

J. M. Sasson, ed. *Civilizations of the Ancient Near East* 3 (1995) New York: pp 1421-1431.

Sea and River Craft in the Ancient Near East

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THE GREAT RIVERS of the Fertile Crescent did more than nourish the crops of those who settled their banks. The Nile, the Tigris, and the Euphrates, with their tributaries and canals, served also as the major highways of Egypt and Mesopotamia. The people of these regions developed their own local types of river craft, but their sea-going ships were eventually influenced by the fleets of the Levantine coast and, perhaps, the Aegean.

RIVER CRAFT IN MESOPOTAMIA

River traffic in Mesopotamia was intense. At the time of the Third Dynasty of Ur, King Ibbi-Sin received a request for six hundred vessels to transport grain from Isin (modern Ishan Bahriyat) to Ur (Tell al-Muqayyar). Cuneiform tablets from the Old Babylonian period tell us not only of grain, but of cattle, fish, milk, vegetables, oil, fruit, wool, stone, bricks, leather, and people being transported over the network of canals, for which clay "canal maps" are still preserved. Commerce was not the sole purpose of river craft. During this same period, Kish (modern Tell al-Uhaimir, Tell Inghara) was threatened by an enemy fleet of 240 ships.

The importance of river and canal traffic is further indicated by the fact that at Lagash (Tell al-Hiba), a full tenth of the population of the

temple of Bau were boatmen, about 125 in all. These boatmen, including rowers and helmsmen, were freemen, but male and female slaves were assigned to crews and even belonged, at times, to the individual sailors, among whom were foreigners.

Traffic was rigidly controlled. Laws of right of way and salvage, as well as laws setting the rates for hiring boats and paying crews, date back at least to the first half of the second millennium. The famous *Code of Hammurabi* even established the amount a worker could charge for caulking a boat (law §234), adding that he would have to do it over at his own expense if the boat leaked within a year (law §235).

All of the types of river craft used on the Tigris and Euphrates for which we have evidence from depictions or models have continued in use until modern times. The simplest is an inflated animal skin capable of buoying a swimmer across a river. Under Shamshi-Adad of Assyria, at least, such skins were a normal part of a soldier's issue. At first, the neck and three legs of the hide were tied tightly, allowing the swimmer to blow from time to time into the open fourth leg to keep the float buoyant. After about 700 BCE, however, larger skins were used with all four legs tightly tied.

One inflated skin could support one person, but for heavier cargoes, from four to hundreds of skins were fastened together beneath a framework of poles and reeds to form a raft called in

Akkadian a *kalakku*, and called today in Arabic a *kelek*. These rafts were particularly suited to those parts of the rivers that had rapids and shallows, for the loss of some skins would not endanger the raft. After the cargo reached its destination, the *kelek* was taken apart, its wood sold, and its skins sent back upstream on donkeys.

A kind of coracle called today a *quffa* in Arabic is (and was) a round basket (Akkadian *quppu*). Ancient *quffas* are usually shown with from two to four rowers, which would make them small by modern standards; in this century *quffas* have carried cargoes weighing more than fifteen tons. There is another difference between modern and ancient *quffas*: in antiquity the wicker framework was covered with animal hides to make it watertight, whereas since the nineteenth century the basketry has been covered with bitumen for that purpose.

Reed boats, or rafts, were suitable for marshes. Made of reed bundles tied together, they probably became waterlogged in a matter of weeks or, at most, months. Some of them had peculiarly high and straight stems and sterns.

Models and reliefs of canoes show that they were propelled both by paddling and by punting (moving the canoe by means of a pole pushed against the bottom). They so resemble modern Mesopotamian marsh canoes that we must guess that they were similarly constructed of wood.

Although timber was scarce, plank-built boats, often made of imported wood, were not uncommon. We do not yet have archaeological evidence for their construction, but ambiguous documents describing their parts have been interpreted by some to mean that they were built in the ancient shell-first manner with mortise-and-tenon joints.

Boats built by the shell-first technique differ from most wooden boats in Europe and America, which are built today by the so-called skeleton-first method; that is, the builder lays down a heavy timber for a keel, to which he adds a stem, sternpost, and frames (commonly called ribs). This "skeleton" forms the shape of his vessel. To it he nails the planks that form a watertight hull.

In antiquity, however, the boatwright constructed the shell of his vessel first, without any interior framework. He cut a series of notches,

or mortises, along one side of the top of the keel and inserted into each mortise a hardwood tenon. He next cut a mirror-image series of mortises on the bottom edge of the first plank of the hull, and shoved this plank down onto the tenons protruding up from the keel. He repeated this procedure on the other side of the keel, and on each succeeding plank of the hull until it was completed. He often drilled through the top and bottom of each mortise-and-tenon joint and drove a peg through to prevent separation of the planks.

Wooden barges of great size are shown being towed from river banks during the Neo-Assyrian period; contemporary reliefs also show series of barges or boats serving as the pontoons for floating bridges.

