

THE ULUBURUN SHIPWRECK AND LATE BRONZE AGE TRADE

CEMAL PULAK

A shipwreck dating to the Late Bronze Age was excavated off Uluburun—or Grand Cape[1]—approximately 9 kilometers southeast of Kaş, in southern Turkey, between 1984 and 1994.[2] It was discovered by a sponge diver during the summer of 1982 and brought to the attention of archaeologists at the Institute of Nautical Archaeology (INA) conducting annual shipwreck surveys along the coast.[3] The original allure of the site was its cargo of copper ingots. Similar ingots had been discovered during the 1960 excavation of a seafaring merchant ship of around the twelfth-century B.C. off Cape Gelidonya, just 65.5 kilometers east of Uluburun. Analyses of finds from the Cape Gelidonya shipwreck had allowed George Bass to hypothesize about the central role of Near Eastern seafarers in Late Bronze Age trade in the Mediterranean.[4]

Excavations at Uluburun quickly revealed the true wealth of the ship. The vast cargo included ingots of copper and tin, other raw materials, several types of manufactured products, and a collection of premium exotic goods. The assemblage recovered from Uluburun has offered great insight into Late Bronze Age trade, both on land and at sea. The raw materials have yielded information on contemporary metallurgy and technology, and the exotic goods illustrate value-laden commodities. With its coherent artifact assemblage and extant hull remains, the wreck is considered the world's oldest seagoing ship and has pushed back the timeline of shipbuilding technology. Examination of the hull and cargo of the Uluburun ship has challenged many previously held assumptions about Late Bronze Age society, and ramifications of the excavation are still being interpreted. Conservation and analyses of the nearly 17 tons of artifacts recovered from the site continue today, demonstrating the multiplicity and complexity of the find.

The Site

Archaeologists first visited the site, situated 60 meters off Uluburun's east face and about 350 meters from the terminus of the cape, in the autumn of 1982. Immediately visible were several dozen ingots, still arranged in four discernible rows. Their shape was reminiscent of copper ingots recovered from the Cape Gelidonya shipwreck two decades earlier and termed "oxhide" for their rectangular, four-handled appearance. It had been assumed that each ingot represented the shape of an oxhide, possibly as a means of assigning value for trade, although this hypothesis has since been disproved. The form of the oxhide ingots and other artifacts from the wreck allowed us to propose a rough date of about 1300 B.C.[5] With this estimated date in mind, excavations began in the hope of uncovering items that would illuminate aspects of Late Bronze Age trade.

Because of the depth of the site—42 to 61 meters[6]—the cargo had been spared from salvage or pillage. Nevertheless, recovery of the artifacts was not easy. The depth created difficulties for archaeologists, who could dive only twice a day, each dive limited to twenty minutes of bottom time. Over the subsequent eleven seasons of excavation, more than 22,400 dives were conducted, logging a total of 6,613 hours underwater at the wreck site. The majority of the artifacts were scattered over about 250 square meters of the rocky bottom, which is characterized by a jagged, steep slope, averaging 30 degrees, and occasional pockets of sand (figs. 91–93). The ancient ship had come to rest listing 15 degrees to starboard, in an approximately east-west orientation (fig. 92). From the appearance of the cargo, particularly the copper ingots, and the discovery of several stone anchors, it was determined that the stern of the ship lay higher on the slope, on the western end, with the bow at the deeper end of the site. As the ship settled under the weight of the cargo, the wood hull gradually collapsed and eroded in stages. Some artifacts settled into level spots, while others tumbled down the slope. This led to problems, as many artifacts were found out of their original context. Because each sherd was numbered on the seabed and plotted on a site plan, ongoing reassembly of the pottery and other cargo revealed the trail of spillage, permitting, through detailed documentation and computer graphics, the reconstruction of the cargo's original placement within the ship's hold (fig. 94).

Figure 90. Archaeologist excavating copper ingots at site of Uluburun shipwreck.

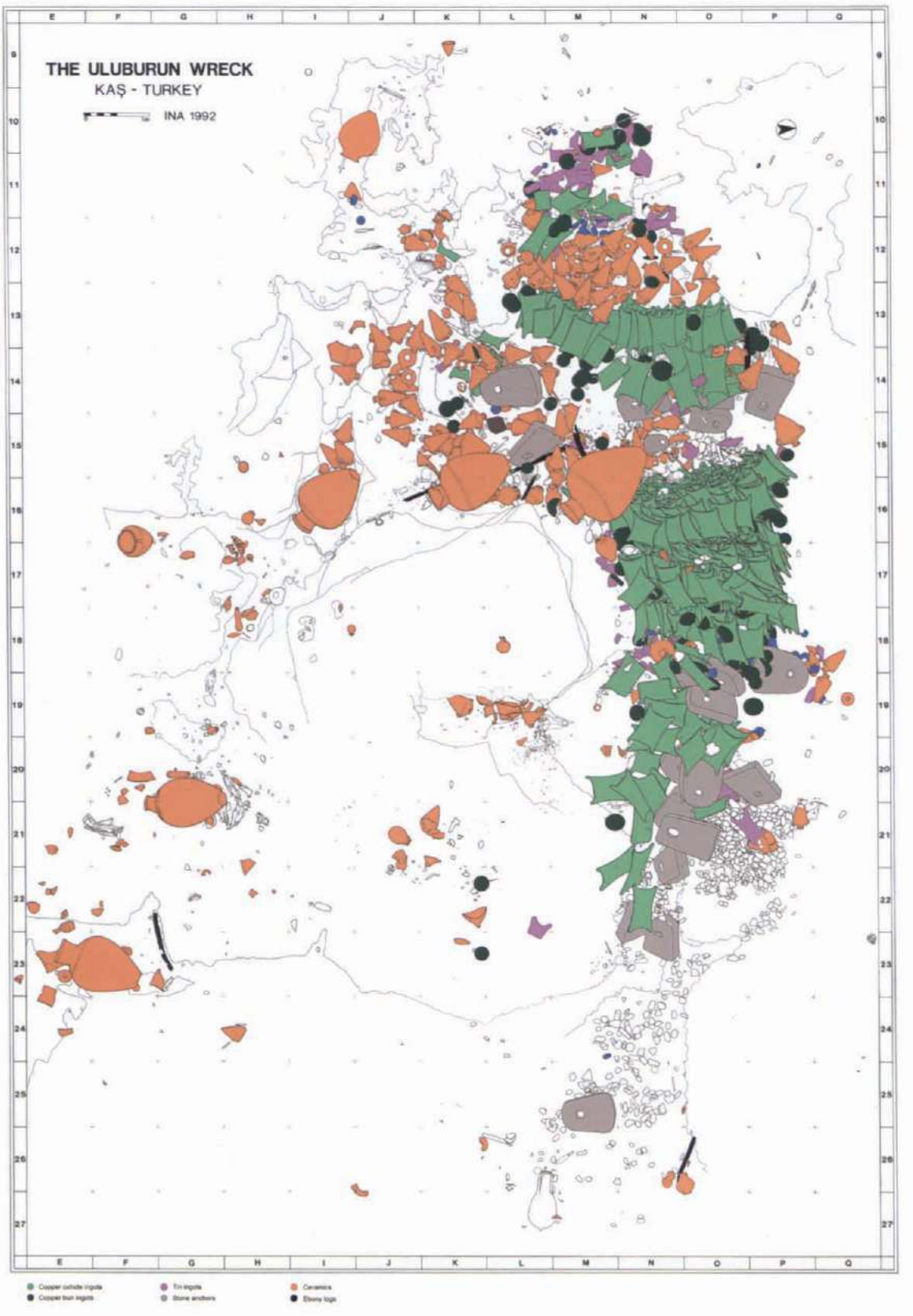


Figure 91. Plan of seabed at the site of the Uluburun shipwreck.

Cargo

The Uluburun ship had a carrying capacity of at least 20 tons' burden.[7] This minimum capacity was calculated by tallying the recovered objects, which included more than 10 tons of copper and one ton of tin ingots, glass ingots, Canaanite jars, large ceramic storage jars (pithoi), stone anchors, and approximately one ton of cobblestone ballast. This estimate assumes that all transport and storage containers were filled with materials approximating the density of water (1 g/cm^3), although some large storage jars were originally packed with Cypriot pottery for export (see cat. no. 193). It is impossible to estimate exactly how much of the ship's original cargo perished, but some fragments of the more delicate items, such as ebony logs, riddled with teredo, or shipworms, hint at the harsh environment.[8]

Of the twenty-four stone anchors carried on the ship, eight remained in the hold in the midship area as reserve anchors

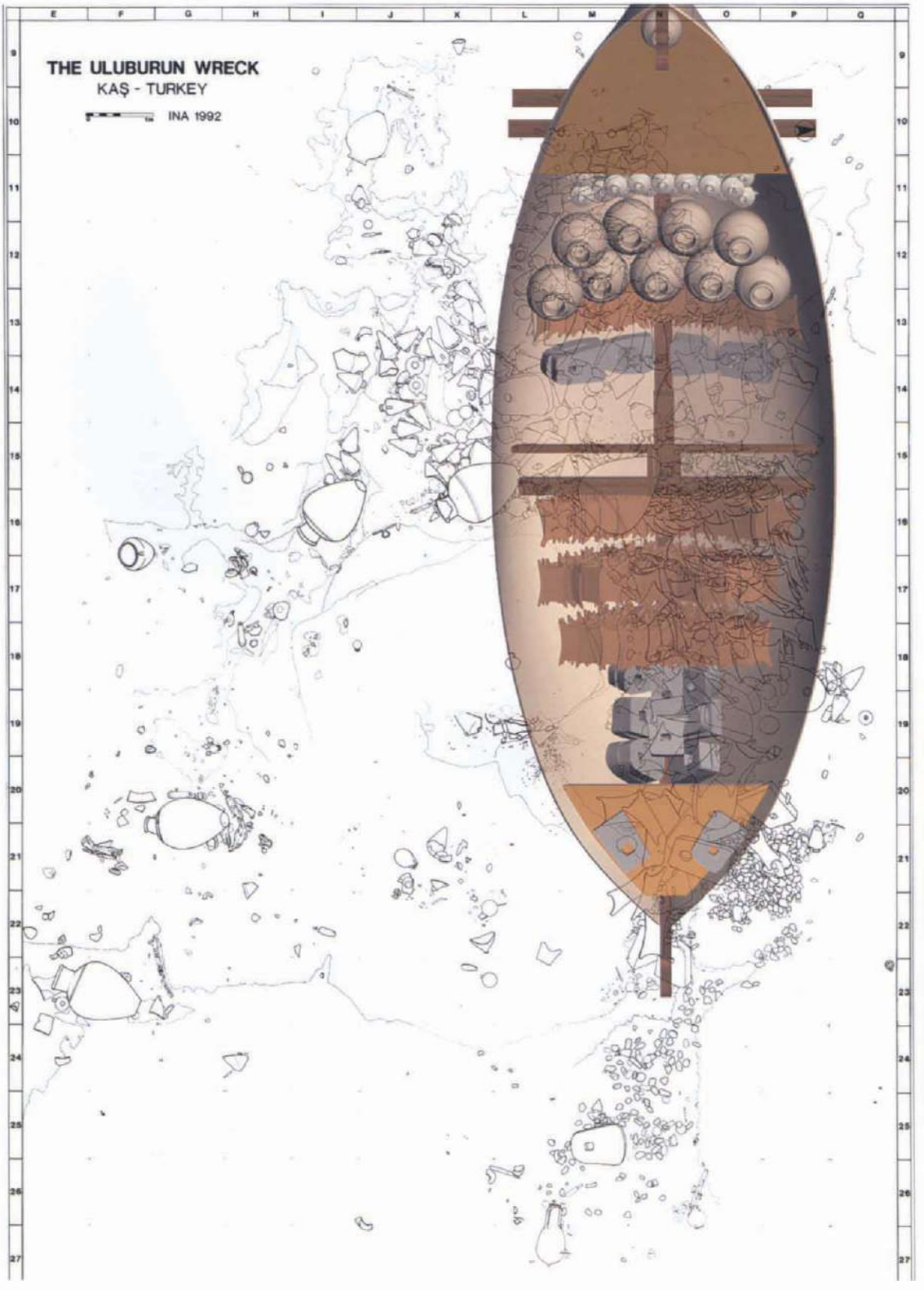


Figure 92. Reconstruction of the Uluburun ship superimposed on plan of seabed.

carried as ballast, while the remainder were stowed at the bow, with several ready for use. An analysis of the cargo provides our clearest glimpse thus far into Late Bronze Age trade in the Mediterranean.[9] The wreck itself is another indicator of a sea route for the east-west transport of materials. Many of the artifacts are Syro-Canaanite and Cypriot in origin, and it seems likely that the vessel was heading for a destination in the Aegean, probably on the Greek mainland (see fig. 97).

Copper and Tin Ingots[10]

The primary freight excavated from the wreck consists of about 10 tons of Cypriot copper in the form of 354 rectangular slab ingots, each with an average weight of about 24 kilograms.[11] Of these, 317 are of the typical oxhide shape, with a protrusion on each of the four corners (see cat. no. 185a); 31 ingots, while of similar form, have only two protrusions, both on the same long side (see cat. no. 185b). The latter are unique

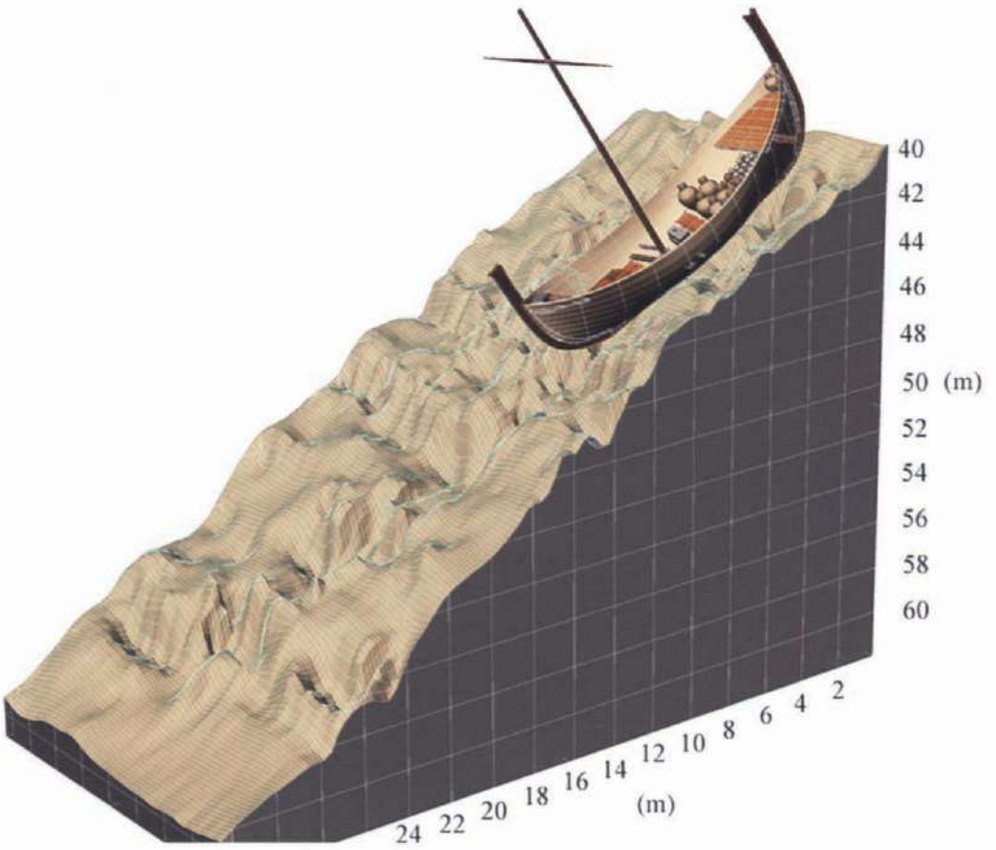


Figure 93. Three-dimensional reconstruction of the Uluburun ship with slope of seabed indicated.

to the Uluburun ship. There are also six smaller oxhide ingots (see cat. no. 185c, e), four of which have shapes of a seemingly earlier type,[12] and 121 plano-convex discoid, or bun-shaped, ingots (see cat. no. 185d), plus fragments of ten more.[13]

Metallurgical analyses of the oxhide and plano-convex discoid copper ingots have shown them to be raw or "blister" ingots of pure copper.[14] Lead-isotope analysis confirms that the Uluburun copper ingots, and most contemporary copper ingots found in the Mediterranean, originally came from Cyprus. Whether they were loaded on the island or at an entrepôt on the Levantine coast cannot be proved, but the latter is more likely.[15] In either case, the evidence provides significant information about how the ship was laden.

Although many ingots slipped down the slope after the ship sank or were displaced as the hull settled and broke apart under the tremendous weight of the cargo, their basic arrangement survived. Four distinct rows of copper ingots stretched transversely across the hull, overlapping like roof shingles. The direction of overlap alternated from layer to layer, apparently to prevent slippage during transit. In each row were as many as 12 ingots, stacked eight to eleven layers deep at the middle of the ship, with the number of ingots decreasing toward either side of the hull. The bottom layers were placed on beds of brushwood and branches, also known as "dunnage," to protect the hull timbers.[16] All ingots appear to have been stowed with their mold sides down, both to facilitate handling when loading and unloading and to increase friction between ingots, thereby minimizing shifting during the voyage.[17] The weight of the ingots, in addition to that of the stone anchors, helped preserve some portions of the hull remains. Several more perishable artifacts were recovered here because they had become trapped between or beneath the copper ingots and thus saved from the ravages of marine organisms by the copper corrosion products.

In addition to the carefully stowed copper ingots, tin was also carried on board. The tin was cast in several ingot shapes: oxhide, discoid, slab, and a unique ingot shaped like a stone weight anchor, with a circular hole at one end. Many of these had been cut into quarters or halves before they were taken on board (see cat. no. 185f, g).[18] Some of the tin on the wreck had, through a complex change in its crystalline structure, converted to another, nonmetallic phase of tin with the consistency of toothpaste, which disintegrated during excavation.[19] For this reason, it is impossible to determine the exact amount of tin on the ship. Although nearly one ton was recovered during excavations, the original quantity carried must have been much greater. Alloying all the metal ingots on board would have produced 11 tons of bronze in the optimal 10 to 1 ratio of copper to tin.[20]

Lacking in the Mediterranean, tin was likely obtained through trade. Sources of Bronze Age tin remain unknown, although ancient texts indicate that it may have been obtained from regions east of Mesopotamia,[21] probably Central Asia,[22] and shipped via the Levantine coast.

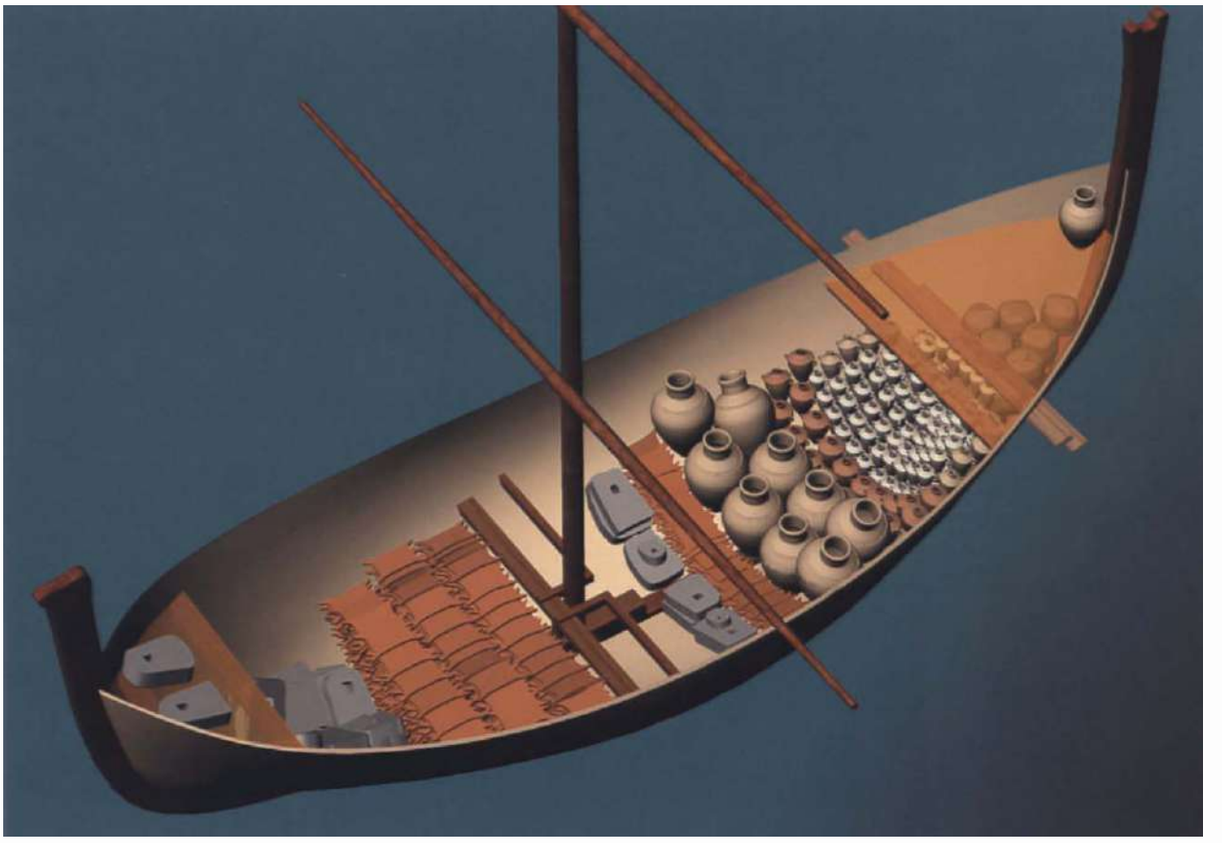


Figure 94. Reconstruction of original arrangement of cargo on the Uluburun ship.

Glass Ingots

Glass ingots, each in the shape of a roughly truncated cone, were also part of the cargo.[23] Some were in an excellent state of preservation, and others suffered partial or complete deterioration, but it is estimated that 175 pieces, totaling some 350 kilograms, were on board. The majority of the glass ingots were cobalt blue or turquoise in color, but at least two ingots of purple and one of amber are also represented (cat. no. 187).[24] These are among the earliest well-preserved examples of their type, as complete glass ingots in any quantity are rarely found in land excavations.

Chemical analyses of the alkalis and the coloring agents suggest that the glass was obtained from both Egypt and the Near East.[25] The transparent cobalt blue ingots, however, are chemically similar to core-formed vessels of cobalt blue glass from Amarna in Egypt and to typical cobalt blue Mycenaean relief beads (cat. nos. 239, 246).[26] This similarity is sufficient to suggest that the glass for all the cobalt blue ingots was probably made in the same general region at about the same time from similar raw materials and following the same batching and glassmaking processes.[27]

Wood

African blackwood (*Dalbergia melanoxylon*) was an important component of Bronze Age trade. This is the ancient *hbny* of the Egyptians, from which the English word "ebony" derives.[28] Ebony has become a generic name for many different dense, black woods from around the world, whereas the *hbny* of the ancient Egyptians originated in tropical Africa.[29] It was the favorite material for furniture among the Egyptian elite, as attested by the bed frames, thrones, chairs, footstools, boxes, and walking sticks made from ebony and found in the Tomb of Tutankhamun.[30] Evidence of the ebony trade exists in both ancient texts and the archaeological record. About 18 intact and fragmentary small ebony logs were found on the Uluburun ship.[31] All are composed only of dark heartwood, the commercially valuable part; the bark and thin layer of yellowish sapwood were useless and therefore stripped from the log. The logs were cut to standard lengths of about one meter,[32] perhaps approximating two Egyptian royal cubits of 52.4 centimeters.

