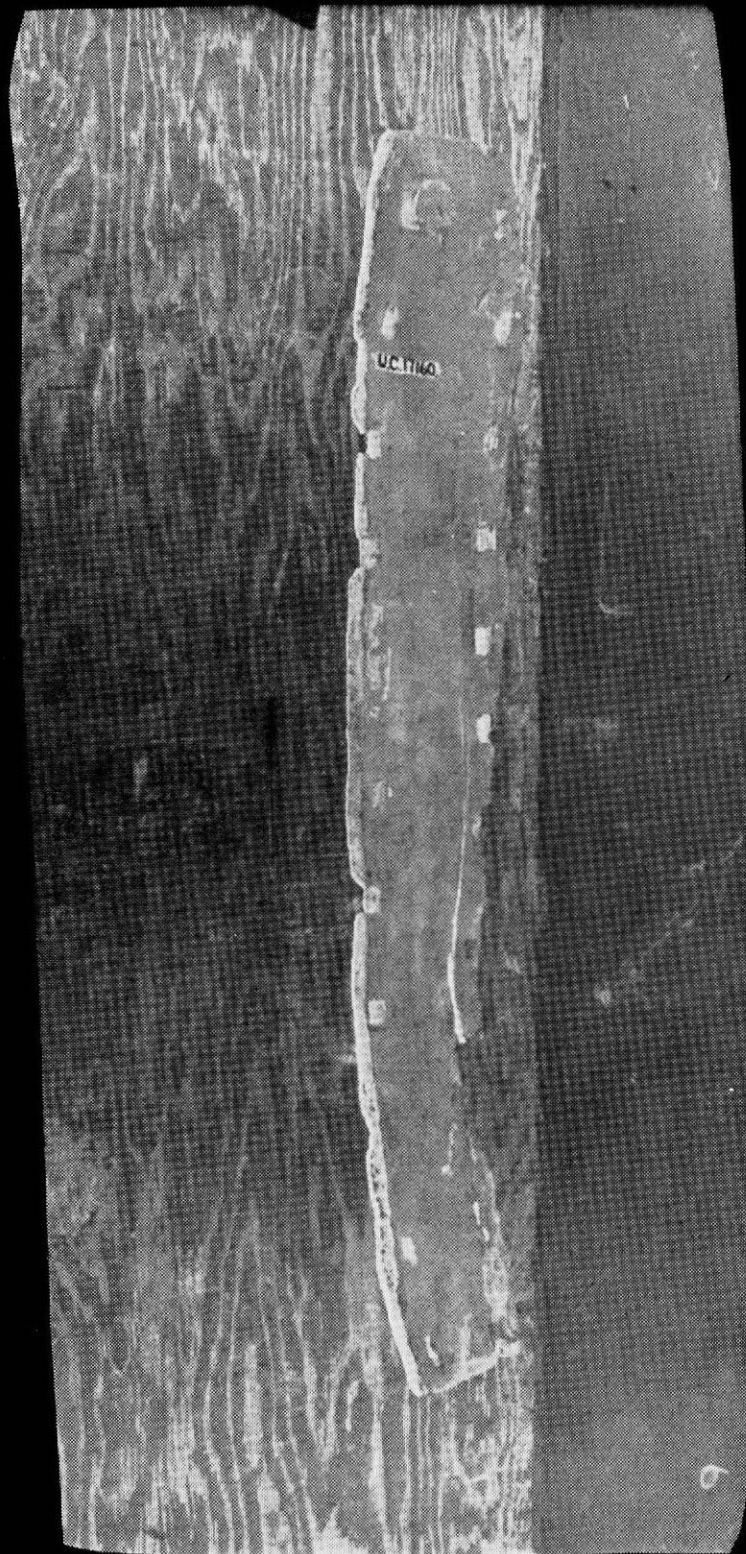


Figure 14. UC 17160. Photo by the author.



Figure 15. Three-way lashing hole (?) or tenon mortise (?) on UC 17160. Photo by the author.

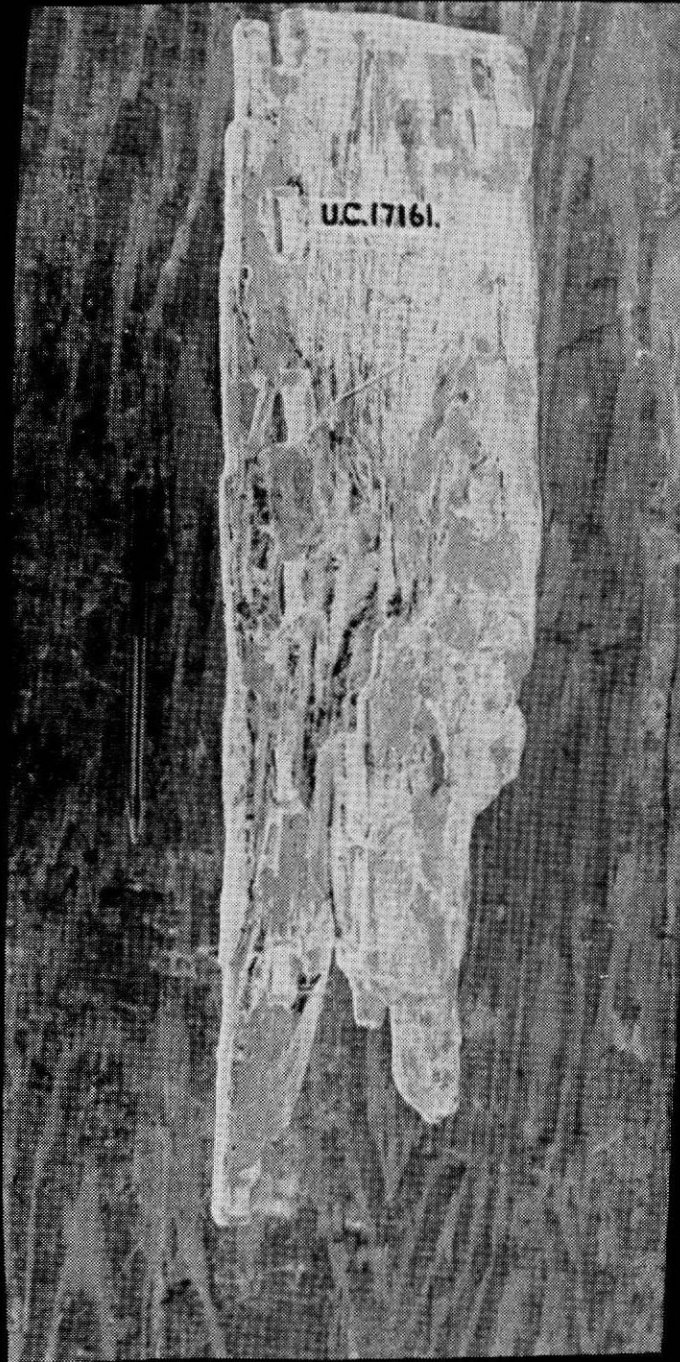


Figure 16. UC 17161. Photo by the author.

width is about 13 cm and its thickness about 3.5 cm. It has one broken and five intact lashing holes along its left edge, four complete lashing holes along its right edge. In addition, there is a hole that could be either a lashing hole that was begun but abandoned, or else recent damage to the plank. A wood chip remains in this particular perforation, and the breaks around the edge seem to be recent. The dimensions of the holes and their spacing are generally similar to the planks UC 17159 and UC 17161. The upper left and upper right edges are more or less intact in this board; the left and lower right edges are eroded and of course the bottom edge is broken off. The board is thickly coated with wax.

UC 17162 (Fig. 17) appears to be a complete example of the kind of construct partially represented by UC 17156. Its maximum length is about 145.5 cm, it is 11 cm wide and about 4.3 cm thick. This piece is marked by both its conspicuous curvature and its three-way lashing holes, characteristics it shares with UC 17156. The plank also has L-shaped lashing holes that penetrate two perpendicular faces of the board. This characteristic it shares with the boards illustrated in Tarkhan pl. IX.4 and 5, and with UC 17166, to be described next.

What is interesting about the three-way holes in this board is the fact that they are in different orientations on either side of the point of curvature.

Looking at the section drawing in Fig. 17, it can be seen that in this orientation, the two sets of holes at far left have two openings along the vertical axis, and only one along the horizontal axis. Just before the point of the transition, however, the

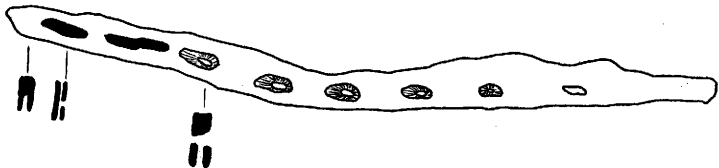


Figure 17. UC 17162. Drawing by the author, after photograph courtesy the Petrie Museum

orientation changes so that two holes exit along the horizontal axis, and only one exits along the vertical axis. This change of hole orientation also seems to be evident in UC17156. In the view shown in Fig. 9, the broken hole assembly at left seems to show penetration of the two wider surfaces and the lower surface, while the intact holes exit the upper and lower surfaces and the wider surface facing the viewer.

In the plank currently under discussion, there are four three-way lashing holes above the point of transition, four below it. The final hole on the left is an L-shaped hole which penetrates the bottom surface and the undrawn surface, but neither the upper surface nor the surface facing the viewer.

Interestingly, the lower opening of the three-way lashing hole at extreme left in Fig. 17 is, like its counterpart in UC17156, longer than the other two openings and in fact forms a notch at the end of the plank. The second three-way lashing hole from the end could in fact be said to be adjoining L-shaped holes, each of which exits the wide surface facing the viewer (in this orientation) and one of which exits the top, the other of which exits the bottom. It can be seen that while the forward-facing holes join, they are slightly staggered and obviously cut in separate operations. Aside from the L-shaped hole at extreme right, there are three small L-shaped holes along the upper side of the plank to the right of the chine, one of which still has lashing material in it.

Perhaps the most interesting point of comparison between UC 17162

and UC 17156 is the that they are in some respects mirror images of one another. In other words, if one places the planks side by side as in Fig. 18, so that the three-way lashing holes are in the same orientation, the extra-long notches in the end of each plank correspond and the apparent chine is in the same place, then it can be seen that above the transition point of each plank the lashing holes exit the top and bottom surfaces of each plank, but that in UC 17162 the hole exits a wide surface towards the viewer, and in UC 17156 it exits the surface away from the viewer. However, if either of the two boards' positions is reversed, the holes will then exit in the same direction, and the curve traced by the boards will be a vaguely boat-shaped shallow U. Assuming the orientation of the lashing holes was important to the function they were intended to carry out, it seems quite possible that these boards are meant as framing for some curved structure. Possible corroborating evidence that UC 17162 is a boat frame or futtock is the fact that the concave surface of the timber is abraded, as if it had been exposed to wear and tear, but the convex surface is mostly intact, as if it had been protected during its lifetime.

The largest and most complex of the pieces in the Petrie collection is UC 17166 (Fig. 8, right). This piece is 200 cm long, 46.5 cm wide at its wider end, 35.6 cm wide at its narrower end, and about 3.1 cm thick. This board includes three of the four types of lashing holes seen in the planks above: V-shaped, L-shaped and simple perforations. It also has at least two and possibly four edge mortises, apparently for mortise-and-tenon joints.

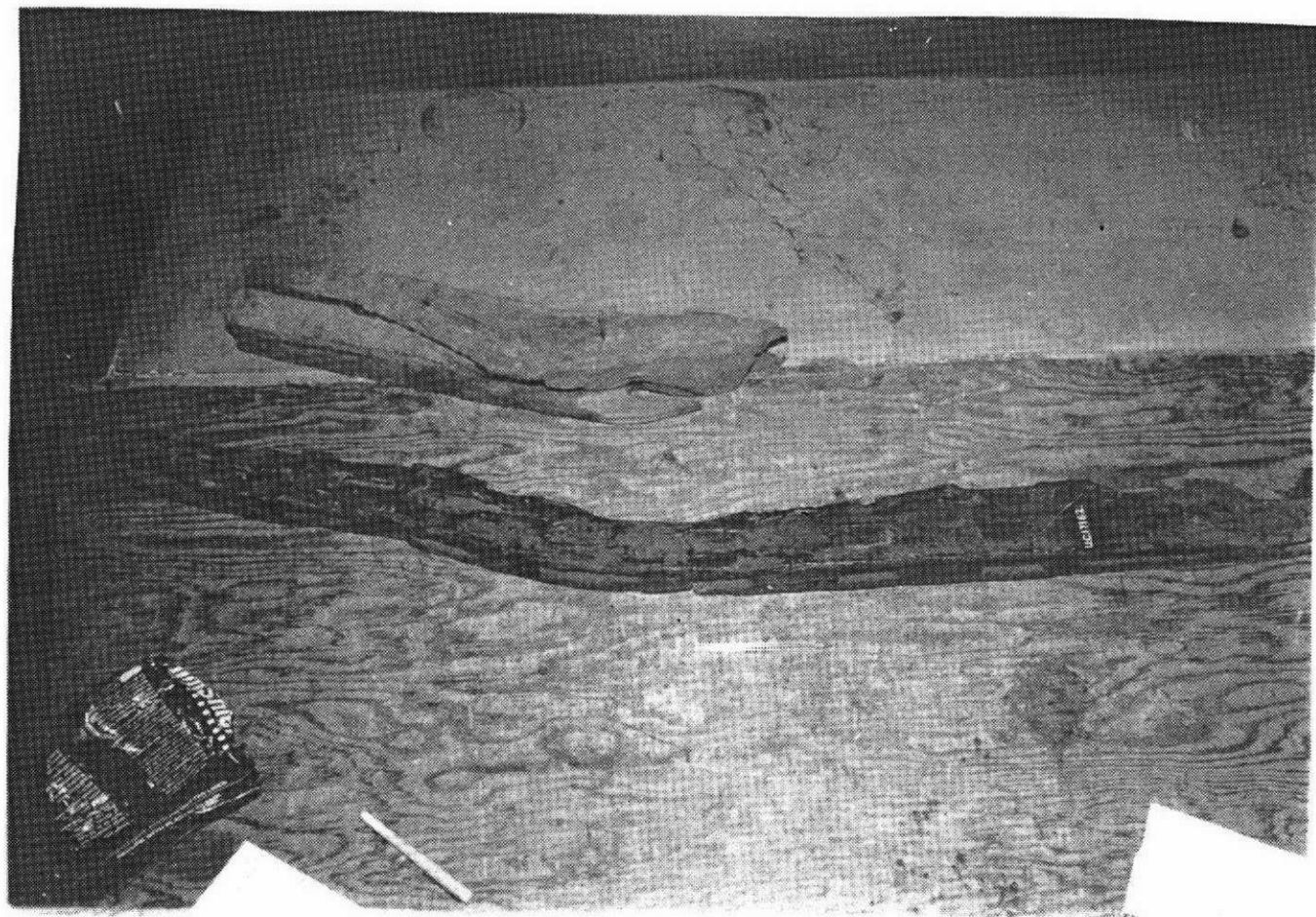


Figure 18. UC 17162 (top) and UC 17156. Photo by the author.

There are three pairs of V-shaped and L-shaped lashing holes, each lined up on opposite edges of the plank. Closeups of the pairs of V-shaped holes are shown in Figs 19-21. The hole above the V-shaped pair shown in Fig. 19 is a simple perforation, which was filled with either a wood chip or bit of lashing material in the photo taken for Tarkhan pl. X.4 (Fig. 8). The two upper pairs of V-shaped holes are about 8 cm from the edge of the plank; the lower pair is about 4.6 cm from the edge. They vary from 1.15 cm to 1.4 cm wide and from 3.2 cm to 4.2 cm long, with a depth of 2 cm to 2.8 cm. The center-to-center measurement for the upper and center V-shaped hole pairs is 78.5 cm; for the center and the lower pairs the measurement is 63 cm.

The L-shaped lashing holes opposite each pair of V-shaped holes are of similar dimensions. Between the center and lower pairs of L-shaped holes are two mortises, apparently for mortise-and-tenon joints, as shown in Fig. 22). The more rectilinear mortise at left measures 4.45 cm long by 0.7 cm wide, and 3.1 cm deep. The less regular cutting at right is 3.3 cm long and 1.2 cm wide, and 3.2 cm deep. Their center-to-center spacing is 11.9 cm. The corresponding area between the center and upper pairs of L-shaped holes is very eroded, but one may make out what could be the last vestiges of a second pair of mortises. If these mortises were meant for the insertion of tenons, the tenons would not have been pegged in place. First-Dynasty Egyptians used pegged mortise-and-tenon joinery in furniture construction (Fig. 6), but no examples of pegged joints have been found in the nautical remains so far recovered from Egypt.



Figure 19. Top pair of V-shaped lashing holes of UC 17166 (when oriented as in Fig. 15). Photo by the author.



Figure 20. Middle pair of V-shaped lashing holes in UC 17166. Photo by the author.



Figure 21. Lower pair of V-shaped lashing holes in UC 17166. Photo by the author.



Figure 22. Tenon mortises in UC 17166. Photo by the author.

no matter what the era. The edge with the V-shaped holes is intact, and there is no mortising.

There are also seven simple perforations of the plank, two at either end and three along the right edge from the center pair of V-shaped holes to the lower pair of V-shaped holes. These last three holes are generally longer than the openings of the V-shaped holes, and thinner as well. They vary from 4.1 cm to 5.2 cm long, and from 0.3 cm to 1.15 cm in width. The four found as a pair at either end are of the same approximate size as the openings of the other lashing holes. The board is mostly coated with wax, but some light red wood is visible.

Most of the boards illustrated in pl. IX (Fig. 7) in Tarkhan, as mentioned above, remain unlocated, but from their drawings in the publication they seem to be on the whole similar to other planks in the collection. Fig. 7.2 has simple perforations along its two edges; Figs 7.4 and 7.5 both have L-shaped lashing holes along their edges. Fig. 7.5 would appear to be intact along its full length; the artist's drawing of Fig. 7.4 clearly indicates that this one is broken at the top as depicted in the plate. The smaller board in pl. X of Tarkhan (Fig. 8) seems to be a miniature version of the large one: both V-shaped and L-shaped lashing holes appear to be visible, along with what could be similar simple perforations at one end. If anything, the smaller plank is more complex--it seems to have at least one V-shaped lashing hole at its lower left side, opposite a V-shaped hole on the lower right. UC 17166 has V-shaped holes along only one edge. The smaller plank also seems to have a

large, square perforation at its lower right. From its location, this could perhaps best be explained as a damaged V-shaped hole. But if the hole completely perforates the plank, perhaps it was meant for the insertion of a square timber (thwart? stanchion?). Of course, it is impossible to say at present whether this board has edge mortises.

The intended functions of these planks have never been determined with certainty. As mentioned above, at least one of the planks was worked into a coffin, but differed from the types normally used in such constructs so that it appeared certain to Petrie that the board had had some other prior use. Others were used simply as roofing material, so that their lashing holes appeared to have no function; again, this indicates that the boards had been made with some other use in mind. Petrie initially postulated that the boards were the remains of wooden houses, and this identification persisted in the literature into the latter half of this century (Bradford, 1954: 305-306; Goodman, 1964: 160).

Petrie thought that the boards would have been lashed together so that their edges overlapped, and provided a model of such lashing (Fig. 7). He considered that this overlapping provided an explanation for the "niched brick" architecture of the Early Dynastic period with its walls with recesses and outcroppings, rather than simple flat planes.

It is obvious that such overlapping boards are exactly the prototype of the stone carving of panelled or recessed doorways, so well-known in the Old Kingdom; the design of these was clumsily copied in brickwork. ...

Here, then, we have the actual timbers of

the wooden houses which served as the prototypes of the stone forms, just as in Greece the wooden architecture originated all the stone forms. Why should such wooden houses have been invented? The present custom gives the explanation. As soon as the green crops come up, the villagers move out into the fields, and build huts of maize stalks to dwell in, so as to be close to their cattle at pasture and to enjoy the cooler air which comes over the vegetation. Here they live until their crops are done and the Nile rises. In the same way early Egyptians probably moved to and fro each year. A wooden house would be used by the more prosperous people, and as it needed to be moved twice a year, the lashing together was the best method of construction (Tarkhan: 24).

In 1941, however, Henri Frankfort challenged Petrie's interpretation. Writing on the earliest niched brick architecture in Egypt, Frankfort argued that such styles originated in Mesopotamia, not Egypt. He further noted that Petrie's proposed method of lashing was not the only possible way in which the boards could be lashed together. This is certainly true--Petrie himself excavated Old Kingdom coffins with boards with the same kinds of lashing holes (with the exception of the three-way lashing hole); all the coffins had edge-joined, not overlapping planks (Fig. 23; Petrie and Mackay, 1915: pl. XXV).

Frankfort went on to offer a much more provocative hypothesis:

The perforations (in the boards) must, of course, be explained. But we know of a most important class of products which were demonstrably built of lashed and pegged timbers. These are the ships of the ancient Egyptians. It is interesting that some of the boards at Tarkhan are curved, most unsuitably if they were lashed together to resist climate changes and to protect the inhabitants of movable wooden houses from "gaps which let the wind blow directly in," but very understandably if they derive from boats. The most natural

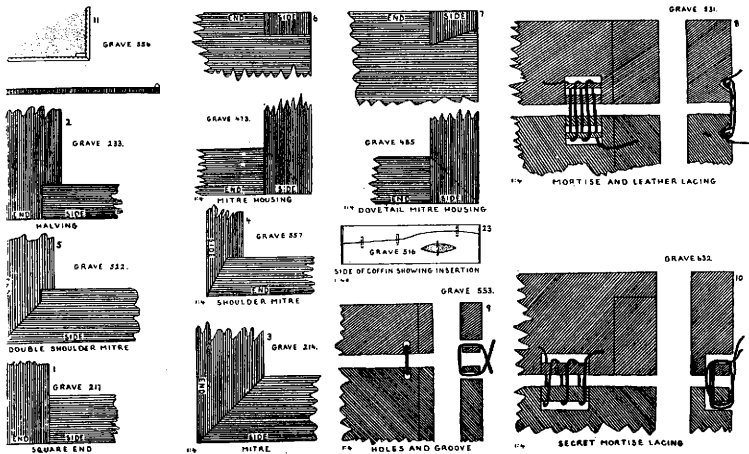


Figure 23. Joinery in Old Kingdom coffins. Petrie and Mackay, 1915: pl. XXV.

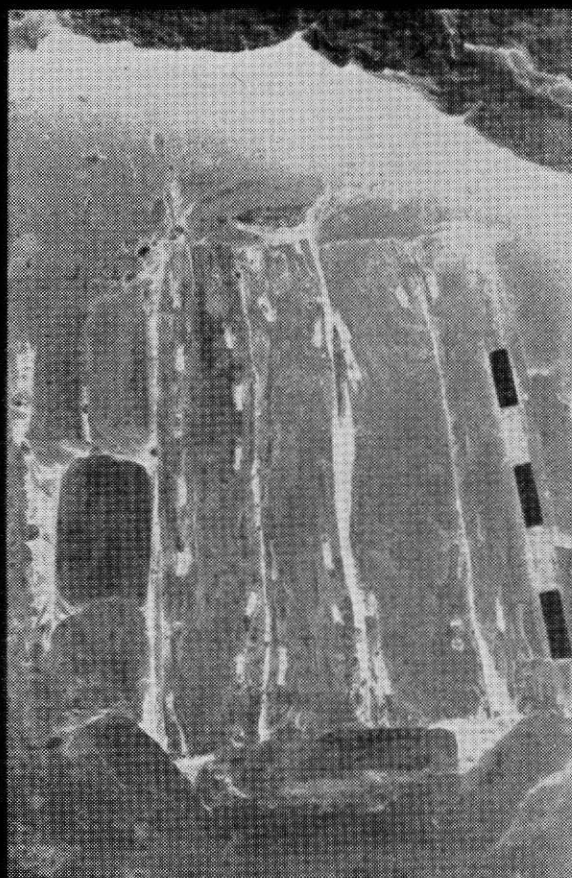
explanation of the Tarkhan boards is, evidently, that they represent raw materials salvaged from wrecked or disused Nile craft which were un-suitable for the living by reason of the holes but which served well enough for coffins (Frankfort, 1941: 343).

Frankfort's assumption here may be tested in two ways. First, are the boards' constructional features similar to features observed in Egyptian boats? Second, do the boards' constructional features have parallels in any other types of wooden constructions from Early Dynastic Egypt?

To take the second question first, the answer seems to be a very qualified "yes." A single photo of a First Dynasty coffin lid from tomb 3500 at Saqqara shows boards that seem much like UC 17158 and those similar to it (Fig. 24; Emery, 1958: pl. 122 B). It can't be ascertained from this photo whether the holes are simple perforations or L-shaped holes. As mentioned above, only the plank illustrated as Tarkhan pl. IX.4 (Fig. 7.4) was certainly part of a coffin, and it has L-shaped holes; but Petrie thought it unusual enough to believe that its use in the coffin was secondary.

UC 17166 in particular is much too large to have been used in a coffin, since Early Dynastic coffins were normally built to hold a body in contracted position. Bed pieces have simple perforations, but the frame pieces are normally pole-shaped, not flat boards. Fragments of a chair (Fig. 5) found by Emery at Saqqara have no apparent points of resemblance to any of the Tarkhan planks.

As to Petrie's original thesis, it must be noted that even if one agrees with Frankfort as to the origin of niched brick architecture, that still does not eliminate the possibility of wooden houses built



b. Top of coffin of sub-burial No. 3

Figure 24. Early Dynastic coffin lid. Emery, 1958: pl. 122.b.

of lashed boards in First Dynasty Egypt. As early as 1927, Firth disputed both the idea that niched brick architecture derived from wood construction and that Egyptians could have had enough timber to supply its populace with wooden houses (Firth, 1927: 10-11). As we have seen above, that may not necessarily be a true statement, but building remains from Pre- through Early Dynastic times provide no support for the idea that any of the Tarkhan planks are house timbers. Among the earliest examples of Predynastic architecture come from Hemamieh and Hierakonpolis. These show that from the Amratian period on, wattle-and-daub huts were the most common habitations. There is even problematic evidence for mud-brick construction as early as the Badarian period.

Caton-Thompson found nine mud hut circles at Hemamieh, dated to between S.D. 35 and S.D. 45, all completely abandoned by S.D. 50 (Brunton and Caton-Thompson, 1928: 86). These all had mud walls about a foot (0.3 m) thick, which were assumed to be no more than a base for a superstructure of thatch or some other material (Brunton and Caton-Thompson, 1928: 83). A similar construction was reported by Hoffman (1980: *passim*) at Hierakonpolis, but here the hut was rectangular rather than oval. The rectangular pit was dug into the Nile silts; then the rough faces were plastered over with a mixture of mud, mud clods and rectangular mud brick debris. There was evidence for eight light timber posts used to support a wattle-and-daub superstructure.

Evidence for mudbrick construction comes from El Khattara, the site referred to above in the discussion of chronology. It will be

remembered that the sherds at El Khattara indicated a Badarian culture, but lithics and radiocarbon dates suggested that the site was contemporaneous with the Gerzean period. Therefore it seems difficult to decide whether the blocky, unfired mud bricks discovered in circular mounds there should be dated to the Gerzean or Badarian periods. Strong evidence for Gerzean mud-brick buildings comes, however, from a model house discovered at El Amrah (Fig. 25; Randal-Maciver and Mace, 1902: 42 and pl. X.1 and 2). Randal-Maciver and Mace suggested that such buildings were constructed of "wattle and mud," but the fact that the window and door seem to have been framed with wooden beams suggests to me a more permanent construction. Mud bricks were certainly used in late Gerzean/Naqada III tomb architecture, as attested by the painted Tomb 100 at Hierakonpolis and a series of similar tombs at Naqada (Kemp, 1973: 38).

In the Early Dynastic period, which most concerns us here, evidence exists for wattle-and-daub huts like those from Hemamieh and Hierakonpolis, as well as for large, imposing brick structures and large reed buildings. Murray (1939: 38) described a rectangular hut about 4 m long by 3 m wide, which was built of low rubble walls about 60 to 70 cm high. Murray did not hypothesize on what kind of superstructure the hut may have had, but it seems similar in concept to the huts described above in Hoffman and Caton-Thompson.

