Uluburun Shipwreck

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In the mid-1950s a photographer and journalist named Peter Throckmorton arrived on the west coast of Turkey, chasing a rumor that a large Greek sculpture had washed ashore. He met a local ship captain, who claimed to know the location of several ancient wrecks. In 1958 Throckmorton persuaded the Explorers Club in New York to mount a preliminary search, which indeed located an ancient ship off a promontory named Cape Gelidonya.The University of Pennsylvania mounted an expedition in 1960 to document the ship and bring up artifacts. The Cape Gelidonya wreck was, at the time, the oldest shipwreck ever located (c. 1200 BCE) and became one of the foundational sites that developed the basic techniques of underwater archaeology, including gridding, specialized lighting and photography, the use of balloons to raise objects, and the rhythm of daily dives. The team brought up wine jars, metal ingots, and ceramics.[[1]](#endnote-1)

After their spectacular success at Cape Gelidonya, Turkish and American members of the excavation team reasonably expected to find other ancient shipwrecks in the same area. They fanned out along the coast, interviewing local sponge divers and showing them pictures of how an ancient shipwreck might look. Over many years, they talked with virtually every sponge diver then active on the Turkish coast. Two decades passed with no results.

In 1982 a new young sponge diver sketched for his captain “four-handed” metal ingots he had seen on a steep underwater slope less than fifty miles west of the Gelidonya site, off a cape called Uluburun. The captain immediately recognized the ingots as similar to drawings and photos that the Gelidonya team had shown him. The diver contacted the Museum of Underwater Archaeology at Bodrum (a major Turkish coastal city two hundred miles to the west of the new site). The hunt was on. The next dive season, the Institute of Nautical Archaeology and Bodrum Museum found the wreck on a steep slope about 150 feet down. They recovered one of many large copper ingots, a tin ingot, several terra-cotta pieces, and an amphora, as examples of the ship’s contents.

**<<COMP: Please insert fig. 6 here.>>**

The Institute of Nautical Archaeology organized the first full expeditions in 1984. Team members lived for months either aboard the dive ship, sharing its sixty-foot length with compressors, oxygen tanks, a full darkroom, freshwater maker, a repair shop, and hoses, or in temporary shelters on the rocky, barren coast. The team established a rhythm of morning and late-afternoon dives, completing more than thirteen hundred dives in the 1984 season. They measured the wreck site (roughly thirty feet by fifty-four feet), established location grids over both the steeply sloping seafloor and two gullies that cut into it, photographed pieces in situ, and began lifting objects to the surface. Only the upper portion of the wreck was excavated the first season. What at first appeared to be lumpy rocks littered this portion of the site. These turned out to be cargo solidified together into masses, which required hammer and chisel to break them free. The objects in the southern gully were merely buried in sand and easier to excavate. At the end of the dive season, thousands of objects still remained on the bottom. The team dumped tons of sand onto the wreck to prevent looting.

The trading ship had lain undisturbed for more than three thousand years and was a veritable catalog of the trade and cultures of the Eastern Mediterranean of the time. The first dive season yielded extraordinarily important material: elephant and hippopotamus ivory, a silver bracelet, amber jewelry, faience jewelry, a drinking cup, seals, copper and tin ingots, glass (beads, figures, and cobalt-blue ingots), lead fishing weights, stone balance-scale weights, bronze weapons, a gold chalice, medallions and a pectoral (a worked sheet of gold that covered the bare chest), bronze finger-cymbals, bronze tools, and stone ship anchors. In addition, the team brought up a variety of ceramic storage vessels, lamps, and bowls typical of ancient Greece, Cyprus, and Syria. Beneath the ballast stones were some remaining ship’s timbers.

At this early stage of the excavation many basic questions remained unanswered, such as which end was the bow and which was the stern. Though some amphorae (cone-shaped storage vessels) contained readily identifiable materials, such as yellow lead, glass beads, or olive pits, others had unidentified resins or seeds. Many of the ceramic objects required cleaning before archaeologists could even speculate on similarities to other Mediterranean pieces of the period. It was not yet possible to separate much of the material into trade goods, ship’s stores, or personal possessions. The original arrangement of the cargo awaited study of photographs and drawings.

The 1986 dive season (June–August) consisted of almost three thousand dives on the wreck, many farther down the slope than earlier explorations. The results were, once again, extraordinary. Divers brought up bulk silver and gold, ship anchors, cast and worked gold pendants, cylinder seals (with which people “signed” documents or secured trade goods) and seal blanks (not yet cut with an individual’s signs), more beads (one of rock crystal and others of types not seen before at the site), bronze tools, more hippopotamus teeth, bronze fishhooks, the matching finger cymbal to the two found in 1985, another drinking cup in the shape of a ram’s head, and a broken ostrich egg. A quite significant find consisted of two matching rectangular wood panels, originally hinged together, each with a rectangular recess and surrounding lip. The piece’s original function was to hold wax in both recesses, into which scribes carved messages, tallies, or administrative orders. Equally important was a gold scarab (a signature seal in the shape of a beetle) inscribed with the name of Nefertiti, the reigning queen of Egypt at the time, found among a group of Egyptian rings, seals, and scarabs.