Several centuries before the Uluburun shipwreck, Hatshepsut's expedition to Punt (see fig. 5), probably somewhere in modern-day Somalia, brought back ebony wood, among many other exotic items.[33] Ebony continued to be exported from East Africa through Nubia, down the Nile, and into Egypt during the reigns of Thutmose III and Amenhotep II.[34] Several New Kingdom reliefs depict Nubians bearing ebony as tribute, including those in the mid-fifteenth-century B.C. Tomb of Rekhmire in Thebes (fig. 95),[35] the late fifteenth-century B.C. tomb chapel of Sebekhotep near Thebes,[36] and the thirteenth-century B.C. rock temple built by Ramesses II at Beit el-Wali in Nubia.[37]

The Egyptians exported ebony in the form of both logs and furniture, and the ebony furniture referred to in the Linear B



Figure 95. Wall painting with Nubians carrying ebony logs and ivory tusks. Thebes, Tomb of Rekhmire (TT 100). Dynasty 18, reigns of Thutmose III–Amenhotep II.

tablets from Pylos, on the Greek mainland, may have come from Egypt.[38] While ebony fits well with the valuable and rare goods that make up some of the cargo, it is remarkable that it was exported in unfinished state, for this suggests that it was destined for a palace or other centralized entity capable of mobilizing the resources necessary to operate a workshop for the final production of such luxuries.[39]

Ivory

The Uluburun ship carried a short section of a large elephant tusk (cat. no. 197) and 14 hippopotamus teeth (see cat. no. 198).[40] Combs, plaques, and furniture inlays made of ivory were common products of the Aegean during the Bronze Age, but ivory was also carved into figurines, containers, and pins.[41] Elephant tusk was the material of choice because it offered large quantities of solid ivory, although hippopotamus teeth were also commonly used.[42] It is not always easy to distinguish between the two types of ivory, and the full extent of the trade in hippopotamus ivory cannot yet be fully assessed. Based on existing finds, including the discoveries on the Uluburun ship, it would seem that hippopotamus teeth were a more common source of ivory than hitherto believed (see pp. 406–7).

Ostrich Eggshells

The Uluburun ship carried three ostrich eggshells, one of which was found intact (cat. no. 194a).[43] These were undoubtedly exotica destined to be transformed into ornate jugs or vases by the addition of spouts, handles, and bases of faience or precious metals.[44] Ostrich eggshell vases and eggshell fragments have been found at several sites on the Greek mainland and the major Aegean islands.[45] A blue glass disc found separately, and in a poor state of preservation, may have been a base for one of the Uluburun eggshells (cat. no. 194b). If this is the case, it is evidence that the eggshells had already been made into luxury vases for use as prestige gifts or items of elite consumption before they were placed in the ship. The Uluburun ostrich eggshells could have been obtained in either Africa or the Near East, as ostriches inhabited both regions at the time.[46]

Orpiment

Orpiment, or yellow trisulphide of arsenic, was also carried on the Uluburun ship,[47] in a quantity that suggests that it was probably cargo, although some of it may have been intended for shipboard use as well. Orpiment was primarily used in Egypt, as a pigment,[48] and perhaps also as an ingredient for lapis lazuli–colored glass later on, in the seventh century B.C.[49] It was also mixed with beeswax, presumably to impart a more pleasing color, and used to create surfaces for wood writing boards,[50] two sets of which were found on the Uluburun ship, although their waxed surfaces did not survive (cat. no. 234). In classical times, orpiment served as a pigment in the encaustic paint used for the hulls of ships,[51] and, when mixed with lime, as a depilatory.[52] Pliny notes that it was mined in Syria,[53] which may have been the source of the Uluburun supply; it is also found elsewhere in the Near East.[54]

Murex opercula

Thousands of opercula from murex (*Murex* sp.) shells were lodged between the copper ingots and elsewhere on the Uluburun ship.[55] An operculum is the chitinous (hornlike material) or calcareous (shell-like material) plate attached to

the foot of a gastropod that closes to form a protective barrier when the snail retracts into its shell. In *Murex* species, the operculum is of the chitinous type and, unlike the calcareous types of some species, normally would not have survived the ravages of the sea for extended periods. Most of the opercula have disappeared, but those that became trapped in the crevices between the copper ingots were preserved as a result of their impregnation with copper and probably also because the toxic environment created by the corroding ingots would have kept away predatory marine organisms. The number recovered suggests that a significant amount of opercula was originally carried on the Uluburun ship.

This is the first discovery of *Murex opercula* in any quantity from a Bronze Age archaeological context. Certain gastropod opercula may have been used in antiquity as an ingredient for incense. Under the Greek name *onycha*, opercula seems to have constituted one ingredient of the Holy Incense mentioned in Exodus (30:34).[56] The *shlt* listed in an Ugaritic inventory of foodstuffs, spices, and medicinal substances may also refer to opercula,[57] whose medicinal uses were noted by Pliny.[58] Opercula may have been procured as a by-product of the more lucrative dye-extraction process.[59] Whatever their purpose, their presence on the Uluburun ship has shown for the first time that they were an item of interregional trade along with spices and resins.

Terebinth Resin

Well over half of the approximately 150 Canaanite jars (see cat. no. 190) aboard the Uluburun ship contained an estimated half a ton of a yellowish substance chemically identified as terebinth resin,[60] making it the second-largest consignment on the ship, after the copper and tin ingots.[61] Terebinth resin has been identified with the Egyptian *sntr* and also possibly as the Linear B *ki-ta-no*.[62] Probably from the *Pistacia atlantica*, a tree common throughout the eastern Mediterranean region, the resin was noted in antiquity for its use in incense and scented oils, and it may have been added to wine to inhibit the growth of bacteria.[63] It is likely that the resin aboard the Uluburun ship was intended for use in the scented-oil industry in the Aegean.[64] If the interpretation of Egyptian *sntr* as terebinth resin[65] is correct, which seems likely, then Thutmose III imported it annually from the Near East, probably in quantities averaging 9,250 liters, to be burned as incense in religious rites.[66] Moreover, it was likely imported in Canaanite jars similar to those found on the Uluburun ship. A Canaanite jar depicted in a storeroom scene in the Tomb of Rekhmire in Thebes is labeled *sntr* (fig. 96).[67]

The terebinth resin on the Uluburun ship, the largest ancient deposit of the material ever found, provided the first opportunity for its identification by modern analytical methods. Analysis of pollen extracted from the terebinth resin cautiously suggests an origin in the general area of the northern Jordan River valley and the Sea of Galilee.[68] The malacological study of endemic terrestrial snails found in some jars similarly points to a nearby region west and northwest of the Dead Sea.[69] The discovery of such a large quantity of terebinth resin in a commercial context leaves no doubt that it was traded in the eastern Mediterranean during the Late Bronze Age.



Figure 96. Wall painting showing storeroom with goods of foreign manufacture. Thebes, Tomb of Rekhmire (TT 100). Dynasty 18, reigns of Thutmose III–Amenhotep II.

Spices, Condiments, and Foodstuffs

Coriander, black cumin or nigella, and safflower were all carried on the Uluburun ship,[70] together with sumac, which was still being exported westward from the Levantine coast in medieval times.[71] Coriander and cyperus may have been imported from Cyprus, as they were described in texts from Minoan Crete as Cypriot.[72] Black cumin was traded at Ugarit.[73] Specialty oils mentioned in Linear B tablets from Pylos, Mycenae, and Knossos were pretreated with astringents such as coriander and cyperus and then scented with rose and sage.[74] The oil base for these specialty products was usually made from olives, almonds, and sesame,[75] some of which were recovered from the Uluburun ship; it is not known whether they were for export or shipboard use.

Organic remains of almonds, pine nuts, fig seed (from dried figs), grape pips (from either raisins or wine), and pomegranate seeds and fruit fragments; several Canaanite jars containing olives; and charred barley and wheat probably represent the ship's stores, although some of it could have been cargo.[76] The contents of one Canaanite jar, for example, consisted of at least 2,500 pits from olives that may have been a specialty product, since olive stones from this jar are generally larger than typical olive stones from most Near Eastern Bronze Age sites.[77] Pomegranate seeds and remains of anther, stamen, and skin were recovered from more than 25 percent of all sampled

contexts on the Uluburun ship. Large, open ceramic storage vessels, such as a pithos and a pithoid krater, produced more than a thousand seeds and epidermal fragments, suggesting that the fruits stored inside it were likely among the products being exported to the Aegean.[78]

Manufactured Goods

Alongside raw materials, the Uluburun cargo included manufactured goods such as Cypriot pottery, copper-alloy vessels, glass and faience beads, and perhaps textiles. Ten large pithoi of varying sizes found on the ship served as containers during transit and likely as export pottery as well. These storage jars are typically Cypriot, known from a number of sites on the island.[79] Careful excavation and sieving of sediments from the more complete vessels have shown that they were used for carrying liquids (perhaps oil), fruit (pomegranates), Cypriot pottery, and probably other commodities.[80] In addition to high-end raw materials like ebony and ivory, some of the manufactured goods aboard the ship, including cosmetics containers of ivory, vessels of tin, and perhaps even dyed textiles or garments, appear to constitute value-laden gifts exchanged between royals or other high-ranking elites. Other manufactured articles offer insight into the number and ethnic identity of the crew and the passengers aboard the vessel, including evidence of their garments, adornments, and personal possessions.

Cypriot Pottery

The Cypriot pottery contained in the pithoi includes oil lamps, wall brackets, Bucchero jugs, White Shaved juglets, Base Ring II and White Slip II bowls and other vessels, making a total corpus of about 155 vessels, including possibly as many as 137 fine wares (see cat. no. 193).[81] The most common vessels are White Shaved juglets and White Slip II milk bowls.[82] If the intended destination of the Cypriot pottery cargo was the Aegean, the sheer quantities of these wares aboard the Uluburun ship contrasts with what has been found to date in the region. If one excludes the shipwreck evidence from Cape Gelidonya and Uluburun from an inventory of Cypriot pottery in the Late Bronze Aegean, one is left with only 68 ceramic vessels. Had the Uluburun ship reached its destination, the number would have been altered significantly. This great disparity clearly demonstrates that the archaeological record, even with respect to nonperishable goods, does not necessarily reflect the true nature and magnitude of the trade in question.[83]

Metal Vessels

In addition to pottery, copper-alloy vessels were carried aboard the Uluburun ship. They were primarily thin-walled and had for the most part disintegrated through corrosion, although their sturdier components, such as rims and handles, survived to reveal their approximate shapes and sizes. Among these are sets of bowls once composed of at least three graduated sizes nested together, suggesting that other scattered bowl fragments may have been grouped in this manner. At least one of these bowl sets appears to have been stored in a large cauldron, identified by its handle and reinforcement straps. Elements of other vessels, such as a riveted spout, hint at the variety of metal forms that existed but which may never be fully reconstructed because of the lack of sufficiently preserved parts.[84]

In addition, several tin vessels, including a pilgrim flask, a plate, and a double-handled cup, have been found. Each is unique, suggesting that such vessels were among the prestige goods carried aboard to be presented as gifts to high-ranking individuals or elites.[85]

Wood Vessels

An oblong lid and a circular base for two containers of boxwood were among the perishable objects recovered from a squat, large-mouthed Cypriot pithoid krater. It is likely that these wood containers fell into the jar after the ship sank and were preserved by being quickly covered with sediments. These and several other poorly preserved fragments indicate that wood vessels of high-quality craftsmanship were carried on the Uluburun ship. Since nearly all of this cargo has perished, it cannot be determined whether these exquisite containers were primary cargo or additional prestige gifts.[86]

Beads

Several types of glass and faience beads were among the manufactured goods. Spherical glass beads were found among the copper oxhide ingots, suggesting that they were carried in perishable containers, such as cloth or leather bags, which have since disintegrated. An irregular, concreted cluster of seemingly white tiny faience beads, which undoubtedly have lost their original colors, was probably also carried in such a bag. Thousands of smaller glass beads were found inside a Canaanite jar (cat. no. 188) indicating that they were intended for export. Faience beads of red, yellow, green, black, and blue, found mostly in a shallow depression in the central part of the wreck site that served as a catchment basin for many objects rolling down the steep slope (see fig. 93), probably constituted a part of a cargo of bulk jewelry, and perhaps also were appliqués on garments or decorative attachments on the surfaces of boxes or other specialty items.[87] Many other types of faience and glass beads, as well as beads of agate, other stones, amber, and ostrich eggshell, may have been for the personal adornment of those aboard the ship.

Textiles

Bolts of dyed cloth may have been carried on the ship, although there is no conclusive evidence to suggest that textiles made up a significant portion of the original cargo.[88] The sediment contents of Canaanite jars contained a number of individual fibers dyed blue, purple, and red, but whether they were from lengths

of cloth, luxury garments sent as gifts, or clothing of the merchants aboard cannot be determined. That some highly valued textiles were carried on the ship, however, is certain.[89]

The blue and purple color of some of the fibers almost certainly came from murex shellfish dye.[90] Who first developed purple dyeing is still unclear, although some of the earlier murex shell middens come from Middle Minoan Crete.[91] Near the dyers' workshops at Minet el-Beidha, the port of Ugarit, slightly later Late Bronze Age heaps of crushed murex shells were identified.[92] Other mounds and pits filled with murex shells abound along the Syro-Levantine coast.[93] Contemporary texts from Ugarit give evidence of a considerable trade in purple cloth.[94] Although murex can yield colors ranging across various shades of red, purple, and blue, it is not known whether the red fibers from the Uluburun ship were colored with shellfish dye or with red dye from another source.

Also in question is whether some of the faience beads from the ship were originally sewn on to cloth or garments. Some of these beads were found concreted, indicating that they were stored together, probably as cargo. The rest, however, may once have been decorative elements of fine cloth, either woven into the weft or embroidered on after the weaving was completed. Examples of cloth with sewn-on beads have been found in both the Aegean and the Near East in Late Bronze Age contexts.[95]

Gold and Silver

Gold and silver were also found on the Uluburun ship, mostly in the form of intact and scrap jewelry but also as a gold ring ingot, silver bar ingots, and amorphous lumps. Along with a large gold chalice (cat. no. 219) weighing about 236 grams, which may have been for personal or ritualistic use, or perhaps represented a prestige gift, approximately 530 grams of gold in total were found on the ship. Much of the gold and silver, whether intact or scrap, was excavated in the same small area of the site, indicating that it was kept together and probably used as bullion when required. Interestingly, two of the scrap silver pieces are debased, containing copper; one of them has a copper core. Two other pieces that appear to be silver bars also yielded high copper content. If these scrap silver pieces were intended as bullion in trade, one must wonder how ancient traders ensured the purity of the metal they received in payment. Even the most pristine jewelry may have been used as bullion when required, for a number of silver bangles and various gold pieces had sections removed with a chisel, apparently for use in previous transactions.[96]

Most of the gold and silver jewelry pieces are Canaanite, but Egyptian items and a few others of unknown origin were also present. One remarkable piece is a small gold scarab (cat. no. 223), inscribed with the name of Nefertiti, wife of the Egyptian pharaoh Akhenaten.[97] It would seem that gold from the Near East reached the Aegean largely as intact and scrap jewelry, not only supplying Aegean craftsmen with raw materials but introducing Near Eastern styles and examples of goldworking techniques.[98]

Based on lead-isotope analysis, the majority of the silver appears to have originated in southern Anatolia, as expected, since this region was well known for its silver. It was therefore traveling westward from eastern sources.[99] The gold and silver, both jewelry and scrap, were probably kept in a pouch or chest along with pieces of ingots, an Egyptian stone plaque, scarabs, and cylinder seals. The pouch was likely the possession of the chief merchant aboard the ship and kept at the stern in a secure compartment. Its precious-metal contents may have been used to provision the ship and crew during the voyage.

Trade Routes

The westward flow of eastern materials indicates the proposed counterclockwise trade routes of the Late Bronze Age Mediterranean (fig. 97). The Uluburun ship epitomizes the various means by which Near Eastern and African raw materials and finished goods reached the Aegean and ports beyond. In addition, its cargo represents the commodities being shipped—utilitarian raw materials, products for elite consumption, and prestige goods for gift exchange.[100]

Using various chronological methods, both relative and absolute, it has been possible to date the Uluburun ship to the end of the fourteenth century B.C.,[101] one of the most active and colorful periods of the ancient world. During this century, seafaring Syrians and Canaanites, a general term used to denote the Semitic peoples along the Levantine coast during the second millennium B.C., traded extensively with Egypt, Cyprus, and the Aegean world. Syro-Canaanite cities served as hubs for overland trade connecting Egypt, Mesopotamia, and the Hittite Empire.[102] The exact nature of interregional trade is not fully understood. Textual evidence suggests, however, that much of the trade that took place at the palace level was conducted in the guise of gift exchange. Transactions, primarily commercial, also occurred at a lower level.

Gift exchange in the Late Bronze Age was, in a sense, a type of prenegotiated directed trade, inasmuch as a vessel was loaded in one port and had a specific destination. In other patterns of so-called tramping or cabotage,[103] the ship was loaded with goods, which it then traded when it made landfall, often without a distinct destination. Tramping was usually a low-commerce trade, whereas gift exchange was a high-commerce, prestigious trade, occurring over long distances and involving items of great economic value. The term is commonly invoked to describe interregional trade between entities of equal (or lesser) power who may also have been competitors. This is the type of trade illustrated by the Amarna Letters (see pp. 168–69), the correspondence between the Egyptian pharaoh and other royalty.[104]

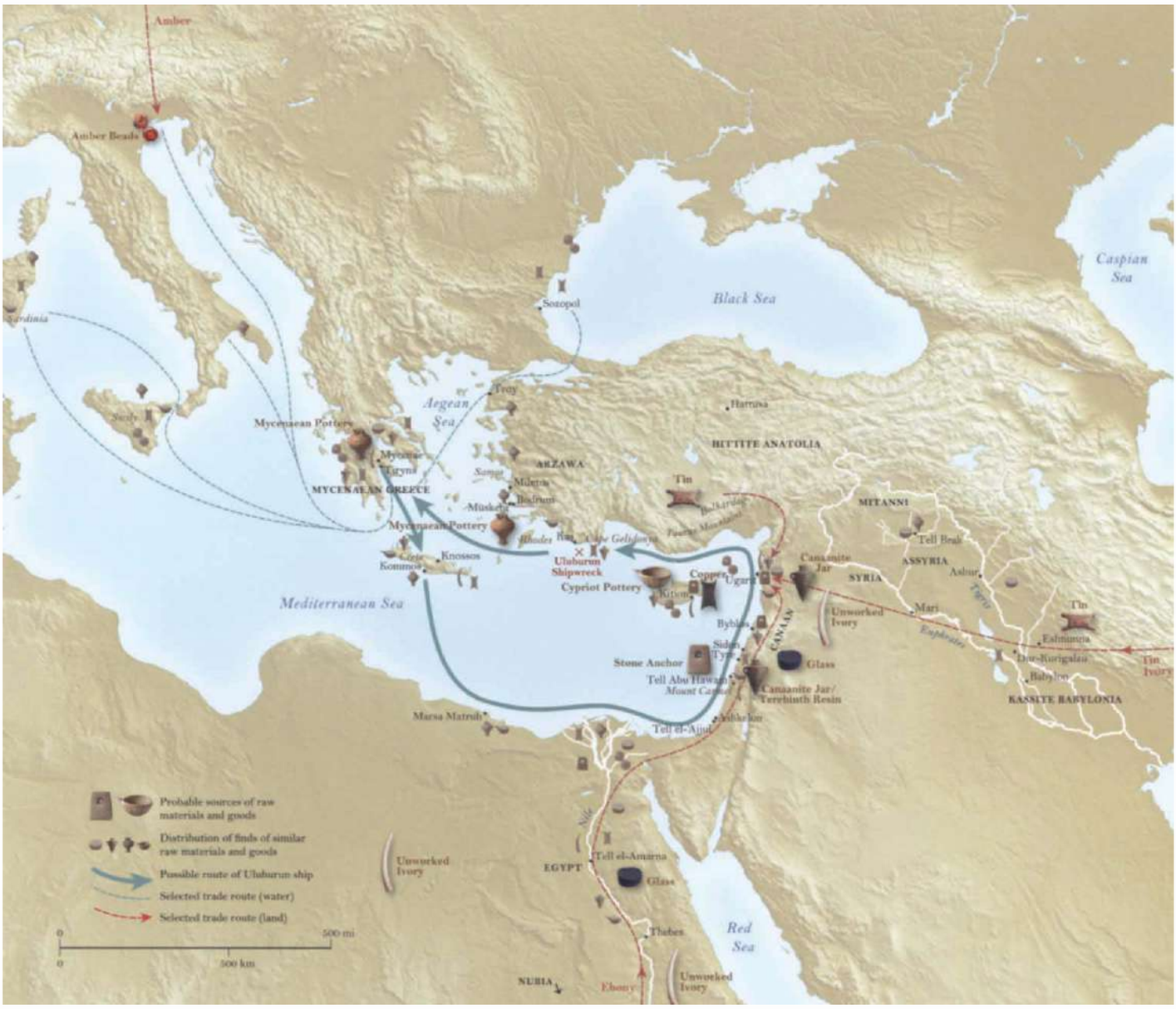


Figure 97. Possible route of the Uluburun ship.

The traditional view of gift exchange sees such transactions as reciprocal; trade relations were conducted between seemingly equal entities and were based on the creation of obligatory, continuing reciprocity. This vision of trade in the Late Bronze Age may seem somewhat altruistic. A closer reading of the Amarna Letters reveals that while luxury gifts were exchanged, they often served specific purposes such as dowries or tribute. Most tribute, on the other hand, may have been only perceived, and was the concept under which most trade was transacted (see pp. 161–68). The exchange of raw and finished goods may have operated through the use of "letters of credit."[105]

As a high-risk endeavor, long-distance trade necessitated extensive preparations, provisions for security during the voyage, and substantial capital investment for the procurement of goods. All these services were best provided by the state, which came to dominate nearly all aspects of social, economic, political, and military life.[106] While private merchants engaged in retail trade in domestic markets, most interregional exchange in the Near East during this time was probably controlled or influenced by the palaces or elite centers. Undoubtedly, some interregional trade must have occurred, but even seemingly private mercantile trade enterprises appear to have been mostly conducted through merchants who were in some manner connected to or operating around the palace. Thus the Uluburun ship probably represents a royal or elite shipment of the type exchanged between Egypt, the Levantine coast, Alashiya (Cyprus), and Anatolia, as is vividly revealed by the Amarna Letters, albeit one whose ultimate destination was in the Aegean. Unlike the Cape Gelidonya ship, which was engaged in opportunistic trade or tramping along the southern coast of Anatolia and Cyprus, probably between minor ports,

and whose cargo included only a modest quantity and variety of raw materials and large amounts of scrap metal, the Uluburun cargo may be seen as evidence for directional trade where intra-Mediterranean voyages involved specific destinations.[107] The study of the ship, its immensely rich and diverse cargo, and the personal effects of those on board corresponds with the commercial activities conducted under the guise of royal or elite gift exchange and partly described in contemporary documents. This notion of distribution appears to be a working example of the concept of gateway communities, in which imported goods are directed to a few major centers characterized by long-distance trade connections.[108]

The Uluburun ship demonstrates the simultaneous flow of raw materials and manufactured goods from the Levantine coast and Cyprus into the Aegean. Some of the cargo was in transshipment, as it came over great distances; the ebony logs originated in equatorial Africa and some of the tin probably came from Central Asia, while other materials were obtained from closer sources—copper and pottery from Cyprus, for example, and glass ingots principally from Egypt. The assemblage reveals the way in which various goods reached the Aegean and, almost certainly, points farther north and west. While evidence for Bronze Age shipwrecks ceases west of the Aegean, goods similar to those found on shipwreck sites are known from mainland Greece, Crete and other islands, southern Italy, Sicily, Sardinia, and elsewhere, indicating that these goods certainly reached the Aegean and central Mediterranean in some quantity by sea.

The Route of the Uluburun Ship

Assigning a specific home port for the Uluburun ship and its crew is difficult, but based on certain artifacts of a personal nature and those intended for shipboard use, it would appear that it was somewhere along the Levantine coast rather than on Cyprus.[109] The stone anchors of the type carried on the vessel are good indicators as these items were not cargo and most were probably not transported very far from their production centers before being loaded onto the ship.[110] Preliminary petrographic examination of the anchors indicates that most of them were hewn from beachrock, or coastal sandstone, found specifically in the vicinity of the Carmel coast in the Levant.[111]

Stylistic features of the ship's galley wares, such as bowls, jugs, and oil lamps, also support this hypothesis.[112] The source of the clay for nearly all the galley wares, including the oil lamps in use aboard the ship (see cat. no. 192), has also shown to have been in the same general area, but just north of the Carmel coast.[113] A site in this region, such as Tell Abu Hawam, may have been the home port of the ship, or at least the origin of its final voyage. Indeed, this site's well-placed location, its prominence in the region, and the period during which it flourished, along with the presence of many objects similar to those found on the ship, make it a likely candidate. Although Tell Abu Hawam is a comparatively small site, excavations have uncovered an international assemblage of artifacts, leading to its identification as the port city associated with the major inland site of Megiddo.[114] Significant quantities of Cypriot pottery found at Tell Abu Hawam suggest that the pottery was imported from Cyprus and then stockpiled to await export aboard such ships as the one that sank at Uluburun.[115]

That the Uluburun ship took its cargo of Cypriot pottery—and probably also the copper ingots—from an entrepôt or way station like Tell Abu Hawam rather than directly from a Cypriot port is also suggested by the nature of the pottery assemblage and the manner in which the pots were stacked. While the pottery comprises nearly all major export types made on the island, there is considerable variation in the style, size, and quality of craftsmanship among individual pieces within a given type. This suggests that the assemblage consisted of leftover pieces obtained at different times from different shipments and, perhaps, from different workshops. Had they been procured directly from Cypriot purveyors as a single group, they would have been significantly more homogeneous within the type groups. On board the ship, Cypriot fine wares were stored along with mainland wares from just north of the Carmel coast, another indication that they were not taken directly from Cyprus.