Evidence for reed buildings comes from ivory plaques found at Naqada and Saqqara. The plaques seem to show structures (Fig. 26) that find a quite close parallel in large reed buildings which were



FIGURE 193—*Predynastic pottery model of a house. El-Amrah, Egypt.*

Figure 25. Gerzean house model. Singer, 1954: fig. 193.

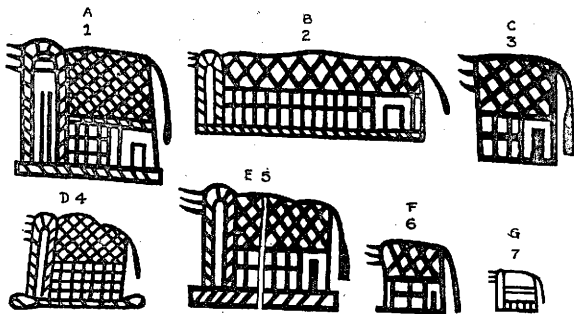


Figure 26. Early Dynastic house representations. Emery, 1939: 99.

constructed into the 20th century by the Marsh Arabs of Iraq (Fig. 27) . Evidence for a "protodynastic" or Naqada III/Early Dynastic post and reed temple was found at Hierakonpolis by Hoffman (1979: 131,132). Brick structures include the royal tombs of Abydos and Saqqara described above, as well as a brick "palace" structure also found at Hierakonpolis by Hoffman and Fairservis (Fairservis, 1971-72: 29ff). This structure was built entirely of mud bricks in the niched style. In an explicit reference to the Tarkhan planks, Fairservis noted that there was no evidence of any wood paneling in the building, which had been covered with a mud plaster. Fairservis further noted Frankfort's rejection of Petrie's explanation of the origin of the Tarkhan planks, bringing up again the notion that they may be boat remains.

The conjecture that the Tarkhan planks are house timbers has one last hope for rescue: the possibility that such houses were built by non-Egyptians. The theory that Egypt's pharaonic civilization was founded by Mesopotamian or other "eastern" invaders will be considered below. For the moment, it suffices to mention that there is also no evidence of such lashed-together wooden buildings in western Asia. Mud brick construction goes back at least to the eighth millennium B.C. in Iran (Flannery and Neely, 1969: 34). Delougaz, Hill and Lloyd (1967: v) make the categorical statement that Mesopotamian houses were built "almost exclusively of sun-dried mud brick."

The fallacy of Petrie's explanation is, of course, that niched-brick architecture in Egypt is contemporaneous with the Tarkhan

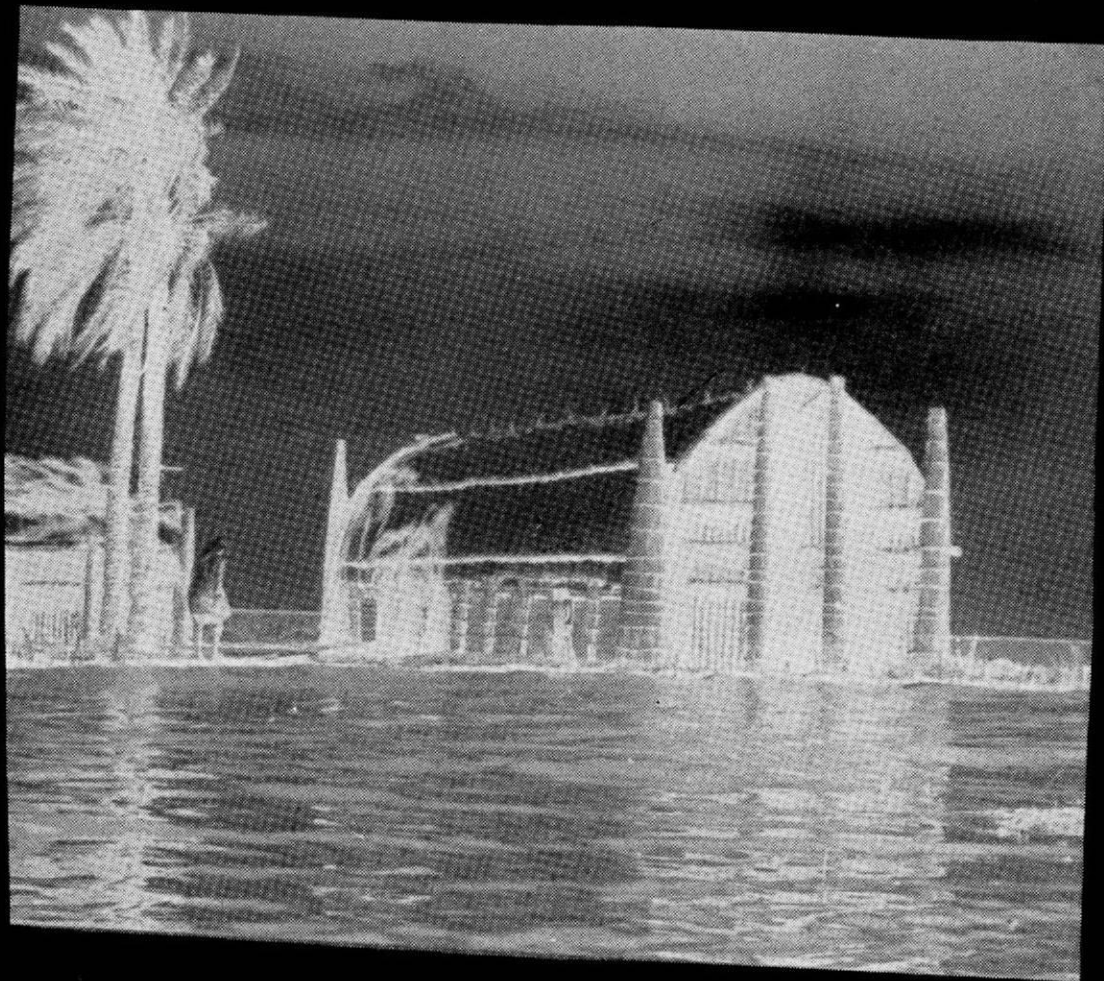


Figure 27. Marsh Arab house from southern Iraq. Thesiger, 1964: fig. 93.

planks; there is nothing to suggest that the former descended from the latter. In the above survey, we have seen that there are no parallels at all in any type of construction, and especially building construction, for the curved planks UC 17156 and UC 17162, and for the big plank UC 17166.

On the other hand, there are many parallels between surviving examples of Egyptian ship construction and the planks, particularly UC 17166. This plank is 2 m long, at the low end of the range of lengths indicated for the side planking of the Chicago Dashur boat (Haldane, 1984: 2) but approximately the length of planks used in the construction of a Nubian naggr described by S. Clark (1920: 49).

The plank has cut in it three pairs of V-shaped lashing holes and three pairs of L-shaped lashing holes, both of which are paralleled in the Fourth-Dynasty Cheops boat. The plank also has simple perforations in pairs at each end, which correspond in location to temporary lashing holes in the midship garboard strake of the Cheops boat (Lipke, 1984: 66, fig. 42; Lipke has kindly informed me that in the Cheops boat, these "strategic" holes are L-shaped, not simple perforations). UC 17166 also has two, and possibly four, edge mortises for mortise-and-tenon joints, paralleled by the Cheops boat. The dimensions of the Cheops boat's tenons average 10 cm by 7 cm by 1.5 cm to 10 cm by 3.5 cm by 1.5 cm. In this boat, tenon mortises were cut both parallel with and perpendicular to its plank faces. The edge mortises in UC 17166, as noted, are 3.3 cm by 1.2 cm by 3.1 cm and 4.45 cm by 0.7 cm by 3.1 cm, respectively. Of the seven simple perforations in the plank, one is extremely distinct

and rectilinear. This perforation, which is near the edge of the plank next to a pair of V-shaped lashing holes, is 5.2 cm long and 1.15 cm thick; the other two are similar long and thin, perhaps more suitable for the insertion of a tenon than for having a rope passed through them. It's conceivable that these could be mortises for tenons joining a plank that sat flush on top of UC 17166; this could explain why there are no mortises in that edge of the plank. A similar situation exists in the bottom planks of the Cheops boat for most of their lengths; except at midships, the garboard rests on top of the bottom planks.

The thinness of this plank is probably the strongest argument against it being from a boat. Its 3.1-cm thickness is slight compared to the planks of the Chicago Dashur boat, whose thinnest listed plank dimension is 6 cm (Haldane, 1984: 21) and to the planks of the 24-foot naqqar, whose strakes were about 10 cm thick (Clark, 1920: 48). However, a boat shorter than the Dashur boats might be expected to have thinner planks.

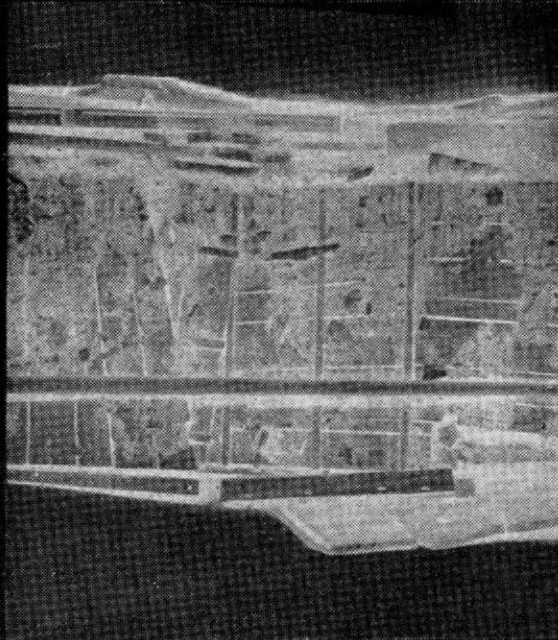
A thickness of 3.1 cm, however, is not impossible for the planks of an ancient boat: the planks of the classical Greek Kyrenia wreck are between 3 cm and 4 cm in thickness (Steffy, 1985a: 79), as are those of the Kinneret boat discovered in 1986 in a Galilee boatyard (J. Richard Steffy, personal communication); the Roman boat at Herculaneum has planks even thinner (Steffy, 1985b: 520). Admittedly, it is risky and probably even inappropriate to draw on such late boats for parallels. But until more ancient boats are found, they serve to point out that usable boats could be and were

built with thin planks in antiquity. Certainly UC 17166 is in itself evidence that such thin planks were being made and used for something.

As for UC 17156 and UC 17162, their curvature and the fact that UC 17162 is abraded on its concave side but intact on its convex side raises the possibility that they may have been frames or futtocks. But it must be admitted that the Cheops boat's frames have no lashing holes and that the Dashur boats have no frames at all. The frames of the Kyrenia ship were squarish, with floors sided and molded at about 9 cm, half-frames sided and molded at about 8.5 cm. This is not out of line with the dimensions of the two timbers under discussion; UC 17156 would be "molded" about 11.2 cm and "sided" about 6.4 cm; UC 17162 would be "molded" about 11 cm and "sided" about 4.3 cm. Its length of 145.5 cm compares favorably with the Kyrenia ship's futtocks.

The other planks have few parallels with Egyptian boat components. A photograph of an unidentified plank from the Cheops boat shows what seems to be a plank with simple perforations along one edge; this would seem to be part of the ship's superstructure (Fig. 28; Nour, Iskander, Osman and Moustafa, 1960: pl. XXXVII). Without a scale or any description it seems risky to leap to comparisons with any of the Tarkhan planks.

The evidence here falls short of demonstrating that any of the Tarkhan planks are Early Dynastic boat remains. I believe they are, but proof could only be in the form of an intact boat of that period or at least remnants from a context that leaves no doubt as to their



Part of the boat's hull which was mostly covered with the layer of matting of *Hypha. striatella* fibres, from which was spread a layer of stucco.

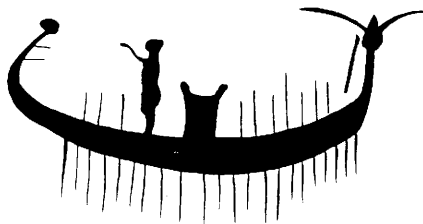
Figure 28. View of Cheops boat timbers in situ. Note plank at bottom with perforation along edge. Nour, Iskander, Osman and Moustafa, 1960: pl. XXXVII.

identification. But the points of similarity are striking, and no tenable alternative hypotheses have been advanced. At the very least, UC 17166 proves that most of the joinery techniques used in the construction of the Cheops boat, i.e. lashing through V-shaped and L-shaped holes and mortise-and-tenoning, were already well-developed in the First Dynasty, and thus may be supposed to have had their origins in the Naqada III or late Gerzean period (at least). How far back such techniques go, and at what point they came to be applied to boatbuilding, is at present a matter for speculation.

CHAPTER V
REPRESENTATIONS OF BOATS

Our evidence for the internal construction of early Egyptian boats--what materials were used, how they were fastened--is necessarily indirect. With the possible exceptions of the Tarkhan planks and some badly preserved and poorly documented First Dynasty boat graves described below, we have no boat remains from the period in hand and so we must rely on general observations on Pre- and Early Dynastic carpentry. For the boats' external appearance, however, we have a great deal of evidence, in the form of vase paintings, petroglyphs, models and a large number of other types of representations. In the Early Dynastic period, we have evidence for shape and maximum dimensions from a large number of holes that once contained buried boats, presumably for the use of kings or notables in the afterlife.

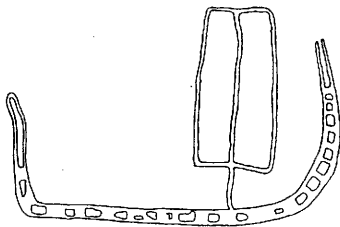
By far the largest number of published boat representations from the Pre- and Early Dynastic periods are petroglyphs; vase paintings are a distant second. In general, the vessels depicted in these two media can be divided into three classes: sickle-shaped boats, angular boats and papyrus rafts. The angular boats may be divided into three subtypes, angular-asymmetrical, angular-symmetrical and angular-very asymmetrical; a variant of the angular-asymmetrical type seems to be datable to the end of the Naqada III period. Figs. 29-30 show what may be considered to be typical examples of each type. Many authors have attempted to make finer distinctions, but such efforts have resulted in a great deal of confusion and



A



B



C

Figure 29. A--Papyrus craft. Cervicek, 1974: fig. 265. B--sickle-shaped boat. Petrie, 1974b: Corpus 41 U. C--Angular-asymmetrical boat. Engelmayer, 1965: pl. XXX.2.

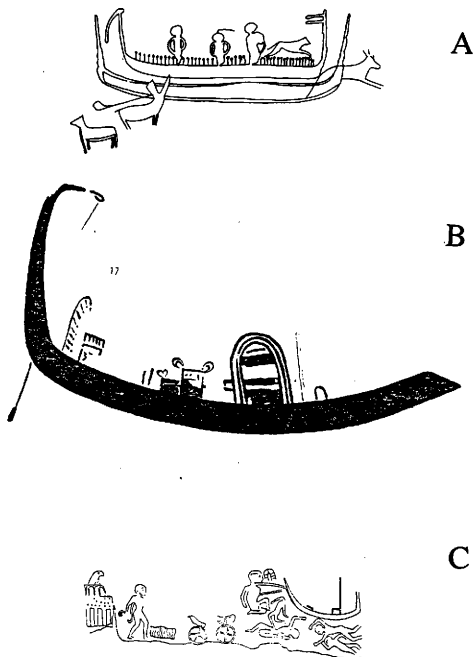


Figure 30. A--Angular-symmetrical boat. Cervicek, 1974: fig. 360.
 B--Angular-very asymmetrical boat. Landstrom, 1974: fig. 17.
 C--Angular-asymmetrical boat from the Early Dynastic period.
 Needler, 1967: 87, fig. 1.

contradiction. My reasons for preferring a wider, more general typology will be explained as the discussion progresses. For convenience, the reader should bear in mind the following criteria for the types. Wooden sickle-shaped craft find their prototypes on the Gerzean decorated pots. In most cases their sheer lines remain parallel to their base lines from bow to stern, and they normally have no stem or stern posts; only palm fronds at the bow. It is this failure for the hull to converge to a point at bow and stern that convinces me that the hulls are not made of reed bundles. And, as will be argued in more detail below, the pot boats do not appear until shortly after the appearance of planks and copper woodworking tools.

Papyrus rafts, which are most often depicted in petroglyphs, are those whose sheer and base lines converge to a point; they have upraised but incurving posts, often with the end of one post topped with a triangular affair with "antennae." Angular craft are those with straight stem or stern posts. They may have one or two high ends. Frequently the stern is triangle-shaped. This boat type, probably also wooden, is the only type of craft that is ever shown under sail. The majority are somewhat asymmetrical, most with a typical triangular-shaped stern post and rather vertical bow; a later variant, of which most examples seem to be datable to the Early Dynastic period, has lost the triangular stern and has a more gently upswinging bow. A few of the boats are very asymmetrical with a high stem post and no stern post. A few are symmetrical fore and aft. It should be noted that Egyptian boats had no keels, and that

what are referred to for convenience as stem and stern posts were only decorative posts placed at the bow and stern, not structural members giving the vessels longitudinal strength.

This typology really only holds true for the Gerzean/Naqada III period. Only a handful of models come from the Neolithic and Badarian periods; models and a few painted vases datable to the Amratian are inconsistent with each other and with the great majority of Gerzean representations. Beginning with the late Amratian/early Gerzean period, however, drawings were standardized and types are relatively easy to discern, although there are always oddities and bastardizations that prevent definitive organization. All of these types persisted into the Early Dynastic period, when a few new types were added as well.

PAINTED CERAMICS

The first reported find of a prehistoric boat representation is apparently a decorated jar found at Abydos in 1870 (Fig. 31) and purchased by the Bode Institute of the Pacific School of Religion in 1930 (Kay Schellhase: personal communication). Before 1891, Petrie noted boat petroglyphs near Aswan that he suspected were to be dated "long before any of the monuments of Egypt that we know" (Petrie, 1891: 75). Jacques de Morgan observed boat petroglyphs only a few years later, between Aswan and Kom Ombo (Cervicek, 1974: III n. 268).

Large numbers of pots decorated with boats came to light in



Figure 31. Decorated jar found at Abydos. Photo courtesy of the Bader Institute of Biblical Archaeology.

Petrie's excavations at Naqada and Ballas and in de Morgan's research at Abydos in the late 19th century, as well as in the cemeteries of Toukh, El Amrah, Gebel el-Tarif, Zawaidah, etc. (de Morgan, 1896: 159). The boat pots are normally associated with the Gerzean culture of upper Egypt, but they have been found recently in the Delta site of Minshat Abu Omar (Wildung, 1984: 267).

De Morgan and Petrie had no qualms about identifying the depictions as boats, but the identification was challenged in the early 20th century and the controversy lingers to the present. As an alternative hypothesis, C. Torr suggested that the pictures were representations of desert forts (Torr, 1898: 32-35; see Aksamit, 1981: 156, n. 1 for an extended bibliography on this subject). A nearly universal consensus exists today that boats are the intended subject, but as recently as 1983, an article was published in which the author attempted to demonstrate that the boats were in fact platforms of sticks (Monet Saleh, 1983: *passim*). The fact that sickle-shaped boats are sometimes shown in conjunction with angular boats, which are frequently depicted with sails or steering paddles, would seem to remove all doubt as to the proper interpretation.

Aside from Gerzean boat pots, complete Amratian ceramics, sherds from all Predynastic periods, and complete ceramics from the Naqada III and Early Dynastic periods include boat representations. Because these ceramic representations are the most easily dated, we will begin our discussion of boat representations with them.

Depictions on white cross-line ware seem to show the general type of boat depicted on the decorated ware, but in a less

conventionalized fashion. The apparent breadth view shown in Fig. 32 (Petrie, 1974b: pl. XV.49; Corpus pl. XXIII.70 M) shows paddles on either side, two cabins and a plant in the bow, all characteristic of the great majority of the Gerzean boats. According to Petrie (1974b: 14), this is to be dated at between S.D. 31 and 34, as is the boat shown in sheer view in Fig. 33 (Petrie 1974b: pl. XXIII.1). This one also has cabins and paddles, though only at bow and stern, not all along the boat as in Fig. 31 and most of the Gerzean boats.

A much more conventional depiction of a sickle-shaped boat appears on a white cross-lined vessel, British Museum 53881 (Fig. 31), and it is this vessel that points up the problems of dating based simply on pottery styles. It was pointed out above that the boat drawn on this pot is absolutely in the Gerzean style, while the vase itself is made in the Amratian style. The boat is so Gerzean in appearance that both Scharff (1928: 263) and the British Museum date it to the Gerzean period, despite the style of the pottery. But the apparent fact that white cross-lined ware persisted into the Gerzean period calls into question the date of the above-described white cross-lined vessels, neither of which is provenienced. Stylistically the depictions in figs 32-33 are cruder than those of the decorated ware, but no cruder than numerous petroglyphs. This makes giving a date to the appearance of sickle-shaped craft with any confidence next to impossible. In my opinion, the lack of evidence for advanced woodworking skills as early as S.D. 34 militates against such an early date for the sickle-shaped boats.

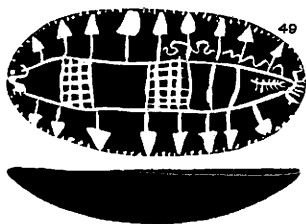
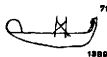


Figure 32. Breadth view of boat on white cross-lined dish. Petrie, 1974b: pl. XV.49.



A



B

Figure 33. A--Sheer view of a boat on white cross-lined dish. Petrie, 1974b: pl. XXIII. B--Potmark from Neqada. Petrie, 1974a: pl. LII.71.

One other possibly Amratian sherd is of great importance: a bit found at Mostagedda and identified as showing a "high-hulled," possibly Mesopotamian vessel (Brunton, 1937: pl. XXXVIII.4). This sherd (Fig. 34) is in the white cross-lined style, and has been adduced as evidence for angular boats in the Amratian period (Kantor, 1965: 17). This drawing is atypical, and does not necessarily have to be accepted as a boat at all, in my opinion; in any case, we do not have the complete representation and so it is impossible to prove that the high structure shown is at the bow or stern--it could as easily be a deck construction of some kind. The second high projection to its right must be such a structure. Whether this boat is angular or not is important to the question of whether "Mesopotamian invaders" were in the Nile valley during the Predynastic period, and this sherd will be discussed further below.

Finally, a late Amratian grave (S.D. 40 or earlier) at El Amrah yielded a mud box with a charcoal drawing of a papyrus raft on its lid (Fig. 35; Randall-MacIver and Mace, 1902: 36, pl. XII). Of the "Amratian" representations described so far, this is the only one that has a sure provenience and which can be confidently dated. This is typical of the representations more often seen in petroglyphs, and so it can be said that this artistic convention, and presumably the raft it was based on, were well-developed late in the Amratian period.

For the Gerzean period proper, the overwhelming majority of boats on ceramics are the boats on small pots. Boats similar in style are occasionally found on other types of objects, in particular a small

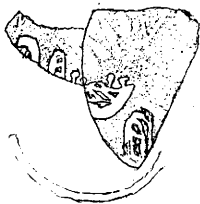


Figure 34. White cross-lined sherd from Mostagedda said to have an angular boat representation on it. Brunton, 1937: pl. XXXVIII.



Figure 35. Papyrus raft drawing in charcoal on Amratian mud box.
Randall-Maciver and Mace, 1902: pl. XII.

terra cotta casket currently in the British Museum (BM 32639; Aksamit, 1981: 1, n. 5). In 1913, Newberry was able to locate 159 pots with 288 boats in various collections around the world. Through correspondence, I have been able to locate 14 more, but since a great deal of buying, selling and trading has no doubt gone on since 1913, there may well be some overlap. Since most of the vases in museum collections lack provenience, there is no small probability that some of them are fakes.

Decorated ware may have evolved during the late Amratian period, according to Hoffman (1980: 129) who found a few sherds with cream-colored slip and red and white paint at the Amratian hut site described above. Classic decorated ware begins at S.D. 40, according to Petrie (Corpus plates XXXIII ff), but boats were not depicted until S.D. 45 (Petrie, 1974b: 18). Typically, the boats have two cabins, paddles extending from the bottom of the hull, a kind of standard on a pole mounted on one of the cabins, and more or less stylized drawings of palm fronds in the bows. Normally, but not always, the line of paddles is interrupted for a space between the two cabins. Within these limits, there is a great deal of variation: standards show numerous differences; hulls range from radically curved to almost straight; details of the cabins change and palm fronds are sometimes so stylized that they are not recognizable as such. Human beings are sometimes shown in conjunction with the boats, but almost never are they shown certainly in the boats (this is not true of similar boats in other media). One or two problematical examples may show sails (figs 36.d, p. 141), but in my

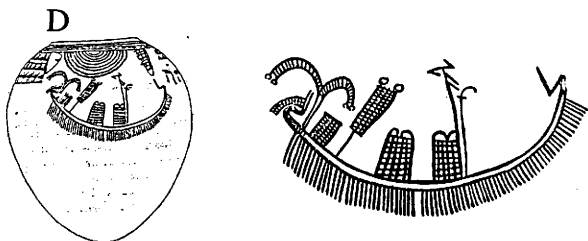
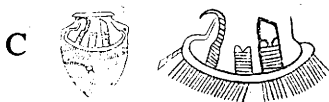
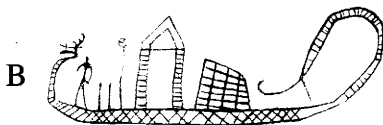


Figure 36. Papyrus craft (?) drawn on decorated ware. A and B--Quibbel, 1905: pl. XXII.C; C--Petrie, 1901b: pl. XVI. D--Bowen, 1960: 144.

opinion this is doubtful. While most of the decorated-ware boats seem to be wooden, a number of anomalous decorated Jars (Fig. 36) apparently show papyrus craft. Two of these have all the accoutrements of sickle-shaped boats. They are only odd in their bent bow and stern decorations.

Deck Structures

Joanna Aksamit has cataloged 10 different styles of cabins representations on decorated jars, and there are many others. Characteristic curved hooks on the cabin roofs point left, right, in and out. Some (Petrie, 1974a: pl. LXVI.9) show sharp rather than curved hooks; another, from Naqada (Fig. 37) shows an apparent canopy over the curved humps on top of the cabin (Petrie, 1974a: pl. LXVII.14); this is much like the baldachins often shown on Middle Kingdom funerary boats (Landstrom, 1970: 22; an even closer parallel to those funerary baldachins is the boat at upper left on the painting from Hierakonpolis Tomb 100). This same boat also has low structures between and to either side of its cabins, which might be interpreted as a rail of some kind.

Aksamit believes these cabins were reed structures, and in light of the preponderance of reed and twig architecture described above, it seems a reasonable deduction to make. The curving hooks on the cabins are reminiscent of the curved "arches" on representations of First Dynasty reed buildings, and it should be pointed out that the deck structures of the Cheops boat were roofed with palm matting and

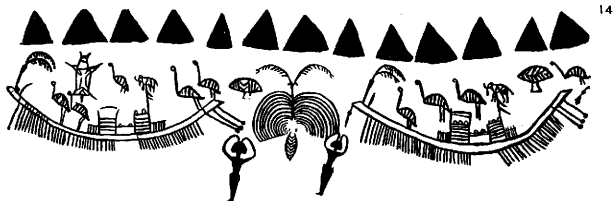


Figure 37. Boats with elephant standards. Petrie, 1974a: pl. LXVII.14.

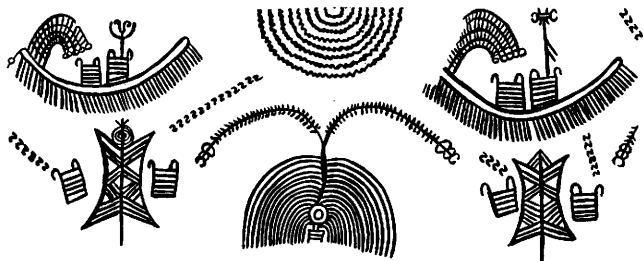


Figure 38. Sickle-shaped boats with cabins shown "ashore." Petrie, 1974b: pl. XIX.41 U.

built of wooden posts carved to resemble papyrus stalks (Lipke, 1984: 73, fig. 47). Neither Petrie nor any other author has suggested that the form of the cabins is indicative of a particular chronological period, and given the large number of unprovenienced examples, there would really be no way to check such a theory. It is worth noting that the sickle-shaped boat shown in sheer view on the Amratian plate described above (Fig. 33; Petrie, 1974b: pl. XXIII.2) has completely different cabins from those of the decorated jars, or of the white cross-lined jar of controversial date: its cabins are rectangular, with X-shaped cross pieces. The white cross-lined dish that shows a boat in breadth view in Fig. 32 shows only cross-hatching where the cabins would be, an indication but certainly not proof that the structures were roofed with matting. One other boat representation of the Gerzean period, from an oddly shaped boat drawn as a pot mark on a vessel at Naqada, shows two vertical posts and two diagonal cross-braces of a kind frequently shown on petroglyphs of papyrus rafts.