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A Ship of the Eastern Mediterranean

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What sort of a ship was the Uluburun wreck? Under ballast stones the divers found a few remaining planks attached to a short section of the keel. Other shattered pieces of the ship appeared under rows of copper ingots. The recovered material did, however, yield significant information on the ship’s construction. The planks were edge-joined, with no evidence of internal framing. Egyptian boats were also built this way, but the Uluburun wreck was very different from Egyptian vessels. As we have seen in chapter 2, Egyptian boats were sewn together with a unique pattern of rope ties, which marched across the planks. None of this stitching is present on the Uluburun planks. In contrast, deep, almost continuous mortises, like long slots, were cut in the lateral edges of the planks. The shipwrights then fitted broad tenons into the mortises and secured them with pegs, which passed through both the mortised planks and the interior tenon, preventing adjacent planks from separating or shifting. The Uluburun ship is the earliest known maritime use of these pegged mortise-and-tenon joints. The boat was open, with no evidence of deck or cargo holds. Analysis of the wood revealed that the keel was of fir, the tenons and pegs of oak, and the planks of cedar, most likely from Lebanon. As we have seen in chapter 2, Lebanese cedar was also the wood of choice for expensive royal boats in Egypt.

The ship certainly came from the Eastern Mediterranean, most likely from either Cyprus or coastal Syria/Palestine. The wreck yielded cymbals of a Near Eastern type, unknown in the Aegean, and many balance weights conforming to standards in the Near East. All twenty-four ship’s anchors conform to designs typical of Syria/Palestine.[[2]](#endnote-2)

The visual record in Egypt may be somewhat helpful in understanding what the Uluburun ship might have looked like. Much evidence comes from a mural in the tomb of Kenamun, an Egyptian official who served under Amenhotep III (ruled 1386–1349 BCE) and, therefore, died only a few decades before the Uluburun wreck. The wall painting depicts ships sailing, in port, and unloading. Unfortunately, Egyptologists have identified many features of the scenes as merely stylized depictions of ships, identical to other paintings in other tombs. Several scholars believe the ships to be, in fact, Egyptian.[[3]](#endnote-3) The ships are, however, very similar to one portrayed in a contemporary tomb with an accompanying wall text that states that the person coming off the ship came from Syria/Palestine for medical treatment.

So, combining all the admittedly fragmentary evidence, what might the Uluburun ship have looked like? It was apparently a sailed ship, not rowed, as there are no oarlocks on the few remaining planks. Existing pieces of the keel at bow and stern suggest a crescent shape with high bow and stern. The Uluburun ship was built of Lebanese cypress with oak for joints and pegs. Wickerwork screens likely ran along the highest plank of the open hull. The ship did not have a hogging truss (described in chapter 2) typical of Egyptian vessels.

**<<COMP: Please insert fig. 7 here.>>**

Direct evidence from the keel suggests that a mast was placed amidships. A simple terra-cotta ship model found in Enkomi on the east coast of Greece of approximately the right period suggests several additional features of the Uluburun ship. The sail was likely low and wide. The massive spar supporting the sail curved downward at both ends. Steering was by means of two large steering oars, one on each side of the stern. A crow’s nest topped the mast.[[4]](#endnote-4) The excavators believe the Uluburun ship to have been about forty-five feet long, with a carrying capacity of about fourteen tons of cargo.[[5]](#endnote-5) The ship would have been good in a following wind, but the large, heavy sail would have made tacking into the wind laborious and dangerous. It is understandable why ships of this design stayed close to the shore whenever possible, probably seeking shelter in stormy conditions.

It seems possible to place the Uluburun wreck within a shipbuilding world that most directly linked Cyprus, the Syria/Palestine coast, and the west coast of Turkey. This shipbuilding tradition shared few features with Egypt but more with Crete, the Greek islands, and the Peloponnesus.

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From Where, To Where, and When?

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Quite remarkably, given the absence of any documents that mention the Uluburun ship, clever scientific research on material from the wreck has built a strong case for both the ship’s last port of call and the date of its last voyage. The data on the last port of call begins with one of the seemingly least important of the Uluburun finds, the bones of a mouse trapped in a food storage jar. Researchers managed to extract DNA from the mouse bones. It turns out that mouse DNA varies in subtle but distinct ways among the various ports and coasts of the Eastern Mediterranean. The Uluburun mouse DNA matches that of mice in the area of Ugarit (northern coastal Syria) and no other port, suggesting that one of the ports of the Syrian coast was the ship’s last port of call.[[6]](#endnote-6) (The reader might recall from chapter 1 that rat DNA was important evidence in establishing the pattern of colonization of the Pacific islands. We should not underestimate rodent information.)