Sailboats were not suitable for the Tigris and Euphrates, and though there is some indirect evidence for their use, they seem not to have been common there, partly because the wind blows roughly in the same direction as the currents of the rivers. This explains why watercraft were sometimes towed; cuneiform tablets tell us that it took sixteen or seventeen days to tow a barge upstream the eighty-five miles (137 kilometers) between Lagash and Nippur (modern Nuffar), about four times as long as it took to cover the same distance downstream.

RIVER CRAFT IN EGYPT

Paddled and punted reed-bundle rafts, as in Mesopotamia, were used on the Nile throughout antiquity, especially for fowling, hunting, and fishing in marshes. Even as early as Predynastic times, however, a sickle-shaped boat made of planks laced together with rope, rather than fastened by mortise-and-tenon joints, was developed.

The detailed appearance of early plank-built Nile boats has been revealed by the discovery and restoration of a Fourth Dynasty boat that had been disassembled and buried in a pit next to the pyramid of Khufu (Cheops) at Giza. This slender vessel (143 feet or 43.6 meters long, with a beam of 18.5 feet or 5.7 meters) had been built in the shell-first manner; its planks, of Lebanese cedar, were held together both with mortise-

and-tenon joints and with ropes laced through V-shaped mortises. Sixteen frames (ribs) were lashed to the inside of the hull. There was no keel. A boxlike cabin stood on deck.

Found in the pit with the boat were a dozen paddles with pointed blades shaped like spearheads, but it is uncertain if they were for propulsion, steering, or ceremony. As no mast was found, the boat may have been towed. If so, it was not unique.

The stone cover of a second pit by the pyramid of Khufu has been pierced to allow inspection of its contents via tiny cameras. Although the wood of the boat in this pit has not yet been studied firsthand, it seems that the hull was about the same size as the hull found in the first pit. The purpose of these boat burials is debated.

Scenes of boat building in the Fifth Dynasty tomb of Ti show clearly the steps by which Old Kingdom hulls were made. Felled trees were trimmed with single-bladed axes and adzes before they were sawn into planks. Workers cut mortises into the resultant planks with wooden-handled, narrow-bladed chisels. The planks were then lowered into place on the unfinished hull so that their mortises fitted over tenons protruding from the next lower planks, already installed. Once aligned, the new planks were pounded home by boatwrights using large, two-handed mauls. Meanwhile other wrights planed and trimmed the boat with adzes. Finally, stanchions were cut and put into place, and decorative features were carved into the completed hull.

Nile boats differed from those in Mesopotamia in other ways. Although there is indirect evidence of some sailboats on the Tigris and Euphrates, we know virtually nothing about them. In Egypt, however, the prevailing north wind led to the development in Predynastic times of sailboats that could sail upstream, against the current, and then return easily downriver under paddle or oar power.

Old Kingdom sailboats had tall masts, usually bipods, with tall, narrow sails, which appear to have tapered downward toward the deck, making them triangular or trapezoidal. The foot of the sail was attached to a boom. The masts were held in place by stays running both forward and aft, but were unstepped on voyages down the Nile. Coming downstream, these boats are

shown either being paddled, with their crews facing forward, or rowed, with the crews facing astern.

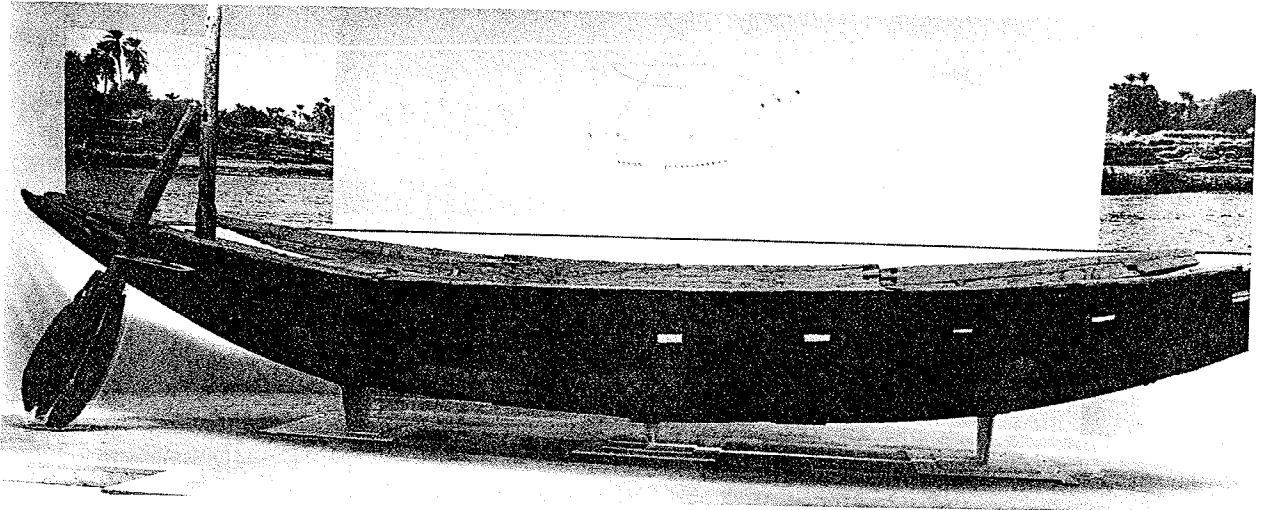
Middle Kingdom Nile boats are especially well known, both from models and from actual hulls. A set of models from the tomb of Meketre at Thebes, circa 2000 BCE, gives a realistic impression of the deceased nobleman's river fleet. A yellow boat for inspection trips was modeled both with sail raised to catch the wind, and with mast unstepped as the boat is rowed downstream. Its sail, with both an upper and a lower yard, is more square than the tall, narrow sails of the Old Kingdom. A vaulted cabin of cloth over a wooden framework could be moved forward and aft on the deck to suit the position of the mast and crew. The steering oar went directly over the stern and was worked with a tiller. When rowed, the boat had a crew of twenty-one, consisting of a captain, helmsman, lookout, and eighteen rowers.