Drawings on some of the decorated jars, for example the one reproduced as type 4IU in Petrie's corpus (Fig. 38), indicate that the cabins might have been removable. This calls to mind the stern shrines on the Late Bronze age ships in the Thera frescoes, found in a house in the destroyed settlement of Akrotiri. Paintings from other rooms of the building show what are apparently the same types of cabins removed from the boats, possibly for use in religious rituals (Brown, 1978: 639). The cabin of the Cheops vessel is not an integral part of the ship's structure, and apparently is removable

(Lipke, 1985: 29). On the papyrus boat depicted in charcoal on an Amratian mud box (Fig. 35), the deck structure is a simple arch. Boats depicted on ceramics in the Naqada III and Early Dynastic periods also have little deck structure detail. The angular boat under sail on British Museum 35324 has only a lean-to of some kind (Fig. 39). Drawings of similar boats from the First Dynasty show different types of deck structures (Fig. 40; a, Emery, 1939: 110; b, Petrie, 1903b: pl. XII.195) but none with as much interpretable detail as the boats on the decorated jars.

Paddles

The boats of the decorated jars are shown with paddles, not oars. This is confirmed by the Gerzean shroud of Gebelino, which shows men using paddles (frontispiece). The sickle-shaped boat in sheer view on the Amratian dish described (Fig. 33) above has only paddles fore and aft; the Amratian boat shown in breadth view (Fig. 32) has paddles from stem to stern, but nine on one side and only eight on the other. In contrast, the sickle-shaped boat on white cross-lined jar BM 53881 and all similar representations on decorated jars have a large number of paddles. Attempts have been made to count these and estimate from them the size of the boats (Aksamit 1981: 159), but corruptions in the successive recopying make any specific deductions hazardous. Aksamit's provisional conclusion that the boats could reach 40 meters (based on 50 paddlers spaced 30 cm apart) is surely well off the mark, given the much smaller maximum

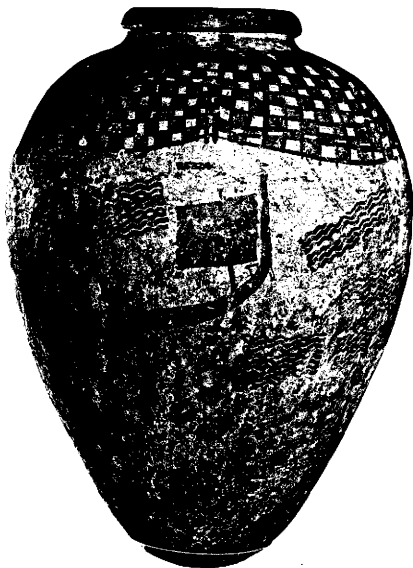
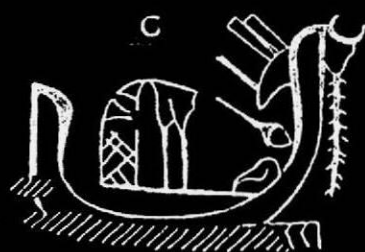


Figure 39. BM 35324. Photo courtesy of the British Museum.



A



B

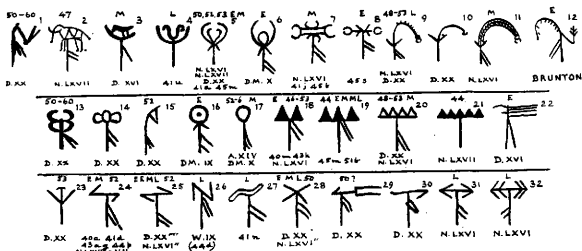
Figure 40. Early Dynastic angular-asymmetrical boats. A--Emery, 1939: 110. B--Petrie, 1903b: pl. XII.

size of vessels from the First Dynasty royal tombs. Steering paddles are not normally represented but do appear occasionally. The vessel from Naqada with the low rail between and on either side of its cabins (Fig. 37) apparently shows three steering paddles on each of its two boats, though these might as well be interpreted as pendants or tassels. There is little from the decorated jars that could give us an idea of how the paddles were made. Normally they are depicted only as strokes, with the blades left undrawn. The Amratian boat shown in breadth view (Fig. 33) has spade-shaped, triangular blades that are paralleled in a few petroglyphs.

Standards

The standards depicted on the boats are one of the most interesting and controversial aspects of the decorated jars; they may have little to do with nautical technology per se but could cut to the heart of the use and range of working boats and any religious significance we might impute to the boat pots. Fig. 41.a shows Petrie's original compilation of ensigns; 41.b shows a more thorough, but still incomplete, compilation undertaken by Aksamit. Students of this aspect of the drawings divide themselves into two schools: those who believe the standards are port-ensigns with geographical and political significance and those who believe the standards are religious symbols. My own inclination is toward the latter view.

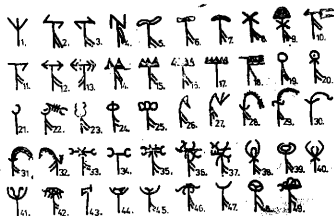
The two crude Amratian sickle-shaped boats referred to above have



ABOVE ENSIGNS. E Early. M Middle. L Late. Skp Type. Numbers = S. D.

BELOW. A. Am'ah. D. Diospolis. DM. De Morgan "Age-Pierre". N. Naqada. W. Walkuright Gerze.

A



B

Figure 41. Compilations of Gerzean standards. A--Petrie, 1974b: pl. XXIII.5. B--Aksemit, 1961: fig. 32.

no ensigns on them; nor do any Early Dynastic vessels. They are a strictly Gerzean feature (though analogous structures reappear in Old Kingdom hieroglyphs; see Miosi, 1975: 442ff, etc.). Petrie thought the ensigns were primarily geographical signs, with any religious symbols among them used in this context for the secular purpose of identifying the home port. "Such," he wrote, "would be very likely to be adopted as port signs where such deities were worshiped, like the signs of the owl of Athene or the caduceus of Hermes" (Petrie, 1974b: 18).

In contrast to this opinion, Newberry (1913: 132) argued that the standards are "cult-objects", and that the purpose of the boats was to serve as sacred vessels for priests to use in symbolic journeys of gods up and down the river (1913: 133). Newberry cataloged all the standards known to him and compared them to Old Kingdom nome (provincial) ensigns. He came to the conclusion that the standards were for the most part related to ensigns of the nomes of the Delta (1923: 135). According to Newberry, the most prevalent ensigns are the "harpoon" ensign, the ensign of the seventh nome of lower Egypt, the hill ensign of the sixth nome, and the crossed arrows ensign of the fourth and fifth nomes of lower Egypt.

Unfortunately for Newberry's thesis, he fudged his data, and classified all variations of the "zig-zag" sign (see Fig. 41.a 24, 25, 26; 41.b 2, 3) as a single sign, the "harpoon." However, the historic harpoon nome ensign (Fig. 42) bears a tenuous relationship at best with the sign that Petrie called a harpoon (Fig. 41.a 29, 30) and that Newberry took over as the archetype for all vaguely

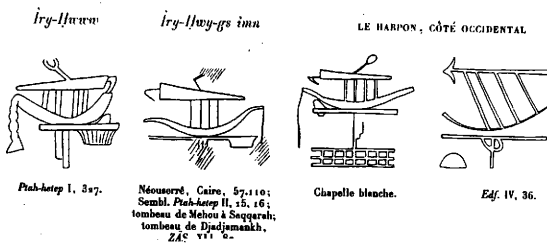


Figure 42. Harpoon nome ensigns. Montet, 1957: 69.

similar ensigns. It is interesting that the historic harpoon nome ensign looks like a sickle-shaped boat with a harpoon over it. However, all but one of these Predynastic "harpoon" representations are double-ended, as none of the historical harpoon representations are, or, for that matter, as none of the actual Predynastic harpoons are.

The "hill" emblem is by far the most common (by Newberry's count, on 66 pots alone or with others; most common, that is, if one does not count all variations of the zig-zag sign as "harpoons"). It is not attested in any Lower Egyptian nome ensigns of the Old Kingdom listed by Montet, but does figure in the "mountain-snake" ensign of Upper Egypt (Montet, 1961: 129). A mountain sign alone on a standard pole does appear as a hieroglyph denoting the name Ha, a god of the Delta Harpoon nome (Montet, 1957: 70). If Ha was indeed a "mountain" god (Arnett, 1982: 11), however, his origin was probably not in the Delta. The same sign appears in a number of hieroglyphs with various meanings.

The cross sign on the Predynastic boats, of which Newberry counts 14 examples, is identified with the symbol of the goddess Neit, and as an emblem of the First Nome of Lower Egypt. But this is not self-evident. In the Old Kingdom and even Early Dynastic times, this symbol had evolved into two distinctly-drawn crossed arrows on a figure-eight shield (Fig. 43), but these details are absent from the Predynastic drawings. There is no shield nor anything to convince one that the cross is meant to represent crossed arrows.

The elephant, which appears on a single example (Fig. 37), is

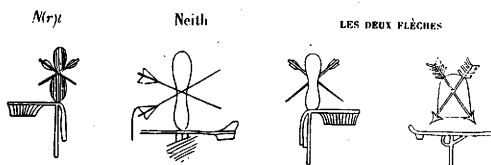


Figure 43. Neit emblems. Montet, 1957: 75.

said to be the cult-object of Elephantine (an island opposite Aswan); this is paralleled, however, in Amratian pot marks from Naqada (Petrie 1974b: 19) and the elephant was, according to Petrie, well enough known in the Nile and North Africa generally so that one could not use it to fix a region. Twenty-two tree-branch signs are identified with Herakleopolis and three falcons are identified with the Horus of Hierakonpolis. Strange horns, crescents and disembodied arms were left unexplained, as they did not continue into historic times in any form.

Of all the above-described standards, only the hawk of Hierakonpolis continues into the Early Dynastic period and Old Kingdom unchanged. A number of standards are shown in other media, datable to the Naqada III period. Some of these, like the mountain sign and hawk in a crescent on the macehead of King Scorpion (Fig. 44), are paralleled on Gerzean boats. Others, like the "Set" animal and jackal do continue into the Old Kingdom, but these are never seen on boats.

Newberry does not interpret a group of standards that show a double-pointed arrow (?) which Petrie identifies with the god Min (Fig. 41.a 31, 32; 41.b 12, 13); a similar emblem appears on a slate palette from El Amrah, Naqada III, Early Dynastic and Old Kingdom examples of the Min emblem show not a double-pointed arrow but a double "bolt" (Fig. 45).

A single example from Naqada shows a "fish" ensign (Fig. 46.a), which Arthur Evans compared with the fish ensigns on the "frying pan" boats from the Cyclades (Fig. 46.b; Evans, 1964: 26). Evans was

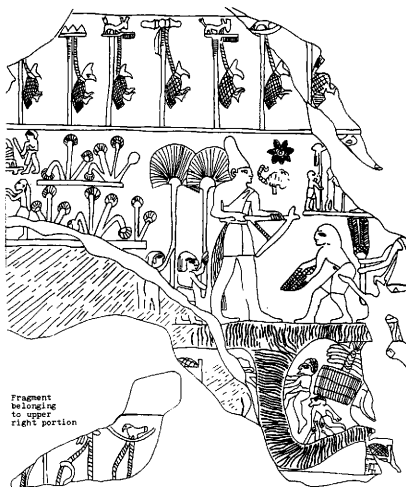


Figure 44. The Scorpion Macehead (unrolled). Arnett, 1982: pl. L.

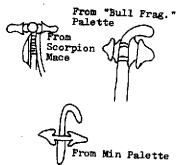


Figure 45. Min emblems. Arnett, 1982: pl. LIX.b.

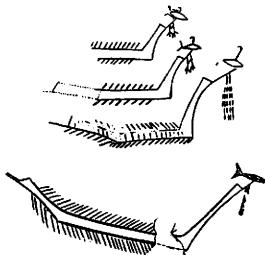
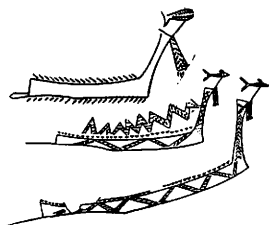
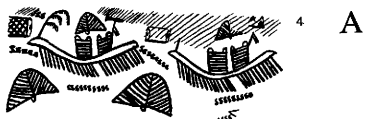


Figure 46. Predynastic and Early Cycladic boats with fish ensigns.
 A--Petrie, 1974a: pl. LXVI.4. B--Raban, 1984: II, III. 1.

a partisan of direct contact between Pre- and Early Dynastic Egypt and the Aegean, but the Cycladic boat representations are about a millennium later than the Gerzean boats. The resemblance is striking, however.

Discounting the identification of the harpoon as dubious and admitting that the mountain sign was subject to multiple interpretations in the historic period, it becomes difficult to agree with Newberry that the standards are cult emblems of the Delta. On the other hand, none of the boat standards, with the exception of the hawk of Hierakonpolis, continues into the historic period as a nome ensign, and few are seen in other Predynastic representations of standards (Fig. 47). These details taken along with the fact that these pots are quite rare in Egypt and apparently served a purpose in funerary rituals lead me to conclude provisionally that the standards had specific religious connotations in the Gerzean period which were lost in later times.

Palm Fronds

The palm fronds in the bows of the boats have been interpreted variously as a kind of proto-sail, as a shade for the boat's look-out, as a symbol of life after death, as a second type of ensign and, most convincingly, as a simple ornament. According to Petrie, the branches were drawn singly on the earliest examples, doubled on later boats then, multiplied into a "grove" on the latest examples (Petrie, 1933: 14). On the other hand, there are examples

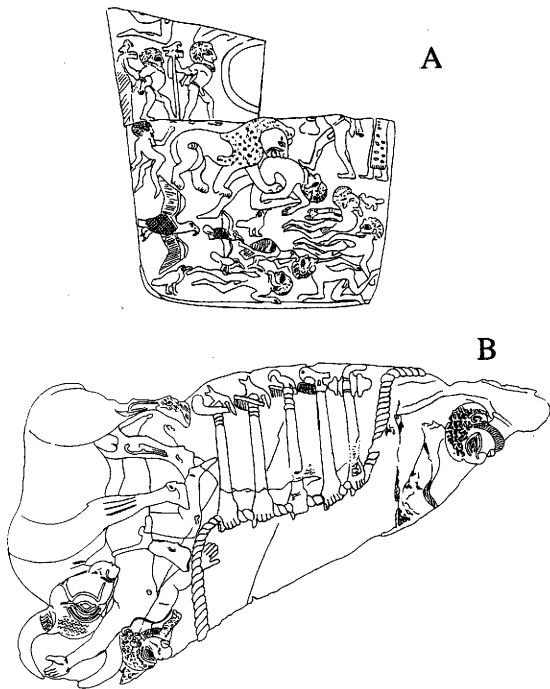


Figure 47. Naqada III standards. A--Battlefield Palette. Arnett, 1982: pl. XLII. B. B--Bull Fragmentary Palette. Arnett, 1982: pl. XLIII.

of vases that have both an "early" and a "late" form on the bows of their boats (Petrie, 1974a: pl. 66.2).

Even if the bow decoration was intended as an ornament, it may well have served the incidental function of a sail. Earlier in this century boats in Cameroon were observed "more or less propelled by a huge raphia frond being fastened like mast and sail in one, and serving the purposes of a sail" (Thomas, 1923: 97). Sea trials on boats with such branches in the bows show that in a light breeze, a branch can help a small boat develop a speed of up to one knot (Marstrander, 1976: 22). Aksamit, however, is dubious of this possibility, as well as of assertions of some that the precise species of the plant can be identified (Aksamit, 1981: 160).

Tassels

The pendants hanging under the bows of some of the boats (Fig. 33; 88) are, in my opinion, either decorative or uninterpretable. Aksamit (1981: 161) believes them to be mooring ropes, but it seems unlikely that such ropes would be hung overboard. Objects hanging from the bow would not be very useful as fenders, a use suggested by Winkler and Petrie (Aksamit 160, n. 67), since the overhanging portion of the bow would be unprotected. Wood and root anchors as suggested by Boreaux (1925: 24) seem unlikely since all of the Bronze Age anchors we know were made of stone; in any case, the anchors would be safer on deck than hanging loose from the bow.

People

People are depicted in conjunction with boats on decorated jars, but rarely are they clearly shown in or on them. Those which show passengers or crew have frequently been suspected of being forgeries. The drawing on Petrie's Corpus type 46K (Fig. 48; Petrie, 1974b: pl. XXI; Corpus pl. XXXIV) shows men punting the boat and others standing high in the bows and on a raised platform; plate XXI of Prehistoric Egypt dismisses this without comment as "fake." In fact, the men standing with their arms at their sides are frequently associated with oddly executed boats, all on unprovenienced ceramics.

El-Yahky has argued on the basis of 12 of those pots that the "armless" men are associated with a second tradition of painting boat pots, and that the invisible arms could mean the depictions are statues or mummies (Fig. 49; El Yahky, 1981: 81) This seems unlikely, since monumental sculpture and extended mummies are so far unknown in the Gerzean period. El-Yahky's collection includes the boat with the platform described above; it includes a boat (Fig. 49.9) that is in most ways identical with a boat currently in the *Archaeologisches Institute* at the University of Zurich which M. Sguaitamattl of the museum suspects of being a fake (personal communication); and it includes seven others whose authenticity has been questioned by several other authors (El-Yahky, 1981: 77 n. 9). Aksamit dismisses them all as fraudulent (1981: 156 n. 5 and personal communication).

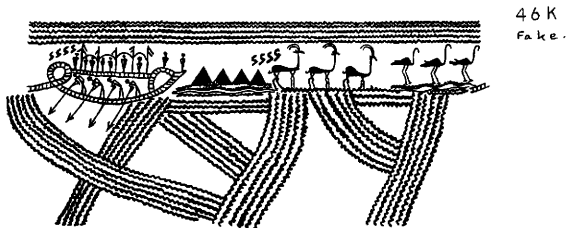


Figure 48. Illustration from a "fake" decorated Jar. Petrie, 1974b: pl. XXI.46 K.

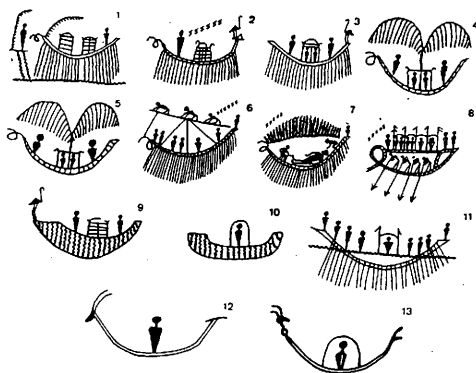


Figure 49. Armless figures from suspected decorated vases. El Yahky, 1981: fig. A.

I mentioned above the possibility that the decorated jars had a part in Gerzean funeral rituals. The only real evidence for that is the fact that all the intact examples whose proveniences are known come from graves and Petrie's statement that decorated jars were often in the same location from grave to grave, in front of the hands (Petrie, 1939: 34-35). On the other hand, Petrie believed that the boats on the decorated ware show common working boats, not boats of the dead. He based this on his opinion that the standards had temporal, geographic significance and upon the fact that aside from the dubious examples mentioned above, none of the boat pots show men or corpses on the boats (Petrie, 1937: 34).

While no intact examples of boat pots are known to have come from outside of graves, Arkell and Ucko were incorrect in writing (1965: 153) that no sherds from boat pots have been found in settlement debris. Caton-Thompson found a number of sherds at Hemamieh she described as having paddle-strokes on them (Brunton and Caton-Thompson, 1928: 100, 102, 103, 105). Peet (1914: 4) found decorated sherds in settlement debris at Abydos, though he did not specify whether any of the decorations were parts of boat representations. As he pointed out, however, "These serve to show us that the painting of vases was not confined to the better examples we find in tombs."

This may lead us to back off somewhat from the assertion that the standards were mostly of funerary significance, though it has yet to

be shown whether boat pots designed for burial with the dead differed from any boat pots which might have been artistic creations for the enjoyment of the living. Petroglyphs show a boat type with a sickle-shaped hull that lacks the conventionalized accoutrements of the boat pots, as we shall see below. Again, the large number of unprovenanced examples and the ever-present threat of forgeries makes this an area in which confident judgments are impossible.

Of the Naqada III and Early Dynastic boat representations on ceramics, the best known is British Museum 35324 (Fig. 39), mentioned above in the discussion on deck structures. This vase includes one of the two earliest representations of a sail (the other, a more or less contemporaneous stone censer from Qustul, will be discussed below). BM 35324 shows an angular boat, completely different from the boats typically shown on decorated ware. It finds its best parallels among objects dated to Kaiser's Naqada IIIb (Anonymous, 1982: 41), though some have proposed that it be dated to the First Dynasty (W.M. Davis, 1980: 15-20). The sail is square, stepped well forward, with no indication of rigging. Other examples on ceramics of boats under sail with slightly different hull and sail forms come from First-Dynasty pots (Fig. 50; Petrie, 1903b: pl. XII). These characteristic First Dynasty profiles shows the bow raked forward; the boat on BM 35324 has a vertical bow and similar boats have slightly incurving bows. In the First Dynasty boats, the sails are moved aft towards the middle of the hull, and shown extending from the top of the mast to the deck. Other First-Dynasty boats drawn on pottery seem more like papyrus rafts (Fig.

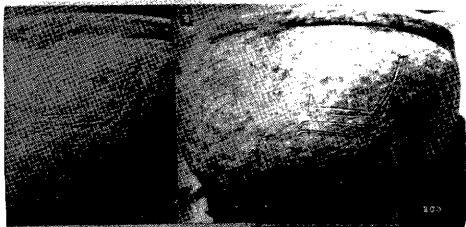


Figure 50. Sailing craft on Early Dynastic vessels. Petrie, 1903b: pl. XII.266.



Figure 51. Early Dynastic papyrus raft (?). Petrie, 1901a: pl. VIII.13.

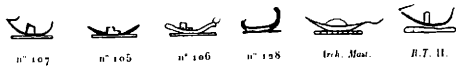









Figure 52. Early Dynastic boat determinatives. Lacau, 1959: fig. 4.

51; Petrie, 1901a: pl. VIII.13).

Also from the First Dynasty are the first literary references to boats, all inscribed or impressed on pottery. A seal impression found in a Third-Dynasty tomb refers to the "Vinyard Prince of the Boats of Seth Peribsen," a reference to a Second-Dynasty king (Massouliard, 1948: 458). And from a set of Early Dynastic pots found in the Step Pyramid of Zoser there are some pots inscribed with the earliest known boat names. These pots are identified with an obscure king whose name is written with the single hieroglyph , which O'Mara (1979: 159) follows Grdselogg (sic; Lacau, 1959: 50) in reading "Weneg." Names of four boats are inscribed on Early Dynastic pots from the Step Pyramid, some perhaps proper names of individual boats, some more likely generic names for boat types. Fascinatingly, they include two of the three major types we are dealing with here (Fig. 51).

On vase 105, Lacau reads the sign , the name of a schematic-looking boat with a chair-shaped deck structure and a steering paddle on a stanchion. Patrick O'Mara has kindly suggested the translation "The Great One, analogous I should think to the British HMS Mighty." On vase 106 are the hieroglyphs  and the determinative sign  which has a strikingly sickle-shaped hull in profile. Lacau reads the name Wild or Savage Bull (i.e. taureau sauvage) and proposes that this is the proper name of a particular boat.

Lacau's vase 107 includes a boat determinative of very schematic design, with even less detail than 105. This vase includes a hieroglyph  that Lacau transliterates without translating: dw.-t..wi. The name is said to appear on the Palermo Stone, however, in a record of ship construction under the Fourth Dynasty pharaoh Snefru. Breasted translates the name of the boats built by Snefru as "Praise of the Two Land" ships, apparently a generic name (Meiggs, 1982: 63). Finally, a boat determinative with an angular, assymetrical profile is shown on Lacau's vase 128. This is accompanied by two hieroglyphs which Lacau reproduces without transliterating or translating: . Lacau (1959: 52) calls this last word a "boat name" without specifying whether he believes it to be a generic or proper name. O'Mara provides the transliteration sb or sbt and suggests that the reading is simply "cargo boat" or "transport boat."

Other Early Dynastic boat determinatives appear on vessels from Abydos (Petrie, 1901a: pl. VIII.6 and Petrie, 1900: pl. VIII.9) and Saqqara (Lacau, 1959: 51, and note 4). Lacau transliterates , from a vase found by Quibbel in a private tomb at Saqqara, as "hr." According to O'Mara, this is a preposition carrying the sense of "under." Petrie (1901a: 26) suggested only that such inscriptions indicated that the vessels in question were part of the equipment for the king's boats.

PETROGLYPHS

By far the largest number of surviving, published Pre- and Early Dynastic boat representations are petroglyphs. Petroglyphs also show the widest variety of boat types: angular, sickle-shaped and papyrus craft are all represented. Egyptian petroglyphs in fact present a record of nautical evolution that extends into classical, medieval and even modern times and make a fascinating study in themselves.

The disadvantage of the petroglyphic record is, of course, that with current techniques it is almost impossible to date accurately. One early method was to try to link rock pictures with local archaeological assemblages (Myers, 1949: 375). Unfortunately, any such method depends on the unprovable assumption that the rock artist stayed at the site long enough to leave datable tools or pottery. A more sophisticated approach is to take into account all aspects of the rock art site: principal subject matter, related subject matter, technique, degree of patination (see below), type and quality of surface, elevation above sea level and stylistic features (Davis, W.M., 1978: 216). The traditional and so far the best method is by comparison with datable parallels. Moreover, many petroglyph sites have stratigraphy: that is, some pictures can be seen to overlay others, and it can thus be proven which are the older.

The possibility of coming up with an absolute dating method depends on the process of "patination," the leaching of trace elements from the interior of the rock to form a dark patina,

sometimes called desert varnish, on the rock's surface. The rock artist breaks through this patina to expose the light-colored rock below it. Patination then begins again with a desert varnish forming on the newly exposed rock, and a rough idea of the age of a petroglyph can be obtained by judging the degree of patination on the drawing. Different degrees of patination on the same rock surface can usually enable one to put those rock drawings in the correct chronological order (Anati, 1979: 21).

A less subjective method would be to measure the degree of patination and compare that to a known rate of patina formation. Experiments using neutron activation to analyze layers of desert varnish have been aimed at figuring out how fast different elements leach out of rock. Unfortunately, this research on American Indian rock art in the Great Basin area of Nevada is so far inconclusive. The experimenters point out that the chemical processes of patination are not well understood, and that external variables such as weathering and climatic change cannot be controlled (Bard, Asaro and Heizer, 1978: 85ff).

If the number of boat published representations is a reliable guide, the ratio of boat drawings to drawings of other subjects decreases as one moves south. Winkler's 1938 collection from the Wadi Hammamat was 40 percent boat petroglyphs; Dunbar's 1941 collection from Nubia about 20 percent; Hellstrom's work in the region north of the second cataract produced about 10 percent boat petroglyphs and south of there, one percent (Cervícek, 1974: 98). Unfortunately, it appears that many of the petroglyphs that have

been observed remain unpublished (Donald Whitcomb, personal communication), so no one without first-hand knowledge can make an informed judgment on this point.

The first large group of boat petroglyphs was documented in the Wadi Hammamat, a large natural pass from upper Egypt to the Red Sea (Winkler, 1938). Boat representations of all periods are to be seen there, including one described as a post-15th-century, European-style three-masted, square-rigged boat (Whitcomb and Johnson, 1979: 3). But the greater number of petroglyphs are along the sandstone cliffs of the upper Egyptian and Nubian Nile valley, some even south of the third cataract (Chittick, 1962: passim).