The dating of the ship also required careful research, based on examination of many ancient samples of wood from the region. Trees grow more in wetter years and less in drier years, yielding, over the life of the tree, a distinctive pattern of rings. It has proved possible to assemble from thousands of tree samples from the Eastern Mediterranean long timelines of distinctive patterns, to which a newly unearthed building post, ship timber, or piece of furniture can be matched. The crucial Uluburun data came from an unlikely source. To protect the hull from abrasion by the copper ingots, they were stacked on freshly cut branches. Comparing the tree rings of these young branches proved more accurate than using the larger trees of the ship’s planks. By this method the Uluburun shipwreck was originally dated to 1306 BCE, though a recent and more thorough Anatolian tree ring timeline has placed the wreck between 1334 and 1323 BCE.[[7]](#endnote-7)

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Contours of Exchange

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Texts from the Eastern Mediterranean in various languages from the period of the Uluburun wreck describe similar ships with equally diverse and valuable cargoes. The Egyptian pharaoh Thutmose II (ruled c. 1479–1425) celebrated his capture of two merchant ships from Syria/Palestine in 1450 BCE with the inscription “now there was a seizing of two ships . . . loaded with everything, with male and female slaves, copper, emery, and every good thing, and his majesty proceeded southward to Egypt.”[[8]](#endnote-8)

Texts in Ugaritic (from coastal Syria) from the period of the Uluburun wreck contain a variety of references to long-distance trade. One mentions a ship lost on a voyage to Egypt; another refers to the loss of a ship laden with copper. A third text mentions the taxes due from a ship, which had traveled to Greece and traded there.[[9]](#endnote-9) Overall, the texts suggest a thriving trade in relatively high-value goods, such as copper, slaves, and specialty woods, all of which connected Egypt, the coast of Syria/Palestine, the coast of Turkey, Cyprus, Crete, and Mycenae in Greece. Let us now turn to some specific goods aboard the Uluburun shipwreck and how they complicate and stretch this image of a self-contained maritime world of the Eastern Mediterranean.

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The Commodities aboard the Uluburun Wreck

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At the very bottom of the ship and resting in neat rows on cut branches to protect the hull were ten tons of copper, cast into large ingots in two well-known shapes: 354 “four-handled” (also known as oxhide) ingots, and 121 “bun” ingots.[[10]](#endnote-10) Copper was one of two essential components of bronze (tin, also found in the wreck, being the other). Without copper there would have been no bronze tools or weapons and no Bronze Age. Where it came from and how it was produced are discussed below.

Archaeologists have excavated “four-handled” copper ingots like those from the Uluburun wreck in a broad band from Sardinia (where fifty ingots were found) on east through Sicily (one ingot), Greece (twenty-two ingots), and Crete (thirty-seven ingots), to Cyprus (twenty ingots). The ingots found on the Uluburun ship, and the Cape Gelidonya wreck located only fifty miles west on the Turkish coast, constitute about two-thirds of all known four-handled copper ingots. Taken as a whole, the Mediterranean ingots vary in thickness, taper, and length of the handles. Weights vary from ten kilograms (22 pounds) to thirty-seven kilograms (81.5 pounds). The earliest of these copper ingots (c. 1600–1500 BCE) lack “handles.” The addition of handles might simply have been to ease carrying the heavy, bulky ingots. Incised marks on many of the ingots belong to no known script and have stubbornly resisted deciphering.[[11]](#endnote-11) Production of this sort of ingot likely ceased about 1200 BCE.

Before turning to the origin of the copper ingots of the Uluburun shipwreck, it is necessary briefly to consider the earliest techniques for the production of copper. Around 9000 BCE the first evidence appears in Iran and Anatolia of the working of copper. In a relatively simple process not requiring a furnace, native copper was heated in flat pans to remove impurities and later reheated to work and form. The earliest cast copper objects date from this period. In the sixth millennium BCE a much more sophisticated process was discovered. When the copper was heated to over 1,000 degrees Fahrenheit, impurities in the ore melted together and formed a lumpy slag, which could be skimmed off the molten surface. This process, known as smelting, yielded a copper with more residual iron than native copper. Archaeologists examining unearthed crucibles and slag can trace the rapid spread of the new process across many copper-producing sites in the Middle East, the Eastern Mediterranean, and Egypt. The new technique required not only high temperatures, but control of air and the gases above the melting copper ore. Charcoal was essential to produce high heat, but it also drew oxygen out of the copper oxide, forming carbon monoxide gas. Adding external air turned the carbon monoxide into more oxygen-trapping carbon dioxide. Such conditions could only be produced in a smelting furnace, rather than the earlier open pan. The early smelting furnaces were carefully sited below the lip of a hill to catch prevailing winds. The artisan smelters used blowpipes when the winds failed.[[12]](#endnote-12)