From its presumed point of origin just north of the Carmel coast, the Uluburun vessel headed north along the Levantine coast and then sailed west along the coast of southern Anatolia, keeping the northern coast of Cyprus on its port side until it eventually foundered at Uluburun. The discoveries of contemporary shipwrecks along the southern coast of Anatolia at Antalya and Cape Gelidonya suggest that ships navigating this route hugged the coast during their journeys from east to west.[116] After negotiating Cape Gelidonya and the treacherous cape at Uluburun, westbound ships apparently continued toward the southwestern tip of Anatolia, as revealed by a copper ingot caught in a sponge trawler's net at Knidos, in water more than 100 meters deep.[117] From there, the ships appear to have sailed either west, in the direction of Greece, or north into the Aegean, as suggested by a shipwreck laden with oxhide ingots reported, but not yet verified, between Samos and the western Anatolian mainland.[118] A single oxhide ingot found on land near Sozopol, on the western coast of the Black Sea, and a corner fragment of an oxhide ingot found just inland of the northern coast of the Sea of Marmara may have originated from such northbound ships or, more likely, arrived there by overland routes after having been unloaded at a port on mainland Greece.[119] On the other hand, copper oxhide ingots, as well as tin and lead ingots of other forms, found south of Haifa represent lost cargoes from the maritime trade in metals along the Levantine coast.[120]

Why the wreck occurred at Uluburun will probably never be known with certainty; it is possible that the ship, sailing in

a northwesterly direction, drew dangerously close to the point before tacking and then failed to clear it. It is also conceivable that the ship was dashed against the rocky promontory by an unexpected southerly gale, or that it experienced some difficulty in steering while trying to round the cape.[121]

The importation to the Aegean of foreign goods from the Levantine coast, Cyprus, and Egypt shows a shift away from Crete and toward mainland Greece at the end of the Late Helladic/Late Minoan IIIA period. This may be an indication that by the end of the fourteenth century B.C., the Mycenaeans had taken away from the Cretans control of the trade routes to the eastern Mediterranean.[122] This is noteworthy, since it coincides with the date of the Uluburun wreck. The importation of foreign goods to the mainland then peaks in the subsequent Late Helladic IIIB period. Based on the nature of the ship's cargo and the likelihood that the Mycenaeans aboard the ship were mainlanders, it would seem that the vessel's final destination was most likely on the Greek mainland. And while its ultimate port of call cannot be determined with certainty, there were in fact few palatial centers on the mainland that could have absorbed the quantity of goods carried on board. Such a center would have disseminated portions of the cargo to lesser centers through a system of redistribution. The most likely palatial center that could have adequately fulfilled these criteria is Mycenae itself, to which imported goods were funneled from the port city Tiryns to its south.

During this period of Levantine imports into Tiryns and Mycenae, Tiryns appears to have retained most of the Cypriot goods (except for copper ingots), which are exceedingly rare at Mycenae. Of the Syro-Canaanite goods, however, some were retained at Tiryns while most were forwarded on to Mycenae.[123] To that end, it may be of some interest to note that both Cypriot goods—mostly in the form of pottery, which seems to have been favored at Tiryns—and Syro-Canaanite goods and raw materials are represented in abundance on the Uluburun ship, perhaps to satisfy the needs of both centers.

The People Aboard the Ship

It is impossible to know the fate of the crew and passengers on the Uluburun ship; surviving artifacts, however, offer insight into their identities. Some of the manufactured goods have been identified as personal possessions of those on board, and give an indication of how many people were on the ship and where they might have come from. Careful study of these artifacts indicates that the ship was crewed by Syro-Canaanite merchants and sailors accompanied by two Mycenaeans of elite status and probably also a third individual who may have been from the area north of Greece.[124] The identifying personal effects are weapons, items of personal adornment, seals, pottery for shipboard use, and ship's tools. Sets of weights and balances, a merchant's most important tools, were also present, as these were essential for conducting trade.[125]

Analysis of the balance weights shows that three or four merchants were aboard, each of whom must have carried a pair of personal sets of weights. In all, 149 objects were catalogued as balance weights, the largest and most complete contemporary weight assemblage from the Bronze Age Mediterranean. As the weights were from a closed context and in use at the time of sinking, the assemblage must exhibit all standards and sets necessary for an effective maritime merchant venture, with the possible exception of smaller denominations in metal that may have been missed in excavation or corroded over the millennia. These weights are divided into three main groups based on shape: domed, sphendonoid, and zoomorphic (cat. no. 235). Many of the sphendonoid weights (oblong, with pointed or rounded ends) correspond to fractions and multiples of a unit mass, or shekel, in the vicinity of 9.3–9.4 grams.[126] It seems that there were at least seven weight sets (four sphendonoid, three domed) that were structured to that standard.

A small portion of the sphendonoid weights, however, do not conform to this mass standard. Most of these correspond to a few precision sets based on a unit mass, or shekel, of about 8.3 grams, a Mesopotamian standard, and a standard close to the Syro-Canaanite *peyem* that ranged from 7.4 to 8.0 grams.[127] Metal corrosion made it impossible to determine the standard(s) represented by the zoomorphic weights.

Each merchant was probably equipped with at least one sphendonoid-weight set (the precision set) for the accurate weighing of valuable commodities, such as gold and silver bullion, and one domed-weight set for weighing heavier or everyday goods.[128] Both sets, regardless of the shapes of their weights, conform to the same mass standard of 9.3–9.4 grams, but with different weighing ranges. This suggests the presence of four merchants, one of whom also carried the zoomorphic weights. This unique set probably belonged to the chief merchant. That these balance weights were for everyday use and not simply a part of the ship's cargo is indicated by their used state and the presence of odd and perhaps homemade pieces to replace those that were lost over time. The four Canaanite or Cypriot merchants proposed for the Uluburun ship compare favorably with the maritime scene depicted in the Tomb of Kenamun at Thebes, which shows a Syrian merchant fleet arriving in Egypt (fig. 98).[129] The four merchants shown on one of the ships are dressed in typical Syro-Canaanite robes with tasseled belts, and are engaged in various activities, including conducting rituals associated with a safe arrival. Three crewmen are also shown climbing around the ship's sail and rigging, while a fourth sits in the crow's nest atop the mast. To sail a ship of that size would have required no less than four crewmen. Even so, it has to be remembered that Egyptian tomb paintings do not necessarily depict reality but rather perception, and care must be used in their literal interpretation.[130]

The numbers of excavated weapons also appear to support the view that there were four merchants aboard. The chief

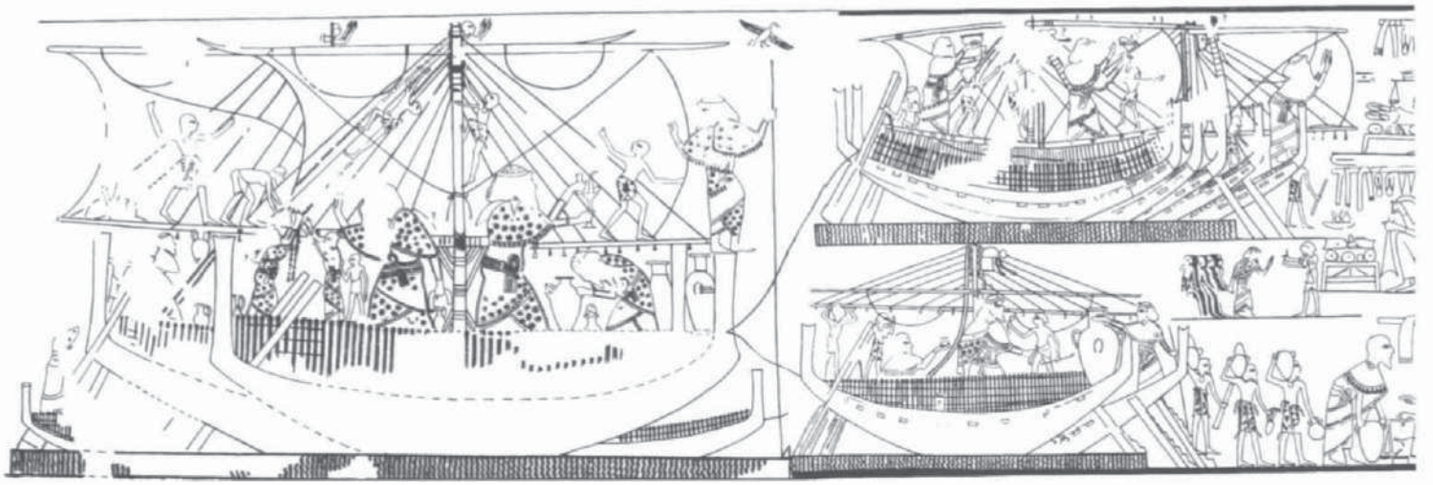


Figure 98. Drawing of wall painting with Syrian ships. Thebes, Tomb of Kenamun (TT 162). Dynasty 18, reign of Amenhotep III.

merchant was in charge of the ship and its cargo. He was also probably the ship's captain, and must have carried the only Canaanite sword found on the ship.[131] Almost fully preserved, it is a single-piece cast-bronze weapon with inlaid hilt plates of ebony and ivory, indicative of the owner's elite status. Among the daggers excavated—visible symbols of status roughly equivalent to the sword—two were nearly identical in make and design to the Canaanite sword; one of the daggers still retains its hilt plates and inlays of ebony and ivory (cat. no. 233).[132] A tanged dagger may have belonged to the fourth merchant.

To these merchants also probably belonged some, if not all, of a group of nine cylinder seals found mostly near the stern of the vessel in association with much of the silver and gold (cat. nos. 230–232).[133] It is uncertain if these items were in use as cylinder seals at the time the ship sank or if they served merely as elaborate beads. They are of different sizes and crafted from various materials: hematite, quartz, other stone, and faience, of which two were gold capped (see cat. no. 231a).

Little can be determined about the Uluburun crew, since their personal effects would not have included distinctive and valuable items. Among the objects recovered are several relatively plain daggers, knives, and simple pendants. Food was prepared by grinding in one of three stone mortars and eaten in simple bowls, and at night Canaanite oil lamps (cat. no. 192) were used for illumination.[134] Assorted fishhooks, lead line sinkers, troll line sinkers, a barbed trident, and a harpoon, along with more than a thousand lead net sinkers of two types, probably denoting seine and casting nets, indicate that the crew fished during the voyage to supplement their otherwise dull diets. What little free time was available may have been passed by playing the game of knucklebones, as suggested by their presence on the ship.

Mycenaean objects, such as fine tablewares, swords, spears, razors, chisels, axes, glass relief beads, faience and amber beads, quartz beads, and lentoid seals, were also discovered.[135] That these artifacts speak to a Mycenaean as opposed to a Minoan presence is evident from three different artifact types: lentoid seals, deep-bar chisels, and double-axes.[136] The closest parallels to the lentoid steatite sealstones from Uluburun (cat. no. 241) belong to Younger's "Mainland Popular Group" from the Greek mainland.[137] Six deep-bar chisels are of the shorter, more robust types associated with the Greek mainland, rather than with the delicate-looking elongated versions found on Crete.[138] Two double-axes have ovoid shaft holes generally found on examples from the Greek mainland, rather than the circular ones seen on those from Crete.[139] The categorically Minoan artifacts aboard the ship were coarse-ware transport stirrup jars, a vessel type made primarily as a container for exporting oil. More telling of the Mycenaeans' identity are the utilitarian fine-ware pouring-and-drinking sets comprising a beaked jug, a narrow-necked jug, a cup, a dipper, and a kylix (see cat. no. 242a).[140] With the exception of the kylix, none in the assemblage is among the Mycenaean types commonly exported to the Levant.[141]

Two knives and a tang portion of a third are also among the Mycenaean artifacts.[142] A knife for everyday needs would have been an essential tool for a Mycenaean Greek, especially one enduring a long journey to and from the Levantine coast. Also on the ship were five typically Mycenaean razors.[143] These offer a glimpse into the grooming practices of these well-equipped individuals, and of the care they afforded to their appearance. Two of the razors are nearly identical in size and shape, and display a fine decorative ridge, just below the back edge, which extends the full length of the blade and tang.

The presence of at least two pouring-and-drinking sets, two swords, two relief-bead necklaces, two quartz beads, and two lentoid seals, along with the occurrence of other Mycenaean objects in multiples, strongly suggests that there were two Mycenaeans aboard the Uluburun ship.[144] These individuals do not appear to have been simple merchants, as they apparently lacked the single most important tool used to conduct

commercial transactions in a precoinage society: balances and weight sets. Without weights, it would have been impossible to measure metals for payment of goods received.[145]

The wealth of their personal adornments and other items considered with the quality of their weaponry suggest that the Mycenaeans aboard the ship were elites. Two bronze swords, typical of Aegean products of the fourteenth century B.C., were also among the Mycenaean finds (see cat. no. 238a). In the Late Bronze Age Aegean, a sword probably served as an object of prestige signifying military rank, or was a weapon used in warfare by a select few.[146] That being the case, it is likely that the two Mycenaeans were of the warrior class or palace staff, perhaps acting as emissaries or ambassadors—the "messengers" mentioned in ancient texts—accompanying to the Aegean a cargo of reciprocated "gift exchange."[147] As representatives of palatial or elite interests, their purpose may have been to oversee the safe delivery of the ship and its precious cargo to its final destination at or near their homeland. Likely empowered to handle letters of credit or other methods of reciprocity by which interregional trade was conducted, they may also have served as pilots and negotiators for the ship in Aegean territorial waters, with which they would have been familiar.

A troubling aspect of the Mycenaean assemblage is the absence of sealstones appropriate to such elites or emissaries. The two steatite lentoid sealstones (cat. no. 241) are of a type predominantly found in simple burials, settlements, and even sanctuaries. Perhaps these items did not function as seals, but instead were strung as beads and served as amulets, talismans, or jewelry.[148] Conversely, they may have been intended as votive offerings to be placed in a sanctuary upon the safe conclusion of the voyage or certain portions of it.[149]

The identity of a third foreign individual on the Uluburun ship is more speculative than that of the Mycenaean emissaries. His presence is attested by an assemblage of loosely linked foreign (northern) artifacts, including a central Mediterranean–type sword, spearheads, a bronze pin, and a scepter-mace with its closest parallels in the northern Balkans (cat. no. 237).[150]

This shadowy figure, possibly hailing from a region north of the Greek mainland, may have served as an elite mercenary in the service of the Mycenaeans, or as another messenger.[151] Piracy on the high seas would undoubtedly have posed a threat for a high-profile mission like the one represented by the Uluburun ship. The shipment of valuable goods was a risky undertaking, and certain Amarna Letters refer to a messenger merchant killed by bandits.[152] These well-armed individuals, along with the armed Canaanite merchants and crew, would have served as a deterrent for looters and rogue seafarers.

The Hull

Because most of the ship's hull as well as some of the cargo perished when the ship sank, and the position of the artifacts that had spilled down the slope no longer reflected their original locations, estimates of the ship's size and shape are, for the most part, necessarily speculative. Nevertheless, the distribution of the recovered remains and the surviving portions of the hull suggest that the ship had a length of about 15 meters and a beam of about 5 meters, with a cargo carrying capacity of at least 20 tons.

In some areas of the site, preservation was aided by conditions unfavorable to shipworms and other detrimental organisms. A portion of the hull remains was located underneath some of the copper ingots. The copper created a toxic environment that discouraged marine life, preserving the hull timbers and layers of dunnage placed over them. These surviving timbers allowed for the identification of the wood as Cedar of Lebanon (*Cedrus libani*), which Bronze Age sources often mention as the preferred timber for building ships.[153]

The ship was constructed in a "shell-based" method, in which the planking is joined edge-to-edge on either side of the ship's keel. In this type of construction, mortises or recesses are cut into the edges of adjacent planks, and a tenon is placed within the mortise. The mortises are then secured with a peg on either side of the plank seam, thereby locking all the planks together to form the hull. The planking of the Uluburun ship was made of cedar, with tenons and pegs cut and shaped from evergreen, or kermes, oak (*Quercus coccifera*).[154] In addition to the hull itself, remains of a bulwark fencing of branches have also been identified (fig. 99).[155]

Reconstructing any hull on paper is analogous to assembling a puzzle or solving a riddle. In the case of the Uluburun ship, this process was complicated by varying levels of preservation and disarticulation of some of the remains. Results of reconstruction studies, in spite of difficulties, have provided an invaluable glimpse into the construction of Bronze Age seagoing ships.

Perhaps the most unusual feature of the Uluburun hull is its keel, the primary longitudinal member forming the ship's spine. Unlike modern keels, it is wider than it is high and extends upward into the hull. Although the keel did not protrude more than a few centimeters beyond the outboard surfaces of the hull planking, it served as an effective spine for the ship. Designated as a proto-keel, it also protected the planking from damage if the ship ran aground, and supported the vessel when beached for repairs or for wintering. Unlike true keels in later sailing ships, however, it did not offer much lateral resistance, which is needed for the ship to hold course when sailing. This rudimentary feature therefore limited the headway a ship could make against counterwinds, which probably resulted in favoring certain maritime routes during certain sailing periods.[156]

The Uluburun ship is significant to any study of shipbuilding techniques, as it is the earliest seagoing ship to be found and excavated. Analysis of the hull, and the manner in which it was constructed, has provided new information regarding seagoing ships and the use of mortise-and-tenon joinery. Early



Figure 99. Archaeologist excavating remains of bulwark fencing. Uluburun shipwreck.

Egyptian examples of mortise-and-tenon joints, as seen in Khufu's funerary boat at Giza and Senwosret III's boat at Dahshur,[157] were freestanding and not pegged to lock adjacent planks to one another. Egyptian woodwork shows that, at least as early as Dynasty 3, the Egyptians, while fully aware of this type of fastening,[158] did not use it in shipbuilding, unless pegged tenons were restricted to ships for which we have no surviving examples.[159]

Exactly when and where pegged mortise-and-tenon joints were first used to build seagoing ships is not known. The earliest documented use of this type of joint in the Near East is much later than in Egypt and is seen in woodwork dating to the Middle Bronze IIB period.[160] Based on present evidence, it appears that the use of pegged mortise-and-tenon joints in shipbuilding developed on the Levantine littoral and spread westward. Their earliest archaeologically documented use in shipbuilding occurs on the Uluburun ship, which almost certainly was built somewhere along the Levantine coast.[161]

Because there is no evidence of frames or other internal lateral strengthening timbers, the strength of the Uluburun vessel must have come almost solely from the hull planking itself, with additional reinforcement provided by bulkheads and through-beams. The mortise-and-tenon joints must have been remarkably strong. The tenons were strikingly large, and frequently spaced.[162] Rather than evenly staggering the mortise-and-tenon joints in one edge of a plank from those in the opposite edge, each mortise cut was positioned immediately adjacent to the nearest joint in the opposite edge of the same plank, such that one mortise often intruded into the space of another. Placing tenons adjacent to one another would appear to have compromised the structural integrity of the planking and thus of the hull. Studies of replicated sections of the hull have shown, however, that the arrangement probably made for a stronger plank than would have been the case had they been placed farther apart.[163] The tenons were obviously more than simple fasteners, serving as small internal frames and providing considerable stiffness and integrity to the shell of planking. The Uluburun ship relied heavily on these long oak tenons, which were clearly intended to supplement the hull's lateral rigidity and to compensate for the paucity or absence of proper frames. This method of construction partially explains how heavy cargoes could be carried directly on the hull planking without resorting to visible lateral support in the form of frames or bulkheads.[164]

Conclusions

Excavation of the Uluburun shipwreck recovered more than 15,000 catalogued artifacts, one of the largest and richest assemblages of Bronze Age goods ever found. The ship's cargo, perhaps of a royal nature, consisted mostly of raw materials, although finished goods were also present. Galley wares, tools, fishing implements, and some foodstuffs were for shipboard use, while cylinder seals, jewelry, weapons, and balance weights represent some of the personal effects of those on board. These items indicate that the likely site for the home port of the ship was just north of the Carmel coast. The finds further suggest the presence on board of three, possibly four, Canaanite merchants, two Mycenaeans of rank, acting as official messengers or envoys escorting a shipment of important cargo bound for their homeland, and another individual, who also may have been an escort in his own right or an elite

mercenary for the two Mycenaean officials. The assemblage has provided evidence for a counterclockwise Late Bronze Age maritime trade network that circled the eastern Mediterranean; it appears the ship was a merchantman from the Levantine coast headed in a northwesterly direction for the Aegean (see fig. 97).

The Uluburun ship epitomizes the various means by which Near Eastern and other foreign goods entered the Aegean during the Late Bronze Age. New implications for the dynamic and far-reaching trade activities in this period are just beginning to emerge. The stunning diversity and wealth of artifacts found on the Uluburun wreck are products of numerous cultures: Canaanite, Mycenaean, Cypriot, Egyptian, Nubian, Baltic, northern Balkan, Old Babylonian, Kassite, Assyrian, Central Asian, and possibly south Italian or Sicilian. The ship and its cargo appear to represent an elite dispatch of an enormously wealthy and diverse cargo of raw materials and manufactured goods intended for a specific destination. In addition to utilitarian objects and raw materials, the presence of value-laden or prestige goods would appear to indicate that the Late Bronze Age Aegean was not far removed from the long-distance interregional trade that was based on royal or elite exchange in the Near East and reflected vividly in the nearly contemporary Amarna Letters. As was the practice in such ventures, the ship's cargo was probably placed in the care of an official who represented elite or royal interests, but who may have engaged in some private trade of his own on the side. This merchant emissary or messenger also was entrusted with a contingent of prestige goods that he would present personally to the royalty or elite receiving the cargo. The Uluburun ship captures, in transit, tangible evidence for the flow of goods and raw materials from the Levantine coast to the Aegean, while at the same time providing a rare glimpse of the individuals involved in long-distance trade and the ships with which it was conducted.