In addition to Winkler's, large collections of boat petroglyphs have been published by Basch and Gorbea (1968), Cervicek (1974), Engelmayer (1965), Dunbar (1941) and Hellstrom (1970). With the exception of Dunbar's and Cervicek's, all of these publications resulted from the international campaign to record Nubian antiquities that were in danger of being inundated by Lake Nasser. Only Engelmayer's volume is devoted entirely to boat petroglyphs. In addition to these large collections, many boat petroglyphs have been published in journal articles and notes. Currently, a Belgian expedition from the University of Leuven is recording petroglyphs at El Kab in upper Egypt (Dirk Huyge: personal communication).

The diversity of prehistoric Egypt's nautical technology can really only be observed and appreciated through rock art. It is only natural, then, that most attempts at creating a typology of Pre- and Early Dynastic boats are based on petroglyphic representations.

Anyone attempting to create a typology of boats in Egyptian petroglyphs or trying to critically evaluate the work of others had better admit at the outset that it is an extremely subjective exercise, and that much is in the eye of the beholder. It is critical to know when a variation reflects a real difference in subject matter and when it is simply a reflection of technique or individual taste, style and ability. In my opinion, the latter variations are bound to be much more numerous than the former. It seems to follow that any attempt to draw extremely fine distinctions will probably result in more types of representations than there were types of boats.

Winkler's categorization was the earliest. He numbered his boats one-100, and divided them into four basic types (Fig. 53): sickle-shaped boats, square boats, incurving sickle-shaped boats and incurving square boats. The sickle-shaped boats were supposed to be the oldest; the square (angular) boats, those of "eastern invaders"; and the incurving types, admixtures of the two (Winkler, 1938: 36-39). In Winkler's opinion, the "square boats" were dugouts; the others, which often have strokes which seem to indicate external bindings, were considered to be reed (Winkler, 1938: 37).

A serious problem with Winkler's typology is the fact that he did not make a distinction between what we have called papyrus rafts, whose sheer and base lines narrow to a point, and sickle-shaped boats like those of the decorated jars, whose sheer lines and base lines almost always remain parallel. However, only a handful of Winkler's boats are of this latter type (for example, his boats 11

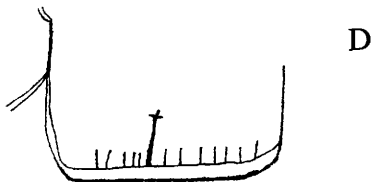
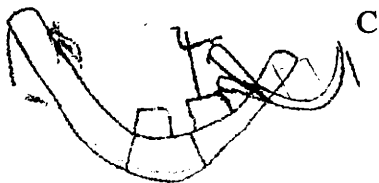


Figure 53. Winkler's four basic types. A--boat 30, "incurved Square." B--boat 17, "incurved sickle-shaped." C--boat 11, "sickle-shaped." D--boat 48, "square."

and 4, Fig. 54.a, b). Boats like his 33-45 (for example, Fig. 54.g) are almost certainly papyrus. A second problem is a general lack of consistency. Boats that I would classify as papyrus he divides between "incurving sickle-shaped" and "incurving square." It makes little sense to me to classify 21 (Fig. 54.d) as the same type as 18 (Fig. 54.c), or 26 (Fig. 54.e) as different from 39 (Fig. 54.g). Square boats are divided into six "derivations," A-F, but it is nowhere explained how these are obtained. I see little difference between his 77 (derivation C; Fig. 55.b), 88, (derivation E; Fig. 55.c) and 92 (derivation F; Fig. 55.d).

The "incurved square boats" and other similar craft, those I think of as papyrus rafts, find their best datable parallel in the charcoal drawing of a raft on the Amratian mud box (Fig. 35, on page 94). Thus this type can be considered to pre-date the Gerzean sickle-shaped boat jars--though of course individual representations may have been made at much later periods. Therefore Winkler's notion that this boat resulted from an admixture of square and sickle-shaped boats is almost certainly wrong.

Later overall classifications were made in the 1960s by Cervicek and Engelmayer, and these resulted in a multiplication of conflicting types. In many cases, both authors drew distinctions based on style and technique which do not necessarily reflect real differences in subject matter. Engelmayer's 1965 effort was the earlier. Studying the petroglyphs in the Sayala district of Nubia, he distinguished 12 types which he dated from the Amratian period into the Middle Ages. The first six of these types were considered

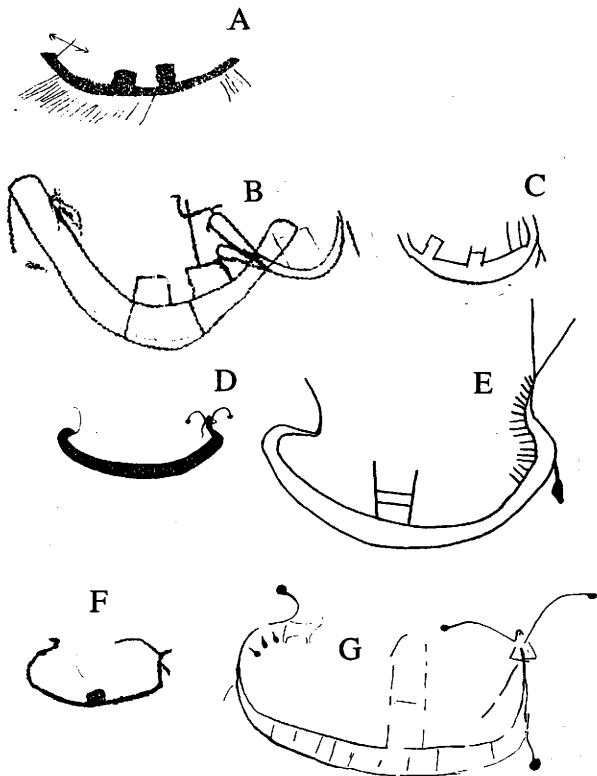


Figure 54. Examples of Winkler's boats. A--boat 4. B--boat 11. C--boat 18. D--boat 21. E--boat 26. F--boat 33. G--boat 39.

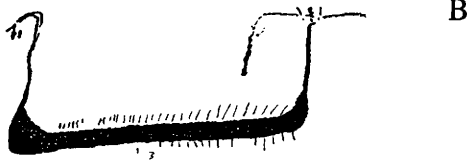
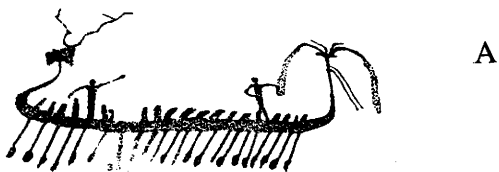


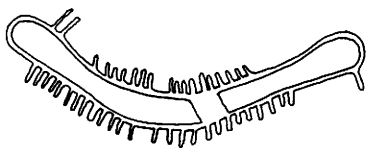
Figure 55. Examples of Winkler's boats. A--boat 45. B--boat 77.
C--boat 88. D--boat 92.

to be Predynastic. Basch and Gorbea adopted this typology for their work in Upper Nubia between Korosko and Ibrim; however, their application of Engelmayr's types yields in many cases results contradictory to his.

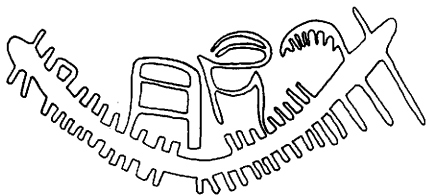
Type 1 finds its prototype in the sickle-shaped boats of Gerzean decorated ware (Fig. 56.a-d). In Engelmayr, examples range from quite close parallels like those depicted on his plates VI.1 and VI.5 (Fig. 56.a, b) to crude drawings like that on his pl. XXII.6 (Fig. 56.c). Quite crude examples are also illustrated in Basch and Gorbea's illustration 3 (Fig. 56.d). This is the oldest of the boat types--so proved, Basch and Gorbea say (1968: 294), because it is often seen with other boat types drawn over it.

Engelmayr's Type 2 boats are among those that I would call angular. Examples from Sayala include his plates XII.4 and VIII.2 (Fig. 57.a, b). Basch and Gorbea (1968: 295) date this type as early as the Amratian (but this probably on the basis of the problematic sherd from Mostagedda described above), and into the First Dynasty. They consider Type 2 to be slightly later than Type 1, however, since it is sometimes seen superimposed on Type 1 boats (but see Cervicek's objections below). Bows are normally higher than the sterns, and in some cases, there is no stern post at all.

Type 3 boats are sickle-shaped boats that differ in detail, but not in basic form, from the sickle-shaped boats of Type 1 and the Gerzean boat pots. They lack the accoutrements of the pot boats--two cabins, two groups of paddles, a standard, a palm frond--but their sheer lines and base lines are parallel throughout, a good



A



B

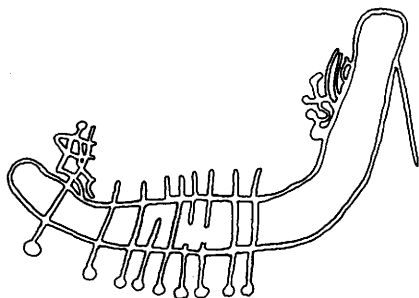


C

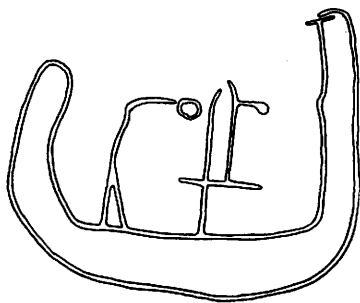


D

Figure 56. Engelmayer's Type 1. A--Engelmayer, 1965: pl. VI.1. B--Engelmayer, 1965: pl. VI.5. C--Engelmayer, 1965: pl. XXII.6. C--Basch and Gorbea, 1968: fig. 3.



A



B

Figure 57. Engelmayr's Type 2. A--Engelmayer, 1965: pl. XII.4.
B--pl. VIII.2.

indication that these are not papyrus rafts. Some, like Engelmayr's pl. LII.1 (Fig. 58.g) have dome-shaped deck structures.

Since, as Basch and Gorbea say (1968: 295), the chronology of Type 3 is "more or less" the same as that of types 1 and 2, it seems prudent to agree with Cervicek (below) that Type 3 boats represent the same general type as those shown on the boat pots and in petroglyphs that are obviously based on them. But Type 3 boats are almost never shown with as many paddles as the pot boats, and it may be that these were smaller, work-a-day versions of boats built in the same basic style.

Type 4 and 5 boats are angular craft. Type 4 is distinguished from Type 2 in that it is more schematically drawn and generally has a characteristic triangular stern post. Examples from Sayala include Engelmayr's pl. LIII.4 (Fig. 59.a). Basch and Gorbea illustrate many of them, some in conjunction with hieroglyphic inscriptions; these inscriptions are always over the boats (their figs 236 (Fig. 59.c) and 238 (Fig. 59.d). A fine parallel is the boat under sail on British Museum 35324; a very similar boat, though lacking the triangle-shaped stern, is to be seen in Engelmayr pl. XXX.2 (Fig. 59.b).

In Engelmayr, Type 5 is more schematic still, a simple line with what appears to be a steering paddle at the stern. In Basch and Gorbea, the sole illustrated example is a very detailed boat that obviously belongs to the historic period (Fig. 60.a, their fig. 173). They argue that 5 is a more advanced stage than 4, but Engelmayr's examples (Fig. 60.b) are so schematic that there are no

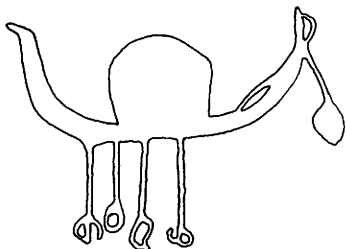


Figure 58. Engelmayr's Type 3. 1965: pl. XXI.1c.

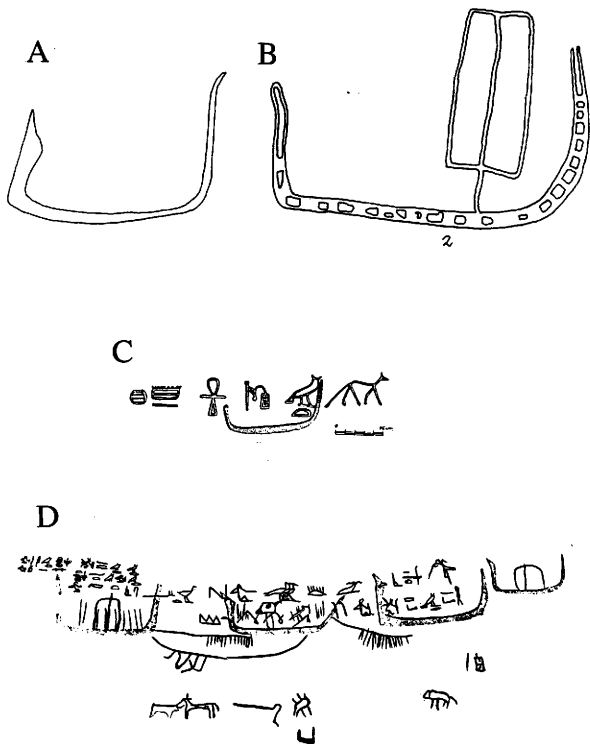
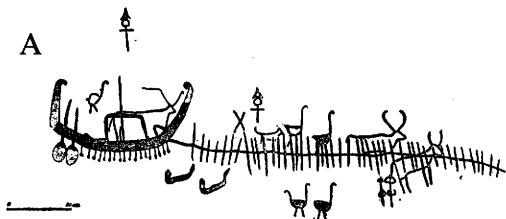


Figure 59. Engelmayer's Type 4. A--Engelmayer, 1965: pl. XXXIV.1. B--Engelmayer, 1965: pl. XXXIII.2. C--Basch and Gorbea, 1968: fig. 236. D--Basch and Gorbea, 1968: fig. 238.



B

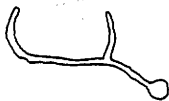


Figure 60. Engelmayer's Type 5. A--Basch and Gorbea, 1968: fig. 173.
B--Engelmayer, 1965: pl. XVI.2.

grounds on which to judge whether the reality they reflect is any different from types 2 and 4. Basch and Gorbea's fig. 173 (Fig. 60.a) shows that boats of similar profiles were to be seen in the historic period, however, so dating these very schematic drawings is difficult.

In Engelmayr, Type 6 is as schematically rendered as Type 5, but has a sickle-shaped profile. I would provisionally classify it with types 1 and 3 as sickle-shaped, but lack of detail makes me less than confident. Basch and Gorbea (1968: 296) consider this a papyrus boat which continued to be used into later periods. Basch and Gorbea's one illustrated example of a Type 6 boat (Fig. 61.b) is totally different from those in Engelmayr (Fig. 61.a). With its triangular stern decoration and straight, high bow, Basch and Gorbea's example looks more like the classically angular Type 4.

Cervicek divided the boat petroglyphs collected over the years by Leo Frobenius and parallel material into 33 types, of which the first 11 are said to be datable to the Pre- or Early Dynastic periods. The typology is complicated and often contradicts that espoused by Engelmayr and Basch and Gorbea; but the material is from a wider geographical area and thus more varied. Nevertheless, I believe it can be more usefully distilled down into the three basic types.

As mentioned above, Cervicek's Type 1 comprises boats similar to Engelmayr's Type 1 and Type 3. An interesting example, Cervicek's fig. 156 (Fig. 62.a), shows a man in the stern working a steering paddle as well as, apparently, many other paddles coming from the

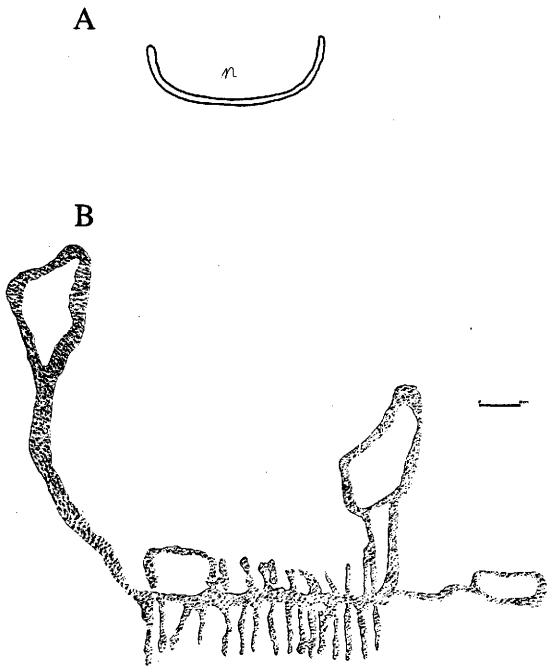


Figure 61. Engelmayer's Type 6. A--Engelmayer, 1965: pl. VII.2.
C--Basch and Gorbea, 1968: fig. 200.

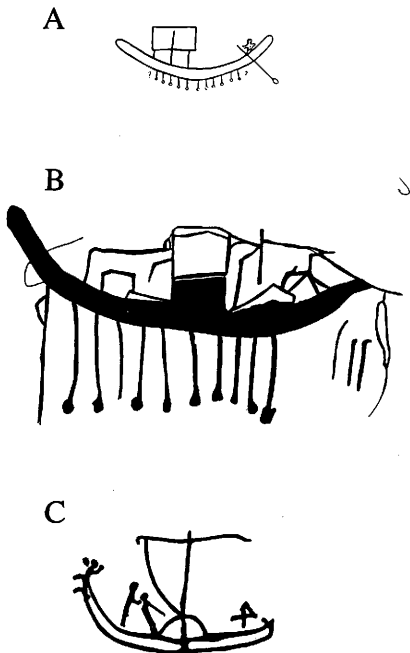


Figure 62. Cervicek's Type 1. A--1974: fig. 156. B--1974: fig. 227.
C--1974: fig. 464.

bottom of the boat. It is an interesting peculiarity of boat petroglyphs that they frequently show a man in the stern but no other crewmen; Prof. Frederick Van Doorninck has suggested that this could signify the higher status of the steersman. This particular boat also has a unique deck structure that might be interpreted as a sail set on a mast with two sheets coming off the bottom corners of the square sail. If so, this would be the be the only sickle-boat petroglyph to show a sail; but the fact that paddles are coming from the bottom of the boat argues for some other interpretation.

Cervicek's figs 227 (Fig. 62.b) and 464 (Fig. 62.c) are clearly of the type classed as type 3 by Engelmayr. The latter fig. appears to show a mast with a yard, but no sail. If Cervicek is right in dating this to the Gerzean period, it would appear to be the earliest known depiction of rigging. Another "sickle-shaped" boat of problematic dating is a boat published by Chittick (Fig. 63; 1962: 329) which shows the familiar profile, but has odd wedge-shaped devices at bow and stern, a single squarish cabin amidships and a steering paddle with a tiller and a square blade. Chittick calls this a boat of Predynastic type, but Cervicek (1974: 107) thinks the craft should be dated to the New Kingdom on the basis of the cabin shape. The tiller, as well, is probably an indication of a later date.

Cervicek's Type 2 (Fig. 64) includes most of the boats I would classify as angular. His prototype for this type is the vessel on British Museum 35324, but he wrote that examples of this type range from Naqada I (Amratian) to the First Dynasty (1974: 109). He wrote

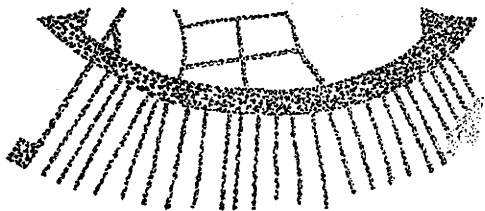


Figure 63. Late (?) sickle-shaped boat. Chittick, 1962: fig. 1.

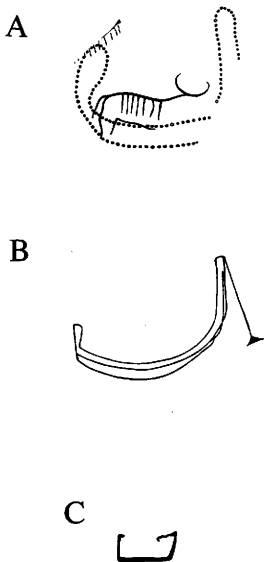
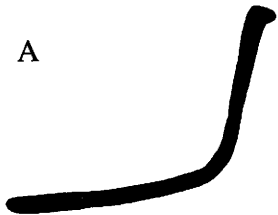


Figure 64. Cervicek's Type 2. A--1974: fig. 507. B--1974: fig. 155.
C--1974: fig. 268.

as well that this general boat representation type survived into the Old Kingdom as determinative hieroglyphs in the Pyramid Texts (1974: 110). But Cervicek makes the statement that boats of this type never overlay sickle-shaped boats (1974: 114) and says that the stratigraphy of rock art sites show that boats of this type do not persist into the Old Kingdom, both assertions contradicted above by Basch and Gorbea. Cervicek's Type 2 includes boats like that in his fig. 507 (Fig. 64.a) that would fit into Engelmayr's Type 2, the boat in his fig. 155 (Fig. 64.b) that would fit into Engelmayr's Type 4, and his fig. 268 (Fig. 64.c) that would fit Engelmayr's Type 5. In general, I prefer this inclusive typology.

Cervicek's Type 3 is a peculiar variation of the angular boats: a boat with a high bow and no stern post at all (Fig. 65.a, b). Like the boats of Type 2, this type is to be dated on the basis of datable parallels to the late Gerzean, Naqada III and Early Dynastic periods (Cervicek, 1974: 116). It is controversial whether the high end is the bow or the stern. The best-known representation of this boat type is the black boat on the Hierakonpolis tomb painting (see p. 180); some have seen in this painting a high-sterned vessel sailing in the direction opposite that of the other boats in the scene, in what might be a naval battle (Case and Payne, 1962: 17). Petrie saw the high end as the bow, however, and petroglyphs showing men with steering paddles in the low end (Fig. 57.a, on page 134) would seem to confirm his belief. There are vessels with steering oars or paddles in the high end (Chittick, 1962: fig. 3), but this example and others (Engelmayr, 1965: pl. I.9b, pl. XXV. 8; Basch and Gorbea, 1968: fig. 223) are probably datable to much later

A



B

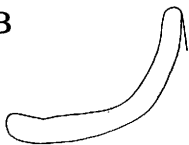


Figure 65. Cervicek's Type 3. A--1974: fig. 481. B--1974: fig. 230.

Gorbea, 1968: fig. 223) are probably datable to much later periods.

Cervicek's types 4 and 5 are those I would call papyrus rafts. The most characteristic feature of these boat types are a sheer and base line that taper to a point, as if they were tied-off papyrus bundles. They differ widely in shape, however, from the almost-sickle-shape of Cervicek's fig. 269 (Fig. 66.a) to the very papyriform fig. 265 (Fig. 66.c) or fig. 274 (Fig. 66.b). The "plant motif" of bow and stern are the same in both cases, however, (Cervicek, 1974: 122) and this is my basis for assuming both types to represent the same real boat type.

Cervicek gives only two examples of his Type 6 (Fig. 66.a; his fig. 306, the two boats at right), and I would classify these as angular. There are four boats in the scene. It can be seen that one of the other boats, while it has a very-much different type of hull profile, has the same type of midship cabin as the boats at right, and so I would question whether it makes sense to assume that the two boats at right were in fact intended to be different from the boat on their left. A relatively straight hull and high bows and sterns are my bases for classifying these as angular.

Cervicek's Type 7 is considered to be a variation of the angular Type 2 (Cervicek, 1974: 126), but these are widely varying boat types, one of which, his fig. 241 (Fig. 67.b), has the proper shape and all of the accoutrements necessary to be classified as a typical sickle-shaped boat. Type 8 includes only two boats, which seem to me to have nothing in common besides their symmetry (Fig. 67.c, d;

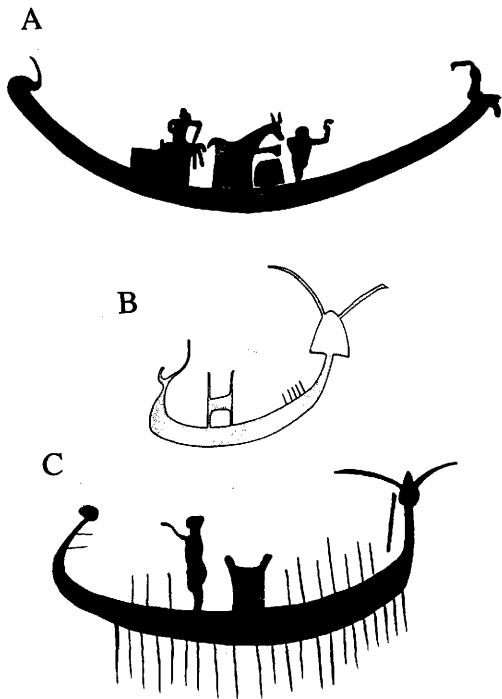


Figure 66. A-B--Cervicek's Type 4. A--1974: fig. 269. B--1974: fig. 274. C--Cervicek's Type 5. 1974: fig. 265.

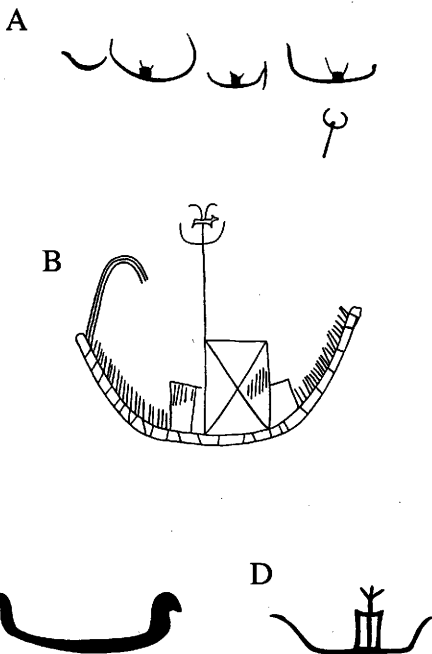


Figure 67. A--Cervicek's Type 6. 1974: fig. 306. B--Cervicek's Type 7. 1974: fig. 241. C-D--Cervicek's Type 8. C--1974: fig. 302. D--1974: 310.

1974: 127, figs 302 and 310). Type 9 is a simply drawn boat found in only one representation (Fig. 68.a, his fig. 471). Cervicek thinks of this as the last, highly stylized development of the papyrus rafts of types 4 and 5 (1974: 128)--I see little interpretable detail in it. Type 10 (Fig. 68.b) is considered to be in the same family as types 7 and 8, possibly related to a boat depicted on an uncited First-Dynasty ivory seal. This boat type is also known from El Kab (Fig. 69; Huyge, 1984: 234, fig. 3) and dated by Huyge to late in the Predynastic period. It is said to be identifiable as a late development of the square or angular boats. Type 11 (Fig. 68.c) is considered to be a variation of Type 1 (Cervicek, 1974: 128).

Cervicek noted the reported patination of most of his drawings, but did not find that they showed enough difference to reliably seriate the Pre- and Early Dynastic boat types; the vast majority of his suggested dates are based on datable parallels. The same situation was noted by Hellstrom in the rock drawings recorded in the early 1960s by the Scandinavian Joint Expedition to Sudanese Nubia. Most of the 91 boat petroglyphs recorded were designated as having "C"-level, or "advanced," patination. Exceptions were the obviously late boat V8 (Fig. 70.a)--whose multiple steering oars give the impression of a late date--and almost certainly Predynastic V40 with "B" or very advanced patination (Fig. 70.b). Other late-looking boats, V21, V23, and V69 (Figs 70.c-e) had advanced patination. According to Hellstrom, advanced or "C" patination has wide limits, so it would not appear to be a very sensitive dating

A



B



C

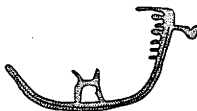


Figure 68. A--Cervicek's Type 9. 1974: fig. 471. B--Cervicek's Type 10. 1974: fig. 363. C--Cervicek's Type 11. 1974: fig. 120.