In equal detail we can see Meketre's yacht; his sporting boat for harpooning fish and netting birds; a pair of paddled reed-bundle rafts between which fishermen pull their net through the water; and his kitchen boat, a small tender on which food for the fleet was prepared. (Jars of beer and wine, pieces of meat, and men baking bread make its function clear.) Written documents suggest that Nile boats, including naval vessels, obtained many of their provisions from riverbank vendors as they traveled.

Middle Kingdom models of funerary boats, with mummies on board, differ in shape and decoration from the more utilitarian boats.

Six actual funerary boats from this period, buried near the pyramid of Senwosret (Sesostris) III at Dahshur, were discovered in 1894. Four are now on display: two in the Egyptian Museum at Cairo, one in the Carnegie Museum of Natural History at Pittsburgh, and one in Chicago's Field Museum. All are about 33 feet (10 meters) long and 9 feet (2.7 meters) wide. They do not have keels. Their planks are fastened together with unpegged mortise-and-tenon joints; dovetail joints also occur, but there is some question whether these are ancient or the additions of modern restorers who worked about the turn of the century.

On New Kingdom river boats, the sails seem to continue the trend seen on Middle Kingdom



One of the six Egyptian funerary boats excavated near the pyramid of Senwosret III, Middle Kingdom. CARNEGIE MUSEUM OF NATURAL HISTORY, PITTSBURGH

boats, now being wider than they are tall. One papyrus roll of the time resembles a ship's log, giving us an idea of how the number of people on one boat varied from day to day between twenty-six and forty, suggesting that some were passengers. Another roll resembles a modern purser's accounts.

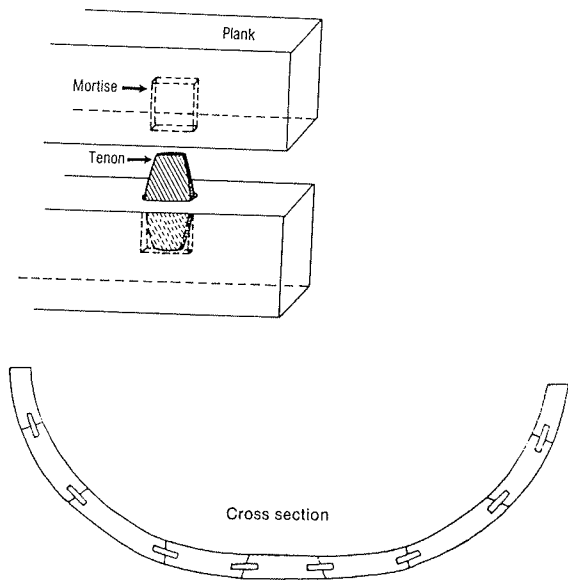


Diagram showing how planks were joined on the Egyptian funerary boats. The tenons joined the planks by locking them together with mortises. DIANA CRAIG PATCH AND CHERYL WARD HALDANE, *THE PHARAOH'S BOAT AT THE CARNEGIE* (1990)

Naval vessels on the Nile (or open sea) probably differed little, if any, from cargo craft, warships being nothing more than troop and cavalry transports.

As in Mesopotamia, there were regulations regarding watercraft. In the late Eighteenth Dynasty decree of Horemheb, for example, a man who steals a boat will have his nose cut off and will be sent to Tjaru (or Sile, a frontier post in the Delta).

As on the Tigris and Euphrates, towed vessels were not uncommon on the Nile. The most remarkable one was an immense barge built in the New Kingdom for Queen Hatshepsut (circa 1472–1458 BCE), in order to transport a pair of obelisks down the Nile from Aswan, where they were quarried, to Karnak, where one still stands. The obelisks weighed about 350 tons apiece, and stood nearly 100 feet (30 meters) high. The load required a remarkable carrier. Based on a relief carved at Dayr al-Bahri, it has been estimated that each of the barge's four steering oars, or quarter rudders, weighed four or five tons. Eight thick rope trusses ran from one end of the barge to the other to keep the ends from sagging. And 810 oarsmen in twenty-seven boats are shown towing this ancient "*Titanic*."

Clues to the construction of such a barge are provided by timbers of a freight boat or boats, fastened more rigidly than in other known Egyp-

tian hulls, that were buried around the pyramid of Senwosret I (early Twelfth Dynasty).