1. As is customary in nautical archaeology, when a shipwreck cannot be identified with a specific name, it and the artifacts found with it are often given the name of the site at which it was found, in this case, Uluburun. Each object was given a find number beginning with KW; originally the ship was referred to as the Kaş wreck.
2. The site was excavated with the permission of the Turkish Department of Antiquities and Monuments. The work was carried out under the auspices of the Institute of Nautical Archaeology (INA) at Texas A&M University, with funding from the INA Board of Directors and grants from the National Endowment for the Humanities, the National Science Foundation, the National Geographic Society, Texas A&M University, the Institute for Aegean Prehistory, and others. The post-excavation, conservation phase continues in the Bodrum Museum of Underwater Archaeology with support from the museum administration, and at the conservation laboratory of the INA Research Center in Bodrum, with grants from the Institute for Aegean Prehistory, funding by the INA Board of Directors and Texas A&M University, and contributions by many individuals and companies. For further reference, see Bass 1986; Pulak 1988; Bass et al. 1989; Pulak 1997; Pulak 1998; Pulak 2001; Pulak 2005c.
3. Bass, Frey, and Pulak 1984; Pulak and Frey 1985.
4. Bass 1967, pp. 163–67; Bass 1973.
5. Pulak 1998, pp. 213–14.
6. Ibid., p. 188.
7. Ibid., pp. 210–13.
8. Pulak 2002, p. 615.
9. Pulak 2001, p. 13.
10. Pulak 1998, pp. 193–201; Pulak 2000b.
11. Originally, the ingots would have been heavier, since the corrosive seawater environment dissolved some of the copper and reduced parts of the ingots to a spongy consistency. The original weight of an ingot is therefore impossible to determine with accuracy.
12. Pulak 2000b, p. 141; Pulak 2001, p. 18.
13. Pulak 2000b, p. 143; Pulak 1998, pp. 196–97.
14. Hauptmann, Maddin, and Prange 2002.
15. Pulak 2001, p. 21.
16. Pulak 2000b, pp. 140–41.
17. Ibid., p. 141; Pulak 1997, pp. 235–36.
18. Pulak 2000b, pp. 150–52, figs. 16–22; Pulak 1998, pp. 202–3, fig. 16; Bass 1986, pp. 281–82, ills. 15, 16.
19. For metallurgical aspects of the Uluburun tin ingots, see Hauptmann, Maddin, and Prange 2002, pp. 15–17.
20. Pulak 2001, p. 22.
21. L. Weeks 1999, p. 61.
22. Dossin 1970, pp. 101–6; Muhly 1985, pp. 282–83; Pulak 2000b, p. 153.
23. Pulak 2001, pp. 25–30; Bass 1986, pp. 281–82.
24. Pulak 2001, p. 25.
25. Lilyquist and Brill 1993, p. 41; Brill and Shirahata 1997, pp. 89–91; Henderson 1997, pp. 94, 97–98; Rehren, Pusch, and Herold 1998, p. 243; Brill 1999, vol. 1, pp. 47–48, 280, vol. 2, pp. 53–54; Shortland and Tite 2000, pp. 16–17, 50, 98, 147–49, 183, fig. 3.1, table 3.2; Pulak 2001, pp. 27–30.
26. Bass 1986, p. 282; Brill 1999, pp. 53–54; Pulak 2000b, p. 28.
27. Brill, personal communication, 1997.
28. Gardiner 1950, pp. 517, 579, 611.
29. Lucas and Harris 1962, pp. 224–28; Hepper 1977, p. 129.
30. Pulak 2001, p. 31.
31. Bass et al. 1989, pp. 9–10.
32. None of the ebony logs is complete, with worm damage on surfaces and ends rendering them somewhat shorter than their original lengths.
33. Naville 1896, pp. 1–3.
34. Davies 1973, p. 14, pl. 17.
35. Ibid., pp. 19, 26, 46, pls. 17–20, 40.
36. Taylor 1991, title page.
37. Ibid., p. 33, fig. 37.
38. Meiggs 1982, p. 284; Ventris and Chadwick 1973, pp. 342–43; EA 1, 31, 34 (Moran 1992, pp. 1–3, 101–2, 105–6).
39. Pulak 2001, pp. 31–32. One ebony piece from Uluburun was worked.
40. Bass 1986, pp. 282–85, figs. 18, 19; Bass et al. 1989, p. 11, fig. 20; Pulak 1995, p. 16, fig. 14.
41. Poursat 1977a.
42. Reese 1985b, pp. 393–94.
43. Pulak 2001, pp. 39–40; Pulak 1997, p. 242.
44. This appears to be their only use in the Bronze Age Aegean (Renfrew and Cherry 1985, p. 324, pl. 64a–b).
45. Cline 1994, pp. 237–38, nos. 945, 946.
46. Conwell 1987, p. 29; Reese 1985a, p. 378.
47. Bass 1997, p. 159; Bass 1986, p. 278.
48. Bass 2004, p. 280, and n. 61; Bass 1986, p. 278, n. 37.
49. Bass 1997, p. 159, citing Oppenheim et al. 1970, pp. 40–43, and nn. 52, 91.
50. Mallowan 1954, p. 99; Wiseman 1955, p. 5.
51. Pliny *Natural History* 35.31.
52. Ibid., 34.56; Bass 1997, p. 159; Bass 2004, pp. 280–81.
53. Pliny *Natural History* 32.22.
54. Schafer 1955, pp. 73–74.
55. Pulak 1988, p. 5; Pulak 2001, pp. 32–33.
56. Hart 1888, p. 200.
57. UT 12, Robert Stieglitz, personal communication, 1994.
58. Pliny *Natural History* 32.41.

59. Pulak 2001, p. 33.
60. Mills and White 1989; Hairfield and Hairfield 1990.
61. Pulak 2001, p. 36; Pulak 1998, pp. 201–2.
62. Bass 1997, p. 164; Melena 1976, pp. 177–90.
63. McGovern 1997, pp. 84–85.
64. Pulak 2001, pp. 35–36.
65. Serpico and White 2000, p. 894.
66. Loret 1949, pp. 20–23.
67. Davies 1973, pl. 48.
68. Jacobsen, Bryant, and Jones 1998, p. 80.
69. Welter-Schultes 2008, pp. 84–85.
70. Haldane 1993, p. 352; Pulak 2001, p. 37.
71. Haldane 1993, p. 352; Bass 1997, p. 167, n. 209.
72. Bass 1997, p. 167; Ventris and Chadwick 1973, pp. 221–22.
73. Heltzer 1978, p. 20.
74. E. Foster 1977, pp. 32–35.
75. Shelmerdine 1985, pp. 17–18.
76. Pulak 2001, p. 37; Haldane 1990, pp. 57–59; Haldane 1993, pp. 352–56.
77. Haldane 1993, pp. 353–55.
78. Ward 2003, pp. 530, 537.
79. P. Åström 1999; Schaeffer 1949, pp. 208–9, fig. 86, pl. 31.2; Watrous 1992, pp. 157–58, fig. 70, pl. 52; Karageorghis 1993, p. 584, fig. 3; Vagnetti and Lo Schiavo 1989, pp. 220–21, fig. 28.1a–b; Vagnetti 1999, pp. 189–90, 206, fig. 4.
80. Pulak 2001, p. 40.
81. Ibid., pp. 41–42. Although the numbers of Cypriot vessels in the cited article are lower, based on ongoing conservation and mending of these vessels, Nicolle Hirschfeld, who is studying the Cypriot fine wares for publication, reports the higher numbers indicated here.
82. Pulak 2001, pp. 41–42; Bass 1986, pp. 279–82, ills. 10–14.
83. Pulak 1997, pp. 242–43.
84. Pulak 2001, pp. 42–43; Pulak 1997, p. 243, fig. 11.
85. Pulak 1997, p. 243.
86. Pulak 2001, p. 43.
87. Ibid., pp. 43–44.
88. Ibid., pp. 44–45.
89. For similar, purple-dyed wool fibers on an eighth-century B.C. Phoenician ship discovered off the coast of Ashkelon, see Stager 2003, pp. 242–43. These fibers suggest the presence on board the ship of prized purple textiles or garments for export, as may have been the case on the Uluburun ship.
90. Pulak 2001, p. 44.
91. Reese 1980, pp. 81–82; Reese 1987, pp. 203–6.
92. Schaeffer 1951, pp. 188–89.
93. Pulak 1988, p. 5, n. 5, with references; Reese 1987, pp. 205–6.
94. Schaeffer 1951, pp. 190–92.
95. Barber 1991, pp. 171–74; Persson 1931, pp. 29–30, 39–41, 60, 106, no. 51, pls. VIII, XV, XXXIV, XXXV; Carter and Mace 1923–33, pp. 167–71, pls. 34, 37, 38; N. Özgüç 1966, p. 47, pl. 22.
96. Pulak 2001, pp. 24–25.
97. Weinstein 1989.
98. Pulak 2001, p. 25.
99. Ibid., pp. 24–25; Zofia Stos-Gale, personal communication, 2000.
100. Pulak 2001, pp. 13–14.
101. Ongoing dendrochronological wiggle-matching and 14-C dating of short-lived specimens from the wreck such as leaves, young branches, olive pits, nuts, and resin suggest a date at the end of the fourteenth century B.C. for the sinking of the ship.
102. Knapp 1993, pp. 334–36.
103. Horden and Purcell 2000, pp. 365–66.
104. Zaccagnini 1987, pp. 47–56; Moran 1992.
105. Manning and Hulin 2005, pp. 286–88.
106. Liverani 1987; B. Foster 1987; Peltenburg 1991, pp. 161–70.
107. Pulak 1998, pp. 215–16.
108. Cline 1994, pp. 87–88; Cline 2007, p. 199.
109. Pulak 1997; Pulak 1998.
110. Pulak 1997, p. 252; J. Shaw 1995, pp. 281–82.
111. Based on petrographic analysis with Yuval Goren.
112. Pulak 1997, pp. 252–53.
113. See note 111 above.
114. Loud 1948.
115. Schaeffer 1939a, p. 19. For similar stockpiling of Cypriot export wares at Minet el-Beidha and in a house at Ugarit, see Schaeffer 1937, p. 128, pl. 20:3; Schaeffer 1962, p. 100, figs. 83, 84, p. 119.
116. Pulak 1997, p. 2.
117. Ibid., pp. 234–35; Bass 1986, p. 272; Buchholz 1959, pp. 27, 29, pl. 3:5–6; Buchholz 1966, pp. 63, 65, fig. 2b.
118. A hoard of 19 copper ingots from a shipwreck near Kyme on Euboia is probably not of Bronze Age date, as the size and shapes of these ingots are very different from the typical Bronze Age oxhide ingot.
119. Pulak 1997, pp. 255–56.
120. Pulak 2001, pp. 16–17.
121. Pulak 1998, pp. 188–89, 218–20.
122. Cline 2007, pp. 194–95.
123. Ibid., p. 195.
124. Pulak 1998, pp. 216–18.
125. Pulak 2001, pp. 13–14.
126. Pulak 2000a, p. 261.
127. Ibid., pp. 256, 261.
128. Ibid., pp. 262–64.
129. Davies 1963, p. 14, pl. 15; Davies and Faulker 1947, pp. 40–46.
130. Wachsmann 1987, p. 4.
131. Pulak 1988, p. 20, fig. 20, p. 21.
132. Pulak 1997, p. 246.
133. See Collon, this volume; Bass et al. 1989, pp. 12–16.
134. Pulak 2005a, p. 296. Ongoing petrographic analysis has shown that the used lamps, revealed by charring around their wick nozzles, were all made with clay from the vicinity of Tell Abu Hawam and slightly farther north.
135. See Pulak 2005a for the Mycenaean objects on the Uluburun ship.
136. Ibid., p. 296; Cline 2007, p. 129; Bachhuber 2006, pp. 351–55.
137. Pulak 2005a, p. 305; Younger 1987, p. 65.
138. Pulak 2005a, p. 302.
139. Ibid., p. 302, n. 58.
140. Ibid., pp. 296–98.
141. Ibid., pp. 297–98.
142. Ibid., pp. 300–301.
143. ibid., pp. 301–2.
144. Ibid., pp. 296ff.
145. Ibid., p. 306.
146. Driessen and MacDonald 1984, p. 56; Pulak 2005a, p. 298.
147. Pulak 2005a, pp. 306–9.
148. Ibid., p. 305; Betts 1997, pp. 63, 65.
149. Pulak 2005a, pp. 307–8.
150. Vagnetti and Lo Schiavo 1989, pp. 223–24; Buchholz 1999; Bodinaku 1995, p. 268; Pulak 1997, pp. 253–54, fig. 22; pp. 254–55; Pulak 2005a, p. 209.
151. Pulak 2001, pp. 48–49.
152. EA 8 (Moran 1992, pp. 16–17); Pulak 2005a, p. 308.
153. Pulak 1999, p. 212. This wood was used for Egyptian funerary ships and for the Cape Gelidonya ship; see Pulak 2001, pp. 27–29, 33.
154. Pulak 2001, p. 13.
155. Pulak 1999, p. 212.
156. Pulak 2002, pp. 618–21, figs. 1–4.
157. Lipke 1984, p. 64; Steffy 1994, pp. 25–27, 32–36; Patch and Haldane 1990, pp. 34–35, fig. 19.
158. Lucas and Harris 1962, p. 451.
159. Pulak 1999, p. 213.
160. Ricketts 1960, p. 530, fig. 229.1.
161. Pulak 1999, p. 215.
162. Pulak 2002, p. 629, fig. 2.
163. Ibid., pp. 626–27, fig. 1.
164. Ibid., p. 626.





Figure 100. Archaeologist preparing to raise anchors from seabed. Uluburun shipwreck.

184

Weight Anchor

Beachrock
Height 75.4 cm (29¾ in.); max. width 61 cm (24 in.); max. thickness 22 cm (8¾ in.); weight 148.3 kg
Uluburun shipwreck
Late Bronze Age, ca. 1300 B.C.
Bodrum Museum of Underwater Archaeology, Turkey 37.1.94
(KW 3330)

The Uluburun assemblage of 22 large coastal sandstone, or beachrock, anchors[1] and two smaller ones of limestone, the latter possibly for the ship's boat, collectively weighs 3.3 tons and is the largest group of anchors found associated with any shipwreck (fig. 100).[2] This example is of beachrock, trapezoidal in shape, with rounded corners and a square apical hole for an anchor cable or hawser at its narrower end. It is one of four with incised marks on the surface, in this case an inverted V.

Because the Uluburun anchors were preserved in their original context, they offer insight into specific onboard uses of stone anchors during this period. The anchors were found in two groups: 16 were strewn in a line at the eastern end of the site, corresponding to the ship's bow, and another line of eight lay two deep across the keel, extending from one side of the hull to the other, near the center of the ship, just aft of the mast step. The anchors found near the center of the wreck were spares stored in the hold and were also used as temporary ballast, while those at the bow were for immediate use.

At least two of the bow anchors were originally stored on the ship's foredeck, ready for deployment, with others stowed in the area under the foredeck and immediately aft of it. These spare bow anchors were meant to be used in addition to those on the foredeck, or as equivalent substitutes in their absence. Although the anchors were intended to be retrieved after use, the large number aboard the ship suggests that they were frequently lost or had to be cut loose in an emergency.[3]

Weight anchors moored ships by sheer mass, in contrast to stone composite anchors, which gripped the seabed with wood stakes.[4] Anchors excavated on land usually represent votive and funerary offerings deposited in wells, temples, and tombs at sites such as Ugarit and its port at Minet el-Beidha,[5] Byblos,[6] and Kition on Cyprus.[7] In marine contexts, however, they often mark offshore moorings, inshore anchorages, and proto-harbors.[8] Other

Bronze Age shipwreck anchors include 15 found off Newe-Yam on the Carmel coast,[9] and a single anchor associated with the Cape Gelidonya ship,[10] although the Uluburun assemblage is the only complete set found to date.

The weight anchor is virtually unknown in the Aegean,[11] although some examples have been found at Mallia and Kommos on Crete as well as off Cape Iria in the Gulf of Argos.[12] Ongoing petrographic analysis of the Uluburun anchors suggests an origin in coastal regions in the vicinity of Tell Abu Hawam or slightly farther north, the same area where the ship's galley ware (see cat. no. 192), much of its pottery cargo, and probably the very ship itself appear to have originated.[13] CP

1. Beachrock is formed by sedimentation of beach sand and sediments in intertidal zones: Beachrock formations occur only a few meters from shore and generally run parallel to the coastline.
2. Pulak 1997, p. 252, fig. 20; Pulak 1998, p. 216. The twenty-two large anchors are loosely grouped into three basic weight categories: the heaviest at about 201 kg, the midrange at 164–82 kg, and the lightest at about 97 kg, averaging 147.7 kg. The two small anchors have an average weight of 23.9. Pulak 1999, pp. 210–11, fig. 1.
3. Pulak 1999, pp. 210–11.
4. Kapitän 1984, pp. 33–36; for Bronze Age anchors in general, see also Wachsmann 1998, pp. 255–93.
5. Schaeffer 1978, pp. 371–81; Frost 1969b; Frost 1991.
6. Wachsmann 1998, pp. 271–73; Frost 1969a.
7. Karageorghis 1976b, pp. 60, 69, 72, 78, 169; Frost 1985; Wachsmann 1998, pp. 273–74.
8. Galili, Sharvit, and Artzy 1994, pp. 93–95, 106–7.
9. Galili 1985, pp. 144–49.
10. Pulak and Rogers 1994, pp. 20–21, fig. 7; Wachsmann 1998, pp. 283, 285.
11. The few stone anchors found in the Aegean and in the western Mediterranean are usually much smaller than those from Uluburun or are of the composite type with three holes, rather than the single-holed weight type recovered from the Uluburun ship. They are catalogued in Wachsmann 1998, pp. 279–83; for Italy and Sardinia, see Lo Schiavo 1995, pp. 406–21.
12. J. Shaw 1995, pp. 280–82, 290, n. 8.
13. Based on preliminary results from Yuval Goren.

185a–g
SELECTION OF INGOTS

a. Large oxhide ingot incised with image of ship
Copper
Height 43.7 cm (17¼ in.); length 77.1 cm (30⅜ in.); thickness 4.2 cm (1⅝ in.); weight 20.4 kg
35.4.88 (KW 1526)

b. Large oxhide ingot with two protrusions
Copper
Height 37.8 cm (14⅞ in.); length 62.2 (24½ in.); thickness 4.5 cm (1¾ in.); weight 22.7 kg
38.4.88 (KW 1549)

c. Small oxhide ingot
Copper
Height 25.6 cm (10⅛ in.); length 32.7 cm (12⅞ in.); thickness 3.7 cm (1½ in.); weight 10.7 kg
104.24.86 (KW 389)

d. Plano-convex discoid (bun-shaped) ingot
Copper
Diameter 22 cm (8⅝ in.); thickness 4.6 cm (1¾ in.); weight 6.6 kg
2006/4/10A (KW 3108)

e. Small oxhide ingot
Copper
Height 24.7 cm (9¾ in.); length 26.7 cm (10½ in.); thickness 6.6 cm (2⅝ in.); weight 10.1 kg
39.5.90 (KW 1983)

f. Quarter-oxhide ingot
Tin
Width 17.4 cm (6⅞ in.); length 29 cm (11⅜ in.); thickness 4 cm (1⅝ in.); weight 6.3 kg
5.1.2000 (KW 3061)

g. Half-oxhide ingot
Tin
Width 29.1 cm (11½ in.); length 29.1 cm (11½ in.); thickness 7.5 cm (3 in.); weight 11.7 kg
60.4.88 (KW 1371)

Uluburun shipwreck
Late Bronze Age, ca. 1300 B.C.
Bodrum Museum of Underwater Archaeology, Turkey

Of the 354 copper oxhide ingots found in the Uluburun wreck,[1] 317 feature protrusions, or "handles," at the four corners,[2] and an average weight of just under 24 kilograms.[3] While of similar form, 31 have only two protrusions or handles on the same long side.[4] There are also 6 smaller ingots, 4 of which are nearly identical,[5] consisting of two pairs of mold siblings, cast in the same mold;[6] a small ingot that has the same general shape as the others but lacks corner protrusions; and an ingot that is much thicker than the other small ingots, with exaggerated corner protrusions.[7] These 6, as well as the two-handled and the small ingots, are unique to the Uluburun shipwreck. There are also 121 intact ingots of a plano-convex discoid, or "bun," shape.[8] As with the oxhide shape, these ingots vary in weight but average about 6.2 kilograms apiece. The recurrence of differing weights for the Uluburun oxhide ingots indicates that they constituted a quantity of "blister," or raw, copper probably subject to weighing and evaluation during each commercial transaction. Although they were not of a standardized quantity of metal, their broadly common weight groupings would have simplified accounting procedures.[9]

The Uluburun shipwreck yielded some of the earliest known tin ingots,[10] most apparently in the same oxhide shape as the majority of the copper ingots. Except for three intact specimens, however, nearly all of the tin oxhide ingots had been cut into quarters or halves before they were taken on board. Other tin ingot shapes from Uluburun include bun ingots, two complete rectangular slab ingots, sections of slab ingots, thick wedge-shaped sections cut from large ingots of indeterminate shapes, halves of elongated ovoid loaves, and a unique ingot shaped like a stone weight anchor with a large hole near one end.[11] The intact tin ingots are of approximately the same weight range as the copper oxhide ingots.[12]

Tin and raw copper were probably transported as whole oxhide ingots, overland from mines, primary smelting works, or central ore-processing installations to distribution or manufacturing centers, where they were cut into fractions of their



185a



185b



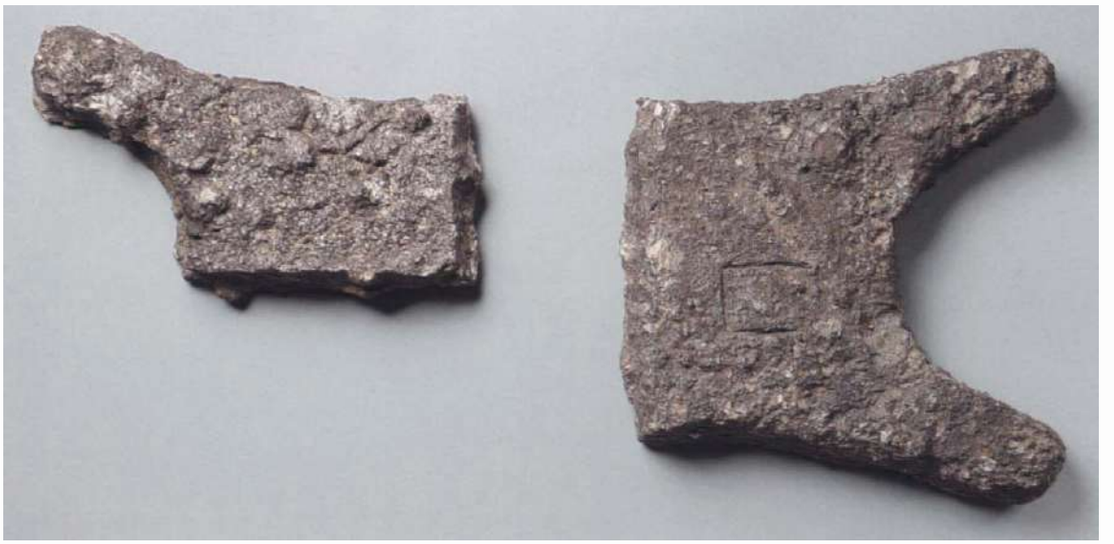
185c



185d



185e



185f, g

original form. The Uluburun assemblage contains many partial tin ingots, which were probably gathered by barter, levies, taxes, gifts, or some other mechanism for constituting the appropriate counterpart to the amount of copper loaded on board the ship. This suggests that the ship owners had direct access to sources of copper, whereas most of the tin was procured through indirect sources.[13]

Preliminary examination of the Uluburun copper oxhide ingots has shown that no fewer than 162 ingots are incised with at least one, and possibly as many as three, marks on their upper surfaces (a).[14] Of the bun ingots, 62 are marked on their lower or mold surfaces.[15] That similar marks were found on both the copper and tin ingots,[16] and that the marks were all incised after casting or cooling, rather than stamped during the casting process, suggest that they were probably made at a point of export or receipt rather than at primary production centers.[17]

The earliest evidence for full-size oxhide ingots comes from sixteenth-century B.C. sites on Crete[18] and depictions in Egyptian tomb paintings, where they are frequently associated with Syrian merchants and tribute-bearers (fig. 101).[19] Later copper-oxhide ingots of the fourteenth, thirteenth, and early twelfth centuries B.C. have been found as far west as Sardinia and Sicily, and as far east as central and eastern Anatolia, Syria, and Mesopotamia.[20] They also occur in southern Germany,[21] Bulgaria, mainland Greece, western and southern Anatolia, Cyprus, the southern Levant, and the Nile Delta.[22]

Thirty-four oxhide ingots were also recovered from the Cape Gelidonya shipwreck.[23] Lead-isotope analysis has shown that oxhide ingots postdating the mid-fourteenth century B.C. differed in the source of their metal from those of earlier Cretan finds. The analysis further indicates that ingots dating from the mid-thirteenth century B.C. to the early twelfth century B.C. were produced from Cypriot copper ores mostly originating in the Apliki mines in the northwestern foothills of the Troodos Mountains.[24] Lead-isotope analysis of the Uluburun oxhide ingots[25] shows that they form a relatively homogeneous Cypriot group and were probably derived from a hitherto undiscovered deposit, almost certainly among the Solea axis ores of northwestern Cyprus, which includes the Apliki deposits.[26]

Sources of Bronze Age tin remain unknown, although ancient texts indicate that



Figure 101. Wall painting with Syrian carrying copper oxhide ingot. Thebes, Tomb of Rekhmire (TT 100). Dynasty 18, reigns of Thutmose III–Amenhotep II.

it may have been obtained from regions to the east of Mesopotamia.[27] Although lead-isotope analysis of tin is in its infancy,[28] preliminary results suggest two sources, one in the Bolkardağ Valley in the central Taurus Mountains in south-central Anatolia,[29] the other probably located in Central Asia, possibly Afghanistan.[30] CP