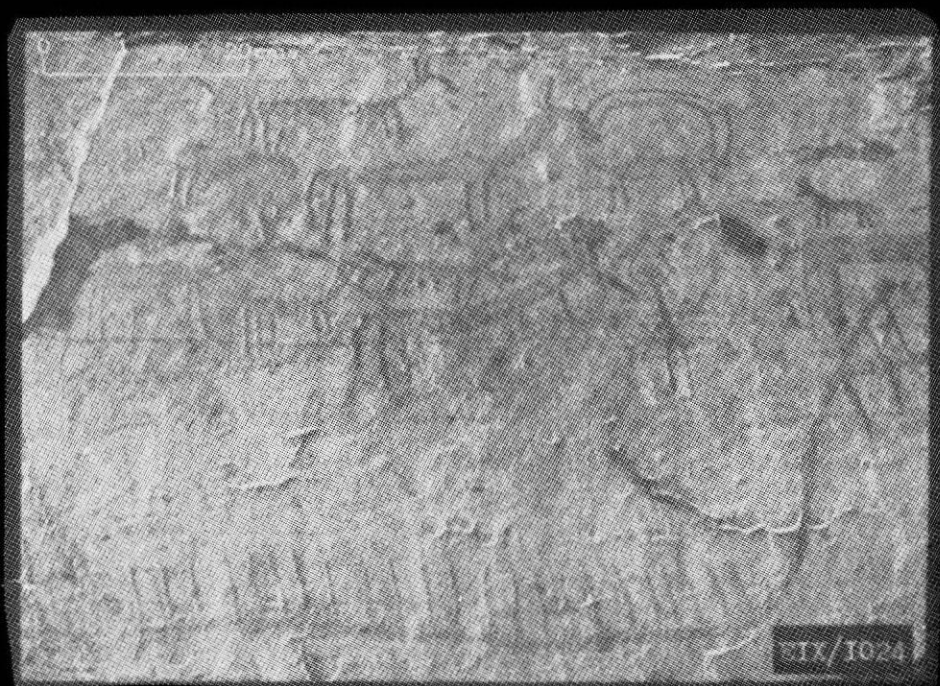


Figure 69. Late angular boat petroglyph. Huyge, 1984b: fig. 3.

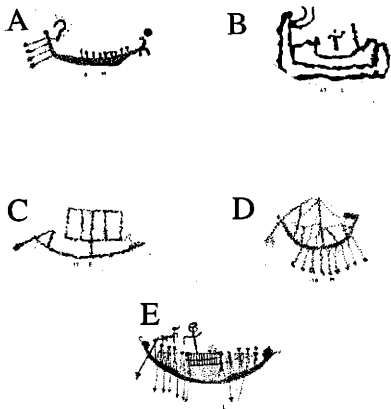


Figure 70. Boats from the Scandinavian Joint Expedition, all in Hellstrom, 1970. A--Corpus V8. B--Corpus V40. C--Corpus V21. D--Corpus V23. E--Corpus V69.

tool.

In general, I hesitate to accept as Predynastic any boat petroglyph that has features not seen in datable Pre- or Early Dynastic representations, in particular tillers, steering-oar stanchions or complicated rigging, especially lifts attached to yards. Well-executed drawings of attractive papyriform hulls seem intuitively to be datable to the later periods. One feature that is frequently seen on late drawings but not on datable Pre- or Early Dynastic representations is a steering oar or paddle with the shaft represented as extending into the blade. I would classify this as a late feature, and not accept any boat with this characteristic as Predynastic.

A problematic class of boat petroglyphs are those angular, symmetrical boats such as those in Figs 67.c and 69. These are not seen in any datable media. As noted above, Huyge and Cervicek associate them with the later period. Winkler associated them with his "Eastern Invaders" (see below), but also considered that the "Invaders" could have been in Egypt in the Amratan period (Winkler 1939: 32, 33). Some of these boats have the triangular decoration with antennae (what Cervicek referred to above as a "plant motif"), and these I have generally regarded as being papyrus. Those without that feature I have generally regarded as being angular; but the crudity of the drawings has made judgment difficult.

Petroglyphs of sickle-shaped boats provide an interesting complement to the much more conventionalized renderings on the grave pots. A drawing from the region of El Khattarah (Fig. 71; Murray and



Figure 71. Sickle-shaped boat being hauled by a gang (most human figures missing from the present illustration). Murray and Meyers, 1933: fig. 1.

Meyers, 1933: fig. 1) shows what appears to be a sickle-shaped boat being pulled by a gang of 33 men, only four of whom are shown in the present illustration. (Murray and Meyers did not see this as a sickle-shaped boat.) Strokes indicating paddles extending from the bottom of the hull, and figures can be seen in the boat, some holding staffs. A figure on the top of of the single midship cabin has one hand on his (?) hip and another extended forward, in a gesture evoking a captain giving directions to his crew. The boat has a standard that is not precisely paralleled on the decorated ware, with a large number of streamers coming off the pole and the standard itself.

The figures on the boat vary widely in size, but if the largest is approximately to scale, this boat would be some 12.2 m long; if the smallest, about 27.5 m (unless, of course, the small figures are meant to be children). It would be interesting to know whether this variation in size is accidental or whether it foreshadows the common historic Egyptian device of showing important people in super-human scale and unimportant people in miniature. The boat has 30 paddle strokes, about the right number for a boat near the lower size limit if one assumes that paddles on both sides of the boat are shown; 30 paddles almost matches the 32 men shown pulling the boat. Murray and Meyers (1933: 131) hypothesize that the drawing represents men on shore pulling the boat through the rapids of the cataract. Grooves found in the region of the cataract have been interpreted as having been left by boats hauled along the shore (Adams, 1977: 184-85). In either case, there would have been work gangs hauling the boats. A

second sickle-shaped boat petroglyph that may be helpful in determining the size of these boats is one shown in Fig. 72 (Dunbar, 1941: fig. 141). This boat drawing has extraordinarily lively figures shown on the boat, with two men working steering paddles that seem to be in proportion to the crewmembers and the boat itself. Lines near the stern may be a partially-obliterated cabin. If the men on the boat are to scale, this boat was about 16.5 m long.

Standards are represented on sickle-shaped boat petroglyphs far less often than on the boat pots, even on examples that are otherwise good parallels for the boat pots, like Engelmayer's pl. VI.5 (Fig. 56.b). I have been unable to find even one exact parallel for boat-pot standard in a published petroglyph.

Finally it should be pointed out that almost all of the representations of Pre- or Early Dynastic boats under sail are petroglyphs. Engelmayer pl. XXX.2 (Fig. 59.b on page 137) is an almost exact parallel for British Museum 35324. Fig. 73.a appears very much like the angular-asymmetrical boat in Fig. 52 with a sail added. Winkler's 1938 boat 16 (Fig. 73.b) is unique; its hull shape is unusual and its mast is set rather far back. But the lack of any depiction of rigging argues for this boat being of Pre- or Early Dynastic date. Three boats under sail illustrated in Hellstrom (Fig. 63.c on page 143) find their closest datable parallels in the Narmer palette (Fig. 4 on page 16) and in a petroglyph at Gebel Sheikh Sulliman near the first cataract inscribed with the name of the First Dynasty King Zer (Fig. 30.c on page 84). These probably represent a variant of the angular boats that appeared at the end of



Figure 72. Well-executed petroglyph of a sickle-shaped boat. Dunbar, 1941: fig. 161.

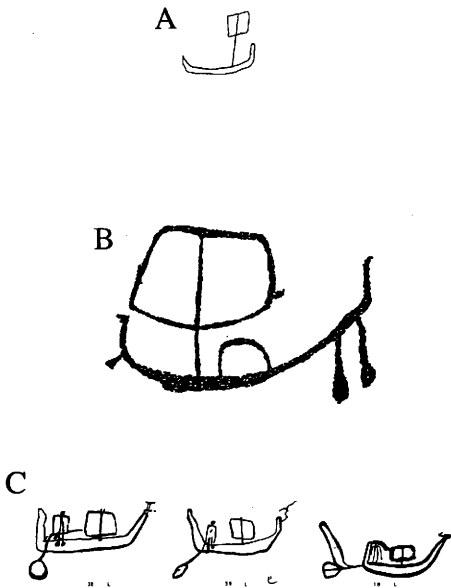


Figure 73. Petroglyphs of boats under sail. A--After Verwers, 1962: pl. III.b. Drawing by the author. B--Winkler, 1938: Boat 16. C--Hellstrom, 1970: V48, V49, V50.

the Naqada III period. This variant continues to have a vertical stern, but the bow becomes gently up-swinging, rather than dead vertical or even slightly incurving. While not forgetting the above cautions concerning variations in drawings and whether they represent true variations in real boats or are simply accidents of taste and execution, I would point out two processions of angular boats with typical triangular sterns that may show this shift in taste for bow shape in progress (Figs 59.d on page 137, 74.a). In each procession, some of these boats have the classic profile, while others show a bow form that is more reminiscent of the Zer petroglyph (Basch and Gorbea, 1968: figs 225 and 238). Other classically Early Dynastic profiles are seen in petroglyphs like Englemayer's pl. XXXVII.1c (Fig. 74.b) or Basch and Gorbea's fig. 237 (Fig. 74.c).

To summarize, this thesis generally considers as papyrus rafts Winkler's incurving sickle-boats and incurving square boats, though assigning types to Winkler's boat representations requires a case-by-case application of the criteria described on pages 82-85. Cervicek's types 4, 5 and 9 also appear to be papyrus rafts. Sickle-shaped boats include Englemayer's (and, following him, Basch and Gorbea) types 1, 3 and 6, and Cervicek's types 1, 7 and 11. Standard angular craft are included in Englemayer's types 2, 4 and 5 and Cervicek's types 2 and 6; angular but symmetrical boats are Cervicek's types 8 and 10; and angular, very asymmetrical boats are Cervicek's Type 3. No recorder of petroglyphs has assigned a specific type to the Early Dynastic profile seen in the Narmer

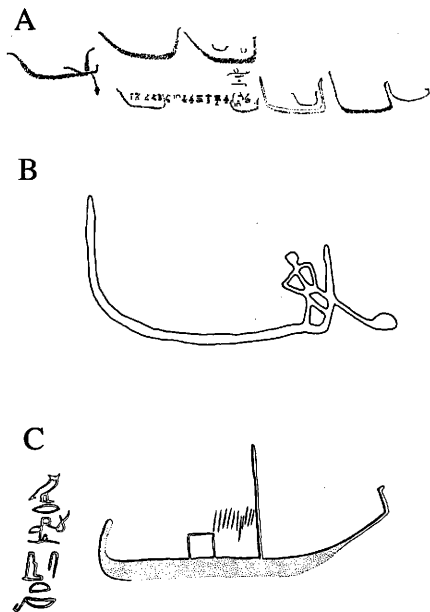


Figure 74. Petroglyphs of boats with Early Dynastic profiles. A--Basch and Gorbea, 1968: fig. 225. B--Engelmayer, 1965: pl. XXXVII.1c. C--Basch and Gorbea, 1968: fig. 237.

Palette or the Zer petroglyph; I would simply classify it as a variant of the angular boats.

MODELS

The oldest datable boat representations from Egypt are models. These might be expected to give us our best idea of what the actual boats were like. Unfortunately, that does not seem to be the case. There are no often-repeating types into which many of the known models can be organized. There are only a few cases in which models can be correlated with graphic representations, and these are late. The earliest models are extremely simple, and tell us little more than that boats existed.

The oldest reported model I am aware of comes from the Neolithic site of Merimde Beni Salaam. The model, with a low free-board, was found loose in the settlement debris at about the 5-foot (1.5 m) level, in a site whose average depth was about 7 feet (2.1 m; W.C. Hayes, 1964: 107). Other Badarian models include a small terra-cotta boat at University College (Landstrom, 1970: 12, fig. 2; Petrie, 1933: 4 and fig. 2) as well as three examples found at Badari by Brunton and Caton-Thompson (1928: 34, pl. XXIII.33).

I said above that wooden boats before the late Amratian period are unlikely, because there is almost no evidence for advanced woodworking skills before this time. Therefore, these obviously built-up boats require special explanation. Landstrom described them as wooden, because Dynastic Egyptian reed craft were not built-up

boats, but rafts. Paintings and models clearly show that Dynastic papyrus craft were usually small skiffs with no bulwarks. Modern large reed craft built in Africa, as well as Hyerdahl's Ra I, were based on the ancient technique of making papyrus bundles shaped like homemade brooms and lashing them together into a solid platform (Landstrom, 1970: 16-19).

There are, however, a number of living traditions in the Middle East and Africa that include reed craft that are definitely boats, not rafts. Tribal peoples on the upper reaches of the White Nile built boats of ambatch (Herminiera elaphroxylon) reeds in this century (Digby, 1954: 732). The zaima, a craft built as late as the 1950s by the Iraqi Marsh Arabs, was a reed canoe whose sides were built up with U-shaped reed bundles, coated with pitch, and held in place with rope thwarts (Thesiger, 1964: 127). A reed canoe from Kuwait called a huwayriyah was actually a kind of cross between a reed boat and a sewn boat. These sea-going craft were made of date palm boughs and bamboo. The boats were about 9 feet (2.7 m) long, and sported a monopod mast and lateen sail. The palm boughs were pierced and sewn together with ropes (Bowen, 1952: 194-95). These examples show that reed craft can be boat-like in every detail.

Corroborating evidence for Predynastic Egyptian reed boats comes from a number of later models. A First Dynasty model from Abydos (Fig. 75.a) shows what Petrie called a "closed raft with fenced sides." It certainly appears to be a craft with lashed-together reed bulwarks, as does the alabaster Predynastic model shown in Petrie, 1974b: pl. XLVI.41 (Fig. 75.b) and a boat model discovered at

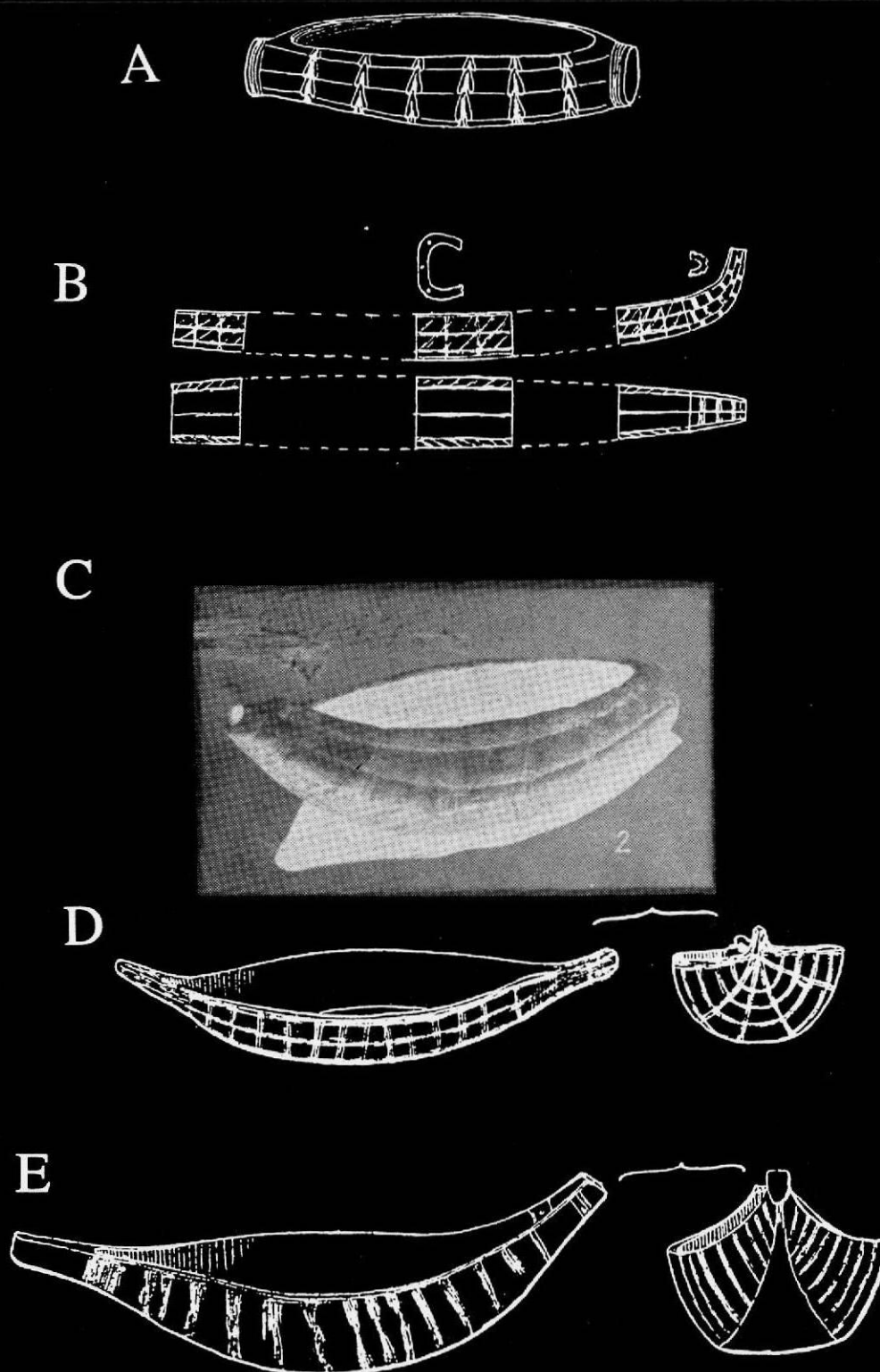


Figure 75. Models of reed boats. A--Petrie, 1933: fig. 5. B--Petrie, 1933: fig. 12. C--Aksamit, 1981: pl. I.2. D--Petrie, 1974b: Corpus pl. XXXVII.81b. E--Petrie, 1974b: Corpus pl. XXXVII.81a.

Minshat Abu Omar (Fig. 75.c; Wildung, 1984: 266, fig. 2). An alternative explanation for built-up reed boat models has been advanced by Basch. He suggests that the actual craft were flat rafts, not built-up boats; but that the models were hollowed out so that items could be placed in them (Basch, 1976: 29-30). Corroboration comes from the numerous examples in Old Kingdom tomb paintings of boat-shaped containers.

In either case, we have alternatives to believing that the built-up boat models from the Neolithic and Badarian periods represent built wooden craft. My own leaning, however, is toward interpreting the craft as reed boats. I would speculate that a craft like the huwayriyah with robust but still flexible boughs sewn together might have been an intermediate step between reed rafts and sewn, planked boats. Certainly reed rafts never went out of use, and I would interpret the petroglyphs of reed craft and the reed vessel depicted on the Amratian mud box as Predynastic reed rafts.

Later models come in a wide variety of shapes and proportions. Two Amratian models from Naqada, dated to S.D. 32-36 (Figs 75.d, e; Petrie, 1974b: Corpus pl. XXXVII.81a, 81b), show canoe-shaped hulls with bands painted on the outside. These could well be reed canoes, as Petrie interpreted them (1933: 5). They are quite similar to an undated model from Diospolis Parva (Petrie, 1974b: Corpus pl. XXXVII.81d). A slightly later model from Naqada (Fig. 76.a; Petrie, 1974b: Corpus pl. XXXVII. 80, S.D. 52), in the decorated style, showing paddlers painted in spaces on the outside of the boat, seems to be of basically the same shape, and to have no

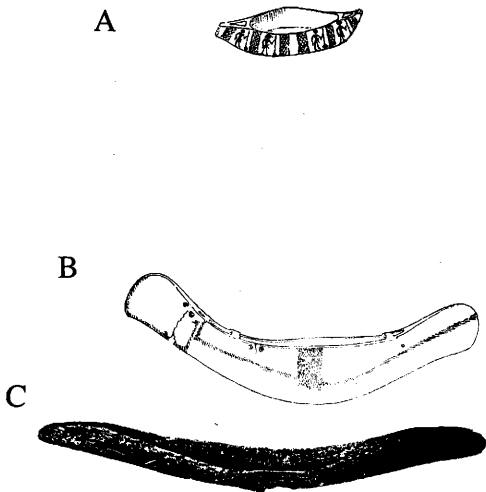


Figure 76. A--Decorated boat model. Petrie, 1974b: pl. XXXVIII.80.
B-C--Sickle-shaped boat models. B--Landstrom, 1970: fig. 19.
C--Landstrom, 1970: fig. 20.

similarity to the contemporaneous pot boats.

Some unprovenanced models in the Cairo and Berlin museums are undoubtedly meant to represent sickle-shaped boats, but they are the only ones of their kind thus far found (Fig. 76; b, Reisner, 1913: Cairo Museum No. 4814; c, Preussischer Kulturbesitz 13801; Landstrom, 1970: figs 19 and 20. Other models show largish craft with deck structures and people in them, such as the funerary model at University College, London, with a canopy and a seated female fig. (Fig. 77; Petrie, 1933: 11, figs 45, 46), or a model with three crewmembers in the Berlin museum (Fig. 78; Petrie, 1933: 6, fig. 15).

A number of unpublished models show a similar variety of unusual features. A beamy model from Abydos, now at the University of Heidelberg, has a 2:1 length-to-beam ratio (Fig. 79). This simple model has stubby bow and stern posts, with one end fairly vertical and the other leaning somewhat forward. I would interpret this forward-leaning end as the bow, but that is only conjecture. A complicated, incomplete model from a private collection in Switzerland (Fig. 80) shows an unusual deck structure along the entire preserved length of the craft, and hatch-marks along the caprail. The small cabin forward is enclosed on the top, the long enclosure aft is open. There is no determining how much of the boat is broken away, but the open-topped structure is intact. The appearance of these deck structures is very closely paralleled by the boat on the First Dynasty Zer comb (Fig. 81).

A model in the Egyptian Museum of Karl Marx University at Leipzig (Fig. 82) is remarkable for its beaminess and what appears to be

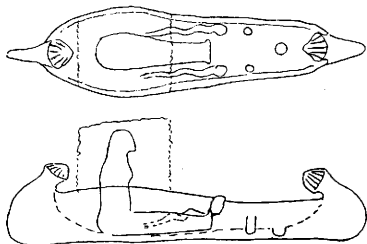


Figure 77. Model with seated human figure. Petrie, 1933: 11, fig.s 45 and 46.



Figure 78. Boat model with crew. Petrie, 1933: fig. 15.

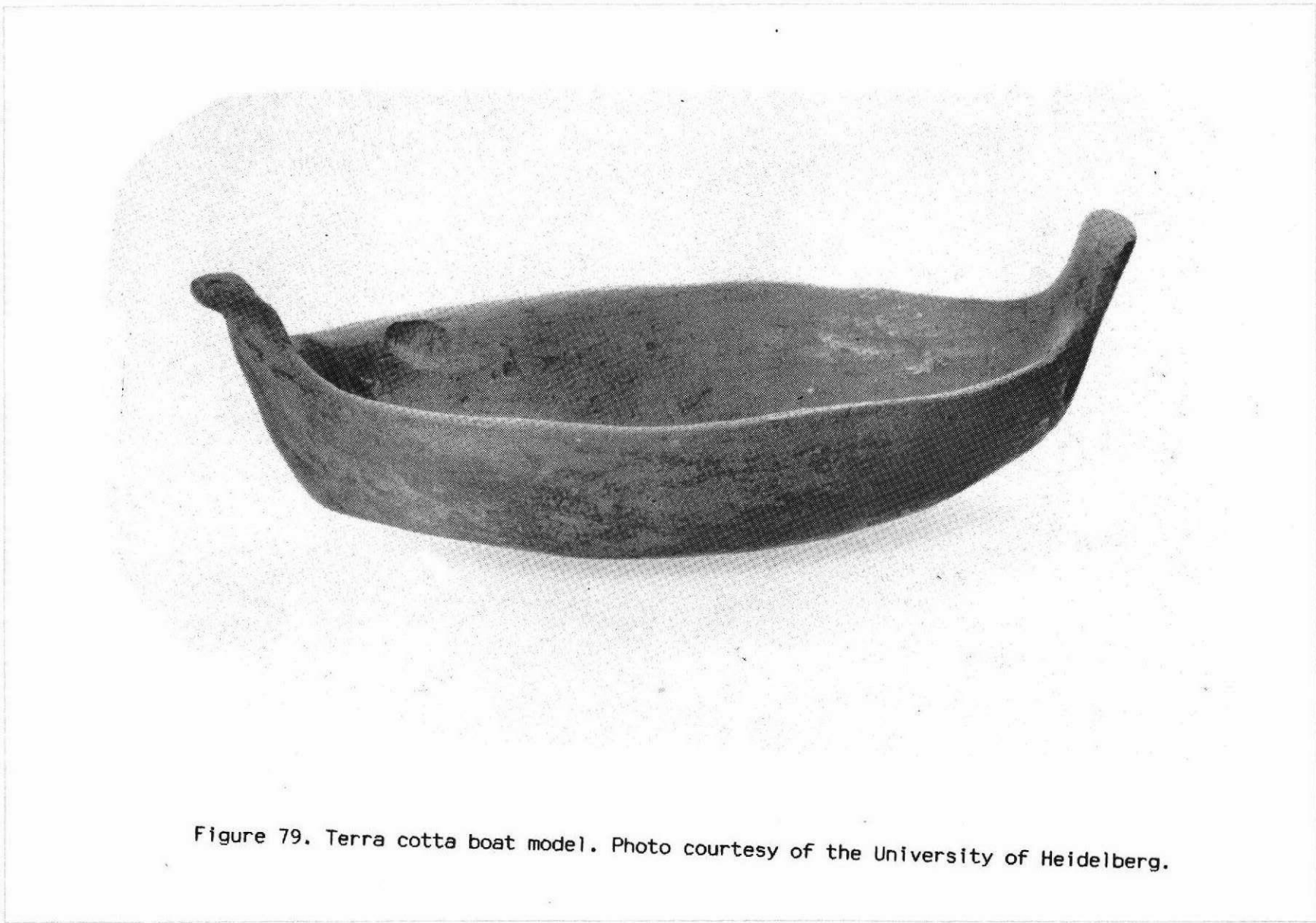


Figure 79. Terra cotta boat model. Photo courtesy of the University of Heidelberg.

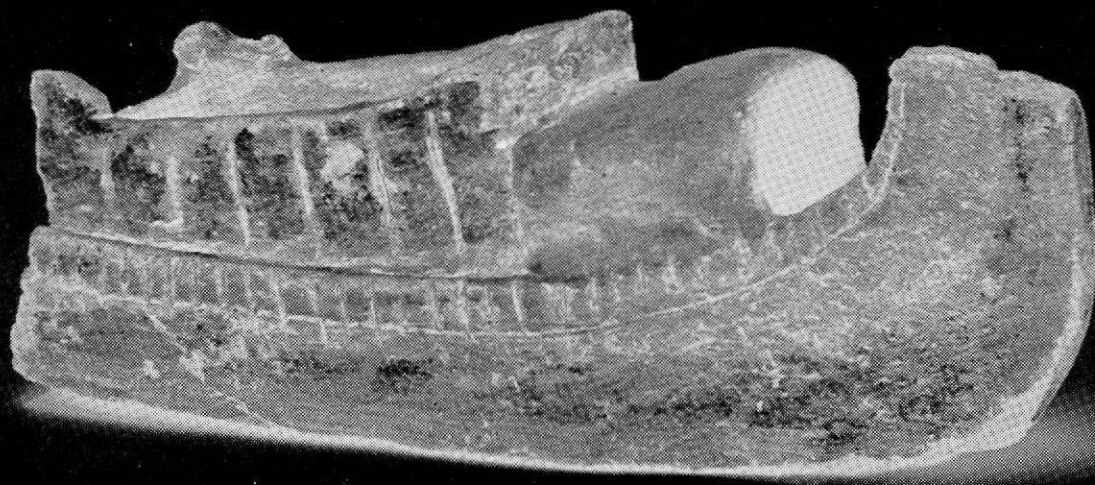


Figure 80. Model with superstructure like that of the boat on the Zer comb. Photo courtesy of the Archäologisches Institut der Universität Zürich.



Figure 81. Boat carved on the Zer comb. Petrie, 1933: fig. 37.