By the time the Uluburun shipwreck, sites across Iran, the Middle East, Egypt, and the Mediterranean had been producing copper for thousands of years. Removing impurities was so elemental to the process that it might seem impossible to identify the source of copper aboard. Fortunately, sophisticated science came to the rescue. With highly sensitive assay methods, scientists discovered that copper ore from each mining site leaves a distinctive fingerprint of trace elements, even through the process of smelting and refining. Three sorts of trace element analyses have proved accurate enough to differentiate the origin of a copper ingot or artifact. One relies on differing proportions of isotopes of lead in the refined copper (based mainly on the geologic age of the copper). The second uses proportions of tellurium and selenium for the same purpose. The third analyzes the proportions of trace silver and gold in the copper. When used together, these tests are particularly good at ruling out sources that decisively do not match the trace element fingerprint. All three methods, however, require a large number of ore samples from each ancient mining area to calibrate the distinctive fingerprint of the area. Only with analysis of many such samples is it possible to establish the parameters of variability of the trace elements within a copper mining area.[[13]](#endnote-13)

Trace element analysis has cut through some uncertainty about the origin of the copper ingots aboard the Uluburun wreck and at other archaeological sites in the Mediterranean. It shows that Cyprus was the origin of the copper ore that was smelted into ingots found in Sardinia, Greece, and Cyprus, as well as the few ingots tested from the Uluburun shipwreck. This sort of analysis cannot, however, establish where the ingots were actually smelted, since it is possible, even likely, that copper ore was traded to smelting sites quite distant from the mine.

The copper ingot trade is not, therefore, a simple story of exports from Cyprus to the nearby Mediterranean world. The earliest copper ingots were discovered not in Cyprus but in Crete and date from the high Minoan period (1580–1500 BCE), two centuries before the Uluburun wreck. Trace element analysis shows that these ingots were neither from Cyprus nor from any known source in the Mediterranean region or Turkey. Archaeologists will have to look farther afield for the source, perhaps to Iran, Afghanistan, Uzbekistan, or Tajikistan.[[14]](#endnote-14) In addition, one of the analyzed ingots from the Uluburun wreck also does not match trace elements from any known sources. Further complicating the picture is the fact that the only known mold for such ingots was found not on Cyprus but a hundred miles east on the coast of Syria.

Taken together, this scientific research suggests that Cyprus displaced earlier sources of copper. Its copper ore was processed both on the island and the nearby Syrian coast and carried west in ships like the ones wrecked at Uluburun and Cape Gelidonya. From the Turkish coast the ships headed west to Mycenae in Greece and, perhaps, on to Sardinia. A single find of a four-handled copper ingot just off Sozòpol in the Black Sea about fifty miles north of Istanbul raises the possibility that the copper ingot trade included the Black Sea.[[15]](#endnote-15) Archaeologists have excavated four-handled copper ingots in southern Germany, suggestive of some sort of carrying trade over the Alps.[[16]](#endnote-16)

Some of the goods aboard the Uluburun shipwreck even further stretch the notion of an enclosed Eastern Mediterranean trading world.[[17]](#endnote-17) Consider, for example, the jointed wood writing boards found at the wreck site. Archaeologists have excavated similar receptacles for incised wax letters and accounts in Old Kingdom Egypt (2686–2181 BCE), and they are mentioned in Middle Assyrian (sixteenth to tenth century BCE) and Babylonian texts, which document the use of wood letter-boards throughout the area of present-day Iraq. The vast majority of the references to wood letter-boards, however, come from the Hittite Empire (at its height around 1350 BCE), which included almost all of modern-day Turkey and Syria. It is possible to envision a cultural world of the wood writing board that stretched from the Nile River more than a thousand miles eastward to the Tigris-Euphrates Valley.[[18]](#endnote-18)

Also aboard the Uluburun wreck were several examples of a drinking vessel known in ancient Greek as a rhyton. The word is associated with an even older Indo-European word meaning “flow.” The rhyton was perhaps originally used to dip water or wine out of a large container in order to drink. Subsequent designs were in the shape of animals or animal heads, with a stream of wine coming out of the mouth.[[19]](#endnote-19) Such vessels in the shape of a bull or bull’s head, fish, octopuses, and beetles have been found on Crete in the ruins of Minoan sanctuaries.[[20]](#endnote-20) Mainland Greek finds include rhyta in the shape of rams, hounds, boar, deer, and goats.[[21]](#endnote-21) In the period of the Uluburun shipwreck, however, the rhyton was also used for feasting, in the area of present-day Iran. If one could define a “rhyton zone,” it would have to stretch from the Eastern Mediterranean fifteen hundred miles eastward to central Iran. Such cultural zones were anything but stable. The rhyton was a common drinking and feasting vessel much later in Rome, and the object traveled with Roman conquest and became localized in what is now Germany, France, and England. The rhyton also traveled along the Silk Road, appearing early in Central Asia and reaching China, at least as early as the Tang dynasty (618–907 CE). There it joined a centuries-older indigenous wine-horn tradition.[[22]](#endnote-22)