SEAGOING VESSELS

Mesopotamian seagoing ships as early as the third millennium BCE sailed to distant but unknown lands for raw materials, almost certainly including Harappan ports on the Arabian Sea. From a land called Dilmun (probably the island of Bahrain, which may have served as an exchange center in the Persian Gulf), they returned with gold, copper, lapis lazuli, ivory, and timber for the cities of Ur, Lagash, and Agade. Melukkha, perhaps somewhere in the Indus Valley, also supplied timber. Magan, another important destination for merchants, may have been somewhere in Oman. (See "Distant Shores: Ancient Near Eastern Trade with South Asia and Northeast Africa" in Part 6, Vol. III, for further discussion of shipping.)

As with river craft, not all seagoing ships were devoted to commerce. Near the end of the third millennium, the Akkadian king Shar-kali-sharri sent a naval force to conquer the islands and coasts of the Persian Gulf, on which Mesopotamia, so lacking in essential materials, was dependent.

In spite of the importance of Persian Gulf trade, and in spite of the fact that we have words denoting "large ship," "short ship," "wide cargo ship," and the like, we have scant evidence for the actual appearance of the ships used. Crude depictions on seals found on the island Failaka, near the Delta, let us know that open-water vessels of the Old Babylonian period were sailed in the gulf, but little more.

Egyptian ships also sailed across open water. In the Mediterranean, they sailed especially to the land now known as Lebanon, probably as early as the Second Dynasty (circa 2700), to obtain cedar and other coniferous woods. An Egyptian crew on such a voyage during the Fourth Dynasty (circa 2500) left its name on an inscribed ax-head at Byblos (biblical Gebal, modern Jubayl).

From the subsequent Fifth Dynasty we have depictions of ships that sailed this route. Reliefs carved in the time of King Sahure record the

departure of a fleet and its return with Syrians, either as prisoners or, more likely, as crew. The type of mast used is the typical bipod, already seen on Old Kingdom Nile boats, which supported a tall, narrow sail. Unstepped masts were laid back to rest on high supports. Helmsmen worked sets of three steering oars, without tillers. We may recognize on deck a large stone anchor with a hole cut through its top for a hawser. What makes this ship differ from most river craft—Queen Hatshepsut's great barge being a notable exception—is the huge rope, or hogging truss, that runs from one end of the ship to the other, supported on crutches, to prevent sagging of the stem and the stern as they passed over the troughs of waves. Additional support for the hull appears as a network of laced ropes that run the length of the hull's exterior.

Two slightly later ships shown returning from Syria, in a relief from the time of Unas (Wenis), share many of these features. Their masts, however, are tripods rather than bipods. If the numerous Syrians on board were crew rather than prisoners, as on the ships of Sahure, we have more evidence of the great antiquity of Levantine sailors, so famed in later times.

We can only estimate the sizes of such ships. However, a cedar ship built in the Fourth Dynasty was said to be 100 cubits, or 172 feet (52.5 meters), long.

In the Red Sea, ships as early as the reign of Sahure sailed for Punt, famed for its myrrh. Punt probably lay on the Somali coast of east Africa. Such voyages seem not to have been uncommon. In the Sixth Dynasty (circa 2200), a helmsman named Khnumhotep left word in an inscription that he had made eleven round trips to that far-off land.

We have no evidence for the appearance of seagoing vessels in the Middle Kingdom, but the Punt trade (as well as that with Byblos) continued to be brisk. A mariner marooned on a Red Sea island, according to the admittedly fabulous tale of *The Shipwrecked Sailor*, was spotted and saved by the crew of another Egyptian ship within only four months. This ancient Robinson Crusoe's lost vessel was about the same size as those which sailed to the Levant during the Old Kingdom: 180 feet (55 meters).

Such vessels, of course, had to be built on the shores of the Red Sea, so each voyage to Punt

began with an overland trek from the Nile along the Wadi Hammamat, whose walls bear graffiti of ships dating back to Predynastic times. At Mersa Gawasis, a Red Sea harbor used by Middle Kingdom ships that sailed to Punt and to the turquoise mines of the Sinai Peninsula, sailors left twelve large stone anchors, seven of them built into the platform for a stela. Fragments of cedar wood found here, cut with mortises, may be the rare remnants of a Red Sea ship.

Shipwrecks at this time are also recorded in the Persian Gulf, where merchants continued to sail for Dilmun to bring back copper, ivory, woolen clothing, leather, barley, and something called "fish eyes" that may have been pearls. The dangers were in fact so great that businessmen protected themselves from losses by not entering into full partnerships with these merchants, despite the consequent reduction in profits. Those who returned safely sometimes dedicated silver models of their ships to their gods in gratitude for their protection.

We are fortunate to have excellent representations of ships that sailed the Red Sea from the time of the New Kingdom in Egypt. The same reliefs at Dayr al-Bahri that inform us of the appearance of Hatshepsut's remarkable barge also depict a fleet of ships the energetic queen sent to Punt. By this time, the sails were extremely broad in relation to their heights and were attached to upper and lower yards on single masts; bipod masts seem not to have lasted beyond the Old Kingdom. Hogging trusses and giant quarter rudders continued in use, as might be expected. The scene is brought to life by the porters who carry exotica such as myrrh trees, gold, and ivory onto moored ships while other ships of the fleet arrive under oars, their sails already furled. Apes clamber along the hogging trusses, and a wide variety of marine creatures swim in the water below.