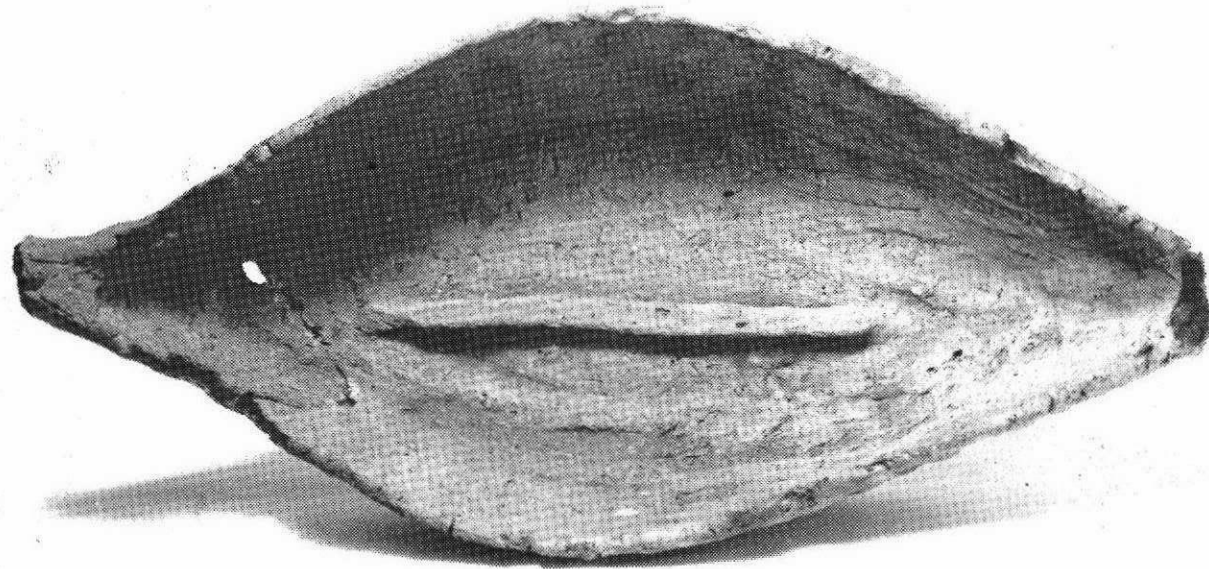


Figure 82. Boat model showing "keelson." Photo courtesy of the Karl Marx Museum, Leipzig.

a keelson in the bottom of the boat. This "keelson" is paralleled only in an incomplete First Dynasty model from Helwan (Fig. 83; Saad, 1951: pl. LXII.C), which has an internal structure that looks very much like floors timbers crossing a keelson. The "frames" of this latter model are not unexpected, in light of the possible frames in the Tarkhan collection and the fact that the Cheops boat is framed; but two models with "keelsons" are remarkable.

Landstrom (1970: 23-24) interprets the cross-hatchings along the sides of boat model 86169 in the Cairo Museum (Fig. 84) as an indication of the lashing of the sides to the bottom of the boat. This is unlikely, in my opinion, because the "lashed-on strakes" do not extend to the bow and the stern, and we have seen that in the First Dynasty the technique of internal lashing through V-shaped holes was known and practiced. Landstrom does not specify the provenience of this model.

A trio of boat models from First-Dynasty Tomb 3503 at Saqqara (Fig. 85; Emery, 1954: pl. LII) nicely parallel the boat profiles shown on the Narmer Palette, the Zer petroglyph and other presumably First Dynasty boat petroglyphs. Finally, a remarkable find from Mostagedda (Fig. 86) provides the only good three-dimensional parallel to angular boats such as that on BM 35324 and in similar petroglyphs. This boat, which is actually a graphic reconstruction of model fragments, was dated by Brunton to the Old Kingdom, but comes from a portion of the Mostagedda cemetery that had Predynastic graves underlying Old Kingdom graves (Brunton, 1937: 96, 25). The fragments were not found in a closed context, but loose in the

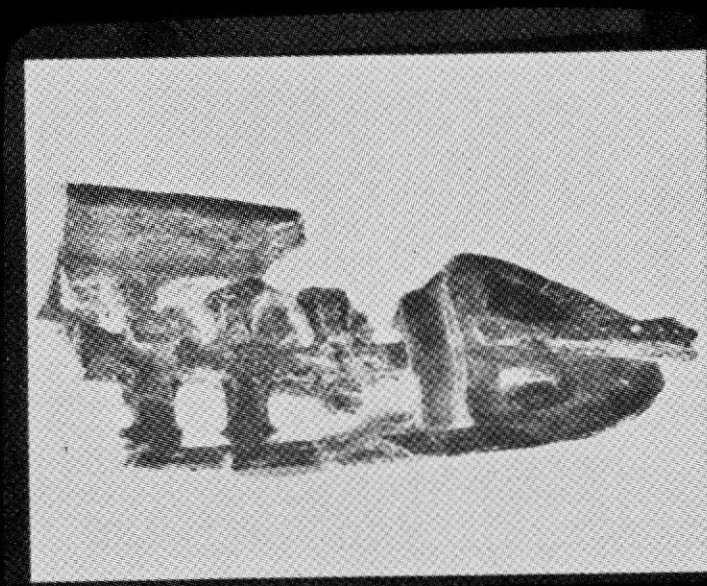
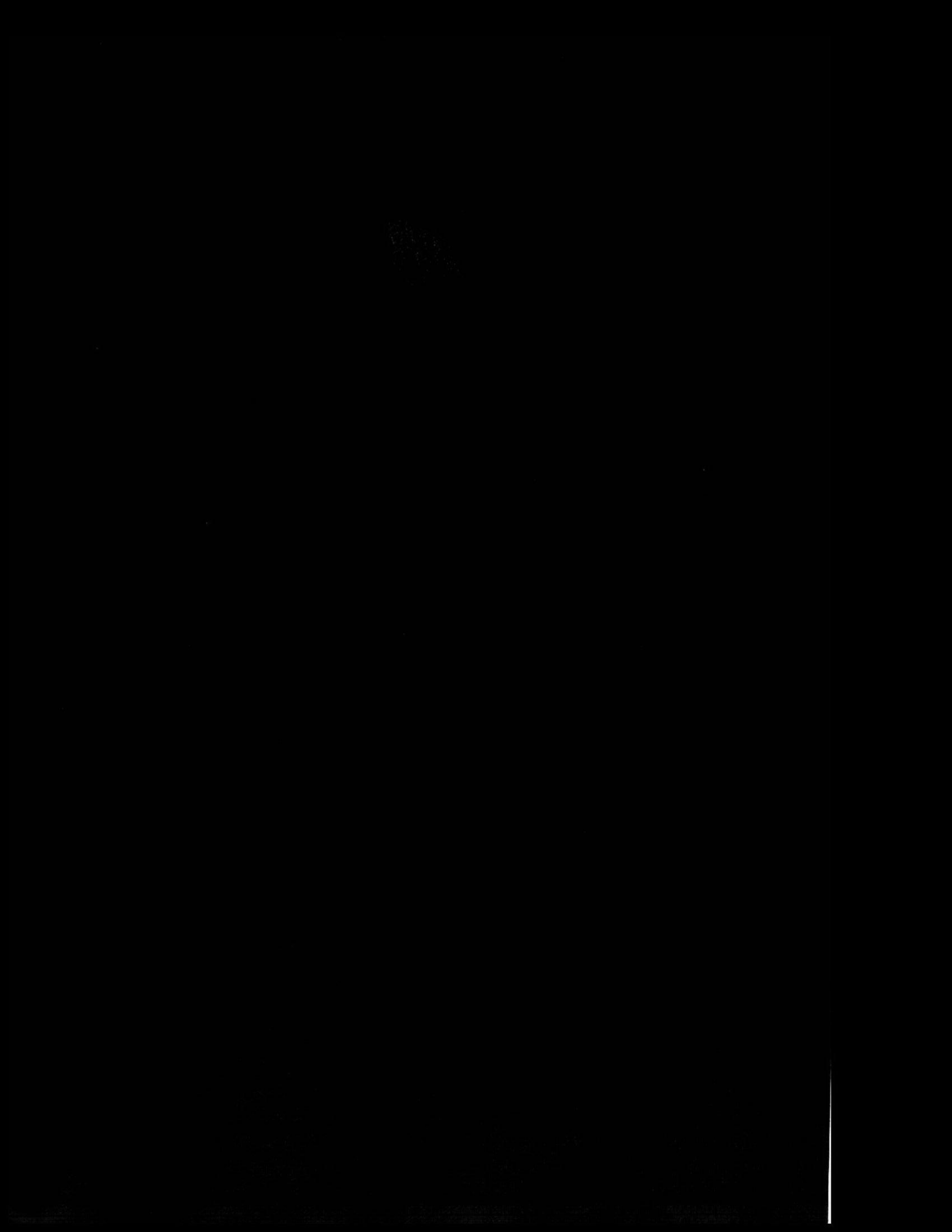


Figure 83. Model showing "keelson" crossed by "floor timbers." Saad, 1969: pl. 104. (Copyright c 1969 by the University of Oklahoma Press. Used by permission.)



Figure 84. Model showing "sewn-on" sides. Aksamit, 1981: fig. 22.



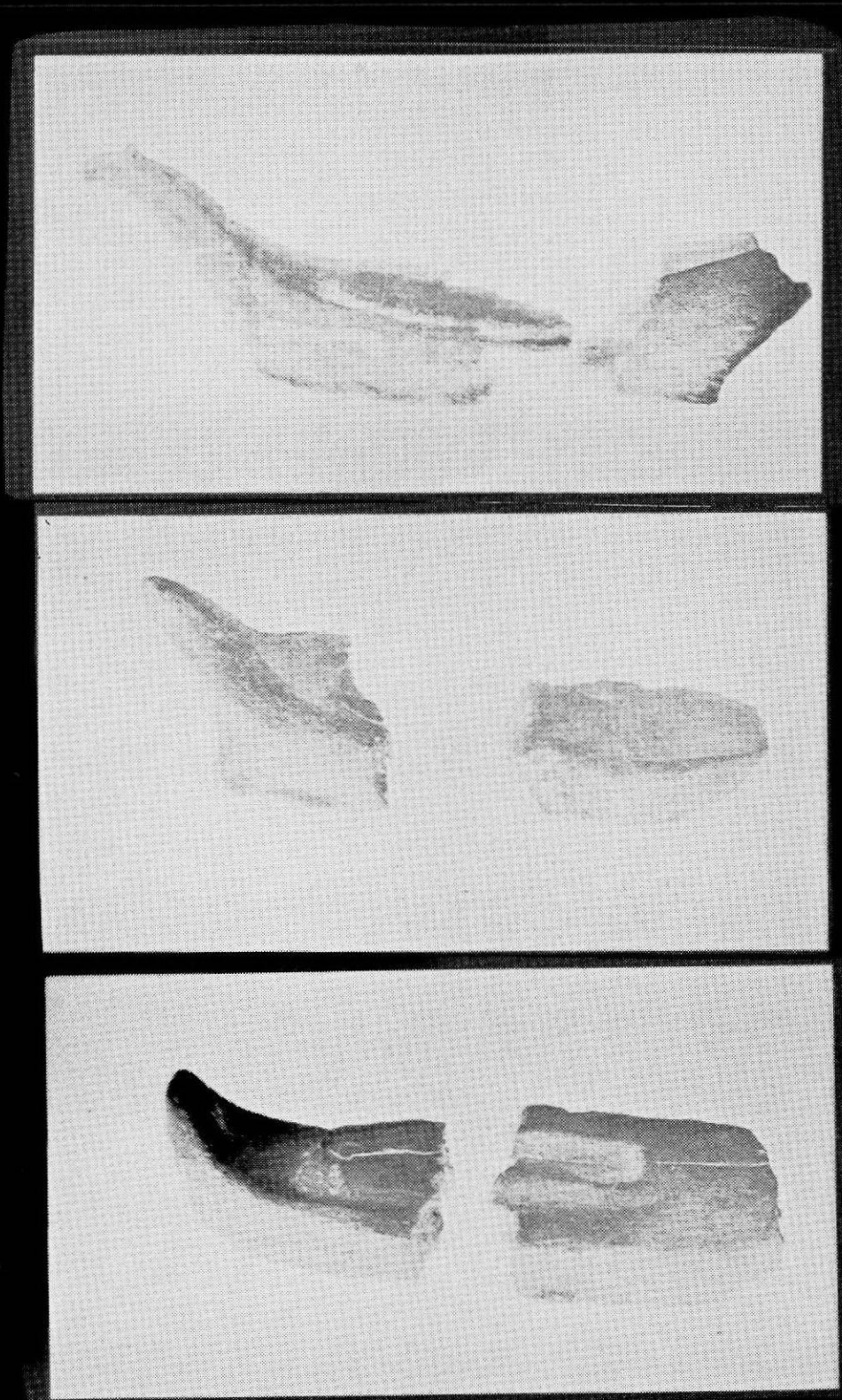


Figure 85. Models with Early Dynastic profiles. Emery, 1954: pl. LII.

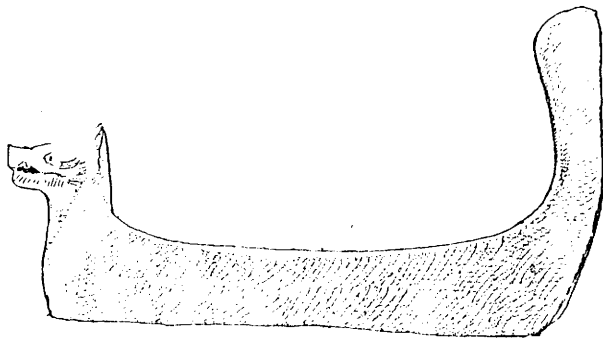


Figure 86. Angular-asymmetrical boat model reconstruction. Brunton, 1937: pl. XLIV.10.

debris. The lion's head is unparalleled in Predynastic boat art, but the boat's profile is strikingly like that of the Late Gerzean, Naqada III and Early Dynastic angular boats, and unparalleled in the Old Kingdom (Gorbea's and Basch's contrary opinions notwithstanding).

The models, where dimensions are published or inferable from photographs or drawings, vary widely in their proportions, from a length-to-beam ratio of 3:1 for the model in Corpus pl. XXXVII.81a to the 7:1 length-to-beam ratio for the Early Dynastic model Cairo 86169. Therefore, there seems to be no way to make a general statement about normal length-to-beam ratios for the boats they depict. We know nothing about the function of these models, whether they were toys, as the Merimde model was assumed to be (W.C. Hayes, 1964: 107), whether they served a purpose in funerary rituals (W.C. Hayes, 1964: 107) or whether they were meant to be containers for the convenience of the living. Very possibly there were boat models to serve all these functions. Given the confusion in the types of boats represented by models, it seems hazardous to draw any inferences that cannot be corroborated.

MISCELLANEOUS REPRESENTATIONS

A large number of other types of boat representations are to be found from Pre- and Early Dynastic Egypt, including cylinder seal impressions, tomb paintings, small carvings and even painted textiles. The best known of these are undoubtedly the Gebel el-Arak

knife handle (Fig. 87) and the Hierakonpolis tomb painting (Fig. 88)

These two deserve to be considered together because they have often been considered to depict the same event: the conquest of Egypt by "Eastern Invaders." Of the two, the Gebel el-Arak knife handle provides the best argument for this thesis. The carving on the small ivory handle, now in the Louvre, shows on one side five boats, three much like the sickle-shaped craft of the decorated ware (though many of the accoutrements are different) and two with angular profiles. These angular profiles differ from most Predynastic Egyptian angular boat profiles in that they are symmetrical--rather than having a bow higher than the stern--and have a number of features that find their best parallels in Protoliterate and Early Dynastic Mesopotamian iconography.

On this side fighting men are shown. The apparent victors in this struggle have usually been identified with the Mesopotamian-looking boats. On the other side is a classically antithetical Mesopotamian scene, showing a hero struggling with two lions and wearing a costume strongly paralleled by the Lion Hunt Stele of Uruk.

The boats were described in some detail by Georges Benedite, who purchased the knife in 1914 for the Louvre (Benedite, 1916: passim). There are, however, a number of mistakes and omissions in Benedite's description. Beginning with what has been assumed to be the bow of the "foreign" boats (Fig. 87.b), one may notice the pole leaning against the post, connected by what Benedite called a triple tie and surmounted by a disk with a vertical cross-piece. Benedite considered this to be the ship's mast, unstepped and secured to the

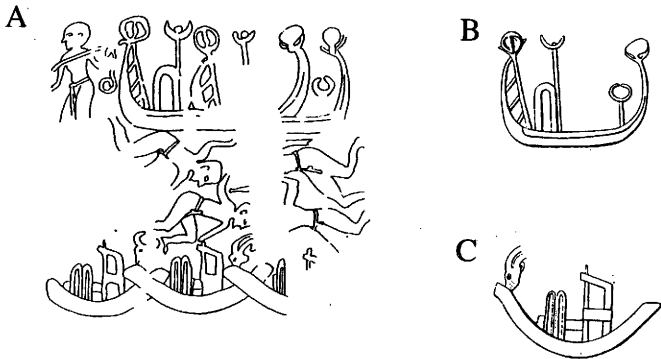


Figure 87. Scenes from the Gebel el-Arak knife handle. A--Landstrom, 1970: fig. 18. B--Benedite, 1916: fig. 10. C--Benedite, 1916: fig. 14.

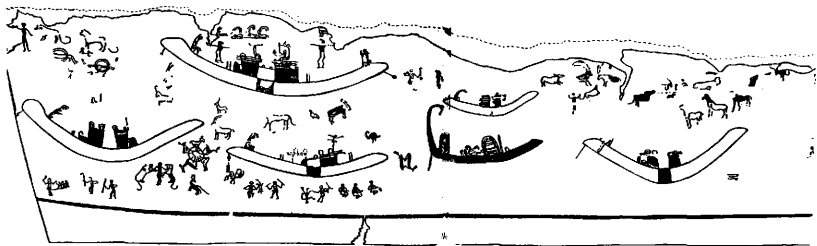


Figure 88. The painting from Hierakonpolis Tomb 100. Boreux, 1925: fig. 8.

stempost. The disk on top was said to be an apparatus through which the main halyard passes. The vertical crosspiece is supposed to function as a pulley; Benedite claimed that it had been drawn sideways through an otherwise-unknown artistic "convention."

There are several things wrong with this interpretation. Cylinder seals from Uruk and elsewhere show similar poles leaning against stems and sterns of boat, in most cases both. In each example, the ship is manned and crew members are seen punting or poling the boat. Clearly, the leaning pole has nothing to do with propulsion, and the idea that the disk on top of the pole in the Gebel el-Arak representation is a guide for the running rigging thus loses considerable force. While no good parallels are found for a disk with crosspiece in Mesopotamian iconography, in every case I have examined, the pole is surmounted by a standard or symbol of some kind.

Moving aft, one observes the low "stanchion" surmounted by a crescent, which Benedite considered the stand for a steering oar. However, Prof. Frederick Van Doorninck has pointed out that close examination of photographs (as opposed to sketches) of the handle shows that the "stanchion" is actually a disk-shaped object. A disk surmounted by a crescent (= a cow's skull?) is familiar from Gerzean iconography--it is shown in the sickle-shaped boats of the fourth register of the knife handle, and is among the emblems listed by Petrie as being found on ships in the decorated ware.

Finally, it is interesting to point out the line drawn below the sheer of the Gebel el-Arak "foreign" craft. This appears to indicate

a sheer strake, perhaps making this the earliest known intentional representation of planking.

Tomb 100 at Hierakonpolis was discovered by Quibbel and Green during their late 19th-century excavation and dated to S.D. 63. The late Gerzean dating has since been confirmed with radiocarbon measurement (Burleigh, 1983: 364). The painting has been interpreted as showing the same event (Childe, 1953: 80) as the Gebel el-Arak handle, or as showing a different battle in a continuing series of conflicts (Petrie, 1974b: 49). The evidence adduced for this is the (spurious) identification of the black vessel of the Hierakonpolis tomb and the high-hulled vessels of the knife handle, the scenes of combat taking place beside the boats and the belief that the vessel is traveling in the direction opposite that of the sickle-shaped craft (although this has not been a universal assumption, even among those who believe a naval battle is shown; Petrie, 1933: 14). Petrie says the "foreign" type of boat on the knife handle is "like" the Hierakonpolis black boat (Petrie, 1974b: 49); Childe says it is "the same" as the black boat (1953: 80); Kantor calls the black vessel "a well-known example of a Mesopotamian type" (Kantor, 1944: 116). Case and Payne, in their 1962 reconsideration of the Hierakonpolis tomb painting, followed conventional thinking in terming the crew of the black vessel "Eastern Invaders." There is no basis for this. The boats of the knife handle do indeed find strong parallels in Uruk/Jamdat Nasr iconography (the only Egyptian representation of which this is true), but the only parallels to the black vessel of Hierakonpolis are Egyptian. It also seems fairly

clear, as Quibble and Green first assumed (1902: 21), the high end is the bow. Parallels for this vessel type that clearly show a high bow are found in Engelmeier (Fig. 57.a on page 134), in a petroglyph that is probably to be dated between the late Gerzean and Early Dynastic period, and the comb found in the tomb of the First Dynasty king Zer at Abydos (Fig. 81 on page 170 ; Goedicke, 1975: 205; Petrie, 1921: pl. XII). In the petroglyph, the figure is clearly in the stern working a steering paddle. In the carving on the comb, the Horus figure is looking toward the high end, perhaps a good indication that it is the bow.

The sickle-shaped boats in the tomb painting are like those of the decorated ware in most details, except that they lack paddles and that one of them is definitely manned. The standards do not find exact parallels on the decorated ware, but they are quite close to several of them (Fig. 41 on page 104).

The scene has also been interpreted as having religious, magical or funerary significance. Raphael (1947: 14) considered that the depiction shows events from the life of the man buried in the tomb being replayed as he journeyed from this world to the next. Quibble and Green (1902: 21) did not impute any significance at all to the painting, other than that it represented a "generality of incidents."

Little constructional information can be gleaned from these two artifacts. The "foreign," angular-symmetrical boats on the knife handle might be assumed to be wooden because of the possible indication of a sheer strake. The sickle-shaped craft I believe to

be wooden for already-described reasons. The construction of the black vessel is less certain. Aksamit believes it to be papyrus, but she classifies it along with a number of other boats that I believe are almost certainly wooden, in particular a sickle-shaped boat with a higher than normal stern and the boats on the Aha label from Naqada to be described below. The single high end could be interpreted as a papyrus bundle tied in place by the partially-obliterated cable. On the other hand, the fact that the black vessel is as large as some of the sickle-shaped boats in the scene and carries substantial deck structures could indicate a more substantial boat.

It is worth mentioning that some have questioned the authenticity of the Gebel el-Arak knife handle (Hans Goedicke, personal communication). There may be good reasons for this, and a radiocarbon assay of the handle would probably be well worth doing. Very small amounts of ivory can be used for radiocarbon dating using recently-developed techniques.

The Qustul Censer

A remarkable find from Qustul, a site in Nubia which will be referred to again below, is a stone censer with a procession of three boats on it (Fig. 89). The boats, one of which is under sail, are of the typical late Gerzean-Naqada III-Early Dynastic type with high bow and triangular-shaped stern. The dating, however, is controversial. Bruce Williams, who participated in its excavation,



Figure 89. The carving on the Qustul censer as restored. Williams, 1980: 16.



Figure 90. Boat from a label found in the tomb of Zer. Petrie, 1933: fig. 14.

dates it to before the First Dynasty, which he places at 3200 B.C. (Williams [1980: 20] notes a "possible" Mesopotamian connection for the boats). As restored, one of the boats has a seated figure wearing the crown of Upper Egypt. In general, Williams considered that Qustul Cemetery L, from which the censer came, dates to "six or seven generations before the start of the First Dynasty" (1980: 20), although it seems difficult to be so precise about the censer because it was not found in a grave, but in fragments scattered all over the site (W. Adams, 1985: 188).

W. Adams, on the other hand, doubts such an early date for the Qustul cemeteries in general and the censer in particular. Adams agreed with Williams that most of the Egyptian pottery at Qustul was of late Predynastic type, but argued that such ceramics continued into the First Dynasty and that locally-made ceramics were of a type datable mainly to the Early Dynastic period (1985: 188). Adams' arguments for a later dating of the cemetery are persuasive, but as far as I know, Williams has not responded to them. The form of the boats are of no particular help, since datable parallels come from both Naqada III (BM 35324) and the First Dynasty (Naqada label, boat hieroglyphs and potmarks).

Labels and Tablets

The drawing of the boat on the Naqada label (Fig. 2 on page 14), said to have the name "Menes" inscribed on it, is a typical angular boat of the type on British Museum 35324 (Fig. 39 on page 101). It has the typical flat hull, high bow and triangular-shaped stern. A

curved deck structure has no interpretable detail. The boat also has a crescent on the top of its stem post with a tassie hanging from it.

The so-called "Menes" tablets from Abydos (Fig. 3 on page 14) have two different kinds of boats on them. One has the typical Early Dynastic vertical stern with gently up-curving bow, with tassies or fenders (?) hanging overboard, and apparent masts; in the third register of this four-register scene are four boats with unusually high bulwarks. A parallel might be drawn with the high-sided model in the Berlin museum (Fig. 78 on page 168 ; Petrie, 1933: fig. 15) and a similar label from the tomb of Zer (Fig. 90 on page 185 ; Petrie, 1933: 5, fig. 14). Petrie called these the "usual freight boat of the First Dynasty" and believed they were made of papyrus. In my opinion, large built-up boats of this size would almost certainly have to be wooden, but the cable coming off the in-curving stem post of the Zer representation appears to present contrary evidence.

The Narmer Palette

The type craft of the First Dynasty may be considered to be the boat on the Narmer Palette (Fig. 4 on page 16). This vessel has the vertical stern and up-curving bow that is also seen in the Gebel Sheikh Sulliman petroglyph and a series of boats under sail on First Dynasty pottery vessels from Abydos (Fig. 50 on page 121 ; Petrie, 1903b: pl. XII.266). The Narmer palette boat has a deck structure near the stern and a small pedestal near the bow. The closely-related Zer petroglyph boat has a chair-shaped mast, a

petroglyph boat has a chair-shaped mast, a feature paralleled by a number of hieroglyphs from Abydos (Fig. 91; Petrie, 1901a: XVII.26, 29). These boats appear to be explicitly identified with royalty, and the Zer petroglyph boat's mast, along with the parallel boats under sail on the Abydos jars and similar petroglyphs, would indicate to me that these were sailing vessels, most probably wooden.

Fragments

Three fragmentary representations are worth mentioning. The First Dynasty "Bird Palette" (Fig. 92) shows the bow of a boat with rope bindings on it; this may be compared to a number of Old Kingdom boat scenes (Fig. 93) that show bound-up bows and sterns on wooden boats under construction. The Naqada III Scorpion Macehead has one end of a boat preserved on it, but there is no interpretable detail. An undated vase fragment now in the Berlin museum (Fig. 94) shows the ends of two boats: one possibly showing planks, the other with the characteristic bent end of a papyrus raft (Capart, 1905: 99).

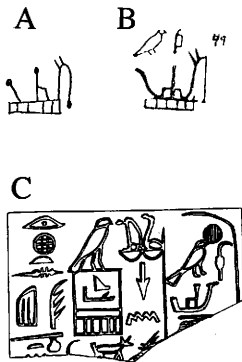


Figure 91. Early Dynastic boat determinatives. A--Frankfort, 1924: 140. B--Petrie, 1900: pl. XVII.26. C--Petrie, 1900: pl. XVII.29.

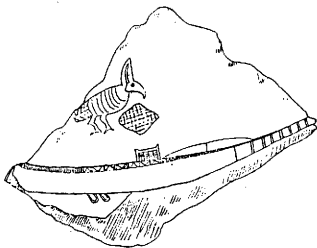
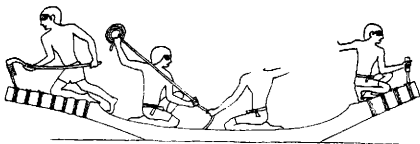


Figure 92. Early Dynastic boat with bound-up end. Capart, 1905: fig. 169.

A



B

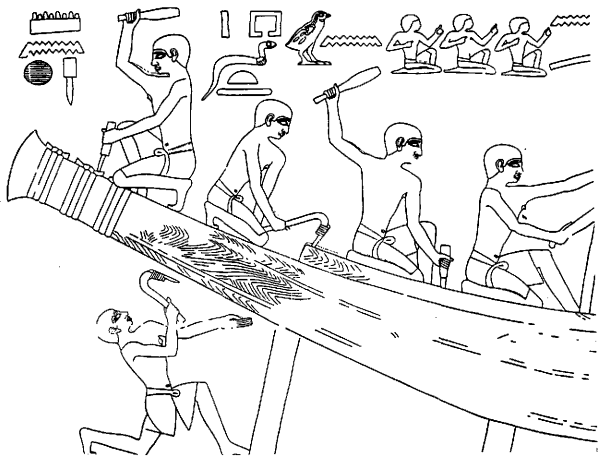


Figure 93. Old Kingdom boat construction scenes. A--From Medum.
Petrie, 1892: pl. XII. B--From the tomb of TI, Saqqara.