The glass aboard the Uluburun wreck both reinforces the picture of an activeEastern Mediterranean trading world and supports the assumption of an evenbroader trading world. Divers recovered three sorts of glass: thousands of beads, several cast figures, and 175 glass ingots, ranging in weight from 3.3 pounds to 5.5 pounds (the lighter ingots had been worn by wave and sand action). The ingots were primarily cobalt blue and turquoise, but a few were purple and amber.[[23]](#endnote-23)

**<<COMP: Please insert fig. 8 here.>>**

The grinding of glass into decorative beads, the melting of colored glass powders into faience jewelry, and the pouring of molten glass into molds to make figurines were widely practiced in the Eastern Mediterranean at the time.[[24]](#endnote-24) Primary production of glass ingots, however, required more specialized knowledge and more sophisticated technology than secondary casting. George Bass, who led the initial Uluburun excavations, in his early analysis suggested that the ingots came from Syria/Palestine, though no known primary glassworks had been located. He conceded, however, that the ingots seemed identical to those from the Nile Delta.[[25]](#endnote-25)

Subsequent research has in fact shown that the glass ingots from the Uluburun wreck are in every way identical to those produced in the Nile Delta. Archaeologists have now excavated an ancient glassworks at Qantir in the Nile Delta where the Uluburun ingots were likely produced. The specialized technological process began with a relatively low-temperature firing of plant ash and crushed quartz, which produced a powdered material. The remaining plant ash had to be washed from the powder. The next phase of production was a relatively high-temperature firing in a crucible with colorant minerals. At the Qantir site, the evidence suggests that individual workshops specialized in specific colors of glass. The shape and size of the crucibles found at Qantir match the ingots from the Uluburun wreck.[[26]](#endnote-26) Colored glass ingots from this Egyptian source were traded across the Eastern Mediterranean and formed the basis for the colored castings of figures sacred and profane, decorations, beads, and other jewelry.

The materials used in coloring the glass, such as cobalt, copper oxide, iron, and gold, suggest connections to a wider world. They, in fact, came from as far away as Persia, Afghanistan, and Africa. Not only had the Qantir craftsmen figured out which minerals and additives produced which colors; they also figured out where the minerals came from and established a stable enough supply chain to produce a steady output of a variety of colored ingots.

It is worth noting the sheer variety and quantity of organic cargo aboard the Uluburun shipwreck. Cheryl Ward, one of the excavators, summarized the plant material as follows:

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So far, Ulu Burun samples have produced almonds, acorns, pine nuts, pine cone fragments, wild pistachio nutlets, olives and olive stones, pomegranate and fig seeds and fruit fragments, and grape seeds of two types. . . . Also recorded are coriander, nigella (black cumin) and sumac seeds, charred barley in the husk and charred wheat, rachis and chaff fragments from barley and other grasses, several kinds of small grass seeds, at least three types of pulses and seeds from more than forty different weeds and other plants.[[27]](#endnote-27)

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The wreck yielded 120 large jars that once held a ton of terebinth, an aromatic tree resin from Syria/Palestine, which was either burned for the scent or used in perfumes. Another jar held a multitude of olive stones larger than most olive stones of the period. Olives were not widely cultivated at the time of the Uluburun wreck, and those found may well have been cultivated specifically for eating, rather than oil. Both terebinth and olives were commercial items of elite lifestyle, rather like the African blackwood, hippopotamus teeth, and ivory found aboard.

So, too, were pomegranates elements of elite lifestyle. Aboard the Uluburun wreck, the remains of pomegranates—seeds and bits of skin—turned up in more than a quarter of the sediments in jars.[[28]](#endnote-28) The pomegranate was no mere fruit but carried complex associations with the passage to the afterlife, as well as romantic and sexual meanings. In the Eastern Mediterranean the fruit appears on tombs, painted on fine ceramics, carved in ivory, represented in faience, cast in imported glass and bronze, and even worked from gold sheet. The geographic spread of these images in the Eastern Mediterranean includes Egypt, the cities of Crete, Cyprus, and Syria/Palestine, and Mycenae and Athens. The symbolic status of the pomegranate is suggested by two of the Uluburun finds—small ivory finials in the shape of pomegranates. The twelfth-century BCE Turin papyrus gives this poetic voice to the pomegranate tree: “My seeds shine like the teeth of my mistress, the shape of my fruit is round like her breasts. I’m her favorite.”[[29]](#endnote-29)

At the time of the Uluburun wreck the pomegranate, native to the Caspian Sea area, had been cultivated for millennia, but was grown nowhere in the Eastern Mediterranean. Fresh pomegranates were thus a high-value, elite food traveling to wealthy cities and elite tables aboard the Uluburun ship. In the larger picture, the movement of expensive fresh fruit suggests a predictability of demand and a backflow of information of tastes and markets that, on the face of it, seems astonishing for a period more than three thousand years ago.