By the time of the New Kingdom, trade was widespread over the entire eastern Mediterranean—and beyond. Many clay tablets excavated at Amarna (Akhetaten) in Egypt preserve for us, in cuneiform writing, lists of goods sent by near eastern rulers to the pharaoh in Egypt, sometimes, at least, in their own ships. The same tablets inform us that Canaanite ships were used to supply food, water, and troops to coastal towns. Other tablets, from the major Syrian port

of Ugarit (modern Ras Shamra), tell us of seafaring activities, including the salvage of a cargo from a merchant ship that had "died"—as the text puts it—near Tyre in a torrential rain.

Tomb paintings, especially at Thebes, show us scenes of porters bearing tribute to the pharaoh from almost all points of the compass. Elephant tusks, logs of Egyptian ebony (African blackwood, *Dalbergia melanoxylon*), and leopard skins arrive from tropical Africa. Copper ingots, Canaanite amphoras filled with incense and other goods, canteenlike "pilgrim flasks," and elephant tusks are among the items of tribute brought by Syrians, and sometimes by men from a land called Keftiu, probably Crete. (See "Island Cultures: Crete, Thera, Cyprus, Rhodes, and Sardinia" in Part 6, Vol. III.)

We have already seen that sailors from Syria may have manned Egyptian ships as early as the Old Kingdom. That Syrian or Canaanite nautical skills were highly regarded in the eastern Mediterranean at the time of the New Kingdom is perhaps reflected by the large number of workers with Semitic names preserved in records from an Egyptian dockyard near Saqqara. Other contemporary documents suggest the numbers and sizes of Canaanite ships. In the thirteenth century, the king of Ugarit was asked to outfit a fleet of 150 ships. In the twelfth century the surprising size of at least some of these ships may be inferred from a request by the king of the Hittites to the king of Ugarit for a ship and crew to transport 2,000 measures of grain—estimated by some scholars to have weighed as much as 450 tons—in one or, at most, two trips.

We wish we knew more about the life of sailors, the length of the sailing season (something we do know from classical times), the durability of ships, their costs, and the size of the crews. At best, we can only estimate crew size from models, reliefs, and information from specific vessels. As far as we can tell, no navigational instruments were used other than sounding rods and probably also lines. Except from our Bronze Age shipwrecks, we do not know what kinds of food were carried on long voyages (and even from the shipwrecks we cannot always determine which foods were for shipboard meals and which were cargo).

In two tomb paintings, Egyptian artists have left for us rare glimpses of actual ships of



A nautical archaeologist attempts to excavate copper ingots from a Late Bronze Age shipwreck near Uluburun, Turkey; analysis of such artifacts may provide clues about the sailors' diet, the trade route used, the crew size, and a dating for the wreck. COURTESY OF DONALD A. FREY, INSTITUTE OF NAUTICAL ARCHAEOLOGY, TEXAS A&M UNIVERSITY, COLLEGE STATION

the Canaanites, the early Phoenicians. In the fifteenth-century tomb of Nebamun at Thebes, a bearded Syrian had just arrived by ship with a cargo that included copper ingots and Canaanite amphoras. The ship itself is poorly preserved, but we can make out a down-curving upper yard and a wicker fence above the cap rail to keep out waves.

In the fourteenth-century tomb of Qenamun, also at Thebes, a Syrian or Canaanite fleet is shown moored at an Egyptian quay, unloading its goods. Porters carry amphoras and what ar-

chaeologists call a "pilgrim flask" and a "spindle bottle" down the stepped gangway. On deck are large jars, some nearly as tall as a person. Syrian merchants and sailors wear round medallions at their necks. The depictions of their ships were well preserved at the time that they were recorded by archaeologists. The ships were steered by quarter rudders with tillers, and their sails were attached to both upper and lower yards, as on Egyptian ships; but in other respects they differed from the vessels of their host country. They, like the ships in the tomb of Nebamun, had wicker fences along their sides to keep out the waves (as did the nearly contemporaneous ship built by Odysseus to leave Calypso's island), they had crow's nests with lookouts in them, and they lacked the hogging trusses seen on Egyptian seagoing vessels.

That Syrian ships reached Egypt, and that Egyptian ships reached the Levant, is not surprising. Seafaring in the Levant is of great antiquity. The island of Cyprus was deliberately colonized about eight thousand years ago (neither humans nor domesticated animals could have survived and multiplied from sporadic, accidental crossings from the mainland), and humans may have been involved in the extinction of the pygmy hippopotamus there two millennia earlier than that.

During the period with which we are concerned, evidence of seagoing vessels comes first from second-millennium Byblos in the form of two ship models, and second from references to Syrian merchants taking goods to Caphtor, probably Crete.