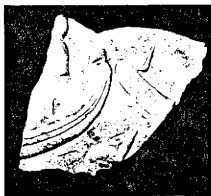


Figure 94. Early Dynastic palette fragment showing ends of a wooden boat (?) and a papyrus raft (?). Capart, 1905: fig. 71.

CHAPTER VI
BOAT GRAVES

In the discussion above I mentioned attempts to estimate sizes of sickle-shaped boats from representations, and arrived at a figure of something slightly in excess of 15 m. This attempt could be justly dismissed as speculative if there were no direct evidence for the size of Pre- and Early Dynastic boats. Fortunately, there is such evidence: about 25 boat graves from the First Dynasty. The boats that were buried in these graves do not necessarily bear directly on their Gerzean predecessors as far as size; but it does not seem unlikely that the funerary boats of the earliest pharaohs would have been near the upper end of the range of possibility, and it does not seem likely that Gerzean boatwrights could have built larger boats than their Early Dynastic successors. It should be conceded at the outset that the dimensions of the boat graves are certainly to some degree greater than the dimensions of the boats that were placed in them; but they do supply an upper limit, and are the best available bases for estimates of the basic dimensions of Early Dynastic boats.

All the reported Early Dynastic boat graves come from Lower Egypt. Zaki Saad excavated 19 boat burials at Helwan (1969: 75), of which only four were even superficially dealt with in professional publications (Fig. 95; Saad, 1951: 41, 42, pl. LIXA, LIXB, LX; Saad, 1957: III, pl. XL, pl. LIX). Walter Emery reported six boat burials in the Early Dynastic "great tombs" at Saqqara, of which one was reported in the Illustrated London News to be

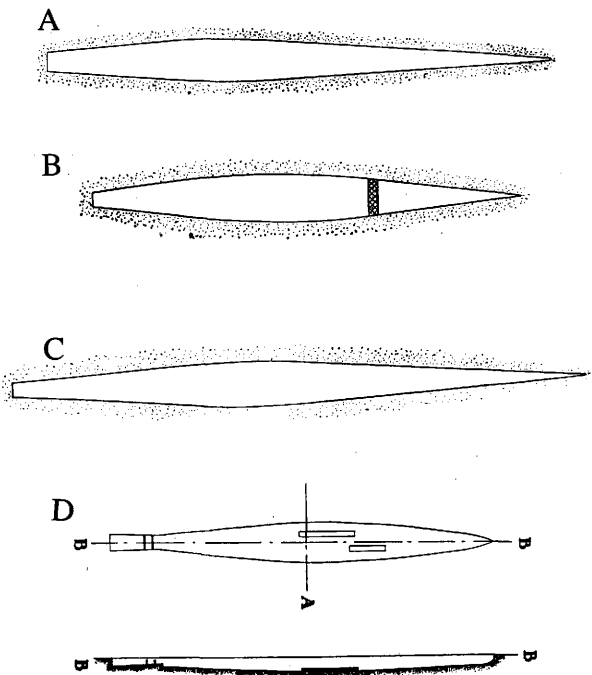


Figure 95. Plans of boat graves from Helwan. A--Grave 762. Saad, 1951: Plan 18. B--Grave 680. Saad, 1951: Plan 17. C--Grave 649. Saad, 1951: Plan 16. D--Grave 1550. Saad, 1957: pl. XL.

"substantially intact" (Emery, 1955: 500). Finally, two "boat burials" from Abu Roash are actually full-sized clay models of boats (Fig. 96). One of these had a body buried in it (Anonymous, 1959; Klasens, 1961: 110ff).

The first of the burials was discovered by Emery in association with the tombs of 'Ankhka and Hemaka, officials who apparently served Den, the fifth king of the archaeological list (Emery, 1939: 8). Hemaka's boat grave is neither drawn nor described. Emery believed Hemaka to be Den's "chancellor" (Emery, 1938: 2). His tomb, Saqqara tomb 3035, is described in the first of Emery's publications on his Saqqara excavations; unfortunately, that book does not mention the boat grave at all.

Better documented is the boat grave Emery identified with Aha, whom he believed to be the Menes of the Dynastic and Ptolemaic king lists (Emery, 1961: 37). Emery drew both plan and profile drawings of the Aha boat grave (Fig. 97), and listed dimensions: 19.3 m long, 3.2 m at the beam and 1 m high (Emery, 1939: 18). However, these dimensions appear to be the maximum external dimensions of the brick casing. The maximum internal dimensions, taken from the scale drawing (Emery, 1939: pl. 3) appear to be 17 m long, 2.5 m at the beam and 1 m deep amidships. The casing was built completely of brick, and Emery believed it was built around a pre-positioned boat. "Fragments" of wood and rope belonging to the boat were reported, but not described (1939: 18).

Emery published the tomb of 'Ankhka in 1949, in this publication spelling the name "Ankh-ka." He supplied a photograph of the boat

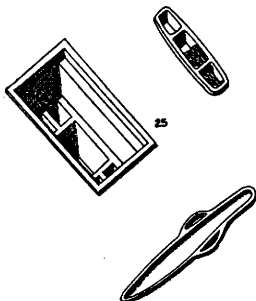
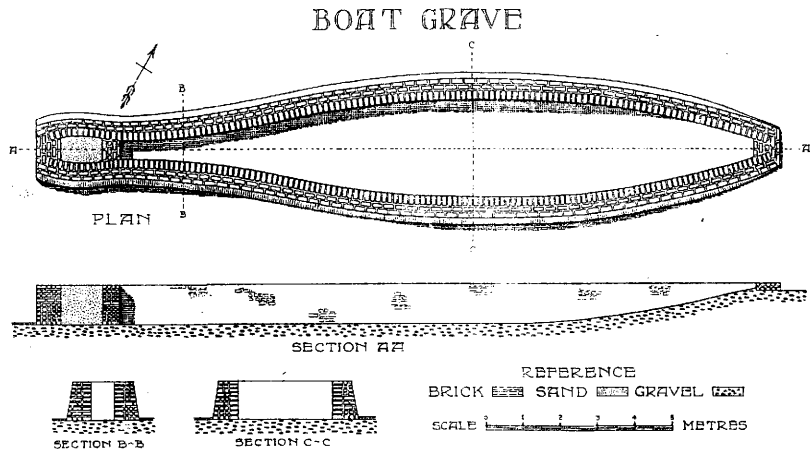


Figure 96. Full-size boat models from Abu Roash. Klasens, 1961: fig. 2.



WALTER B. EMERY
1928

Figure 97. Plan of the Aha boat grave. Emery, 1939: Plate III.

grave (Emery, 1949: pl. 19) and listed its dimensions: maximum length, 14.3 m; maximum beam at the top of the trench, 2.15 m; maximum beam at the bottom of the trench, 1.8 m; maximum depth, 0.75 m (1949: 75). It is not specified whether these are the external or internal dimensions of the structure, which was faced with bricks. No scale drawing was supplied.

In 1954, Emery published a boat grave associated with Saqqara tomb 3503 (Fig. 98). He thought this tomb to be the tomb of Mer-Neit, who he thought died during the reign of Zer (Emery, 1954: 128), the fourth king of the archaeological list. (Kaplan, on the other hand, has proposed that Mer-Neit should be placed sometime before Zer, contemporaneous with Palestine's Early Bronze I-C; see 1979: 23ff.) Emery showed the boat grave in breadth view and at its midship station. Again, the dimensions listed are the external, not internal dimensions of the brick structure. They are: 17.75 m long, 4.25 m wide and 0.8 m high. As far as can be determined by the scale drawing, the internal dimensions were 14.3 m long, 3 m wide at the bottom of the structure, 3.5 m wide at the top of the trench and 0.8 m high. There is no reference to any wooden remains associated with this boat grave.

Aside from the boat graves in tombs 3035 (Hemakah), 3357 (Aha), 3503 (Mer-Neit) and 3036 ('Ankhka), an undescribed boat grave was found associated with grave 3500 (dated to Ka) (Emery, 1954: 169).

The best-preserved boat grave is that associated with tomb 3506, associated with Den (Emery preferred the alternate form Udimu). In the headline for his 1955 Illustrated London News article, Emery (or

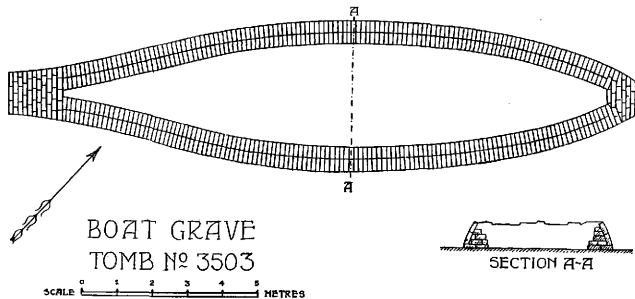


Figure 98. Plan of the boat grave from Saqqara Tomb 3503. Emery, 1954: 138, fig. 203.

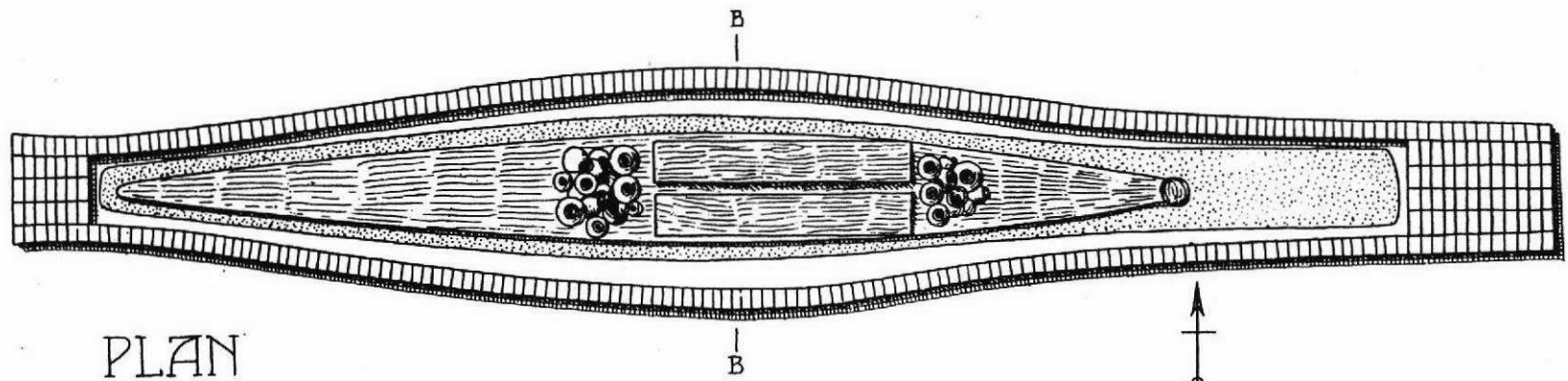
an anonymous ILN headline writer) wrote that the tomb was "probably that of Udimu" (Emery, 1955: 500). In the professional publication of the site, Emery only went so far as to write that the tomb belonged to a member of the royal family (1958: 37). Both the ILN article and the 1958 Great Tombs III are full of tantalizing references to the boat remains found with Tomb 3506, but both are almost completely devoid of hard information.

Yet they suggest that more detail was observed than was reported. The boat was described as having two cargo holds full of pottery, which was found in situ and shown in photographs (Fig. 99; Emery, 1958: pl. 66.a). Emery thought he knew that the boat was decked and had a cabin, which was supposed to have been dismantled and laid flat on the deck. The bow and stern of the boat were held up on a platform of bricks, which were still in place. Below the bricks, two reed baskets were preserved (Emery, 1958: 49). In the ILN article, the boat is described as having been built of white-plastered wood (Emery, 1955: 500).

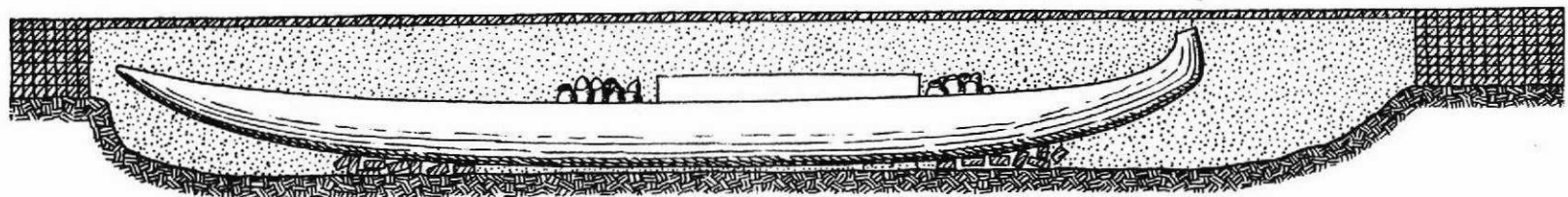
Emery included a reconstruction drawing of the boat in Great Tombs III, pl. 44 (Fig. 100). The drawing includes details whose bases are not revealed. In particular, two longitudinal girders are shown supporting the deck, a detail that is paralleled in the Cheops boat. The Cheops boat had been discovered by the time of the publication of Great Tombs III. Emery might have drawn this detail from that larger vessel, but its reconstruction had only just begun. Was he that familiar with the reconstruction efforts then going on? He didn't say. The reconstruction drawing also includes a graceful,



Figure 99. Pottery in the "holds" of the boat in Saqqara Tomb 3506.
Emery, 1958: Plate 66.B.



PLAN



SECTION ON A-A

RECONSTRUCTION OF A BOAT BURIAL



SECTION ON B-B

REFERENCE



-  BRICK~
-  WOOD~
-  GRAVEL~
-  SAND~

Figure 100. Reconstruction of the boat in Saqqara Tomb 3506. Emery, 1958: Plate 44.

gently-upcurving bow and a stern that ends in a truncated vertical post, in close approximation to the First Dynasty profile known from models, petroglyphs and the Narmer Palette. Is this rendering based on the remains in the grave or upon those representations? It ought also to be noted that Emery's pl. 44 is enigmatically titled "Reconstruction of a Boat Burial," the indefinite article perhaps indicating that this is a hypothetical model of an ideal boat grave rather than a specific attempt to reconstruct the boat at Tomb 3506.

Photographs of the boat remains still in the grave show a long, low tumulus of amorphous-looking material (Emery, 1958: plates 66, 67 and 68). In Fig. 99, the truncated stern post is apparently visible; in Fig. 101 is a reasonably clear shot of what appear to be the deck cabin planks. Fig. 102 seems to show wood fragments that are in a very bad state of preservation. Fig. 103 shows the boat burial cleared of all material.

At the very least, it proved possible to measure the extent of the boat remains, though unfortunately only the length, 14.5 m, was reported (Emery, 1955: 500). The boat, then, was considerably smaller than the hole it was placed in. The dimensions of the brick structure were 22.15 m long, 3.4 m wide at maximum beam and 1.1 m deep, from the bottom of the trench to the top of the brick casing.

What happened to the material recovered from Tomb 3506 is not clear. Emery was a professor of Egyptology at University College, London. Staff members there report that the material was not brought to England and is not on display in Egypt. One speculated that perhaps it was reburied on the site (G.F. Martin: personal

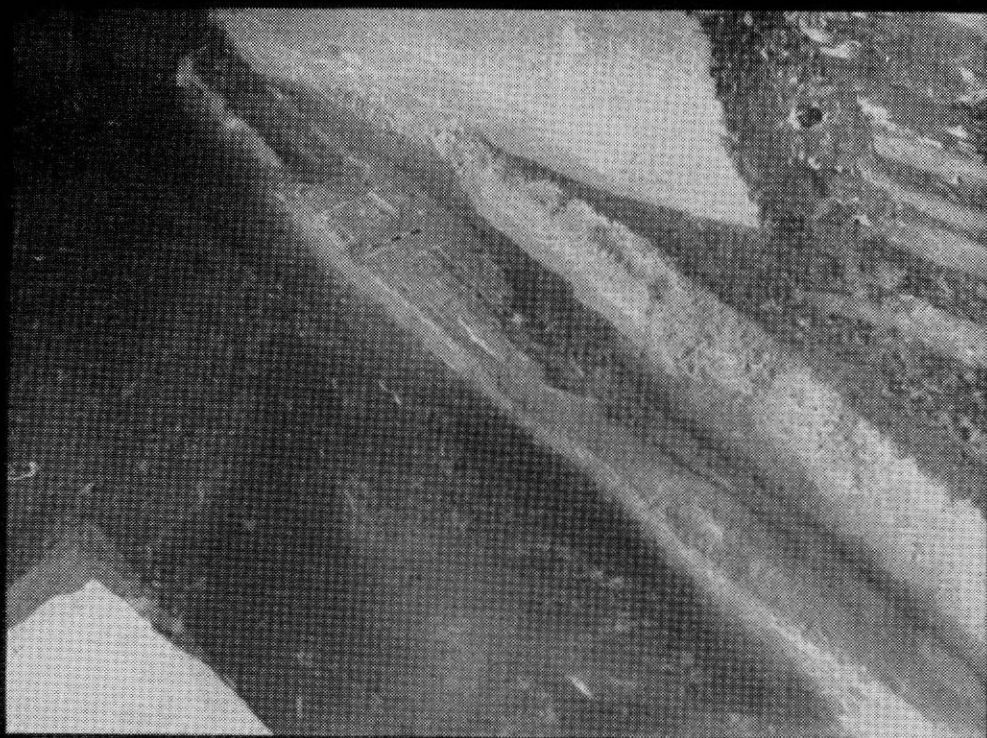


Figure 101. Funerary boat in Saqqara Tomb 3506 cleared of pottery.
Emery, 1958: Plate 66.b.



Figure 102. Funerary boat in Saqqara Tomb 3506 cleared of pottery.
Emery, 1958: Plate 68.c.

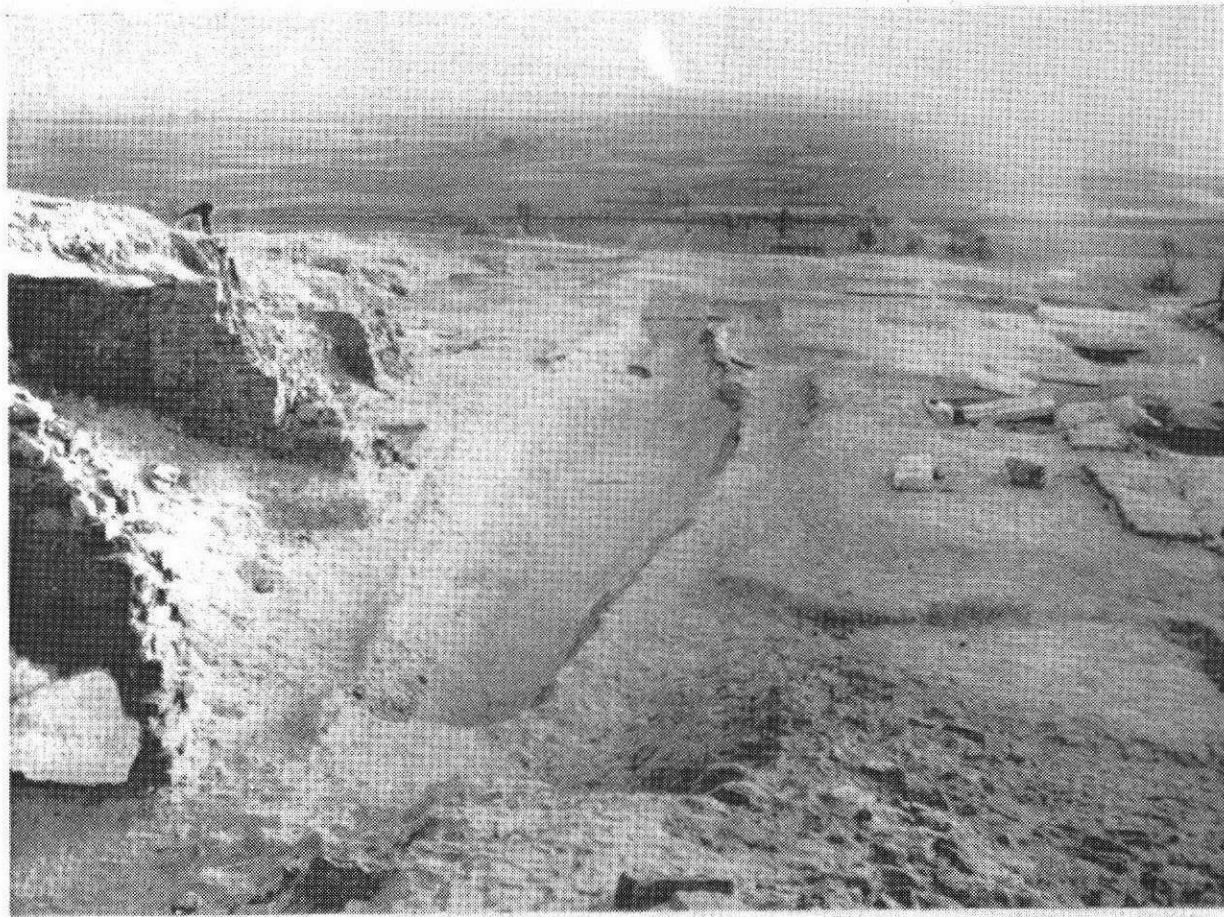


Figure 103. Boat grave at Saqqara Tomb 3506 cleared of all remains. Emery, 1958: Plate 67.d.

communication).

The boat burials recovered at Helwan by Saad were apparently those of private citizens (Saad, 1951: 41), and were far less substantial than the burials in Saqqara. Those which were sketched and photographed were simple trenches cut in the ground, with no brickwork (Fig. 95 on page 194). Their dimensions are: Tomb 649 (Saad, 1951: plan 16), 13.4 m long, 1.5 m at maximum beam, 0.60 m deep at maximum beam; Tomb 680 (Saad, 1951: plan 17), 9.5 m long, 1.3 m wide at maximum beam, 0.75 m deep at indicated section; Tomb 762 (Saad, 1951: plan 18), 10 m long, 1.2 m wide at maximum beam, 0.25 cm deep amidships; Tomb 1502 (Saad, 1947: pl. XL), 13.75 m long, 1.5 m wide at maximum beam, 0.33 m deep at maximum beam. The dimensions given here for Tomb 1502 and for the depths of hull of all graves are approximate, taken with dividers and rule off scale drawings; the hull depths are probably meaningless because they do not take into account how much, if any, overburden covered the in-situ boat.

Like Emery, Saad reported fragments of wood coming from the boat graves, but did not describe them (Saad, 1947: 111; Saad, 1951: 41). The drawings of the boat grave associated with Helwan Tomb 1502 show what appears to be a schematic rendering of two large planks resting in the bottom of the hole, but these are not commented on.

Finally to be described are two so-far unique full-sized boat models discovered at Abu Roash in 1959 by Adolf Klasens of the Leiden Museum of Antiquities (Fig. 96 on page 196; Anonymous, 1959; passim; Klasens, 1961: 10,11). The smaller of these two "boats" is built of yellow clay bricks and has a truncated bow and stern. Its

measurements are 4.75 m long, 1.29 m wide and 0.47 m deep. It was divided into three compartments by lateral "bulkheads"; the center compartment contained a skeleton. The larger of the two was 8 m long, 1.85 m wide and 25 cm high. This "boat" was molded in clay, not constructed of bricks. It had two unique "outrigger" structures on each side, just aft of amidships (Klasens, 1961: 110-111). These "outriggers" were not commented upon by Klasens, and as far as I know are not paralleled in any other type of contemporaneous boat representation.

Traces of wood were found in both models, but there is no evidence or suggestion that actual boats were contained within the clay structures.

The value of these boat burials and full-sized models is that they give us our firmest bases on which to estimate basic sizes and proportions of Early Dynastic boats. We have to bear two factors in mind, however: the certainty that the boats were to some degree smaller than the graves they were placed in, and the possibility that the boats buried in the holes were not entirely like working vessels of the period. They may have been built to special ceremonially-required dimensions; they may not have been functional boats at all.

All the boat graves must have contained vessels that were long, narrow and of shallow draft. The average length-to-beam ratio is about 7.9:1. The narrowest of the graves is Heiwan Tomb 1502, with a length-to-beam ratio of just over 9.1; the beamiest is the Aha grave, at about 6.8:1. The ratio of maximum beam to sheer height for

the Hor Aha boat grave is 2.5:1. For the boat remains from Saqqara Tomb 3506, the length of the boat remains themselves can be taken into account, but not their beam. Comparing the length of the boat to the width of its hole yields a ratio of 4.1:1, about the length-to-beam ratio of the Chicago Dashur boat (Haldane, 1984: 8). The true ratio must have been somewhat higher.

The proportions of the Hor Aha boat grave, on the other hand, turn out to be in good accord with those of the Cheops boat. The Fourth Dynasty craft is 43.63 m long, 5.6 m wide at maximum beam and 1.78 m from bottom plank to sheer line amidships (Lipke, 1984: 97), for a length-to-beam ratio of 7.1:1 and a midship beam-to-sheer height ratio of 3.1:1. This means the Cheops boat is proportionately slightly narrower and has proportionately less free-board, perhaps giving it a more graceful appearance. But this is not necessarily evidence of an evolutionary trend, since the Helwan boats would have appeared even narrower. In contrast, the boat models from Abu Roash are on the tubby side. The smaller boat's length-to-beam ratio is 3.6:1, the larger's 4.3:1.

These boat burials show that a well-developed planked boat industry existed in the Early Dynastic period. Royal boats like the Hor Aha vessel or the boat with Saqqara Tomb 3506 were in the vicinity of 15-17 m long. Boats were sufficiently common, and the beliefs concerning them sufficiently developed, for non-royal persons to want to take them into the next world. It is a mystery, then, why no boat burials have been reported accompanying the Early Dynastic royal tombs at Abydos. Boat burials might have been

destroyed by plunderers and later construction. If they never existed at all, perhaps this is a good indication that the tombs at Saqqara were in fact the burial places of the kings, and the tombs of Abydos were cenotaphs.

CHAPTER VII

USE AND RANGE

There is a great deal of evidence for the exchange of goods in the Pre- and Early Dynastic periods, both within the Nile Valley and between the Nile Valley and western Asia, and perhaps even the Aegean. There is very little direct evidence for how much of this trade was water-borne. Historically, however, merchant shipping has proved to be far more economical than caravaning, and it is hard to believe the advantage of the Nile as a natural highway escaped the notice of Predynastic Egyptian traders. Certainly the importation of large beams of wood from Syria-Palestine or the Aegean, as was undertaken in the First Dynasty, required seagoing merchant vessels.

TRADE WITHIN THE NILE VALLEY

A large amount of material was transported within the Nile valley during the Pre- and Early Dynastic period. Early exchanges are documented in the Fayum Neolithic, where Caton-Thompson found sea shells from the Atlantic, Mediterranean, Red Sea and Indian Ocean (Caton-Thompson, 1934: 87). Brunton and Caton-Thompson found ample evidence for exchange at Badari: basalt was assumed to be from the Delta, elephant ivory from Nubia or farther south; porphyry slabs from Nubia or the Red Sea hills; and glazed steatite from some unspecified foreign locale.

Trade between Egypt and Nubia certainly was underway by the Amratian period (early A-Group in Nubia), documented by finds of Egyptian ceramics south of the cataract (W. Adams, 1977: 36) and black incised Nubian ceramics in Egypt (Arkell, 1953: *passim*). In fact, black incised wares are reported by Brunton and Caton-Thompson from the Badarian remains at Badari, though they are attributed to an unspecified western source (Brunton and Caton-Thompson, 1928: 41). In addition, a series of possibly late-Amratian maceheads have been found in Neolithic sites in the Sudan (Arkell, 1953: 79). Arkell went so far as to suggest that Amratian raiders left these weapons behind after attacks that brought the Khartoum Neolithic phase to an end.

The common Egyptian ceramics found in Nubian sites were probably containers for some perishable product. Nordstrom (1972: 27) has suggested that this was foodstuffs, like wine, beer, cheese or oil. W. Adams (1977: 137), on the other hand, arrived at the opposite conclusion, arguing that commodities imported by Nubia "are not likely to have been the food products which were common to both countries: cereals, cheese and beer." He believes, on the basis of later Dynastic texts, that cosmetics and oils were the most likely Egyptian exports. Copper implements as well as jewelry and other items were brought to Nubia, but in small amounts compared to whatever was transported in the pottery vessels.