The Uluburun wreck carried mainly high-value raw materials for the expression of a shared elite lifestyle across much of the Eastern Mediterranean: elephant and hippopotamus ivory, copper, tin, and glass in ingot form, ostrich eggs, African blackwood, pomegranates, olives, and tree resins for perfumes. Some of the goods came long distances, such as resins from southern Arabia, lapis lazuli from Afghanistan, and ostrich eggs from sub-Saharan Africa. While archaeologists have quite a good idea that the ship came from the coast of Syria/Palestine, they can only speculate as to where it was going. Minoan Crete is unlikely; its fabulous palaces had been destroyed more than a century earlier. The more likely destination was the wealthy city of Mycenae on the Peloponnesian Peninsula of Greece. Archaeologists have found a good number of artifacts from Egypt, Syria/Palestine, Mesopotamia, Cyprus, and Anatolia in and around Mycenae.[[30]](#endnote-30) From Mycenae the ship might have been bound for Egypt, though the direct route from Syria to Egypt would have been much shorter and safer.

It is important to emphasize two features of this Eastern Mediterranean world. First, in spite of trade connections, it contained profoundly different cultures, such as Egypt, Mycenae, and the Hittite kingdom. The copper, tin, and glass aboard the Uluburun wreck was likely turned into a variety of different objects in different places. As we have seen, however, the entire region did share some elite objects, such as the drinking vessel known later as the rhyton. Second, demand connected to supply sources far beyond the Eastern Mediterranean, reaching into Asia and Africa. Political boundaries in no sense matched trade or economic boundaries. It is worth noting, however, that the Eastern Mediterranean world barely connected, via supply or demand, with the western Mediterranean, and not at all to most of Europe.[[31]](#endnote-31)

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The End of the Uluburun World

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This interconnected trading world, which brought elegant materials for beautiful and powerful objects, fresh pomegranates, drinking cups for banqueting and metals for statues, weapons, and tools, was not long to survive. Within two centuries of the Uluburun wreck many of these glittering capitals and the kingdoms that supported them were gone.[[32]](#endnote-32) Ugarit on coastal Syria, and the cities of Cyprus and Mycenae, were attacked and destroyed by the mysterious “Sea Peoples.” A few documents of the time mention them, but none describes them, so theories are rampant: they came from the north of Greece in waves of migration, they came from Central Asia, or they were native to the Syrian coast and rose against their overlords.

All we actually have are the facts of near-simultaneous decline and destruction, much of which seems to have little to do with “Sea Peoples.” The Hittite capital, Hattusha, about 150 miles east of Ankara and far from the sea, was burned in 1160 BCE. Troy was destroyed, rebuilt, and destroyed again. Archaeologists have speculated that the new iron weapons coming into use throughout the Middle East and the Eastern Mediterranean were so lethal that defeated armies were utterly destroyed and sacked cites never recovered. Like other theories of the sudden decline of this world, the “iron weapon” theory has been roundly criticized.

The end of the world of the Uluburun wreck also likely had natural causes. Pollen analysis suggests that the whole region became much drier, and drought was common. This reality may be the time referred to in the biblical story of Exodus from Egypt, with its years of good harvest and the years of famine. Drought and famine would have stressed, if not doomed, kingdoms around the Mediterranean. Still, it is important to remember that Egypt and Assyria survived as major kingdoms. So did some smaller cities, such as Phaistos on Crete. But not until three centuries after the Uluburun wreck would begin the long, slow development of the city-states of classical Greece.