By good fortune, a merchant ship of the same period as those depicted in the tomb of Qenamun, the fourteenth century, has been found and excavated off Uluburun, Turkey, a rugged peninsula near Kaş (pronounced Kash). The ship carried a cargo of raw materials, including more than 350 ingots of Cypriot copper (weighing about ten tons), a ton of tin ingots from unknown mines, more than a hundred ingots of cobalt-blue and turquoise glass, a ton of terebinthine resin in more than a hundred Canaanite amphoras, logs of ebony from Egypt, an elephant tusk and part of another, hippopotamus teeth, ostrich eggshells, tortoise shells, the doors of murex shells, an amphora full of orpiment (a pigment, yellow trisulfide of arsenic), and a variety of

fruit and spices, including figs, pomegranates, grapes, olives, safflower, and coriander. The four-handled copper ingots, laid like overlapping shingles from one side of the hull to the other, rested on dunnage of thorny burnet, a common near eastern bramble.

The hull was probably about fifty feet (fifteen meters) long. The keel plank (not a true keel) and hull were of fir, with mortise-and-tenon joints held together with oak pegs. On board were twenty-four stone anchors. Two of them were small, ovoid stones, of the size one might imagine being used for a ship's boat or as hawser sinkers; but the others were rectangular or slightly trapezoidal slabs in two approximate size groups, weighing perhaps from 121 to 208 kilograms (266 to 458 pounds), each with a single hawser hole near its top. Similar anchors are not known in the Aegean, but they are commonly found by divers along the entire coast of Israel, and there is some evidence from Tell Abu Hawam that they were manufactured on that coast. After their life at sea, it seems, they were often used as construction blocks in buildings in the Near East, as at Ugarit and Byblos, as well as at Kition (Roman Citium, possibly biblical Kittim), a Bronze Age port city on Cyprus; their frequent inclusion in temples and tombs suggests commemorative usage.

Although the Uluburun ship reminds us of the paintings of Syrian ships in the tombs of Nebamun and Qenamun, with Syrian pilgrim flasks, Canaanite amphoras, spindle bottles, large jars (called *pithoi*, singular *pithos*), and round gold medallions among its finds, just how hard it is to determine its nationality is shown by the broad geographical spread of other artifacts on board. Ceramic cargo containers come both from the Levant and from the Mycenaean world, but personal storage and drinking wares seem mostly Mycenaean. At least two of the *pithoi* carried Cypriot export pottery.

In another *pithos*, which contained whole pomegranates, was found an ivory-hinged wooden diptych (or folding writing tablet), on whose waxed inner faces someone once wrote with a stylus; none of the wax was preserved to reveal the writer's language. This is the earliest known writing diptych, the next oldest being from the end of the eighth century at Nimrud (ancient Kalkhu, biblical Calah) in Iraq. In that

case, the wax had been mixed with orpiment to give it the proper consistency. If the orpiment on the Uluburun wreck was intended for the same use, its quantity may suggest that diptychs were commonplace on the ship, as also suggested by the discovery of what seem to be hinges from two other diptychs.

The nature and dating of the Uluburun ship's last voyage were initially established by the discovery on the wreck of a unique gold scarab of Queen Nefertiti of Egypt, who died about 1340. It was later recognized, however, that the scarab lay near a small hoard of scrap jewelry, mostly Canaanite, of gold, electrum, and silver; if the scarab was part of this jeweler's hoard, it tells us only that the ship sank at some time after Nefertiti's death.

It still seems likely, however, that the ship was on a royal mission, for its cargo matches the largest shipments of copper recorded in the royal correspondence found at Amarna. The copper described in those letters was sent to Egypt by the king of a land called Alashiya, generally identified as Cyprus. We might then guess that the Uluburun ship was Cypriot, except that the only Cypriot ceramics on board were new export wares, carefully packed in *pithoi*, and not the pottery used by the merchants and crew.

Nor do the weapons on the Uluburun ship offer a clue to the ship's home port. Found scarcely a meter apart were Mycenaean and Canaanite swords, both of bronze. And Kassite, Mycenaean, Syrian, Egyptian, and Babylonian seals (the last recut by an Assyrian artisan) confuse rather than clarify the picture.

Whatever its nationality, the ship seems to have been traveling the well-known counterclockwise route—from Phoenicia to Egypt, by way of southern Crete—described by Homer, and seemingly confirmed by discoveries of Canaanite and Cypriot pottery at the southern port city of Kommos on Crete and at Marsa Matruh (Paraetonium) on the Mediterranean coast, some two hundred miles west of the Nile Delta.

Although Mycenaean (or Bronze Age Greek) ships are not among the foreign ships depicted in Egyptian tomb paintings, it was long believed by scholars that Mycenaean merchants held a virtual monopoly on maritime commerce in the eastern Mediterranean. This theory was based on the archaeological discovery of Mycenaean

pottery on Cyprus, along the length of the Syro-Palestinian coast, and in Egypt, similar quantities of near eastern pottery not having been found in Greece.

The Uluburun ship points out the danger of basing archaeological theories on negative evidence, for none of its cargo would have been recognized as near eastern in origin had it reached its destination; the raw materials would have been quickly manufactured into products typical of the culture that imported them.