1. Pulak 2000b, pp. 140–41, fig. 3, pp. 141–53; Pulak 2001, pp. 18–22; Pulak 2005c, pp. 59–65, figs. 5–13.
2. Such rectangular ingots with a projection at each corner were originally termed "oxhide" when it was believed, erroneously, that they were cast to resemble dried oxhides (Bass 1967, p. 69). The shape itself probably evolved to facilitate loading of the ingots onto specially designed saddles or harnesses for transport over long distances by pack animals (Pulak 1998, p. 193; Pulak 2000b, pp. 137–38).
3. The original weights would have been heavier prior to the corrosion and metal leaching that occurred during three millennia in the undersea environment.
4. Pulak 2000b, p. 141, fig. 4.
5. The four small ingots are roughly pillow shaped, seemingly a type more common in the sixteenth and fifteenth centuries B.C. Rather than representing the earlier ingot type, the Uluburun examples are seen as fractional copper ingots, which would have been handled differently and not have required the large corner projections (Pulak 2000b, p. 138).
6. Mold siblings are revealed by identical impressions on the surfaces in contact with the mold. At least six ovoid bun ingots, which also bear identical incised marks, are also mold siblings. It is likely, therefore, that these ingots may have been cast in reusable stone or clay molds, rather than in temporary sand molds. Although not yet studied, a single pair of "two-handled" oxhide mold siblings has also been identified (Pulak 2005c, pp. 59–60, fig. 8, p. 567, figs. 30, 31; Pulak 2000b, pp. 141–42, fig. 5).
7. Pulak 2005c, p. 568, fig. 32; Pulak 1998, pp. 193–94, fig. 9.
8. Pulak 2005c, pp. 59–60, figs. 9, 10, pp. 569–71, figs. 33–46; Pulak 2000b, pp. 143–46, figs. 8–12.
9. Pulak 2001, p. 18; Parise 1968, p. 128; Zaccagnini 1986, pp. 414–15. For a discussion of the chemical composition of the copper and tin ingots, see Hauptmann and Maddin 2005, pp. 133–40; Hauptmann, Maddin, and Prange 2002.
10. Pulak 2005c, pp. 63–65, figs. 12, 13; Pulak 2001, pp. 22–23; Pulak 2000b, pp. 150–55; Pulak 1998, pp. 199–201, figs. 13, 14. Although poorly preserved, a single tin ingot resembling one from the Uluburun shipwreck was found in a foundation deposit in the House of the Metal Merchant on Mochlos, Crete, in a Late Minoan IB context. It is more than a century older than the Uluburun tin ingots (Soles 2008). Tin ingots were also found on wrecks off Cape Gelidonya (Bass 1967, pp. 52–83) and Haifa (Stos-Gale et al. 1998, pp. 119, 123, fig. 6; Galili, Shmueli, and Artzy 1986).
11. Pulak 1998, p. 199, fig. 14. For other tin ingot shapes from Uluburun, see Pulak 2005c, pp. 572–75, figs. 47–61; Pulak 2000b, pp. 150–53, figs. 16–22.
12. Pulak 2000b, p. 152.
13. Pulak 2001, p. 22; Pulak 2000b, pp. 152–53.
14. The marks vary in shape from a simple cross to more complicated forms, some associated with the sea and ships (cat. no. 185a), such as fishhooks, a trident, a fish, and possible quarter rudders. Pulak 1998, pp. 194–96; Pulak 2000b, p. 146, fig. 13.
15. There are thirty-two different types of marks on the ingots. Of these, only thirteen appear more than once, and one is repeated as many as seventeen times. Only seven different marks are found on the bun ingots, five of which are also occur on the copper oxhide ingots (Pulak 2000b, p. 146, fig. 13).
16. Ibid., pp. 146, 153, figs. 13, 21.
17. Pulak 1998, pp. 194–96.
18. Buchholz 1959, p. 33, pl. 4; Platon 1971, pp. 116–18; Hazzidakis 1921, pp. 56–57, fig. 31; Gale 1991b, pp. 202–3, pls. 1–2d. The Cretan ingot finds are listed in Evely 1993–2000, vol. 2, pp. 343–46; and in Hakulin 2004, pp. 19–20, 54–55.
19. Pulak 2000b, p. 138; Pulak 1998, p. 193; Bass 1967, pp. 62–67.
20. Muhly, Maddin, and Stech 1988, pp. 281–85, fig. 1; Gale 1991b, pp. 200–201.
21. Primas and Pernicka 1998, pp. 27–50.
22. Gale 1991b, pp. 200–203, fig. 2; See also Stos-Gale et al. 1997, pp. 109–15, for lead-isotope data for most of these oxhide ingots.
23. Bass 1967, pp. 52–60; for lead-isotope results of the Cape Gelidonya ingots, see Gale 1991b, pp. 227–28.
24. Gale and Stos-Gale 2005, pp. 117–31; Gale, Stos-Gale, and Maliotis 2000, p. 339; Stos-Gale et al. 1997, pp. 109–12; Stos-Gale et al. 1998, pp. 115–26.
25. Gale and Stos-Gale 2005, pp. 117–31.
26. This is supported by recent analysis of copper ores from the nearby Phoenix mine and fourteenth century B.C. copper-smelting slag from Enkomi and Kalavassos. See Pulak 2001, pp. 20–21; Stos-Gale, personal communication, 2000.
27. Descriptions of the tin trade in ancient texts from western Asia hint at a tin source located somewhere to the east, perhaps Iran or Central Asia. Pulak 1998, p. 199; Dossin 1970, pp. 101–6 (see fig. 1, this volume); Muhly 1985, pp. 283–85; L. Weeks 1999, p. 51.
28. Gale and Stos-Gale 2002, pp. 279–302.
29. Pulak 2000b, pp. 153–55, fig. 23; Stos-Gale et al. 1998, pp. 119, 123, fig. 5.
30. L. Weeks 1999, pp. 60–61.

Cyprus: An International Nexus of Art and Trade

During the Late Bronze Age, a period marked by increasing international contacts within the eastern Mediterranean world, the geographic position of Cyprus, together with its historical role as a crossroads of the Near Eastern, Egyptian, and Aegean worlds, stimulated artistic creations that benefited from many influences. Its natural wealth and resources, especially its many copper mines, encouraged the development of a thriving trade. Metalwork in particular prospered on the island. While the objects manufactured in its many workshops drew upon techniques known throughout the eastern Mediterranean, Cypriot craftsmen achieved an even greater mastery and became the foremost producers of cast-bronze objects.

Enkomi, a prosperous center on Cyprus, seems to have held a leading position in this industry. Various metallurgic installations dating from different phases of the Bronze Age have been identified there as using copper extracted from the nearby ore deposits of Troulli, Mthiati, and Sha. Much of the copper produced was apparently intended for export and shaped into oxhide ingots (see cat. no. 185). Copper was also alloyed with tin to manufacture objects of bronze. Iron, too, was mined on Cyprus, its production mastered as early as the twelfth century B.C. *It is unknown whether iron technology was developed locally or imported from Iran, the Caucasus, Anatolia, the Aegean—or even central Europe.*



Figure 102. Bronze statue of armed god standing on base in the form of an oxhide ingot. Enkomi, Sanctuary of the Ingot God. Late Bronze Age. Cyprus Museum, Nicosia Field no. 1142

Oxhide ingots constitute a category of object that sheds light on the trade between Cyprus and other regions of the Mediterranean ranging from Sardinia to Crete, mainland Greece, and the Levantine coast. Large quantities dating from the Late Bronze Age have been found in the cargoes of sunken merchant vessels discovered near land, especially off the coast of southern Anatolia (see cat. no. 185). Egyptian paintings of the fifteenth and fourteenth centuries B.C. *depict Asiatics and Aegeans bearing gifts of ingots to pharaohs (figs. 50, 85, 101). Although these ingots traditionally signify Cyprus, their production was not restricted to the island, as evidenced by the discovery of a mold in a royal palace at Ras Ibn Hani, near Ugarit.*

The significance of oxhide ingots on Cyprus can be seen by the fact that they were used as motifs in religious contexts. They were associated with the deities whose figures they came to represent, and miniature ingots—some with inscriptions in Cypro-Minoan writing or Egyptian hieroglyphs—have been found in shrines, where they may have been deposited as votives. The association of the realm of the gods and copper ingots is further confirmed by another category of objects typical of Cyprus during the Late Bronze Age: bronze stands with openwork decoration. They appear to have been offered as symbolic representations of shrines, made to hold vases or basins that were probably used in religious ceremonies; their surfaces were decorated with scenes that represented the rituals or mythologies involved.

One of the stands depicts the bearer of an ingot moving toward a pillar that is topped by a series of volutes, an ornamental motif associated with a female deity (cat. no. 186). The combination of this motif with the oxhide ingot created a general association of copper and metallurgy with the realm of gods and wealth.

Other objects demonstrate the religious syncretism that stemmed from repeated foreign contact. Metal statuettes of standing male deities were widely distributed throughout the Near East beginning in the Middle Bronze Age, illustrating these shared tendencies. With their combative stance and specific attributes, Cypriot divine figures from the Late Bronze Age are related to Canaanite representations of Baal, god of storms, thunder, and lightning. On Cyprus such a god was represented on an oxhide ingot (fig. 102), thus linking his image directly to the art of metallurgy. This would have involved not only a knowledge of deposits and techniques, but also his control of thunder and lightning, which are evoked in turn by the fire and the din of the forges. This association recalls similar connections made between technology and deities, between artisan gods and guardians of knowledge—Ptah in Egypt, for example, Kothar at Ugarit, and Hephaistos in Greece. Cyprus thus participated in the religious world that was shared by the regions of the eastern Mediterranean and that entailed the creation of closely related forms of artistic expression. In the midst of this iconographic mainstream, however, the island also developed its own characteristics, which added a further dimension to the international repertoire. As in the preceding millennia, the craftsmen of Cyprus, immersed in a sea of different cultures, drew inspiration from their great neighbors—Egypt, Crete, Mycenae, the Aegean islands, and Canaan—and developed their own forms of expression in masterful syntheses of artistic and iconographic currents. SC

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Openwork Stand

Bronze
Height 12.5 cm (4⅞ in.); width 11 cm (4⅜ in.); diameter 8.5 cm (3⅜ in.)
Episkopi (?)
Late Bronze Age, ca. 1250–1050 B.C.
The Trustees of the British Museum, London
1920.12–20.1



The Amarna Letters between the Egyptian pharaoh and the king of Alashiya record a shipment of 500 talents of copper from Cyprus.[1] While a major source of the metal in the Late Bronze Age, the island produced metal wares that remained conservative in form and technique until the thirteenth century B.C., when contact with surrounding regions, particularly the Mycenaean world, dramatically transformed Cypriot bronze making.[2]

This well-executed four-sided stand, decorated on each face with a man and a stylized tree, would have supported a large vessel such as a cauldron.[3] It represents the flowering of Late Cypriot craftsmanship and imagery, with iconography reflecting Aegean and Near Eastern symbolism. This is particularly significant in view of the probable religious, funerary, or ceremonial context in which the stand would have been used.

The rods of the frame and the supporting ring for the vessel were cast or hammered, while the figures, with shallow, subtle detailing, were made in open molds; the various parts of the stand were hard-soldered (brazed). Both techniques require high levels of skill. Each of the trees is shown with volutes of twisted bronze rods representing leaves. The male figures are similar and may represent the same individual. They wear only a long kiltlike garment. The face is fleshy, the nose prominent, and the hair (or wig) falls to the nape of the neck. One figure carries what looks like a fish; the other bears over the left shoulder a long, sinuous object that trails on the ground. The copper oxhide ingot carried by the third figure recalls scenes of Minoans and Mycenaeans in Dynasty 18 Egyptian tombs (see figs. 85, 134). It was also featured widely in Cypriot religious imagery of the thirteenth and twelfth centuries B.C., where it was sometimes associated with a divinity. The Late Cypriot IIC–IIIA temple complex at Kition in southeastern Cyprus included metal workshops within the sacred enclosure, indicating a further link between the alchemic nature of metallurgy and religious (or ideological) forces.[4]

The final scene shows a man playing a multistringed instrument and possibly singing. He is perhaps an archetype of Kinyras, the legendary musician-king of Cyprus and also perhaps of Levantine



186, alternate view

bardic figures such as King David, or even of the Greek Homer. The relationship of music to ritual or to religious activity is strong in all the cultures that came together in areas like Cyprus in the thirteenth to the eleventh century B.C. Music was commonly used to evoke a divinity, prophesy the future, or accompany recitations to honor distinguished ancestors. While the tree may simply indicate a landscape, it may be a sacred image, perhaps a goddess of fertility. Stylized trees, sometimes in association with ingots, appear on locally produced cylinder seals throughout the Late Bronze Age.[5]

The exact find context of the stand is not known, apart from its association with the village of Episkopi, near ancient Kourion. No examples of its type were found in the many tombs of the thirteenth and twelfth centuries B.C. at Kourion.[6] Excavations at the Early Iron Age necropolis of Kaloriziki revealed several rich tombs of the late eleventh and tenth centuries B.C. containing bronze stands of a simpler rod type without figures.[7]

Stands became common in burials of the aristocracy of Kourion and of its neighbors on Cyprus.[8] The present stand is a precocious early example originating in the metallurgical revolution of the thirteenth and twelfth centuries B.C. that gave rise to the adoption of iron technology in which Cypriot artisans played a leading role.

JLF

1. EA 35, Moran 1992, pp. 107–9.
2. Catling 1964, pp. 299–302; Catling 1986, p. 99.
3. Catling 1964, pp. 205–7, pl. 34; Matthäus 1985, pp. 314–15; Papasavvas 2001, pp. 239–50, no. 23, pls. 42–47; Macnamara and Meeks 1987, p. 58, pl. XVIII.
4. Webb 1999, passim; Knapp 1986.
5. Zevit 2001, pp. 321–22, 325, with further references.
6. Murray, Smith, and Walters 1900, pp. 56–86; Benson 1972.
7. Benson 1973; McFadden 1954.
8. See Matthäus 1985 and Karageorghis 1983 for examples from Palaepaphos, and, more generally, for Cyprus in this period see Karageorghis 2002, pp. 115–49.

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Glass Ingots

Cobalt, turquoise, purple, and amber-colored glass
Max. diameter 11–16.2 cm (4⅜–6⅜ in.); max. thickness 3.7–7.2 cm (1½–2⅞ in.); max. weight 0.8–2.8 kg
Uluburun shipwreck
Late Bronze Age, ca. 1300 B.C.
Bodrum Museum of Underwater Archaeology, Turkey
7.7.95 (KW 3950), 55.7.95 (KW 3576), 9.1.2000 (KW 4532), 70.7.92 (KW 2923), 10.1.2000 (KW 3779), 2003.1.23A (KW 3163)

The Uluburun ship's cargo included approximately 175 glass ingots of cobalt blue, turquoise or light blue, amber, and purple color, each roughly in the shape of a truncated cone. Of these, 112 essentially retained their original shape and color, while 32 were fragmentary and ranged in size from one-quarter to three-quarters of an ingot. The remaining ingots, however, had partially or completely weathered and transformed into amorphous lumps that for the most part crumbled or disintegrated.[1] Although the sizes of the ingots vary, using an average weight of 2 kilograms, it is estimated that some 350 kilograms of glass must have been on the ship.[2]

While most of the glass ingots were found scattered among the rows of copper ingots stacked forward of midships, a group of 20 found at the stern suggests they were stored there, just aft of the Canaanite jars, with several copper and tin ingots. Only half of the ingots were sufficiently preserved to reveal their cobalt blue color. These formed a relatively tight cluster on the seabed, suggesting that they were originally kept in a perishable container, perhaps a bag. Evidence for the stacking of the ingots is tenuous, as they were displaced during the wrecking of the ship, but in situ positions of six in the group kept at the stern suggest that they were placed with the larger surface of one ingot adjacent to the smaller surface of the next ingot.

The Uluburun glass ingots are among the earliest known examples of their shape.[3] Other excavated glass ingots include three fragments of a mid-fifteenth to early fourteenth-century B.C. dark blue ingot from Nuzi,[4] 13 light and dark blue ingots and fragments from the fourteenth-century B.C. Mitanni palace at Tell Brak,[5] a number of small ingot chunks from fourteenth-century B.C. Tell el-Amarna,[6] a thirteenth-century B.C. dark red ingot from Qantir in the Nile Delta,[7] and chunks from blue glass ingots from Ugarit.[8] Two pieces of cobalt blue glass and two fragments of light blue ingots from the island of Failaka (ancient Dilmun) in the Persian Gulf[9] suggest that glass was also exported to areas outside the greater Mediterranean basin.[10]

It is not known where the Uluburun glass ingots were made, whether all the ingots of different colors were obtained from a single location, or if they came from different sources specializing in the production of specific colors. A series of fragmentary cylindrical terracotta vessels excavated at Tell el-Amarna may be similar to the crucibles used in producing glass ingots of the type found at Uluburun. Although no complete ingots themselves



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survive,[11] traces of cobalt blue glass in these crucibles suggest that the dark blue glass commonly found at Amarna was made there. If so, Amarna would rank among the earliest glass-producing centers in the ancient world.[12] In fact, a replica of a cobalt blue glass ingot from Uluburun fits snugly into several of the Amarna crucibles.[13]

Glass is formed by melting silica, lime, and soda. The silica is commonly obtained from sand or crushed quartz pebbles; lime, which is required as a stabilizer for the silica, is also often naturally found in sand. The soda, which serves as a flux for lowering the melting temperature for the silica, may be obtained either from natron, a mineral that occurs naturally in Egypt, or from the ash of saline plants, usually used in glass manufactured outside Egypt. Different colors are produced by the addition of various metal oxides.[14] The chemical composition of the Uluburun cobalt blue glass ingots matches that of contemporary Egyptian core-formed vessels, fragments of cobalt blue ingots from Amarna, and Mycenaean relief beads (see cat. nos. 239, 246), which suggests a common source for all.[15] Based on the chemical composition and the use of natron in production, the cobalt blue ingots from Amarna were probably manufactured locally, using local materials.[16] It would appear that the Egyptians manufactured cobalt blue glass as imitation lapis lazuli during the Late Bronze Age.

One Amarna Letter, however, lists both "genuine lapis lazuli" and simple "lapis lazuli" as coming to Egypt from Mitanni.[17] Cakes of "lapis lazuli" and "turquoise" (as opposed to "genuine lapis lazuli" and "genuine turquoise") are shown as tribute from Syrians in a relief at Karnak (fig. 96).[18] Glass ingots such as these are quite likely the *mekku* and *ehli-pakku* listed on Amarna and Ugaritic tablets as trade items.[19] They were apparently exported to Egypt from Tyre, Akko, Ashkelon, Lachish, and Yura on the Levantine coast.[20] A Ugaritic text reveals that Ugarit also exported raw glass.[21]

Light blue glasses are regarded as typically Mesopotamian products. The basic composition, which almost certainly involved the use of quartz pebbles and plant ashes, appears in Mesopotamia at the very beginning of glassmaking.[22] Chemical analysis of the two light blue ingots from Uluburun, however, reveals a composition somewhat different from that of blue glass from Mesopotamia and Egypt,[23] although excessive weathering of the Uluburun sample in seawater may have altered its chemical composition. Furthermore, as most of the variations in their compositions may be explained by the difference in colorants,[24] there is nothing to suggest that the Uluburun light blue glasses were made in a workshop other than the one that produced the glasses of cobalt blue.

One of the purple glass ingots from the Uluburun ship was found to be consistent with a plant-based alkali and is chemically similar to a rare purple ingot fragment from Amarna.[25] If the use of plant ash is considered indicative of glass manufactured outside Egypt, it would appear that the Uluburun ship was carrying a cargo of glass obtained from both Egypt and the Near East.[26]

Chemical analysis of a limited number of cobalt blue ingots from Uluburun suggests that they were made in Egypt,[27] but there may be additional evidence for determining their origin. A fragment of the crucible used in making glass had adhered to one of the Uluburun ingots and became separated from it after the ship sank. If the source of the clay from which the crucible was made can be identified, this would provide conclusive evidence not only for the provenance of some of the Uluburun glass ingots, but also the first definitive indication of the location of a Bronze Age glass-production site.[28] CP

1. Pulak 2005c, pp. 68–71; Pulak 2001, pp. 25–30; Pulak 1998, pp. 202–3; Bass 1986, pp. 281–82. The better preserved cobalt blue ingots vary from 1.3 to 3 kg, the turquoise ingots from 1.1 to 1.4 kg: Pulak 2005c, pp. 68–69, figs. 21, 22; Pulak 2001, pp. 25, 27; Nicholson, Jackson, and Trott 1997, pp. 147–50; Rehren, Pusch, and Herold 1998, pp. 244–45.
2. Pulak 2001, p. 25.
3. Nicholson 2007, pp. 23–24.
4. Barag 1988, pp. 140–41, fig. 16.
5. Oates, Oates, and McDonald 1997, pp. 85–86, fig. 124.
6. Petrie 1974, p. 26, pl. 13.40.
7. Rehren 2005, p. 538; Rehren and Pusch 1997, pp. 134–35, pl. 18.3.
8. Matoïan, personal communication, 1998.
9. Pollard 1987, pp. 186–87.
10. Pulak 2001, p. 26.
11. Nicholson 2007, pp. 13–82.
12. Nicholson 1995c, p. 127; Nicholson, Jackson, and Trott 1997, pp. 147–50; Rehren, Pusch, and Herold 1998, pp. 244–45.
13. Nicholson 1993, pp. 49–51; Nicholson 1995a, pp. 14–16; Nicholson 1995b, pp. 17–18; Nicholson 1995c, pp. 127–28.
14. Nicholson 2007, pp. 118–21.
15. Bass 1986, p. 282.
16. Shortland and Tite 2000, pp. 147–49; Nicholson 2007, pp. 102–7; Brill 1999, p. 280.
17. EA 25 (Moran 1992, pp. 72–81).
18. Sherratt and Sherratt 1991, p. 386.
19. Oppenheim 1973, pp. 259–63.
20. Pulak 2001, p. 26; Bass 1997, pp. 161–62; Heltzer 1978, p. 80; EA 148, EA 235, EA 327, EA 328, EA 331, EA 314, Moran 1992, pp. 235, 293, 351, 355, 347.
21. Heltzer 1978, p. 80; Nougayrol, PRU, VI, 6 (RS. 17.144, 40).
22. Brill and Shirahata 1997, pp. 89–94.
23. Pulak 2001, p. 29.
24. Brill, personal communication, 2001.
25. Shortland 2000, p. 17, table 3.2, pp. 50, 98, fig. 3.1, p. 183.
26. Pulak 2001, p. 29.
27. Bass 1986, p. 282; Brill 1999, pp. 53–54.
28. Pulak 2001, pp. 29–30.

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Canaanite Jar with Glass Beads

Ceramic, glass
Jar: height 32 cm (12⅝ in.); width at base 4.5 cm (1¾ in.)
Beads: average length 0.6 cm (¼ in.); diameter 0.8 cm (⅜ in.)
Uluburun shipwreck
Late Bronze Age, ca. 1300 B.C.
Bodrum Museum of Underwater Archaeology, Turkey 62.1.2000 (KW 8)

Tens of thousands of beads found in the Uluburun shipwreck represent a wide range of materials, including glass, faience, amber, rock crystal, agate, carnelian, bone, and ostrich eggshell (see cat. nos. 189, 195).[1] Some probably represent personal belongings; others, however, were items of cargo, as evidenced by a concreted cluster of some 70,000 tiny faience beads,[2] which, based on the shape of the cluster and lack of pottery sherds associated with it, represent the contents of a bag, now lost, and by the glass beads transported inside this Canaanite jar (for Canaanite jars, see cat. no. 190). Contained within the preserved section of the jar was a mass of heavy encrustation consisting of approximately 8,000 small glass beads.[3] When filled to capacity, the jar would have held approximately 26,000 beads.[4] The preservation of these glass beads and others found elsewhere at the site is quite poor, and their original color is now lost.



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Although all are devitrified, a single bead retains a bright blue glassy area. The poor condition of the beads found on the ship makes it impossible to determine their original numbers, but surviving artifacts and observations of bead impressions suggest that, in addition to the glass beads found in this jar, another 1,500 were on board, and the actual number carried was significantly higher.

All of the glass beads, with the exception of mold-cast Mycenaean relief beads (cat. no. 239), are of the type known as "wire wound," formed by trailing molten glass around a wire, mandrel, or some other core material.[5] The wound-glass beads from Uluburun are grouped according to two sizes: either large glass beads, which may be plain or possess decorative "eyes" of a different color of glass applied to the bead,[6] or small globular beads. About 9,000 of the glass beads on the Uluburun ship, including those in this jar, are generally considered small glass beads. The average bead is either spherical or slightly oblate in shape. Some have tapering holes that are either impractically narrow on one end or fail to penetrate the full diameter of the bead completely. Since these were found intermixed with completely perforated beads, it is likely that they represent manufacturing flaws. The presence of these flawed beads also indicates that the jar's contents were not strung into necklaces but carried as raw cargo.