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1. The discovery and initial exploration of the Uluburun wreck are well described in George F. Bass, “A Bronze Age Shipwreck at Ulu Burun (Ka<<s-tail>>): 1984 Campaign,” *American Journal of Archaeology* 90, no. 3 (July 1986): 269–296. See also C. Pulak, “The Bronze Age Shipwreck at Ulu Burun, Turkey: 1985 Campaign,” *American Journal of Archaeology* 92 (1988): 1–37. For a later consideration of the three dive seasons see C. Pulak, “The Uluburun Shipwreck: An Overview,” *International Journal of Nautical Archaeology* 27 (1998): 188–224. [↑](#endnote-ref-1)
2. See Cemal Pulak, “The Cargo of the Uluburun Ship and Evidence for Trade with the Aegean and Beyond,” in *Italy and Cyprus in Antiquity: 1500–450 BC*, ed. Larissa Banfante and Vassos Karageorghis (Nicosia: Costakis and Leto Severis Foundation, 2001), 24. [↑](#endnote-ref-2)
3. There might even have been copybooks available to tomb painters, showing how ships or animals or gardens should be portrayed, though no actual examples of such copybooks have been excavated. [↑](#endnote-ref-3)
4. Several of these features are present in a simple terra-cotta ship model found at Enkomi on the east coast of Cyprus. The model was, however, found on the surface and cannot therefore be accurately dated. [↑](#endnote-ref-4)
5. Cheryl Ward, “Pomegranates in Eastern Mediterranean Contexts during the Late Bronze Age,” *World Archaeology* 34, no. 3, Luxury Foods (February 2003): 529. [↑](#endnote-ref-5)
6. Thomas Cucchi, “Uluburun Shipwreck Stowaway House Mouse: Molar Shape Analysis and Indirect Clues about the Vessel’s Last Journey,” *Journal of Archaeological Science* 35 (2008): 2953–2959. See Also François Bonhomme, Annie Orth, Thomas Cucchi, Hassan Rajabi-Maham, Josette Catalan, Pierre Boursot, Jean-Christophe Auffray, and Janice Britton-Davidian, “Genetic Differentiation of the House Mouse around the Mediterranean Basin: Matrilineal Footprints of Early and Late Colonization,” *Proceedings: Biological Sciences* 278, no. 1708 (April 7, 2011): 1034–1043. [↑](#endnote-ref-6)
7. Sturt W. Manning, Bernd Kromer, Peter Ian Kuniholm, and Maryanne W. Newton, “Anatolian Tree Rings and a New Chronology for the East Mediterranean Bronze-Iron Ages,” *Science*, New Series, vol. 294, no. 5551 (December 21, 2001): 2532–2535. [↑](#endnote-ref-7)
8. Quoted in Shelly Wachsmann, *Seagoing Sips and Seamanship in the Bronze Age Levant* (College Station: Texas A&M University Press, 1998), 39–40. [↑](#endnote-ref-8)
9. Ibid., 40. The importance and volume of trade in the Late Bronze Age Eastern Mediterranean are much debated in the scholarly literature. See the chapters by H. W. Catling, A. M. Snodgrass, G. F. Bass, and M. Melas in *Bronze Age Trade in the Mediterranean*, ed. N. H. Gale, Studies in Mediterranean Archaeology, vol. 90 (Paul <<A-circle>>ströms Förlag, 1991). See also Stuart W. Manning and Linda Hunt, “Maritime Commerce and Geographies of Mobility in the Late Bronze Age of the Eastern Mediterranean: Problematizations,” in *The Archaeology of the Mediterranean Prehistory*, ed. Emma Blake and A. Bernard Knapp (Oxford: Blackwell, 2005), 270–303. [↑](#endnote-ref-9)
10. Andreas Hauptmann, Robert Maddin, and Michael Prange, “On the Structure and Composition of Copper and Tin Ingots Excavated from the Shipwreck of Uluburun,” *Bulletin of the American Schools of Oriental Research*, no. 328 (November 2002): 2. [↑](#endnote-ref-10)
11. See Nöel H. Gale, “Copper Oxhide Ingots: Their Origin and Their Place in the Bronze Age Metals Trade in the Mediterranean,” in Gale, *Bronze Age Trade in the Mediterranean*, 200. Good answers to questions about the method and its results are found in Sophie Stos-Gale, “Trade in Metals in the Bronze Age Mediterranean: An Overview of Lead Isotope Data for Provenance Studies,” in *Metals Make the World Go Round: The Supply and Circulation of Metals in Bronze Age Europe*, ed. C. F. E. Pare (Oxford: Oxbow Books, 2000), 56–69. [↑](#endnote-ref-11)
12. I recommend to the reader the marvelous article by Paul T. Craddock on early copper smelting in the region, “From Hearth to Furnace: Evidences for the Earliest Smelting Techniques in the Eastern Mediterranean,” *Paléorient* 26, no. 2 (2000): 151–165. [↑](#endnote-ref-12)
13. Microanalysis of core samples of the Uluburun copper ingots found a consistent and distinctive structure of voids and boundaries of grains and large slag inclusions throughout the sampled ingots. The microstructure of the relatively low-grade Uluburun ingots contrasts sharply with the much more highly refined bun ingots of the period from Oman or those found off Israel. Chemical evidence suggests a single source and technology for the Uluburun ingots sampled, without admixtures of recycled bronze. The microstructure and refining methods are consistent with copper from Cyprus. See Hauptmann et al., “On the Structure and Composition,” 17–19. The bibliographic references in Hauptmann et al. are useful in reconstructing the positions taken by various academics in discussions, occasionally acrimonious, of the issues of the four-handled copper ingots. [↑](#endnote-ref-13)