How many such cargoes did reach their intended ports we can only guess. Analysis of the Uluburun glass ingots, for example, shows them to be chemically identical to the blue glass in bottles from Eighteenth Dynasty Egypt and in beads from Mycenaean Greece, suggesting that all of the Late Bronze Age blue glass in the eastern Mediterranean shared a single source, something not previously suspected, as glass ingots were previously unknown from this period.

Four-handled copper ingots like those on the Uluburun wreck have been excavated in Sardinia (where Late Bronze Age pottery like that on the Uluburun ship has also been found), Greece, and Cyprus. They have also been found off the coasts of Israel, Greece, and Bulgaria, giving some indication of the wide spread by sea of this necessary ingredient of bronze. But the only other Late Bronze Age shipwreck that has been excavated sank off Cape Gelidonya, Turkey, the next peninsula to the east of Uluburun. Its 1960 excavation revealed a slightly later wreck, seemingly from the late thirteenth century. This modest merchant vessel, probably only twenty-five to thirty feet (eight or nine meters) long, carried only thirty-four four-handled copper ingots from Cyprus, an unknown quantity of tin ingots, and a smaller cargo of scrap bronze from Cyprus. The copper ingots in this case were stacked one upon the other, but as at Uluburun they were bedded on dunnage, in this case of twigs. Metalworking tools such as stone hammerheads, a small bronze anvil, as well as stone polishers and a whetstone, suggest the presence of a tinker. It seems more likely that the ship was on a private merchant venture than on a royal mission, but that cannot be proved. Whatever its nature, the personal possessions found on the ship—cylinder seal, scarabs, balance-pan weights, stone mortars, and lamp—

point to a Syrian or Canaanite crew. Nevertheless, a Ugaritic document lists a similar cargo of copper and bronze on a ship from Alashiya in a Ugaritic harbor. Thus, if Alashiya was Cyprus, the possibility that the ship lost at Cape Gelidonya was Cypriot cannot be ignored. Another late-thirteenth-century wreck of possible Cypriot origin has been found near Iria, in the Bay of Argos, Greece.

If a slightly earlier shipwreck of copper ingots, found in the neighboring Bay of Antalya by Greek sponge divers in the 1920s, can be relocated and excavated, it will provide the third wreck on the same hypothesized counterclockwise route between the Levant and Egypt, and will provide additional evidence for the nature of Late Bronze Age trade.

Shortly after the modest merchant ship sank off Cape Gelidonya, the nature of seafaring in the eastern Mediterranean was to change forever. Among the symptoms of the collapse of the Late Bronze Age were attacks by the mysterious Sea Peoples, perhaps at least partly from the Aegean, who ravaged towns on Cyprus and along the Syro-Palestinian coast. Early in the twelfth century, in a naval battle memorialized by Ramesses (Ramses) III in a relief at Medinet Habu in Thebes, the Egyptian fleet finally defeated a Sea Peoples fleet at some unknown locality, perhaps in or near the Nile Delta. In the relief, the Sea Peoples' ships are shown as double-ended vessels with birds' heads on their bows and sterns, reminding us of bird-headed Aegean vessels. The sails of the Sea Peoples' ships are not attached to lower yards, and they seem to be furled by means of lines called brails. As the lion-headed Egyptian vessels have similar sails, one must suppose that Egyptian mariners had adopted a foreign rig. (See "The 'Sea Peoples' and the Philistines of Ancient Palestine" in Part 5, Vol. II.)

Shortly thereafter the Egyptian fleet slid into decline. The *Tale of Wenamun*, a story of a temple official from Karnak who sailed to Byblos to obtain wood for a ceremonial barge, tells us that by a little after 1100, Canaanite ships dominated trade along the Levantine coast.

From that time, the history of ships and shipping in the Levant is a history of later Canaanite, or Phoenician, ships. In the tenth century, for example, King Solomon had to call on the Phoeni-

cian king Hiram of Tyre for experienced mariners to help man a fleet sent to Ophir to obtain gold. The location of Ophir is today debated, but this joint Hebrew-Phoenician fleet was based at the port of Ezion-geber (near Elath) on the Gulf of 'Aqaba, where archaeological excavations at Tell al-Khalayfa have uncovered slightly later ships' stores: rope, nails, and pitch for caulking.

Assyrian kings also depended on Phoenician sailors and shipwrights. Thus it is, ironically, from Assyrian depictions that we know most about the three major types of Phoenician ships.

The *hippos* (Greek for "horse," plural *hippoi*) was a double-ended coaster whose high stem and sometimes stern were decorated with animal heads; in some cases the stem alone was shaped like the head of a horse. *Hippoi* were propelled by from two to five standing rowers who faced forward and worked oars with curiously curved blades. A mast with a crow's nest for a lookout is depicted on one of them. (Apparent *hippoi* shown on rivers are, in fact, Assyrian royal boats adapted from the Phoenician prototypes.) An eighth-century relief from the palace of Sargon at Khorsabad (ancient Dur Sharrukin) shows them used to tow logs.