Similar glass beads have been found at sites throughout the Levant. Nearly identical examples were found on the Greek mainland at Prosymna and Mycenae,[7] with similar ones also coming from Dendra[8] and Tiryns,[9] as well as on Crete[10] and Cyprus,[11] perhaps representing Near Eastern glass beads imported to the Aegean like those on the Uluburun ship. Additional close parallels have been found along the Levantine coast at Lachish[12] and Tell Abu Hawam,[13] as well as blue-colored beads from Egypt at Gurob[14] and el-Lahun.[15] Although none survived the excavation, several hundred glass beads, including small spherical ones, were also carried, in a pottery vessel, on the Cape Gelidonya ship.[16]

The missing portion of this dark reddish brown Canaanite jar was not found during excavation, suggesting that the jar may have been broken prior to loading and was being reused as a transport container for the beads. Moreover, the clay used to make the jar is believed to come from a northern Syrian source, indicating that the jar and its contents could have been imports whose origin differed from that of the two other groups of Canaanite jars aboard the ship, traced to clay sources farther south.

Because beads found in archaeological sites are notoriously difficult to date as a result of their extended use over time, the discovery of beads clearly representing items of cargo is significant in that their production dates are more secure. The abundance of beads aboard the Uluburun ship also supports their likely function as an imported trade commodity during the Bronze Age. CP

1. Pulak 1998, p. 206.
2. Pulak 2005c, p. 590, fig. 98; Pulak 2001, p. 44.
3. Pulak 2005c, pp. 74, 590, fig. 97; Pulak 2001, pp. 41–42; Bass 1986, pp. 278, 289.
4. Ingram 2005, pp. 207–9. The Canaanite jar is of the smallest standard size of about 6.7 liters represented on the Uluburun ship; for other Uluburun jar capacities, see Pulak 1998, p. 201.
5. For this type of glass bead and four other types used in the Bronze Age, see Beck 1981, pp. 60–62.
6. Ingram 2005, pp. 61–66; the author also discusses a variant of the decorated glass bead termed "crumb" bead where colored glass crumbs are worked into the matrix of the bead, also found on the Uluburun wreck.
7. Tomb XIX at Prosymna yielded 97 glass beads (Blegen and Blegen 1937, pl. 1:298) and chamber tomb 524 at Mycenae revealed more than 110 beads (Wace 1932, p. 43, no. 31).
8. Persson, Hammarstrand, and Hamilton 1942, p. 86, no. 32c.
9. Rudolph 1973, p. 118.
10. A. Evans 1906, pp. 71–72, no. 66f.
11. L. Åström 1967, p. 55, no. 1.
12. Tufnell, Inge, and Harding 1940, pl. XXXIV, nos. 19, 20.
13. Hamilton 1935, pp. 61–62.
14. Brunton and Engelbach 1927, pl. XLV, no. 80B.
15. Petrie 1974, pl. LXII, no. 80N.
16. Bass 1967, p. 132, Type 2 shown in figs. 139.B and 142.

189a–c

Beads

Rock crystal

a. Beads
Average height 2 cm (¾ in.)
79.5.87 (KW 716, KW 728, KW 758, KW 765, KW 815, KW 882, KW 911, KW 922

b. Cylindrical bead
Height 2.3 cm (⅞ in.); diameter 1.2 cm (½ in.)
40.24.86 (KW 379)

c. Mycenaean bead
Height 1.35 cm (½ in.); diameter 1.55 cm (⅝ in.)
79.5.87 (KW 767)

Uluburun shipwreck
Late Bronze Age, ca. 1300 B.C.
Bodrum Museum of Underwater Archaeology, Turkey



Fourteen beads fashioned from white, transparent quartz or rock crystal were found on the Uluburun ship (ten are on exhibition). They were imported either as finished products or as raw material and manufactured locally or elsewhere in the Near East. Most are amygdaloid, or almond-shaped, and their sides taper toward truncated ends. The beads are of different sizes, some flatter on one side than the other and at least one exhibiting a pronounced triangular cross section.[1] Unique in the group is a single well-formed and polished barrel-shaped bead. The cylindrical bead, lower left, is similar in size and shape to two quartz cylinder seals found on the wreck (cat. no. 231), although it is not engraved.[2] Ten of the beads were found in close proximity to one another, which suggests that they were originally strung together. Another three amygdaloid beads found slightly farther down the slope, in a trail leading away from the main cluster, delineated the path of spillage. The two quartz cylinder seals were also found among the bead cluster, but whether they were strung into a necklace (compare cat. no. 258) or simply stored in a bag with the beads is not known. Located at the stern of the ship, the beads were most likely personal possessions for adornment rather than items for exchange.

Although a study of the drilling technique used in perforating the beads for stringing has yet to be completed, preliminary observations reveal that nearly all of the quartz beads, including the cylinder seals, were bored from both ends, in the common manner of drilling ancient beads. Most of the drilled holes meet slightly askew, approximately at the center, although some meet much closer to one end of the bead than the other. Four of the beads, however, were either drilled through in a single pass or, equally likely, were drilled from opposite ends in perfect alignment. The profiles of the perforations indicate use of a bevel-tipped copper drill used together with an abrasive powder.[3] Also found on the wreck were nearly 1,200 agate beads, which were probably items for trade. Most are irregularly shaped discoids, although some retain much of their roughly chipped shape, with only minimal smoothing or surface treatment; because of the thinness of these beads, drilling was performed from one side only.[4] They contrast with the quartz beads, which are more uniformly shaped and polished smooth on all surfaces.

Amygdaloid and cylindrical quartz beads are rare in the Aegean, but the former shape is reminiscent of some Cretan and Mycenaean engraved seals made of a variety of hard stones, including carnelian, sard, agate, and jasper.[5] Although these bead forms occur in the Levant, they do not appear to have been very common there. Similar examples, including the barrel form, are found among a group of beads from Middle Bronze II period Megiddo.[6] A number of truncated amygdaloid and cylindrical beads were also recovered at Megiddo from the Early Iron I (ca. 1150–1100 B.C.) level,[7] some of which may well have been heirlooms from earlier periods.

At least one of the quartz beads (c, bottom row, center) is of a typical Aegean shape.[8] It is decorated with five plain flutes and five gently undulating ribs, consisting of three spines each, oriented along the bead's longitudinal axis. Like the other quartz beads, this one was found at the stern of the ship near most of the gold artifacts and other items of personal value, suggesting that it belonged to one of the Mycenaeans aboard the ship (see cat. nos. 238–242) and therefore was not a gift item or part of the cargo. A smaller plain spherical quartz bead (bottom row, right),[9] also almost certainly of Aegean origin, was found farther downslope, near the mast-step, and

must have rolled from an area near the stern.

A fluted quartz bead from a tomb near Knossos is similar in size and overall shape but carved with seven ribs.[10] Fluted beads of similar shape but with differing styles of ribbing were found on the Greek mainland at Prosymna.[11] Similar beads from tombs at Mycenae, made of sard, a reddish variety of agate, have only four flutes.[12] One of the beads from Tomb 91 at Mycenae, perhaps the closest visual parallel for the Uluburun bead, is of similar gadrooned form but of discoid shape; it is believed to be carved of fluorite, a softer material than quartz.[13] This tomb also yielded a plain spherical bead of approximately the same size as the one from Uluburun (KW 5144).[14] CP

1. Pulak 2005c, p. 82, fig. 34, p. 592, fig. 100:a–o.
2. Pulak 1988, p. 25, fig. 28.
3. Kenoyer 1997, p. 270, fig. 3a; see Gorelick and Gwinnett 1987, pp. 37–38.
4. Pulak 1988, pp. 24–25, fig. 27.
5. See, for example, Kenna 1964, p. 9, pls. 1:29, 31–33, 36, 37, 3:23, 24, 26, 30, 32–35, 37. Boardman (1970, pp. 36, 47, 57, 59, and ills., p. 39, figs. 7–10, p. 49, fig. 2, for some examples) notes that on Minoan Crete, from the Middle Minoan III period on, the most common shapes for sealstones were lentoids and amygdaloids, and in Late Minoan II–IIIA:1 the lentoid became the preferred form, but amygdaloids were also still quite common. There is a similar pattern in Late Helladic I–IIIA Mycenaean Greece, with lentoids of banded agate and onyx as the preferred sealstones; only a few amygdaloid examples are still present.
6. Loud 1948, pls. 209:24, 209:35, 36 (more of ovoid form than amygdaloid), 211:52.
7. Ibid., pl. 216:122.
8. Bass et al. 1989, pp. 8–9, and fig. 16; Pulak 2005a, pp. 304–5; Pulak 2005c, p. 592, fig. 100:f.
9. KW 5144: height 1.01 cm, width 1.11 cm.
10. Hood, Huxley, and Sandars 1958–59, p. 250, no. X.11, fig. 35:X.11; also in Effinger 1996, p. 25, no. KnG 10f, pl. 5:c.
11. Blegen and Blegen 1937, fig. 599:10.
12. Xénaki-Sakellariou 1985, p. 73, no. 2387(15), p. 293, type 6, p. 196, no. 2927(2), p. 293, type 7, pl. 85:2927(2).
13. Ibid., p. 261, no. 3192(6), pl. 127:3192(6).
14. Ibid., p. 261, no. 3192(2), pl. 127:3192(2). Another similar spherical bead was found at Prosymna. Blegen and Blegen 1937, p. 293, fig. 169:6.

190a, b

Canaanite Jars

Ceramic

a. Canaanite jar
Height 53.5 cm (21 in.); max. diameter 26.4 cm (10⅜ in.); capacity 9.7 liters
50.31.84 (KW 102)

b. Canaanite jar with shoulder markings
Height 48.8 cm (19¼ in.); max. diameter 23.7 cm (9⅜ in.); capacity 6.5 liters
44.31.84 (KW 93)

Uluburun shipwreck
Late Bronze Age, ca. 1300 B.C.
Bodrum Museum of Underwater Archaeology, Turkey

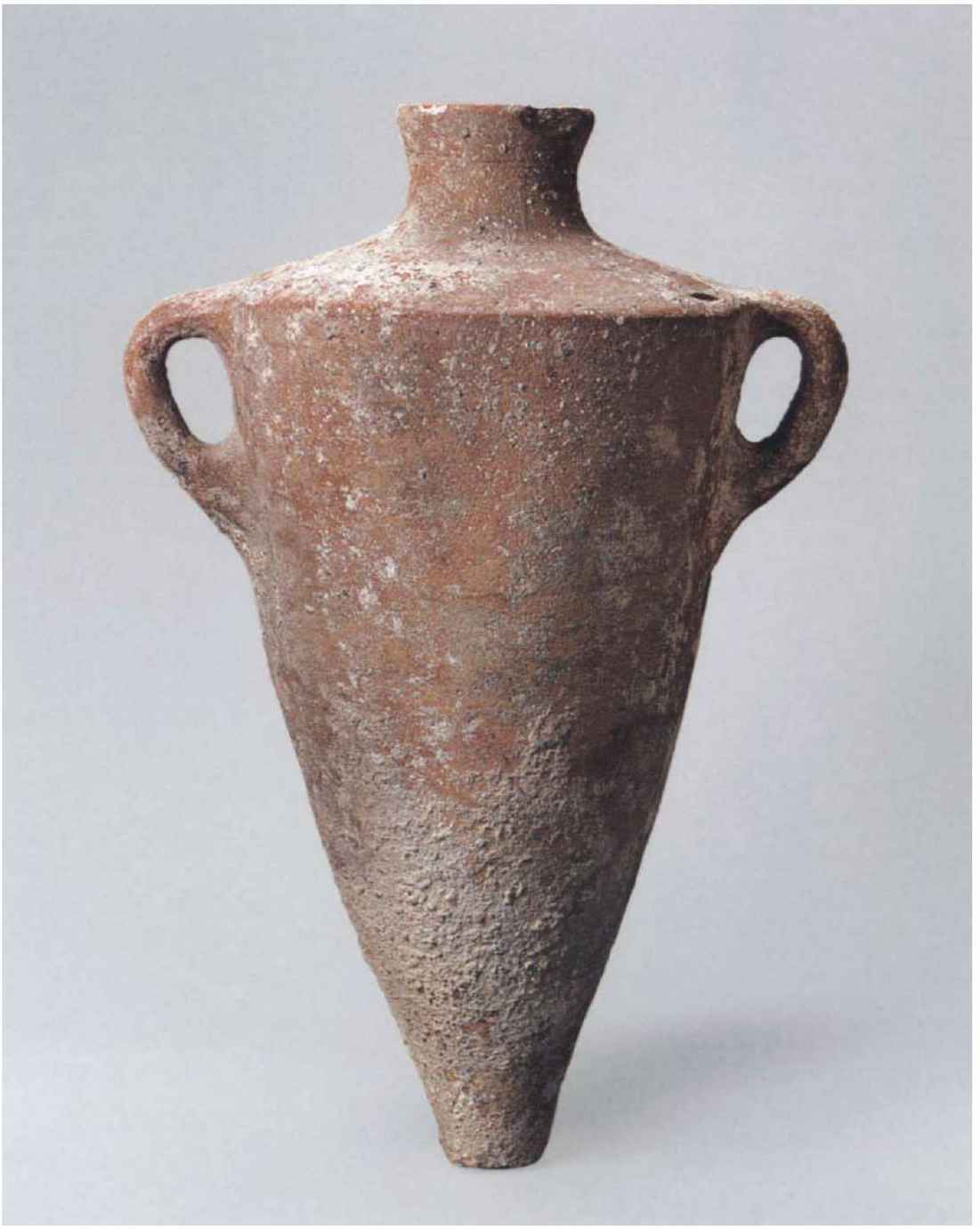
More than 150 Canaanite jars were found on the Uluburun shipwreck, two of which are included here, one marked with three incised parallel lines on its shoulder.[1] The decanted contents of both jars revealed a quantity of yellowish matter identified as terebinth resin. Body sherds found inside some of the intact Canaanite jars suggest that they had been stoppered with organic material, over which was placed a potsherd, after which the jar was sealed with mud or clay. All of the Uluburun Canaanite jars were stored aft of the large storage jars at the stern of the ship, regardless of their size and type, with the smaller jars stacked two deep.

The Uluburun jars fall into three general size groups, with the smallest (representing about 75 percent) having an average capacity of 6.7 liters, the medium (about 11 percent) about twice that volume, and the largest examples some 26.7 liters.[2] This last value may correspond to a *kd*, meaning "jar," mentioned in Ugaritic texts of the thirteenth century B.C., which corresponds to the eighth to seventh century B.C. Judean *bat*, a unit of liquid measure usually calculated during the Iron Age as about 22 liters, or a derivative thereof.[3]

Despite the size differences, nearly all Uluburun Canaanite jars conform to a single morphological type.[4] Further analysis, however, reveals two fabric groups corresponding to two different manufacturing methods for their inner bases. The two groups seem to correspond to two different cargoes: terebinth resin and a vegetable oil, possibly olive. Petrographic analysis of the two clay matrices of the fabrics has shown that the majority of the jars were of clay found immediately north of the tip of the Carmel coast, while those



Figure 103. Facsimile of wall painting showing Syrians with Canaanite jar and gold vessel. Thebes, Tomb of Rekhmire (TT 100). Dynasty 18, reigns of Thutmose III–Amenhotep II. The Metropolitan Museum of Art, New York, Rogers Fund, 1930 30.4.83



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of the second group seem to have come from the general region of Sidon.[5]

Canaanite jars, widely found in the eastern Mediterranean, were the most popular type of vessel imported into the Aegean. In Egyptian tombs such as those of Kenamun and of Rekhmire at Thebes (fig. 103),[6] the jars are depicted as cargo or tribute brought by Syrian merchants to Egypt. The best morphological parallels for the Uluburun Canaanite jars are from Tell Abu Hawam, Tell el-Amarna, Mycenae, and Menidi.[7] A storeroom at Minet el-Beidha, one of the two ports servicing Ugarit, contained some 80 Canaanite jars, possibly awaiting export by sea.[8]

Unlike the fine wares aboard the Uluburun ship, the Canaanite jars themselves were valued primarily for their contents, although empty containers were sometimes recycled and pressed into everyday use. These contents could have included wine, oil, olives, and honey.[9] One jar from Uluburun was filled with glass beads (cat. no. 188), several others with olives.[10] The chemical analysis of preserved organic residues, however, revealed that more than two-thirds of the jars were probably carrying *Pistacia* species resin, most likely terebinth resin from the *Pistacia atlantica* tree,[11] which produces more abundant resin than the other *Pistacia* species found in the eastern Mediterranean. The Uluburun resin cargo—originally at more than half a ton—represents the largest ancient deposit of the material ever found.

Before this discovery at Uluburun, in an unmistakably commercial context, the best evidence for the trade of terebinth resin was in textual references and iconographic depictions, with nearly all the ancient authors agreeing on its superiority



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over other resins.[12] Its medicinal qualities as an antiseptic and its use in the preparation of incense and scented cosmetics have long been recognized.[13] A few Linear B tablets from Knossos contain the word *ki-ta-no*, which has been translated as "terebinth fruits,"[14] but, more recently, possibly as "terebinth resin."[15] Terebinth resin may also be the Egyptian *sntr*, the aromatic most often mentioned in Egyptian texts, brought from the Near East to the pharaoh primarily in Canaanite jars. Large quantities of *sntr* were recorded over a period of five years in the annals of Thutmose III, and *sntr* is found among the hieratic inscriptions on the Canaanite jars from Tell el-Amarna and Memphis.[16] A depiction of a storeroom in the Tomb of Rekhmire shows a representative group of Canaanite jars, with the contents of one jar labeled *sntr* (fig. 96).[17] The jars were most likely inscribed to indicate the commodity they contained upon first reaching Egypt. Chemical analysis of residues from two Canaanite jars from Tell el-Amarna, inscribed *sntr*, as well as from many other uninscribed jars confirmed the identification as terebinth resin.[18] These jars are made of the same clay fabric as the resin-bearing jars from Uluburun, indicating a common source for both the jars and, perhaps, also their contents in the vicinity of Tell Abu Hawam.[19] CP

1. Bass 1986, pp. 277–79, ills. 7, 8; Pulak 1988, pp. 10–11; Pulak 1997, pp. 240–41, fig. 9; Pulak 1998, pp. 201–2, fig. 15; Pulak 2005c, p. 581, figs. 80, 81.
2. Pulak 1998, p. 201; Pulak 1997, p. 240. These values were obtained early in our study and, therefore, represent only the intact jars that were devoid of encrustation. As jars are cleaned and mended and capacity measurements taken, the average values and their percentages within the cargo assemblage will vary accordingly.

3. Heltzer 1989, pp. 197, 201.
4. They have conical bodies, pointed bases with slightly convex toes, carinated body-shoulder junction, and slightly convex shoulders leading to a narrow, cylindrical neck and a tall lip defined by an incised line. Vertical ovoid loop handles are attached opposite each other at the junction of the shoulders and bodies of the jars.
5. Yuval Goren, personal communication. Clay, from near the sites of Tell Abu Hawam and Tel Nami, was identified from the Amarna project's petrographic analysis of the Canaanite jars from Memphis and Tell el-Amarna. See Bourriau, Smith, and Serpico 2001, p. 140.
6. Davies 1963, pl. 15; Davies and Faulkner 1947, pl. 8.
7. Bass 1986, p. 277.
8. Schaeffer 1949, p. 209, pl. 31:1; Schaeffer 1932, p. 3, pl. III:3.
9. Leonard 1996, p. 251.
10. Pulak 1997, p. 240.
11. Mills and White 1989; Hairfield and Hairfield 1990; Haldane 1991, p. 219; Haldane 1993, pp. 352–54.
12. Stol 1979, p. 15.
13. Ibid., pp. 3, 16; Pulak 2001, pp. 33–36.
14. Pulak 2001, p. 36; Bass 1997, p. 164; Melena 1976, pp. 177–90.
15. Pulak 2001, p. 36
16. Loret 1949, pp. 20–25.
17. Davies 1973, pl. 48.
18. Serpico and White 2000, p. 894.
19. Stern et al. 2000, p. 412.



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191
Pilgrim Flask

Ceramic
Height 29.5 cm (11⅝ in.); width 24.2 cm (9½ in.); capacity 3.2 liters
Uluburun shipwreck
Late Bronze Age, ca. 1300 B.C.
Bodrum Museum of Underwater Archaeology, Turkey 63.1.2000 (KW 3686)

192
Lamp for Shipboard Use

Ceramic
Height 5.7 cm (2¼ in.); width 13.8 cm (5⅜ in.); length 14.3 cm (5⅝ in.)
Uluburun shipwreck
Late Bronze Age, ca. 1300 B.C.
Bodrum Museum of Underwater Archaeology, Turkey 10.5.90 (KW 1742)

This Canaanite pilgrim flask from the Uluburun ship has a round, lentoid body with a sharply carinated edge and a narrow neck widening to a small mouth with a thick, triangular-sectioned rim.[1] Two round vertical handles project from the top of the body and rejoin the vessel about halfway up the funnel-like neck, which appears to sprout from between the handles with the rim resting on them. The body of the flask was thrown on its side on a potter's wheel as a single piece, and the resulting hole at the middle of the top half of the body was sealed and smoothed over.[2] The flask is in good condition, with a rich, light brown color, buff to greenish gray surface slip, and a somewhat coarse fabric with finely scattered dark inclusions and a gritty, sandy surface. At least sixty such pilgrim flasks, forming a homogeneous group but of varying sizes, were found on the Uluburun ship. They represent the second largest group of vessels carried on board.

The flasks appear to be undecorated, though a few may show remnants of the

usual red concentric circles seen embellishing better preserved examples of this type known from excavations elsewhere. Had decorative painting been present, it would have disappeared, along with much of the original surface slip, as a result of the underwater environment. Pilgrim flasks of this type are common in fourteenth-century B.C. assemblages, with good parallels found at Tel Dan,[3] Hazor,[4] Tell Abu Hawam,[5] Beth-Shan,[6] Gibeon,[7] Akko,[8] and Lachish,[9] among others. Ongoing petrographic analysis of the flasks indicates that they are all of the same fabric and probably originated in the same workshop located somewhere along the southern Levantine coast.

The 60 pilgrim flasks on the Uluburun ship vary greatly in size. Only 46 were recovered intact or could be later restored into complete vessels for taking capacity measurements. They range in capacity from 0.16 to 8.84 liters.[10] As with the Canaanite jars, the pilgrim flasks almost certainly served simply as containers and were in demand for their contents, and not for the vessels themselves.

Sieving the sediments decanted from the flasks during excavation yielded many varieties of seeds, but most frequently encountered were those of figs. Because fig seeds were recovered in great quantities throughout the shipwreck site, indicating that they were carried aboard the ship either for consumption or as cargo, they may have been intrusive elements deposited in the flasks after the ship sank. The narrow necks of the flasks indicate that they probably carried a liquid such as oil. A pilgrim flask, along with Canaanite jars and several other items of the type represented on the Uluburun ship, can be seen being unloaded from a ship in the scene of a Syrian merchant venture to Egypt in the fourteenth-century B.C. Tomb of Kenamun at Thebes (see fig. 98).[11]

Sixteen Canaanite oil lamps were found on the vessel. They are made of medium coarse red-orange gritty fabric with a reddish brown surface.[12] One corner of the saucer-shaped lamp bowl is pinched to form a nozzle for the placement of the wick. On one side of the nozzle is a semicircular impression in the clay resulting from pinching between a thumb and index finger, and around the interior circumference is a slightly raised ridge. The nozzle exhibits soot stains from burning, suggesting use aboard the ship. Similar charring is seen on several other lamps, all of the same type, although two types of lamps were found on board. The lamps that exhibit charring are larger, and more coarsely made than the more numerous second type,[13] which is of Cypriot manufacture (cat. no. 193d); some were found still nested one inside another along with Cypriot export pottery within one of the large storage jars or pithoi. These Cypriot lamps are in pristine condition, thus representing cargo. Unlike the Cypriot examples, the Canaanite lamps may provisionally be taken as an indicator of the ship's point of origin.[14]

Similar lamps have been found at Tel Michal,[15] Tell Abu Hawam,[16] Megiddo,[17] Tel Dan,[18] Hazor,[19] and Lachish,[20] among many others. Ongoing petrographic analysis reveals that all of the heavier lamps were made of the same type of clay as that used in producing most of the ship's cargo of coarse wares such as the pilgrim flasks (cat. no. 191), most of the Canaanite jars (cat. no. 190), and several types of bowls, suggesting that all were taken on board in the same general region. Unlike the cargo, which cannot be used to indicate a ship's home port, a ship's galley wares, among which oil lamps are to be included, are excellent indicators of a ship's port of origin. The evidence of these oil lamps, along with several bowls for shipboard use thus represents one of the strongest indications that the ship's home port was in the vicinity of Tell Abu Hawam or slightly farther north along with Levantine coast. CP

1. Pulak 1988, p. 12, fig. 7, p. 13; Bass 1986, pp. 284–85, 286, ill. 21.
2. For a similar fabrication method of pilgrim flasks from Beth-Shan, see James and McGovern 1993, pp. 100–101.
3. Biran and Ben-Dov 2002, pp. 77–78, 88–91.
4. Yadin et al. 1960, pl. CXXX:8–13.
5. Hamilton 1935, p. 42, no. 255.
6. Oren 1973, figs. 41:4, 44b:27, 30, 31.
7. Pritchard 1963, fig. 8:25.
8. Ben-Arieh and Edelstein 1977, p. 23, fig. 11.1–4, pls. III:4, IX:3–4, XII:3.
9. Tufnell 1958, p. 217, pl. 84, no. 955.
10. Nearly half the flasks have capacities of under 2 liters, and seven are more than 6 liters, approximately the average capacity of the small Canaanite jars on the ship (see cat. no. 190).
11. Davies and Faulkner 1947, pl. 8; Davies 1963, p. 14, pl. 15.
12. Pulak 1988, p. 12, fig. 6, p. 13; Bass 1986, pp. 285, 287, ill. 22.
13. Bass 1986, pp. 285–87, ill. 22; Pulak 1988, pp. 12–13, fig. 6. A total of 27 Cypriot lamps were among the assemblage of Cypriot pottery on the Uluburun ship.
14. Pulak 1997, p. 252.
15. Negbi 1989, fig. 5.7: 9.
16. Hamilton 1935, p. 23, no. 93, p. 49, no. 300.
17. Loud 1948, pls. 9–12.
18. Biran and Ben-Dov 2002, pp. 78, 92–93.
19. Yadin et al. 1960, pp. 149–50.
20. Tufnell 1958, pl. 73, especially classes F and G.