14. Gale, *Bronze Age Trade*, 225–226. [↑](#endnote-ref-14)
15. Ibid., 201. [↑](#endnote-ref-15)
16. See M. Primas and E. Pernicka, “Der Depotfund von Oberwilfingen: Neue Ergebnisse zur Zirkulation von Metallbarren,” *Germania* 76 (1998): 25–65. [↑](#endnote-ref-16)
17. I see little useful in the decades-old debate over whether the goods on the Uluburun ship were for trade or gifts between kings. Trade goods are generally defined as having extrinsic value when exchanged for some other commodity (some quantity of grain exchanged for some quantity of fish). It is argued that gifts, in contrast, have intrinsic value because they initiate and strengthen relationships and cannot readily be converted into other commodities. The distinction seems arbitrary and unsatisfactory. Many gift items, in fact, had intrinsic value. Thus, gold jewelry, once a gift, could be sold, melted, and reused. In similar fashion the gift of one king to another might well be quantified in terms of the projected benefits of a strengthened alliance. In the absence of any documentation referring directly to the Uluburun ship, we cannot know whether the objects were intended for trade, gift, or some blending of intrinsic and extrinsic value. See Christoph Bachhuber, “Aegean Interest on the Uluburun Ship,” *American Journal of Archaeology* 110, no. 3 (July 2006): 345–363. [↑](#endnote-ref-17)
18. D. Rutter Symington, “Late Bronze Age Writing Boards and Their Uses: Textual Evidence from Anatolia and Syria,” *Anatolian Studies* 41:111–123. See also E. Laroche, *Catalogue des textes Hittites* (Paris: Klencksieck, 1971). [↑](#endnote-ref-18)
19. See Dorothy G. Shephard, “Two Silver Rhyta,” *Bulletin of the Cleveland Museum of Art*, October 1966. See also A. S. Melikian-Chirvani, “The Iranian Wine Horn from Pre-Achaemenid Antiquity to the Safavid Dynasty,” *Bulletin of the Asian Institute* 10 (1996): 85–139. [↑](#endnote-ref-19)
20. C. Davaras, “A Minoan Beetle-Rhyton from Prinias Siteias,” *Annual of the British School at Athens* 83 (1988): 45–46. [↑](#endnote-ref-20)
21. Susanne Ebbinghaus and J. Ellis Jones, “New Evidence on the Von Mercklin Class of Rhyta: A Black-Gloss Rhyton from Agrileza, Laureion, Attica,” *Annual of the British School at Athens* 96 (2001): 381–394. [↑](#endnote-ref-21)
22. François Louis, “The Hejiacun Rhyton and the Chinese Wine Horn (Gong): Intoxicating Rarities and Their Antiquarian History,” *Artibus Asiae* 67, no. 2 (2007): 201–242. [↑](#endnote-ref-22)
23. Pulak, “Cargo,” 25. [↑](#endnote-ref-23)
24. See A. L. Oppenheim, “Towards a History of Glass in the Ancient Near East,” *Journal of the American Oriental Society* 93 (1973): 259–263. See also Marco Beretta, *The Alchemy of Glass: Counterfeit, Imitation, and Transmutation in Ancient Glassmaking* (Chicago: University of Chicago Press, 2010), chap. 1. [↑](#endnote-ref-24)
25. The coastal areas of Palestine/Syria certainly produced glass, since its import is mentioned in Egyptian records. At roughly the same time Egypt was exporting glass ingots to Mesopotamia. These exports and imports hardly make sense unless various glassworks produced specialty colors. See Pulak, “Cargo,” 27. [↑](#endnote-ref-25)
26. Thilo Rehren and Edgar B. Pusch, “Late Bronze Age Glass Production at Qantir-Piramesses, Egypt,” *Science*, New Series, vol. 308, no. 5729 (June 17, 2005): 1756–1758. [↑](#endnote-ref-26)
27. Cheryl Haldane, “Direct Evidence for Organic Cargoes in the Late Bronze Age,” *World Archaeology* 24, no. 3, Ancient Trade: New Perspectives (February 1993): 352. [↑](#endnote-ref-27)
28. My discussion of the pomegranate relies on Ward, “Pomegranates,” 529–541. [↑](#endnote-ref-28)
29. Ibid., 529. [↑](#endnote-ref-29)
30. See Eric H. Cline, “Egyptian and Near Eastern Imports at Late Bronze Age Mycenae,” in *Egypt, the Aegean and the Levant: Interconnections in the Second Millennium BC*, ed. W. Vivian Davies and Louise Schofield (London: British Museum Press, 1995), 91–115. [↑](#endnote-ref-30)
31. Some Baltic amber circulated in the world of the late Bronze Age Eastern Mediterranean, but the finds are rare, and the imports were probably occasional. All the finds of Baltic amber in the Eastern Mediterranean at the period of the Uluburun wreck could have been carried in a single backpack. See Anthony Harding, Helen Hughes-Brock, and Curt W. Beck, “Amber in the Mycenaean World,” *Annual of the British School at Athens* 69 (1974): 145–172. [↑](#endnote-ref-31)
32. This period of decline has been termed the “Bronze Age collapse.” The evidence was synthesized by Robert Drews, *The End of the Bronze Age: Changes in Warfare and the Catastrophe ca. 1200 B.C.* (Princeton, NJ: Princeton University Press, 1993). The theory has been criticized for lack of chronological accuracy and combining various local and regional factors into a single large pattern. [↑](#endnote-ref-32)