A warship with a metal-sheathed ram protruding from its bow appears in an eighth-century painting at Til-Barsip (modern Tell Aḥmar). This ship was a true weapon, like a spear, and not simply a military transport. Its oars passed through small oarports in the hull, rather than over the cap rail, perhaps for protection of the rowers.

The ship's ram had already appeared in Greece in the ninth century, and by the eighth century some Greek warships had increased the number of rowers by seating them on two levels.

Exactly when Phoenicians adopted the ram and developed galleys rowed from two levels is not known, but by the seventh century their warships were rowed from two levels, the lower rowers' oars passing through oarports, and the upper rowers' oars passing over the cap rail. A row of round shields was attached to the sides of an upper deck, above the heads of the upper rowers, to protect the soldiers there. A pair of quarter rudders was operated from the upper deck. The bow of each ship tapered to form a pointed ram.

Double-banked warships with rams are

known especially from a series of reliefs that record the flight to Cyprus by the people of Tyre to escape an invasion by Sennacherib. A unique type of ferry appears in the same scene. It, too, was rowed from two levels; it, too, had shields along its upper deck to protect its passengers—men, women, and children—and it, too, was steered by a pair of quarter rudders. But it was a tubby, symmetrical vessel with high, vertical stem and sternpost.

Egyptian rulers, like their Hebrew and Assyrian counterparts, also turned to Phoenician seamen. If we are to believe a tale repeated by Herodotus, Phoenician sailors sent out by Pharaoh Necho II circumnavigated Africa about 600 BCE. Herodotus himself did not believe this story because the sailors had claimed that as they sailed around Africa, from the Red Sea to Gibraltar, the sun appeared on their right, to the north. Herodotus found that claim preposterous. Today we know that it is exactly what would have happened in the Southern Hemisphere, which makes the story more believable.

That Phoenicians sailed beyond the Straits of Gibraltar is certain. At the time of their probable circumnavigation of Africa, they founded a trading colony at Mogador on the Atlantic coast of Morocco. (For a different view and for a map of this region, see "The Phoenicians" in Part 5, Vol. II.) What kinds of ships they used to brave this great ocean we do not know. But certainly some of them sank. Their remains, and the remains of near eastern vessels of all periods, await discovery and examination by the nautical archaeologists who will one day write a definitive history of seafaring in the Near East.

BIBLIOGRAPHY

General Works

GEORGE F. BASS, ed., *History of Seafaring Based on Underwater Archaeology* (1972); LIONEL CASSON, *Ships and Seamanship in the Ancient World* (1971); and JAMES HORNELL, *Water Transport: Origins and Early Evolution* (1946; repr. 1970).

River Craft in Mesopotamia

MARIE-CHRISTINE DE GRAEVE, *The Ships of the Ancient Near East (c. 2000–500 B.C.)* (1981).

Sea and River Craft in the Ancient Near East

River Craft in Egypt

CHARLES BOREUX, *Études de nautique égyptienne* (1925); S. R. K. GLANVILLE, *Catalogue of Egyptian Antiquities in the British Museum*, vol. 2: *Wooden Model Boats* (1972); CHERYL WARD HALDANE, "Boat Timbers from el-Lisht: A New Method of Ancient Egyptian Hull Construction," *Mariner's Mirror* 74 (1988); J. J. JANSSEN, *Two Ancient Egyptian Ship's Logs* (1961); NANCY JENKINS, *The Boat Beneath the Pyramid* (1980); PAUL LIPKE, *The Royal Ship of Cheops* (1984); DIANA CRAIG PATCH and CHERYL WARD HALDANE, *The Pharaoh's Boat at the Carnegie* (1990); GEORGE A. REISNER, *Models of Ships and Boats*, *Catalogue Général des Antiquités Égyptiennes du Musée du Caire* (1913); and HERBERT E. WINLOCK, *Models of Daily Life in Ancient Egypt* (1955).

Seagoing Vessels

GEORGE F. BASS, *Cape Gelidonya: A Bronze Age Shipwreck*, *Transactions of the American Philosophical Society* 57, pt. 8 (1967), and "Oldest Known Shipwreck Reveals Splendors of the Bronze Age," *National Geographic* 172, no. 6 (1987); MANFRED BIETAK, "Zur Marine des alten Reiches," in *Pyramid Studies and Other Essays Presented to I. E. S. Edwards*, edited by JOHN BAINES et al. (1988), pp. 35-40, with pls. 5-9; BJÖRN LANDSTRÖM, *Ships of the Pharaohs* (1970); ROBERT PAYTON, "The Ulu Burun Writing-Board," *Anatolian Studies* (1991); TORGNÝ SÁVE-SÖRDERBERGH, *The Navy of the Eighteenth Egyptian Dynasty* (1946); and SHELLEY WACHSMANN, "The Ships of the Sea Peoples," *International Journal of Nautical Archaeology and Underwater Exploration* 10 (1981), and *Seagoing Ships and Seamanship in the Late Bronze Age* (1994).

SEE ALSO *Island Cultures: Crete, Thera, Cyprus, Rhodes, and Sardinia* (Part 6, Vol. III) and *Distant Shores: Ancient Near Eastern Trade with South Asia and Northeast Africa* (Part 6, Vol. III).