193a–e
Cypriot Pottery

Ceramic

a. Bucchero jug
Height 16.2 cm (6⅜ in.); diameter 11.4 cm (4½ in.)
8.31.84 (KW 15)

b. White Slip II milk bowl
Height 8.2 cm (3¼ in.); diameter 15.1 cm (6 in.)
27.6.98 (KW 5734)

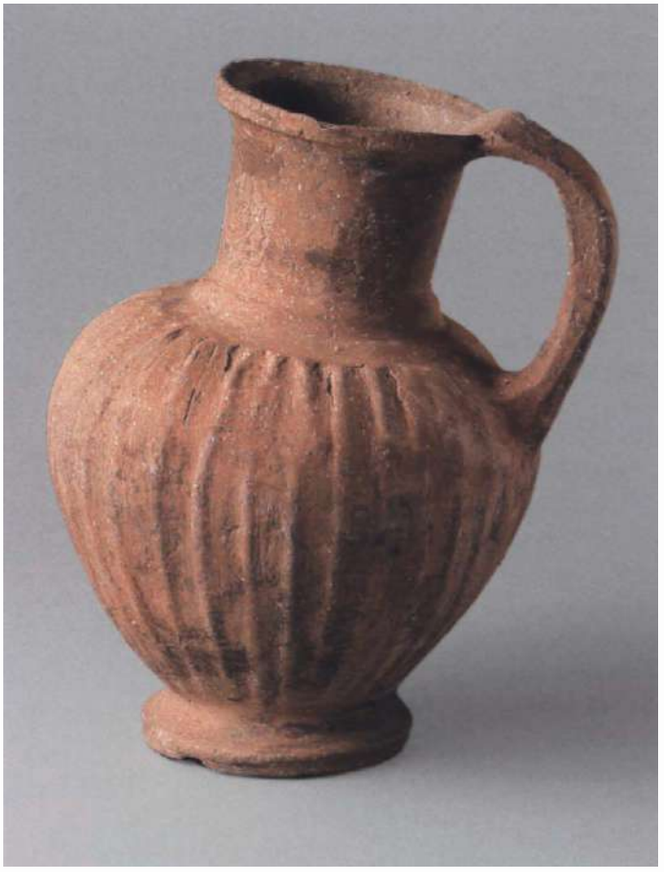
c. Base-Ring bowl
Height 7.5 cm (3 in.); width 18 cm (7⅛ in.)
11.31.84 (KW 18)

d. Lamp
Height 4.3 cm (1¾ in.); length 13.3 cm (5¼ in.)
15.31.84 (KW 23)
(Three lamps are shown on p. 322)

e. Wall bracket
Length 39 cm (15⅜ in.)
14.4.88 (KW 1539)

Uluburun shipwreck
Late Bronze Age, ca. 1300 B.C.
Bodrum Museum of Underwater Archaeology, Turkey

At least 3 of the 10 pithoi (large ceramic transport containers) stowed on the ship that sank at Uluburun contained Cypriot pottery: Bucchero jugs, lug-handled bowls, milk bowls, Base Ring bowls and a single juglet, White Shaved juglets, lamps, and wall brackets—about 140 pieces in total, excluding the pithoi. The Uluburun shipment and the ceramic cargo jettisoned off Point Iria on the Greek mainland a century later are the only extant excavated direct archaeological evidence for the transport of pottery in the eastern Mediterranean during the Late Bronze Age.[1] These examples of ceramics-in-transport are highly significant for what they tell us about how pottery was procured and organized for shipment. This, in turn, is important because archaeologists often view imported ceramics as significant indicators of exchange and chronological synchronization.



193a



193b



193c



193d

The Cypriot ceramic cargo at Uluburun was not the primary cargo of the ship, nor even of the containers in which it was packed. Bowls found on the seabed in tightly packed stacking arrangements would have only partially filled the pithoi. Each pithos carried a different assortment of pottery. The Bucchero jug (a), for example, was one of three found on the wreck, all packed into a single pithos. Similarly, another pithos held the only examples of a unique variety of White Slip bowls. None of the pithoi contained a homogeneous shipment, and there was diversity even among vases of a particular type shipped in one container. For instance, the Base Ring bowl (c) is one of two varieties of this shape found on the wreck. Both types were found nested together in a spill of pottery that fell from the third pithos (fig. 104), still in a coherent stack in spite of having been shaken out of their container as it lurched down the sloping surface.

The wall bracket (e) fell from the same pithos. Whatever the function of these enigmatic objects—most likely they served as lamps or lamp holders—it is somewhat surprising to find these clunky, coarse-ware



193e

Figure 104. Author excavating Cypriot ceramics spilled on seabed. Uluburun shipwreck.



pieces packed alongside fine tablewares. Also surprising is the discovery of non-Cypriot ceramics packed together with Cypriot vases. Inside the krater was a White Slip bowl (b) stacked with another milk bowl in a carinated bowl that was probably made in the Levant. Herein lies the key to understanding the diversity of this mixed lot: it was a secondary cargo, relative not only to the shipment of ingots and luxury items carried on board this ship, but also in the sense that it was picked up not at any single primary production center, but rather at a trading entrepôt, likely located on the Levantine coast. These Cypriot artifacts thus provide a view into the complexity of exchange within the eastern Mediterranean during the latter half of the second millennium B.C.

NH

1. Most of the ceramics found on the Cape Gelidonya ship, the one other excavated wreck from this area and era, were probably in use on board the ship rather than transported as cargo.

194a, b

Ostrich Eggshell and Glass Base

a. Ostrich eggshell
Height 13.6 cm (5⅜ in.); diameter 12.4 cm (4⅞ in.)
7.4.88 (KW 1391)

b. Base
Blue glass
Diameter 6.4 cm (2½ in.)
Lot 3783 (2006/4/28A)

Uluburun shipwreck
Late Bronze Age, ca. 1300 B.C.
Bodrum Museum of Underwater Archaeology, Turkey

In addition to many ostrich eggshell beads (cat. no. 195), the Uluburun ship carried three ostrich eggshells, one of which was found intact.[1] All three eggs had been decanted of their contents in antiquity by means of a 2.5 centimeter hole chipped through at one end. The thickness of the eggshell at the hole is about 0.2 centimeters, roughly the same as that of the ostrich eggshell beads. The eggshells were undoubtedly exotica destined to be transformed by local artisans into ornate jugs or vases by the addition of bases, spouts, and perhaps other components of faience, precious metals, and additional materials. That the hollow eggshells did not float away in the course of the ship's sinking, and that one of them survived intact, suggests they were packed snugly in a strong container, perhaps a box made of wood, kept in a compartment at the stern of the ship. Nearly all the eggshell fragments recovered from the site during excavation joined one of the two broken eggshells, indicating that only three eggshells were carried on the ship.

The eggshells could have been obtained in Africa or the Near East, since ostriches inhabited both continents in the Late Bronze Age.[2] Cups made by slicing off the top quarter of an ostrich eggshell—found in burials dating to the mid- to late third millennium B.C., in Syria and Mesopotamia—probably came from the Asiatic variety of the ostrich.[3]

On the Levantine coast, excavations at Byblos have also revealed a complete



eggshell found in an Early Bronze I tomb,[4] and eggshell fragments have been found at Tel Arad.[5] Two intact eggshells were recovered at Sahab from a Late Bronze II–Early Iron I tomb.[6] Eggshells have been unearthed in three tombs at Enkomi on Cyprus.[7]

Ostrich eggshells, along with ebony, ivory, and other exotic goods, were transported to the Aegean in unfinished form. They are conspicuous indicators of long-distance trade between the Levant and the Aegean (especially Crete), from the Early Minoan II period at Palaikastro[8] until the Late Cycladic period at Phylakopi on Melos. This trade cannot have involved many recipients. It is highly likely that only palace residents or the affluent could mobilize the resources necessary to operate a workshop for the final production of such luxury goods.

One popular use of ostrich eggshell was in the manufacture of rhyta, or ritual libation vessels, two examples of which were found at Akrotiri on Thera.[9] Rhyta were fashioned by making a large hole in one end of the eggshell for the attachment of a neck piece, while a second hole was made at the opposite end for the positioning of a foot. These attachments were made of gold, silver, bronze, faience, or wood.[10] Rhyta were important pieces of cultic equipment, often imitated in both stone and clay (see pp. 426–30).[11] An ostrich eggshell rhyton with mountings of gold, silver, bronze, and faience was discovered in a royal tholos tomb at Dendra,[12] reflecting the prestigious value of such items. Ostrich eggshell vases have been found on Crete, Rhodes, the Greek mainland at Mycenae, and Ayios Stephanos;[13] they are often embellished with incised decoration. On Crete they are found at Zakros,[14] and an eggshell—originally identified by Evans as fragments of a marble vase[15]—was excavated in the palace at Knossos in the Middle Minoan IA level of the Vat Room deposit.[16] On the Greek mainland they are found at Mycenae and Gla.[17] Painted fragments have been recovered from the Temple of Athena on Chios.[18]

Elsewhere in the Aegean, eggshell fragments are found at Troy.[19] Unworked ostrich eggshell fragments excavated at the fourteenth-century B.C. outpost at Marsa Matruh on Bate's Island off Libya were found with Minoan, Mycenaean, and Near Eastern ceramics.[20] Presumably, ostrich eggshells could have been transported directly to the Aegean from the Libyan coast. More likely, they were shipped eastward to Egypt and the Levantine coast, perhaps by ships returning from the Aegean in a counterclockwise circuit or by overland routes. Eggshells from both Africa and Asia would have been exported by ships sailing from Late Bronze Age Levantine ports to the Aegean,[21] perhaps by way of Cyprus, where contemporary finds of such shells are abundant.[22]

The purpose of the blue glass disc, found at the stern of the ship, was undetermined until recent examination suggested that it served as a base for an ostrich eggshell vase. If so, this would provide unique evidence for the exportation of ostrich eggs to the Aegean as finished products.[23] The glass base appears to be mold formed with a raised rim and a concave center, which would have supported the egg, though the thinnest portion is worn through. Originally opaque blue in color, these devitrified areas are now covered with a whitish crust.

At present, it is not known whether two of the eggshells were being shipped as raw exotica or if all three were intended to be worked into ornate vases displayed atop bases of glass or another material. In either case, these eggshells were most likely destined to serve as gifts for elite recipients.

CP

1. Pulak 2005c, p. 79; Pulak 1997, p. 242. For a discussion of ostrich eggshells in antiquity, see Caubet 1983; Reese 1985a; Conwell 1987; and Moorey 1994, pp. 127–28.
2. Conwell 1987, p. 29; Reese 1985a, p. 378.
3. Mackay 1925, p. 136; Moorey 1970, pp. 105, 116, 118, 120, 122. See also Hansen in *Art of the First Cities* 2003, no. 70b (Ur), and Porter and McClellan in ibid., p. 184 (Tell Banat).
4. Dunand 1945, pl. I:b, d.
5. Amiran 1978, p. 58, pl. 120:8.
6. Dajani 1970, p. 34, pl. II:SA151, 52.
7. Dikaios 1969, p. 367, pl. 211:42; Åström 1972, pp. 557, 616; Reese 1985a, p. 371. One example, from a Late Cypriot II tomb, had a hole and is believed to be associated with an ivory piece from the same tomb, which may have been a spout: Åström 1972, pp. 557, 616.
8. Dawkins 1904, pp. 201–2.
9. S. Marinatos 1972, p. 35, pls. 36:b, 81:a,b.
10. Sakellarakis 1990, p. 285. For a broad discussion of ostrich eggshells in Aegean contexts, see Sakellarakis 1990. Sometimes the underside was only painted and, rarely, handles were added.
11. Ibid., p. 295. Sakellarakis (p. 285) notes twelve examples of such rhyta from the Aegean.
12. Persson 1931, pp. 37, 54, pl. III.
13. Cline 1994, pp. 237–39, nos. 940–43, 947–49, 951–54.
14. Platon 1971, p. 159.
15. Panagiotaki 1998, p. 180, pls. 33:a, 34:b.
16. Cadogan 1980, p. 28.
17. Cline 1994, pp. 237–38, nos. 945, 946.
18. Boardman 1967, p. 243, pl. 97:604.
19. Blegen, Caskey, and Rawson 1953, p. 264.
20. White 1986, pp. 79, 82; Conwell 1987; White 2002, pp. 60–64.
21. Caubet 1983, p. 195.
22. Reese 1985a, pp. 371–72. See Reese 1985a for a summary of ostrich eggshells in Cypriot, Aegean, Near Eastern, and western Mediterranean archaeological contexts.
23. Unlike Aegean examples, this base would have allowed the egg to stand upright on its own.

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Disc-shaped Beads

Ostrich eggshell
Length 19 cm (7½ in.)
Uluburun shipwreck
Late Bronze Age, ca. 1300 B.C.
Bodrum Museum of Underwater Archaeology, Turkey 2006/4/30A

Seventy-six individual disc-shaped ostrich eggshell beads were gathered from the Uluburun shipwreck.[1] All are cylindrical in shape, with smooth edges. Most have an hourglass-shaped cross section at the perforation, which likely resulted from the method of drilling the central stringing hole.

The Uluburun ship carried many exotic items, both as raw materials and in finished form. Among the more delicate were ostrich eggshells (cat. no. 194a) and these beads. It is difficult if not impossible to determine whether the beads were personal possessions of those on board or if they were intended as gifts along with the eggshell vases and other items on the ship.

Most ostrich eggshell beads are initially shaped roughly by chipping, after which a hole is bored at the center to produce a bead with jagged edges. These crude forms are then ground smooth on their circumference by rubbing the edges against an abrasive stone, which usually produces an asymmetrical bead with irregular edges. The Uluburun examples, however, were manufactured in a different manner. Their central holes and outer edges exhibit great regularity and were



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likely formed with a tubular drill, allowing the outer surface to be shaped simultaneously with the central perforation by means of an added central projection on the drill bit. Although tubular drills existed as early as the late third millennium B.C.,[2] this particular method of bead manufacture has yet to be verified by technical examination.

Discoid ostrich eggshell beads are among the earliest known manufactured ornaments and are quite common at Late Paleolithic and later prehistoric sites along the Nile in Egypt.[3] Since Neolithic times, ostrich eggshells have been fashioned into beads and other shapes to make pendants, necklaces, belts, and anklets.[4] Outside of Africa ostrich eggshell beads are rare. They have been found in Early Bronze IV–Middle Bronze I transition (ca. 2300–1900 B.C.) contexts in the Negev Highlands, where Rekhes Nafha and the Camel Site have revealed implements, debris, and sandstone grinding stones associated with the manufacture of beads.[5]

In the Early Bronze Age cemetery of Bab edh-Dhra, on the southeastern Dead Sea plain, ostrich-eggshell beads were placed with the skeletal remains.[6] The so-called Copper Age Site H at Beth-Pelet produced not only ostrich eggshell beads, but also sandstone bead grinders.[7] Ostrich eggshell beads—blackened from either fire or cremation[8]—have also been found in the central Mediterranean in the Bronze Age Tarxien Cemetery of Malta (ca. 2500–1500 B.C.);[9] the presence of these imported items in Tarxien may reflect possible connections with the eastern Mediterranean. The frequent occurrence of ostrich eggshells or their fragments at many Late Bronze Age sites in the eastern Mediterranean demonstrates their popularity as objects, yet the near total absence of ostrich eggshell beads at the same sites is difficult to reconcile. CP

1. Owing to their minute size and indistinct creamy white color, some beads could undoubtedly have been missed during excavation.
2. Kenoyer 1997, p. 271; Moorey 1994, p. 56.
3. Manlius 2001, p. 947.
4. Such objects are still made today by the Bushmen of the Kalahari Desert in southern Africa. Conwell 1987, p. 30.
5. Saidel 2002, pp. 40, 58–59, 60.
6. Chesson 2007, pp. 117–19.
7. MacDonald 1932, p. 12, pls. XXIV:45, XXVI:54.
8. M. Murray 1934, p. 3.
9. J. Evans 1959, p. 175.

196

Inlaid Rings

Shell, bitumen
Diameter 2.1–2.5 cm (⅞–1 in.); thickness 0.3–0.5 cm (⅛–¼ in.)
Uluburun shipwreck
Late Bronze Age, ca. 1300 B.C.
Bodrum Museum of Underwater Archaeology, Turkey
14.6.98 (KW 5106), 16.19.90 (KW 2201), 22.8.96 (KW 4182), 26.19.90 (KW 2335), 9.6.98 (KW 4877), 8.13.93 (KW 3259), 32.7.95 (KW 3525), 10.4.88 (KW 1501), 35.5.90 (KW 1952), 7.13.93 (KW 3219)

Included in the finds from the Uluburun ship were 28 shell rings.[1] The groove cut around the exterior circumference of each ring contains bitumen, a petroleum-based natural asphalt, for affixing decorative inlays, now lost. This characteristic is unique to the Uluburun rings. Most of the rings were found scattered just aft of amidships, indicating that they were originally stored at the stern along with most of the other precious items on board. The large number of rings suggests that they were likely prestige gifts or valuable cargo items rather than personal effects of those on the vessel.

The ring assemblage exhibits three different patterns of inlays, as revealed by the impressions visible on the bitumen layer. Of these, 19 rings are embellished with the same pattern, while one pattern is either unique or also represented on a second ring but on which the bitumen is too poorly preserved to be certain. The sharp, irregular edges of the impressions suggest that the inlays were fashioned from bits of colored glass, which have since disintegrated.[2] This conclusion finds some corroboration in traces of a white powdery material in the recesses of some inlay depressions.[3] The black bitumen used as the adhesive backing for the inlays also forms a part of the decorative scheme, visible around many of the inlay pieces.

The most common pattern of embellishment used on the rings is that of a varied number of alternating circles and rectangles (seven rings depicted).[4] The bitumen on some of the rings is poorly or only partially preserved, making it impossible to determine with certainty the number of inlays used in each ring, although it would appear to range from eleven to thirteen.



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At least seven rings are of a design in which standing triangles alternate with inverted triangles, resulting in a close-fitting arrangement. Again, the number of inlay pieces varies, in this case from 26 to 36.[5] The most intricate and possibly unique inlay design in the assemblage consists of rectangles alternating with larger rectangles composed of four triangles, sometimes quadrilaterals, placed so that their peaks meet at the center.[6]

The effort expended in acquiring, shaping, and polishing the Uluburun rings would have followed the practice in crafting shell rings found elsewhere, but the exterior grooves were a further complication. The inlay work would have required much additional patience and skill. The Uluburun shell rings must therefore have been highly prized prestige items, products of an accomplished artisan operating in a controlled workshop environment.

The rings are shaped from the apical ends of marine gastropod shells, most likely those of cone (*Conus*) or conch (*Strombus*) species.[7] Although the exact species cannot be determined because of the extensive modification of the shells by cutting and grinding, the large size of the rings indicates that they were not crafted from the Mediterranean cone shell (*Conus ventricosus*); rather, they were imported, almost certainly as finished products, along with five "buttons" or ornaments found on the wreck, also of cut and ground-down cone or strombus whorls. These finely crafted imported objects contrast sharply with the simplicity of the few objects found on the ship that were made of local shells, such as beach-polished apertural lips of Mediterranean bonnet shells (*Phalium undulatum*), two cockleshells (*Glycemeris*) used as spoons or scrapers, and water-polished fossil and semi-fossil shells and shell fragments.

Chemical analysis conducted on the bitumen from three of the Uluburun shell rings has revealed that it originated from a single Mesopotamian source, probably one of the natural seepages in the region of Hit,[8] where bitumen was also extracted for use at Mari.[9]

Seashell rings have been found in Late Bronze Age contexts in the Aegean, Cyprus, and Syria,[10] but these examples are carved from native Mediterranean top shells (*Mondonta* sp.). Two shell rings, contemporary with and probably made of a species similar to those at Uluburun, were found at Megiddo.[11] While such shell rings are rare in the Mediterranean, they are not uncommon in Mesopotamia, with more than 1,431 examples coming from 'Usiyeh alone, dating to the early second millennium B.C.[12] Other Mesopotamian examples have been found in burials, one including 19 ring-shaped shell ornaments laid across the midsection of a body, which were likely strung together for interment.[13] This suggests that they may have been linked together to form a belt as was probably the case earlier at Kish[14] and also at Ur.[15] Contemporary parallels are also found in Dilmun (Bahrain).[16] Although some of these rings were intricately decorated with incised figured and geometric designs, none display the expert craftsmanship of the Uluburun rings, nor do they retain traces of bitumen. Nevertheless, the Uluburun rings provide evidence for trade between the Persian Gulf and the Levantine coast during the fourteenth century B.C. Shells of Indo-Pacific origin were either imported into Mesopotamia as finished rings, as may have been the case at 'Usiyeh, or they were made into rings there and probably also embellished with inlays affixed with Mesopotamian bitumen before being exported to the Levant.

CP

1. Pulak 1988, pp. 26–27, fig. 31; Bass et al. 1989, pp. 11–12, fig. 20; Pulak 1998; Pulak 2005c, pp. 85, 593.
2. In the event that inlay pieces had fallen off the rings but had survived, the sand around and under each ring was recovered and raised to the surface for sifting through fine-mesh sieves. No inlays were recovered during this procedure.
3. The white powder could be remnants of devitrified or weathered glass. The inlays could presumably have been of colored bits of faience as well, but it would seem that the impressions of the inlay edges preserved in the bitumen would have been more regular and smooth, since such faience inlays would have been shaped by casting and firing. Even in the event that they were cut and ground to shape, they still would have produced smoother edge impressions on the bitumen.
4. Catalogue nos. KW 1501, 3219, 3259, 3525, 4182, 4877, and 5106.
5. Catalogue nos. KW 1952 and 2335.
6. Catalogue no. KW 2201. Catalogue no. KW 3525 may have been embellished with the same inlay design, but its bitumen layer is too poorly preserved to make a positive attribution.
7. Moorey 1994, p. 133.
8. The bitumen from the Uluburun rings was analyzed by J. Connan of Elf Exploration Production (personal communication, May 25, 1993) using gas chromatography, for which I am most grateful; also briefly mentioned in Connan et al. 1999, p. 36.
9. Moorey 1994, pp. 332–35; Connan et al. 1999, pp. 33–38.
10. Reese 1984, pp. 237–38; personal communication.
11. Loud 1948, pl. 224:14–15.
12. Oguchi 1992, p. 69, fig. 4:1–10, pl. 4:a, b. Because partially worked shells or shell waste were not found at the site, it is likely that the rings were imported as finished items (ibid., pp. 69–70).
13. Boehmer and Dämmer 1985, pp. 8–9, 58–60, pls. 21, 22, 145, 17:2.
14. Moorey 1978, p. 77.
15. Woolley 1934, p. 243.
16. Ibraham 1982, p. 88, no. 54:9, p. 216, pl. 54:9.