What was brought back by Egyptian traders is even less certain. So few items of Nubian provenience have been found in Egypt that it has been suggested that Egyptian goods were payment for Nubian

mercenaries serving in the north (W. Adams, 1977: 137). Some have theorized that the Nubians exported cattle northward (Piotrovsky, 1967: 130ff, in Nordstrom, 1977: 21); several petroglyphs of boats with animals aboard have been published (for example, Fig. 104; Engelmayr, 1965: pl. XVI.5, LX.2).

Gold, copper and slaves were taken from Nubia by the Dynastic Egyptians, but it is not certain that Nubian mineral deposits were known in Predynastic times, or that the A-Group population was large enough to supply many slaves (W. Adams, 1977: 137). Yet, since few Nubian objects are found in Egypt, and transshipment through Nubia of tropical ebony and ivory is not attested to before the First Dynasty (Nordstrom, 1977: 27), it seems indisputable that Predynastic Egyptians were taking raw or perishable materials back with them. Whether all black incised ware in Egypt can be attributed to exports from Nubia or the Sudan has yet to be proven.

In the Gerzean period, the appearance of large numbers of boat representations and an acceleration of cultural development would seem to demonstrate an increase in water-borne trade. F. Hassan (1984: 62) proposed that the boats of the Gerzean decorated vessels were engaged in shipping grain, probably in the summer after the harvest period. At this time of the year, the modern (but pre-Aswan dam) Nile had a velocity of 1.5 km per hour, and boats drawing less than 1 m could navigate (recall that the dimensions of the boat graves indicate that even the largest royal craft were less than 1 m from bottom to sheer). Presumably the Nile was at least slightly higher and faster in Predynastic times, even during low river.

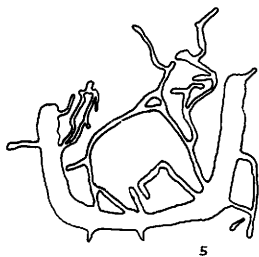


Figure 104. Boat with bull aboard. Engelmayer, 1965: Plate XVI.5.

Representations of boats of all types are found in the Nile Valley as far south as the second cataract, but then they dramatically drop off. "Predynastic"-looking petroglyphs in the Sudan are of problematic date, as we have seen above.

Within Egypt proper, there was apparently trade between Upper and Lower Egypt. At the site of Maadi, evidence of a copper import/export economy has been found, and Hoffman (1979: 153) suggests that Maadi imported copper from the Sinai, smelted it, and re-exported it southward along the Nile. In Maadi, rhomboidal slate palettes like those made at Naqada have been found (W.C. Hays, 1964: 133). This may be evidence of exchange with Upper Egypt. On the other hand, a "Gerzean" culture center at Minshat Abu Omar in the Delta indicates that such things might have been obtainable locally.

Another commodity that may have been traded in the Gerzean period is clay. This was first suggested by Mond and Meyers in their volume on Armant (1937: 50, in Butzer, 1974: 337 n. 1). According to them, there are only a few areas where the specific clay necessary to produce buff ware was available. Butzer (1974: *passim*) disputed that view, arguing that the proper clays are available throughout most of Middle and Upper Egypt (1974: 382). Pearlman, on the other hand, has supported the former view. His neutron activation studies on Predynastic pottery have shown that clays from different areas were mixed in the manufacture of decorated wares, wavy-handled wares and coarse wares; both Nile mud and calcereous clays brought in from regions away from the river were used (1969: 34 and personal communication).

Galena, a lead sulfide, was also apparently traded in Egypt. This substance, which was ground up and applied to the eye as a cosmetic, is known from a number of Predynastic burials (A.A. Hassan, 1981: 77); lead isotope analysis of this galena matches ores from the Eastern Desert fairly closely (A.A. Hassan, 1981: 78).

The Early Dynastic period saw the end of trade with Nubia and the beginning of a long history of raid and pillage (Nordstrom, 1977: 31). The petroglyph at Gebel Sheikh Sulliman attributed to a raid under Zer shows a boat with local prisoners tied to it, and what have been interpreted as the standards of two conquered villages (W. Adams, 1977: 138). These attacks may have begun in Naqada III times. An inscription showing a scorpion holding a man in one of its pincers has been interpreted as a possible record of a similar raid by Scorpion. Interestingly, the recorder of this petroglyph thought there are traces of a boat in the scene (Needler, 1967: 89), though this portion of the petroglyph was left unillustrated. Boats associated with invasions in the Naqada III and Early Dynastic periods indicate an early awareness of the boat's usefulness in warfare.

Internal trade in Egypt must have prospered under the First Dynasty. The beginnings of stone architecture must certainly have required large barges to haul granite blocks like those used in the tomb of Den at Abydos (Amelineau, 1899: 124). According to Amelineau, only sandstone is available at Abydos. In fact, boulders of Aswan granite were being brought to Hierakonpolis in the Naqada III period (Hoffman, 1984: 244). Stone was also widely traded for the

manufacture of bowls (Emery, 1961: 203).

The only indication we have of the possible size of cargos in the Early Dynastic period is the pottery cache found in the "holds" of the boat at Saqqara Tomb 3506. The total of 50 jars and bowls (Emery, 1958: 49) is disappointingly small and did not at all fill the boat. Regrettably, none of the pottery vessels from the boat are reported to be inscribed, so we are unable to test Petrie's theory that boats' equipment was marked with some sort of naval designation.

EXTERNAL TRADE

Trade with partners beyond the Nile Valley is documented from the Neolithic period on. As mentioned above, the inhabitants of the Fayum were receiving shells from the Red Sea and Indian Ocean. Brunton and Caton-Thompson believed that turquoise found at Badari showed trade with the Sinai in the Badarian period. Other non-Egyptian objects reported in the Badarian period include a possibly Syrian four-handled pink vessel. Lapis lazuli appears for the first time at S.D. 36 (Petrie, 1974b: 44), though it is far more common after S.D. 50. As noted above, foreign woods found at Badari and datable to the late Amratian/early Gerzean period show that some kind of trade in wooden objects was underway, though there is no evidence for a full-scale timber trade in the early Gerzean period, and as we have seen, no real need for one.

With the Gerzean period fully under way, foreign trade must have

increased substantially. A large metal axe dated to the beginning of the period was found by Brunton at El Matmar in Middle Egypt. Lucas believed this axe to have been made of Sinai copper, since it contains manganese and the copper workings at Magharah are also near manganese deposits. Obsidian was available in the Gerzean period, though it was extremely rare. Petrie found a single obsidian knife was found in Naqada tomb 743 (Baumgartel, 1970: XXIX), a tomb datable to S.D. 60. Other obsidian was found at Diospolis Parva, datable to S.D. 43, and Gerzeh, datable to S.D. 43-70 (Massouliard, 1949: 204). More recently, obsidian beads have been found at Hierakonpolis, dated to the Naqada III period (Hoffman, 1982: 91). Obsidian must have come from far from Egypt; the nearest sources are in sub-Saharan Africa, western Asia or the Aegean. To my knowledge, none of the obsidian from Egypt has been chemically analyzed. However, Neolithic obsidian found near Jericho was determined by Renfrew, Dixon and Cann (1966: 32-33) to come from sources in western Anatolia, a source that also apparently supplied obsidian to Neolithic Crete. Since Predynastic Egypt certainly had contact with Palestine and possibly was in contact with Crete (see below), this source would also seem to be a likely candidate for the Egyptian obsidian. Frankfort believed that Crete was the source of Egyptian obsidian (1924: 1,115). Chemical analysis would answer the question definitively.

Syro-Palestinian ceramics are certainly known from Egypt in the late Gerzean and Early Dynastic periods, and possibly earlier. In lower Egypt, pottery with Syro-Palestinian parallels has been found

at Maadi (Hoffman, 1979: 207), as well as at Minshat Abu Omar (Wildung, 1984: 267). Another major site whose pottery parallels that of the eastern Mediterranean coast is Qustul, a center of advanced culture just north of the modern Egyptian-Sudanese border, near Gebel Sheikh Sulliman and the second cataract. Pottery matching styles from the Levant were found there in excavations in 1962 (Williams, 1980: 16). This site was mentioned above in the discussion of petroglyphs and angular, assymetrical boats; its date could range from the late Gerzean to Early Dynastic periods.

In the Early Dynastic period, foreign vessels were found in the royal tombs at Abydos by Petrie. These were identified by him as Aegean, but Frankfort argued (1924: 106) that the jars' provenience was North Syria, an identification which is still generally accepted. It has also been argued that the wooden beams used in the construction of the Early Dynastic tombs at Abydos were imported (Frankfort, 1924: 115; Childe, 1953: 89). As far as I know, however, this opinion is based on the size of the beams, not on an identification of the wood. Petrie (1900: 9) specified only that the wood was a coniferous species. But the maximum sizes of the beams described above are not out of line with the maximum size of timbers that could be obtained locally, as we saw above.

Nibbi has argued that juniper stands were available in the Sinai, and that transportation of wood from Syria-Palestine by sea was impractical. This is certainly contradicted by texts from Egypt like the Middle Kingdom Tale of Wenamon, from Byblos, and from the Bible. Large, well-built ships were not necessary to transport

timber from point to point along the coast. In I Kings 5:8-9, Hiram, king of Tyre, exported building timbers to Solomon by simply placing trunks in the water "as rafts in the sea, unto the place which you will send to me; and I shall break them apart there, and you will carry them" (Stieglitz, 1971: 82-83). Texts from Byblos show that in historic times, such rafts would have had sails (Stieglitz, 1971: 83-84). It is not certain what Egypt was sending to Syria-Palestine and Crete (?) in return for obsidian, wood and the contents of ceramics. Only a handful of Pre- or Early Dynastic Egyptian objects have been found outside the Nile Valley. Kantor (1942: 196) describes two Predynastic Egyptian palettes at Byblos, one lozenge-shaped, one bird-shaped, neither of which could be precisely dated, and a single palette found at Jericho (1942: 200). She specifically argued that Byblos was "subjected to Egyptian influence from a very early time. Apparently even in Predynastic times Byblos was the port whence Syro-Palestinian products were shipped to Egypt" (1942: 201). By the First Dynasty, a considerable Egyptian presence is documented (Montet, 1921: 239ff).

In Canaan, Egyptian sherds bearing the name Narmer have been found at Arad and at Tel 'Erany (Schulman and Gophna, 1981: 167). At Azor, Egyptian vessels and a flint knife "similar to the one known from Gebel el-Arak" were found (Ben-Tor, 1981: 449). If this knife is in fact a serially-flaked knife of the Gebel el-Arak type, it must have been made during the late Gerzean period (Midant-Reynes, 1984: 261), though it may have been deposited later. Tel Gath as well yielded many Early Dynastic Egyptian ceramics, as have Tel

Maahaz and 'En Besor. An Egyptian sherd with a fragment of a serekh on it, possibly datable to the Naqada III period, was found at Tel Maahaz (Schulman and Gophna, 1981: passim).

The inscriptions of Narmer in southern Canaan and the palettes at Byblos and Jericho are clear proof of two-way trade between Egypt and Syria-Palestine from the Naqada III period at the latest. Finds of Egyptian material along the northern Sinai coast suggest a water-borne point-to-point coastal trade route (Fig. 105; Beit-Arieh, 1984: 21). Interestingly, no finds of Egyptian material have been reported along the southern Sinai coasts of the Gulf of Suez or the Gulf of Aqaba, even though Canaanite remains have been found in a large number of sites in the southern Sinai interior. This admittedly negative evidence suggests that there was no trade route along the Red Sea coast to the vicinities of Elliot or Suez. (But there is the First Dynasty inscription at Maghara in the southwest quarter of the peninsula; see Gardiner and Peet, 1917: pl. I). Beit-Arieh suggests that the city state of Arad was receiving copper from the interior; perhaps this was the primary resource the Egyptians were seeking. Traders in Maadi or the Gerzean/Naqada III culture at Minshat Abu Omar would be the most likely to take the Mediterranean route to Syria-Palestine, where perhaps they traded for copper or timber with middlemen in Arad and the other proto-urban centers. Unfortunately, none of this evidence tells us what the Egyptians were exporting.

The evidence for communication with Crete is slimmer and more controversial. Arthur Evans found a number of stone bowls or bowl

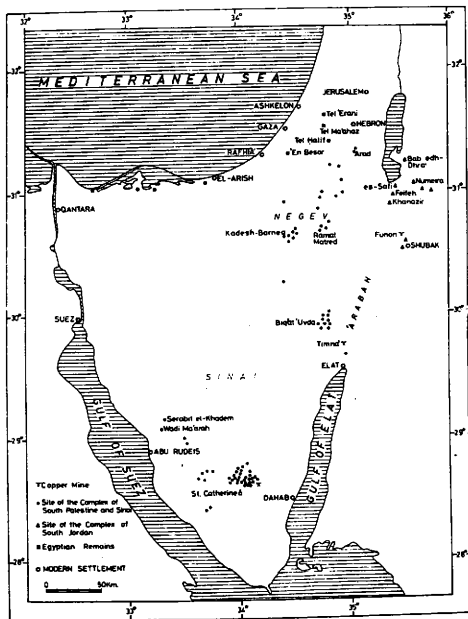


Figure 105. Early Bronze Age sites in the Sinai and southern Palestine. Beit Arie, 1964: 21.

fragments that he believed to be of Egyptian provenience and Pre- or Early Dynastic date in Neolithic levels of Knossos (Evans, 1964: 30-31). Whether the context was certainly Neolithic, however, is controversial, and some of the bowls are missing (Warren, 1969: 106); thus the Egyptian manufacture of all bowls and fragments cannot be confirmed. Warren does, however, believe that a "reasonable case" can be made for the bowls, and accepts Pre- and Early Dynastic contact between Crete and Egypt. On the other hand, Stubbings (1980: 243) calls the evidence of the bowls "illusory or misleading" (without explaining why), and goes on to say "clear evidence from the Egyptian side is hardly to be obtained at present." Earlier authors also split on the question: Vercoutter (1956: 407-408) argued against Egyptian contact with Crete before the Late Bronze Age; Smith (1965: 10) accepted Early Bronze Age contact.

The aspect of Predynastic Egyptian trade most pregnant with possibilities for early long-distance shipping is the question of relations with Mesopotamia. There is certainly evidence for Mesopotamian influence on Gerzean culture. The boats in the upper register of the Gebel el Arak knife handle (Fig. 87 on page 179) are strikingly Mesopotamian-looking, as is the scene on the reverse of the handle. The antithetical scene is also paralleled on the Hierakonpolis tomb painting (Fig. 88), which shows a much less detailed figure of a hero struggling with lions. The intertwined serpent's necks on the Narmer palette (Fig. 4 on page 16) and the horizontal winged griffin on the Naqada III "Fantastic Animal" palette (Arnette, 1982: pls LIV, LV) also seem to be of

Mesopotamian inspiration.

However, actual items of Mesopotamian provenience are rare in Predynastic Egypt: they amount to three pots and four cylinder seals (Kantor, 1965: 10). The one datable pot comes from Matmar, and is ascribed to the late Gerzean period. On the other hand, the vagaries of sequence dating make it unclear whether any cylinder seals in Egypt can be securely dated to before the First Dynasty (Kelley, 1973: *passim*). Mesopotamian cylinder seals are also known from Early Bronze Age Canaan and could easily have been brought from there.

In contrast to the situation in Syria-Palestine and Crete (?), there is no evidence of Egyptian presence in Mesopotamia. Kantor admits as much (1942: 201), and there is no evidence of Egyptian trade routes beyond the Red Sea around the Arabian coast, nor of Mesopotamian vessels coming toward Egypt by sea. No Jamdat Nasr sites seem to have been found south of Oman (Potts, 1979: 35). Inland Jamdat Nasr sites are all within the coastal hills; the only record of any westward over-land penetration is a single Ubaidian sherd found at the Jabrin Oasis (Fig. 106; Potts, 1979: 34). No Protoliterate Sumerian or Predynastic Egyptian sites are reported on the southern or western coasts of the Arabian peninsula.

Winkler thought that the Wadi Hammamat in Upper Egypt was the route taken by "eastern invaders," a Mesopotamian-affiliated people who, he believed, founded Dynastic Egypt. Kantor (1965: 13), arguing for a direct Mesopotamia-Egypt sea route, also considered the entry via the Wadi Hammamat the most likely for traders. Yet there is no trace of these people near the Red Sea coast. There is rock art near



Figure 106. Chalcolithic and Early Bronze Age sites in the area of the Persian Gulf and Arabian Peninsula.

the sea, but no representations of "foreign" boats (Whitcomb and Johnson, 1979: 330), where presumably they would have been seen for the first time and made the biggest impression.

In contrast to this, it does appear that there were Sumerian colonies in northern Syria during the Late Uruk period. The Sumerians were trading for the same things the Egyptians would have wanted: timber and metal (Potts, 1979: 43). This would appear to supercede Kantor's argument (1965: 13) that Sumerian influence in Chalcolithic Syria-Palestine was weak. Since Egyptians were beginning to be interested in Syria-Palestine at about this time, it seems likely that cultural influence was transferred here, not by a direct sea route. This Sumerian influence seems to have ended abruptly at the end of the Uruk period or the beginning of the Jamdat Nasr period, conceivably paving the way for Egyptian traders.

CHAPTER VIII
INTERPRETATIONS AND CONCLUSIONS

Simple papyrus skiffs like Breasted's "earliest boats on the Nile" could have been built at any time in history by people of any level of technology. There seems to have been a parallel development toward the late Neolithic period of reed boats and reed rafts, the former having built-up bulwarks, the latter flat platforms. Models of boats show simple canoe shapes. Models of apparent reed boats appear first in the Merimde Neolithic and persist into the First Dynasty.

By the late Amratian period, a large reed raft type had been standardized: a vessel with incurving bow and stern posts topped with triangular decorations with strange antennae. This craft normally carried a single deck structure. Representations vary in the amount of detail presented but two petroglyphs from Hierakonpolis show elaborately canopied reed cabins (Fig. 107; Hoffman, 1982: 62,62, figs I.18, I.19). This vessel type persists, at least as an artistic motif, through the Naqada III period and into the First Dynasty.

Developing woodworking technologies in the late Amratian and early Gerzean period allowed the development of a new type of boat: a sickle-shaped wooden craft of over 15 m in length, powered by crews of paddlers up to 30 strong. Funerary representations present us with a highly standardized version of this boat: two cabins, many

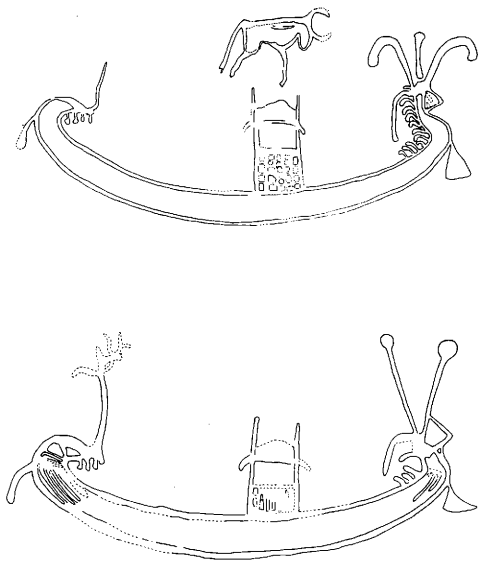


Figure 107. Papyrus raft petroglyphs from Hierakonpolis. Hoffman, 1982: 62-63, fig. 1.18, 19.

paddlers fore and aft, and distinctive standards. On the other hand, petroglyphs show the boat in more varieties and sizes. In particular, a class of Nubian petroglyphs presents us with a similarly-shaped boat with a single, dome-shaped cabin, normally with far fewer paddlers.

The idea of hewing or dubbing planks with axes and adzes was well developed, and sewing and lashing was the normal mode of fastening. There is no indication yet that the ideas of "rail-to-rail" lashing through V-shaped holes or mortise-and-tenon joinery had been conceived of in the Gerzean period, but examples of joinery are fragmentary. Nor do we have any firm basis on which to argue that Gerzean boats were or were not framed. The assumption that Nile boats were never framed was disproven by the discovery of the Cheops boat. But Nile boats were made in antiquity and continued to be made into the 20th century without frames (Hornell, 1938: 35). We might postulate that the earliest boats lacked them, and only practical experience with larger boats led to their introduction, perhaps in the Naqada III period.

By the Naqada III period, a third type of boat is documented, which seems to have been introduced from Nubia. This boat had upright stem and stern posts, seemingly in imitation of papyrus posts. This brings up the interesting question of whether angular boats descended from sickle-shaped boats or represent an independent tradition. If they descended from Gerzean boats, we are at a loss to explain why the papyriform post was re-introduced after centuries of the simple sickle-shape.

Representations of the angular boats are less detailed than the boats of the grave pots. The evidence that they are wooden comes from their late date, and from the fact that only this type of boat is ever certainly seen under sail. They appear at a time when trade and warfare were beginning to take merchants and marines to places as far away as Nubia and Byblos, possibly even across the sea to Knossos. It appears coastal traders left Delta communities like Maadi and Minshat Abu Omar and ventured across the northern coast of the Sinai where they struck out for the southern Canaanite city states and traded for timber, obsidian, copper and lapis lazuli, the luxury items of the emerging elite. Possibly beginning under Scorpion and certainly under Zer, pharaohs plundered weak Nubian chiefdoms to the south, dispatching fleets in some of history's earliest amphibious assaults.

In the First Dynasty, tastes in boat design changed so that the bow curved more gracefully. Construction advanced steadily, and mortise-and-tenon joinery and lateral lashing through V-shaped lashing holes were known and practiced; I argue that they must have been used in Early Dynastic boat construction. The Tarkhan planks indicate that boats were framed; complicated lashing holes in the Tarkhan "frames" would seem to show that the engineering pendulum had swung rather far and that boatbuilders were concerned to bind their hulls as tightly together as possible. There might have even been tentative, precocious experiments in stiffening hulls with a "keelson," a device which, if it was ever introduced, was supplanted in Dynastic times by the hogging truss.

These First-Dynasty royal boats seem to have been about the size of their largest Gerzean predecessors, c. 17 m long at the most. They had sails, with masts stepped a little farther aft than their immediate Naqada III prototypes. They most certainly did not have bipod masts, a device that is not attested to before the Old Kingdom.

Egyptian mariners were venturing onto the Mediterranean in the Naqada III-Early Dynastic period, and their interactions with their Syro-Palestinian, Anatolian and Minoan counterparts would be a fascinating study in its own right. To what extent was Egyptian ship building influenced by the Minoans, for example, who belonged to a sea-going tradition already millenia old in the Early Bronze Age? Our current knowledge suggests that the mortise-and-tenon joint and the V-shaped lashing hole appeared suddenly at the Naqada III-Early Dynastic horizon; could they have been imports from Crete or Syria-Palestine? My own feeling is, maybe, but probably not. The fact that Egyptian angular types seem to have developed in Upper Egypt or Nubia would seem to argue against diffusion from the Mediterranean. Similarly, lack of convincing evidence of a concrete Mesopotamian influence in Predynastic Egypt militates against the belief that Egyptian craft were inspired by Sumerian vessels.

Certainly the Egyptian record seems to show a gradual, indigenous development of the types of skills needed to build wooden boats: cutting planks, sewing them together, building larger and more complex structures to serve a growing variety of needs. One by one, assumptions that this or that facet of Egyptian culture (writing,

kingship, boat building, etc.) were the results of an invasion or diffusion have fallen as the record is more completely illuminated. Mortise-and-tenoning and rail-to-rail lashing were ideal engineering solutions to boatbuilding problems with which the Egyptians had already had centuries of experience by the time these devices came on the scene. The mortise-and-tenon joint, in particular, was so useful that it persisted into the early Middle Ages as a shipbuilding technique. We have no indication that anyone used this device before the Egyptians did. The evidence suggests that this fundamental feature of ancient Mediterranean shipbuilding emerged from the Nile Valley.

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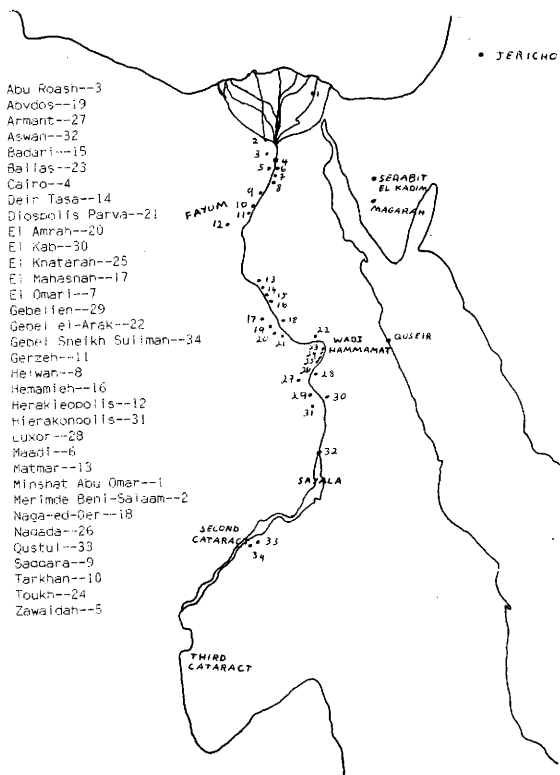
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APPENDIX I

KINGS OF EGYPT BEFORE THE OLD KINGDOM

Scorpion
(?)
Narmer
Aha
Zer
Uadjit (= Wadj, = Zet)
Den (= Udimu, = Samt)
Anedjib (= Azab, = Merbapa)
Semerkhet
Ka
Raneb
Weneg (?)
Neteren
Sneferka
Peribsen
Khasekhemwy

APPENDIX 2
 MAP OF SITES MENTIONED IN THE TEXT



APPENDIX 3
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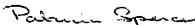
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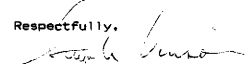
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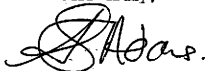
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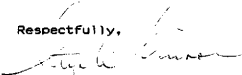
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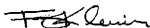
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Le collectionneur possédant un beau modèle en terre cuite de bateau égyptien s'appelle Jean Siegrist, Türkheimstrasse 4, CH-4009 Bâle. Je vous joins des photos des deux pièces en question en vous priant de ne pas les publier. (L 494 et L 495)

Avec mes respectueuses salutations

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15th June, 1987

Mr. Steve Vinson,
4209 Aspen,
Bryan,
Texas 77801
U.S.A.

Dear Steve,

Thank you for your letter of 27th May informing us that you will not be passing through London this time.

There is no need to worry too much about permissions to be used in a thesis. We bother more if it is published. Those extra you request will be added to your prior permissions.

Our conservators will not be collecting objects until the week beginning 22nd June. Helena Jaeschke will be happy to undertake your sketches and will contact you directly for certain clarification and costs, but of course it will not be on time for your symposium.

For permission to use the Hierakonpolis boat pictures, you should write directly to Michael Hoffman at Earth Sciences Resources Institute, University of South Carolina, Columbia, S.C. 29208. Mentioning my name might help.

Best wishes,

Yours sincerely,



Barbara Adams
Curator
Petrie Museum.

P.S. Would you ever like to write "Egyptian Ships and Boats" for my Shire series?

Mr. Stephen Vinson
4209 Aspen
Bryan, Texas 77801

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Patricia Spencer

Patricia Spencer
Secretary
Egypt Exploration Society
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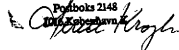
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15 June 1987

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APPENDIX 4
BOATS ON THE SHROUD OF GEBELIEN



This illustration was taken from Scamuzzi, 1965: Plate V.

VITA

Stephen Michael Vinson was born Feb. 27, 1960, in Shreveport, La. He grew up in Houston and received a Bachelor of Journalism degree from the University of Texas at Austin in 1982.

In the summer of 1982, he worked as a volunteer excavator at Tel Aphek/Antipatras, Israel. In the summer of 1983, he was accepted as a student at Texas A&M University's nautical archaeology program and attended the A&M field school at Port Royal, Jamaica. In the summers of 1985 and 1986, he worked on the Late Bronze Age excavation at Ulu Burun, Turkey.

He is currently employed as a newspaper reporter for the Bryan-College Station Eagle. Correspondence may be sent in care of the Institute of Nautical Archaeology, P.O. Drawer AU, College Station, Texas 77843.