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Elephant Tusk

Ivory
Height 20.1 cm (7⅞ in.); max. diameter 14.6 cm (5¾ in.)
Uluburun shipwreck
Late Bronze Age, ca. 1300 B.C.
Bodrum Museum of Underwater Archaeology, Turkey 73.31.84
(KW 162)



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A length of elephant tusk, cleanly sawn off at both ends, was recovered in good condition from the shipwreck.[1] Oval in cross section, the tusk is slightly curved and narrows toward the distal end. In addition to the saw marks evident on both ends, several cut marks are visible on the sides. The lack of any trace of the pulp cavity indicates that it was cut from the distal two-thirds of a sizable tusk. Its color is a mottled light brown stained gray green from the copper ingots on the wreck, and it exhibits slight surface pitting and deep longitudinal grain cracks. The tusk was located at the stern of the ship along with 14 hippopotamus teeth (see cat. no. 198) and other delicate and valuable objects.[2] Its placement with other trade items and the raw nature of the tusk are clear indicators that the ivories aboard were intended for trade. Small pieces of roughly worked raw and scrap ivory were also found on the ship.

Elephant and hippopotamus ivories were traded as a luxury commodity as early as the Chalcolithic period and onward.[3] An elephant tusk and worked elephant and hippopotamus ivories have been excavated in a late fourth-millennium B.C. Levantine workshop at Bir es-Safadi.[4] The Middle Bronze Age palace at Alalakh (see pp. 197–98) produced five tusks belonging to the Asian elephant; tusks have also been found at Megiddo.[5] The Amarna Letters reveal that ivory objects and tusks were a part of the gift-exchange system in the eastern Mediterranean.[6] Lacking local supplies of its own, Egypt acquired elephant ivory from Syria and Nubia. The fifteenth-century B.C. Tomb of Rekhmire at Thebes vividly depicts ivory brought to Egypt in the form of raw elephant tusks as well as a live elephant (fig. 105).[7] Extant texts from the same period in Qusr Ibrim, Nubia, mention 250 "man-loads," or up to 500 tusks, imported from "southern countries," as well as 700 tusks obtained by Hatshepsut from eastern Tjehenu (eastern Libya/western Egypt).[8] Hatshepsut also sent a fleet to the fabled land of Punt (see fig. 5) to acquire African elephant tusks,[9] and in northern Syria Thutmose III hunted Asian elephants for ivory.[10]



Figure 105. Facsimile of wall painting showing Syrians with elephant and ivory tusks. Thebes, Tomb of Rekhmire (TT 100). Dynasty 18, reigns of Thutmose III–Amenhotep II. The Metropolitan Museum of Art, New York, Rogers Fund, 1931 31.6.43

The probable Near Eastern origin of

the Linear B word for ivory, *e-re-pa*,[11] hints at a Near Eastern source for the early ivory that reached the Aegean, but it was also imported from Nubia and, probably, from North Africa.[12] The only unworked elephant tusks from the Aegean are four complete ones excavated in fifteenth-century B.C. Crete in a Late Minoan IB context at Zakros,[13] and partly worked tusk sections recovered in fourteenth-century B.C. (Late Helladic IIIA) levels at Kommos.[14] Sections of elephant tusk[15] and hippopotamus canine[16] were also found in thirteenth-century B.C. (Late Helladic IIIB) contexts at Mycenae.

From the sixteenth to the thirteenth century B.C., both elephant and hippopotamus ivory were used in the Levant and the Aegean (see pp. 406–7). Elephant tusk was the material of choice for large objects because it offered large quantities of solid ivory for carving. These objects included combs, relief plaques, figurines, and cosmetic containers or pyxides.[17] The large central pulp cavity of an elephant tusk would have facilitated the carving of a pyxis; its base and lid would have been fashioned from separate, transversally cut slabs of ivory, with the base pegged to the bottom of the pyxis body.[18]

While physical and chemical analyses can distinguish between hippopotamus and elephant ivories, there are no known scientific methods at present for differentiating between Asian and African elephants.[19] Whatever the original source, it appears that elephant and hippopotamus ivory, in the form of complete tusks and teeth as well as partly modified pieces, reached the Late Bronze Age Aegean and the central Mediterranean on ships like the one that sank off Uluburun. CP

1. Pulak 2005c, p. 583; Bass 1986, pp. 282–83, 284, ill. 18; Pulak 1995, p. 51, fig. 14.
2. Bass et al. 1989, p. 11; Pulak 2001, pp. 37–39.
3. Tusks, teeth, and bones of elephants and hippopotamus found in the Near East and the Aegean, as well as possible sources of elephant and hippopotamus ivory, are discussed in Reese 1985b.
4. Ibid., pp. 394, 399; Mellaart 1966, pp. 28–31; Perrot 1955, p. 172, n. 24.
5. Barnett 1975, pp. 164–65, n. 3; Scullard 1974, p. 30.
6. Peltenburg 1991, p. 170.
7. Davies 1973, pls. XIX, XX, XXIII.
8. Hayward 1990, pp. 104, 107.
9. Breasted 1962, p. 109, no. 265.
10. Crowfoot and Crowfoot 1938, p. 54; Collon 1977, pp. 219–20.
11. Ventris and Chadwick 1973, pp. 343–46.
12. Hayward 1990, pp. 103–4.
13. Platon (1971, pp. 116, 120, 245, 61 with figure) mentions only three, but Reese (1985b, p. 400) notes that four tusks were found; Krzyszkowska 1988, p. 230.
14. Reese and Krzyszkowska 1996, p. 324.
15. K. Wardle 1973, pp. 339–40, fig. 23, pl. 61; Reese 1985b, p. 400; Cline 1994, p. 234, no. 908.
16. Cline 1994, p. 235, no. 917; Reese 1985b, p. 393; Krzyszkowska 1984, p. 124.
17. For the variety of Mycenaean objects made of ivory, see Poursat 1977a; Krzyszkowska 1988, pp. 209, 230–31.
18. Krzyszkowska 1988, p. 212.
19. Stable isotope analysis has been used to source ivory from modern African elephants, but the methodology for its application to archaeological specimens has yet to be developed. See Vogel, Eglington, and Auret 1990.

198a, b
Hippopotamus Teeth

Ivory

a. Incisor

Length 31.2 cm (12¼ in.); diameter 5 cm (2 in.)

2006/4/12A (KW 2893)

b. Canine

Length 25.5 cm (10 in.); diameter 4.5 cm (1¾ in.)

2006/4/11A (KW 5187)

Uluburun shipwreck

Late Bronze Age, ca. 1300 B.C.

Bodrum Museum of Underwater Archaeology, Turkey



198a, b

The Uluburun ship carried 14 complete and unmodified hippopotamus teeth consisting of eight incisors and six canines.[1] The lower left canine (p. 329, right), which is the largest tooth of a hippopotamus, is naturally curved, is of subtriangular cross section, and has a pulp cavity occupying its proximal end. A hard, ridged enamel covers the two outward faces, with the third covered only with cementum. A marked wear facet at the distal end was caused by grinding against the upper canine. Other than a crack along the natural fracture of the tooth, it is well preserved.

The lower incisor (left) is straight, with a subcircular cross section. As with the canine, a tapering pulp cavity occupies its proximal end, which is chipped and cracked. The distal end, which shows some surface loss, is partly flattened by grinding, with the outer surface covered only with cementum.

Hippopotamus ivory is generally denser, harder, finer grained, and whiter than elephant ivory, and retains its whiteness over time instead of turning yellow.[2] Its limited size, however, precludes the carving of large pieces. Moreover, both the enamel and cementum have to be removed to facilitate carving, which is one of the drawbacks of using lower canines.[3]

Hippopotamus ivory was commonly exploited in the Levant at least from the Chalcolithic period into the Iron Age (see pp. 406–7).[4] Archaeological evidence shows that hippopotamus teeth were fashioned into a variety of small objects, including seals, inlays, and plaques.[5] It was traded over long distances, reaching Cyprus[6] and the Aegean by sea, where ivory objects on Crete first appeared during the third millennium B.C.[7] A fragment of a hippopotamus lower canine was found at Knossos in an Early Minoan context, suggesting that ivory in the form of hippopotamus teeth reached in the Aegean from the earliest days of ivory working in the region.[8]

The concentric growth rings, or lamellae, of hippopotamus ivory are wavy and discontinuous, unlike elephant ivory, which has smooth, even layers, making distinction possible between the two types.[9] It would now appear that certain small carvings, previously assumed to be of elephant ivory, may instead be of hippopotamus ivory. Reexamination of some earlier Bronze Age Minoan ivory objects has shown this to be the case[10] and indicates that the use of elephant ivory became more the norm in the Aegean later, during the Mycenaean period.[11] A similar reexamination of Late Bronze Age ivory objects from Ugarit in Syria has shown the majority to be of hippopotamus rather than elephant ivory.[12]

Quantities of hippopotamus and elephant ivory reached Aegean artisans in the form of raw teeth and tusks on ships like the one that sank at Uluburun. While the full implications of the trade in hippopotamus ivory cannot be assessed based on the existing finds, it would seem that hippopotamus teeth were more commonly used as a source of ivory than hitherto believed.

CP

1. Bass 1986, pp. 283, 285, ill. 19; Bass et al. 1989, p. 11, fig. 20; for color illustration, see Pulak 1995, p. 51, fig. 14; Pulak 2001, p. 39; Pulak 2005c, pp. 78, 583.
2. Krzyszkowska 1990, p. 38; Horwitz and Tchernov 1990, p. 67.
3. Krzyszkowska 1990, p. 42.
4. Horwitz and Tchernov 1990, pp. 67–68.
5. Krzyszkowska 1988, pp. 215–26.
6. Various Bronze Age ivory objects from Cyprus have recently been shown to be made of hippopotamus incisors and canines. See Reese 1998, p. 140.
7. Krzyszkowska 1984, p. 123.
8. Ibid., pp. 124–25, pl. XIIIa (right); Reese 1985b, p. 393; Reese 1998, p. 142. A large fragmentary hippopotamus lower canine was discovered in a much later context at Mycenae. See Krzyszkowska 1984, p. 124, pl. XIIIa (left); Krzyszkowska 1988, p. 210; Reese 1985b, p. 393.
9. Krzyszkowska 1988, pp. 211–15, pls. 24:b–d, 25:b; Krzyszkowska 1990, pp. 42–47, figs. 17–19.
10. Krzyszkowska 1988, pp. 228–29.
11. Ibid., pp. 230–32.
12. Caubet and Poplin 1992, pp. 92–93, 100.

199a, b
Duck-Shaped Vessels

Ivory

a. Height 9.2 cm (3⅝ in.); width 8.8 cm (3½ in.); length 20.4 cm (8⅛ in.)
62.7.92 (KW 2818), 53.8.96 (KW 2818), 58.7.95 (KW 2818), 26.8.96 (L10019)

b. Height 8.8 cm (3½ in.); width 5.7 cm (2¼ in.); length 17.8 cm (7 in.)
60.7.95 (KW 2534), 51.19.90 (KW 2534), 63.7.92 (L6582), 59.7.95 (L9014)

Uluburun shipwreck
Late Bronze Age, ca. 1300 B.C.
Bodrum Museum of Underwater Archaeology, Turkey

Among the most impressive finished-ivory objects recovered from the Uluburun ship are two duck-shaped vessels, presumably containers for holding cosmetics, unguents, or other similar materials. Although different in shape and style, both vessels have a pair of pivoting wings that serve as lids for the body cavities.[1] They were found disarticulated, with various components spilled into deeper parts of the site; most of them, however, were recovered among the three rows of copper oxhide ingots stowed forward of amidships. Because this is an unlikely area for such delicate objects, we can assume that the vessels floated down from the stern of the ship where most of the other fragile and valuable objects were kept.

The duck vessel shown opposite, above, is the larger and more complete of the two vessels. It is composed of an ivory head, hollow body, neck, two wings, two wing



Figure 106. Fragmentary ivory duck-shaped vessel. Alalakh, Level II. Late Bronze Age. Antakya Archaeological Museum 6082



199a



199b

pins, and a base plaque.[2] These pieces, as well as the missing legs, were held together with pins. The shape of the back of the head and the upper neck clearly indicates that the head faced forward. The hollow body was covered by the wings, which pivoted on small mushroom-headed pins to reveal the contents inside. The double lids are flat pieces of ivory carved into the shape of wings, and include a portion of tail feathers, or retrices. Two S-shaped bands, one wide and one narrow, divide the wings into three zones, and a third band separates the wing from the integrated partial tail. The wings are embellished with shallow carved and incised designs that represent long flight feathers, or remiges, and greater and primary covert feathers. Compass-incised overlapping circles on the anterior third of the wings represent lesser and median covert feathers. The wide S-shaped band frames a guilloche pattern. The center of each guilloche circle is pierced by a small hole,

which was probably accentuated by inlays, perhaps of colored glass or semiprecious stones. The narrower central band is decorated with a series of semicircles. The wing lids were designed to create a complete tail when the two pieces were brought together to close the vessel. The shape of the tail is echoed in the carving of the body, with the wings overhanging slightly on all sides. The entire assembly is supported by a base plaque, which features a pair of duck feet carved in low, rounded relief and incised with web detailing. There are two rectangular mortises on the underside of the body for attaching the legs to secure the vessel to the base.

The vessel on page 331, below, is the smaller and less well preserved of the two. It comprises a head, a body, one wing, and a feet plaque. Like the larger example, it too is a double-winged container, although only one wing was recovered during the excavation. This wing is also a flat piece of ivory with two S-shaped bands of equal width, creating three zones. The stylized design on the wing consists of shallow carved and incised lines that represent greater and primary covert feathers. The wing's anterior zone is embellished with overlapping compass-incised circles to indicate the lesser and median covert feathers. The small holes piercing the bands likely held decorative inlays. A single larger hinge-peg hole pierces the anterior of the wing; a smaller hole on the inner posterior edge probably held a knob to manipulate the lid and to secure the two wing lids together when they were closed.

The shape of this wing differs from those of the larger vessel. The posterior end is cut at an angle, giving it a swept-back appearance. Unlike the larger vessel, the duck's body does not have an integrated tail projection. Rather, it was fitted with a separate tail component, now lost, that was attached with a pair of pins driven into two holes in the rump. The underside of the body also has sockets for the attachment of the missing legs, which would have been inserted into the webbed feet carved in low relief on the base plaque. The neck would have been affixed by a single peg inserted into a hole on the forward edge of the body. Judging from the shape of the head, it must also have faced forward. Both duck vessels were probably produced in the same workshop, perhaps even by the same hand.

The elite nature of ivory and the high level of craftsmanship suggest that the vessels represent prestige gifts or valuable trade items. Likely they served as toilet accessories of a ritual nature for cosmetics.[3]

Many duck vessels and their components have been found in the eastern Mediterranean. Although sometimes believed to represent geese rather than ducks,[4] the birds are mostly modeled after the Egyptian Goose, of the Shelduck subfamily. The vessels may be grouped into two general types: those with single oval lids and those with double-wing lids. The former appear to be of Canaanite inspiration and the latter, to which the Uluburun examples belong, are of Egyptian derivation.[5] The more naturalistically rendered double-lidded duck vessels have two wings that pivot outward in opposite directions from a point on the forward edge of the body, while the stylized single-lidded variety pivots in either direction from a similar point (see cat. nos. 201, 202). Both vessel types appear to have been equally valued, with the single-lidded version encountered slightly more frequently in the archaeological record.[6]

Duck vessels from the Levantine coast are approximately contemporary with those found in Egypt. The Uluburun examples seem to incorporate features of both types. The compass-drawn circles and straight lines representing feathers appear to be Canaanite in style. The integration of the tail into the body is probably an Egyptian trait.[7] The transformation of the Egyptian-style tailed body into an ovoid shape and its embellishment, including the entire underside, with chevrons or circles and semicircles representing body feathers, seem to be of Cypriot design.[8]

The closest parallels for the Uluburun ducks are seen among vessels from Egypt that represent a double-winged duck held by a nude swimming girl with outstretched arms (see cat. no. 200).[9] They are often referred to as "spoons"[10] and are almost exclusively made of wood.[11] Although there are differences in material and the Uluburun vessels do not feature a nude swimming girl, the waterfowl portions of the spoons are remarkably similar to the larger of the duck vessels.[12]

No complete double-winged duck vessels are known from outside of Egypt. Many incomplete vessels or fragments have been found on the Levantine coast and Cyprus. Examples are found at Megiddo,[13] Tel Dan,[14] Kamid el-Loz,[15] Meskene-Emar,[16] Ugarit,[17] Alalakh (fig. 106),[18] and Tell Qasile.[19] On Cyprus, parallels are found at Enkomi[20] and Kition.[21] The earliest duck vessels with both single and double lids are found in Late Bronze Age II contexts, but the great majority of them are from the Late Bronze Age III period, with the exception of a single-lid type body fragment found at Ugarit and a pair of wings from Kamid el-Loz, which date to Late Bronze Age I.[22] They continue in use until the early Iron Age.

The Uluburun duck vessels represent the only relatively intact examples of the two-winged type found in this region. They provide the only evidence for the manner in which these vessels were fitted with base plaques having carved duck feet, and they help us to interpret similar plaques found elsewhere.[23] The wings of the Uluburun examples are also distinctive, with the addition of a central zone representing primary and greater covert feathers. In Egypt, the cosmetic spoons with ducks and nude swimming girls also feature a middle zone of feathers. Outside Egypt, the closest parallels in style and execution for the Uluburun wings are from Megiddo, although these do not denote the central feather zone. The Uluburun duck vessels thus represent Canaanite versions of Egyptian spoons in which the female form has been eliminated and the swimming duck is instead supported with legs and feet for a base. As such, they provide strong stylistic evidence of an Egyptian origin for the two-winged duck vessels produced in the Levant.

Ivory held an important place among value-laden objects used as prestige gifts, whether in raw form, such as tusks, or as finished products. It was also the material of choice for Near Eastern duck containers. Only four duck vessels, all of the single-lidded type, have thus far been found in the Aegean.[24] If the Uluburun duck vessels were part of the cargo, as is likely, evidence is provided for the exportation of the first double-winged vessels from the Levant.

CP

1. Pulak 2005c, pp. 83, 605, fig. 128; Pulak 1997, pp. 244–45, fig. 13; Pulak 1995, pp. 54–55, fig. 28.
2. The components of the duck containers have not yet been examined to determine if they are of elephant or hippopotamus ivory. The body of cat. no. 199a is quite wide and likely to

have been fashioned from elephant ivory, while the other components are smaller and may have been crafted from hippopotamus ivory.

3. Reports of a Dynasty 18 vessel in the form of a swimming nude female pushing a duck, which contained ointment (Kozloff 1992, p. 331), have been disputed; see cat. no. 200.
4. Ibid., p. 332.
5. Gachet-Bizollon 2007, p. 66.
6. Ibid.; see also the convenient inventory of both types compiled on pp. 67–70.
7. Ibid., pp. 60–61, 65.
8. Ibid., pp. 61, 66.
9. The only example of this type of vessel outside of Egypt was found on Cyprus. Perhaps in keeping with the tradition of Near Eastern duck vessels, it is made of ivory. Murray, Smith, and Walters 1900, pp. 14–15, with fig. 21; Gachet-Bizollon 2007, p. 64, fig. 20, p. 66.
10. Although there are many more examples of spoons with nude swimming girls supporting various spoon bowls, only about a dozen complete or nearly complete duck versions are known with perhaps another dozen or more fragmentary examples throughout the museums of the world; *Egypt's Dazzling Sun* 1992, pp. 331, 347–48.
11. Drioton 1949, pl. 105; Petrie 1891, pl. 18; Vandier d'Abbadie 1972, pp. 44–45 or 117–19. For examples of these vessels, see *Egypt's Dazzling Sun* 1992, p. 331, fig XI.1, p. 347, fig. XI.75, with color photograph on p. 365, pl. 39; Vandier d'Abbadie 1972, pp. 10–11, 13 or 1–3; Saleh and Sourouzian 1987, pl. 157.
12. An example from the Musée du Louvre (cat. no. 200) is particularly close; Vandier d'Abbadie 1972, pp. 10–11, 13 or 3. See also *Egypt's Dazzling Sun* 1992, pp. 347–48, fig. 75, p. 365, pl. 38.
13. At Megiddo, there are at least five heads, three bodies, and six different wings of which three are paired. This indicates that there must have been at least six double-winged duck vessels among the ivories found (Loud 1939, pl. 12:45–53, pl. 24:129, pl. 30:157, pl. 31:158, with various duck heads in pl. 45).
14. Biran and Ben-Dov 2002, pp. 141–44, with figs. 2.101 and 2.102, pl. IIIa; Biran 1971, pl. a; Biran 1970, p. 119.
15. W. Adler 1996, p. 105, fig. 2; Metzger 1993, pl. 46:3, nos. 9976, 1143, 1149, and also no. 1034; Hachmann in *Frühe Phöniker im Libanon* 1983, p. 163; Hachmann and Kuschke 1966, pl. 20:9.
16. Beyer 1982, p. 123, fig. 1.
17. Gachet-Bizollon 2007, pp. 46–47, 357, pl. 7, p. 415, pls. 65, 66.
18. Woolley 1955, pl. 75.
19. Although of a later, Iron Age date, the rectangular body with integrated tail is of interest in showing the continuation of this style; Mazar 1975, p. 81, pl. 7:C.
20. Murray, Smith, and Walters 1900, pp. 32, 41; Gallis 1973, figs. 4, 5; Courtois 1984, p. 576, fig. 18:12, pl. 6:11; Gachet-Bizollon 2007, pp. 69–70, and p. 63, figs. 16a and 18a, for drawings of one of the unpublished examples.
21. Karageorghis and Demas 1985, pls. CXXI no. 5332, CXXXV, and CCIV no. 2526.
22. Gachet-Bizollon 2007, pp. 50, 66.
23. Three base plates with crudely incised duck feet are found at Megiddo (Loud 1939, pl. 25:143–45) and one from Tel Dan (Biran and Ben-Dov 2002, pp. 142–43, fig. 2.101:204).
24. They are from Rhodes (Ialysos), Crete (Zafer Papoura), and the Greek mainland (Mycenae and Asine), all listed in Gachet-Bizollon 2007, p. 51, table 4.

200

Duck-Shaped Container with Female Swimmer

Wood, ivory

Width 5.5 cm (2⅛ in.); length 29.3 cm (11½ in.)

Egypt

New Kingdom, Dynasty 18, reign of Amenhotep III, ca. 1390–1352 B.C.

Musée du Louvre, Paris, Département des Antiquités Égyptiennes E218

Although often referred to as cosmetic spoons because they were found among personal belongings in Egyptian tombs, the meaning of these fascinating Egyptian offering containers remain to be fully explained. No clear traces of the original contents have been detected on their wood or ivory surfaces, unlike Egyptian cylindrical compartmented boxes (see cat. no. 270). Moreover, the often fragile handles, made of thin layers of carved wood, hardly lend themselves to frequent use.

Lacking evidence of a practical purpose, the form and decoration of these objects may help with their interpretation. The absence of any explicit correspondence with deities, in the form of attributes or inscriptions, encourages us to seek a symbolic system common to the entirety of the imagery they bear. Scenes presented include ritual offerings, the royal cartouche, the bucolic world of the Nile as an emblem of rebirth (marshes, boats on the river, harvesting, tilapia fish, ducks), and female eroticism (nude young women, swimmers). The rare inscriptions, with wishes for the new year or good fortune, may provide a key to their meaning; such vessels could have been objects for private use exchanged on the occasion of the great renewal feast of the Egyptian calendar, a time when Egyptian royalty also renewed itself.

This object, in the shape of a duck and a female swimmer, presents a surprising combination of Egyptian and Levantine elements. The woman's form and facial features unquestionably speak for the Egyptian style under the reign of Amenhotep III. On the other hand, the wings of the duck have the same contours as those (in ivory) found in the Uluburun shipwreck (see cat. no. 199a, b). As for the duck's head, which is of ivory and disproportionately large in relation to the swimmer, the



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details around the base of the beak are similar to those on lidded boxes discovered at Ugarit (see cat. no. 201),[1] on the basis of which one may suppose a common place of manufacture. This type of object, made during the fourteenth century B.C., hints at an artistic community that shared forms and exchanged detachable parts, with itinerant craftsmen active in an area that stretched from the Levant (especially Ugarit) to the palaces of Egypt.

Here, the duck's body is carved from the same piece of wood as that of the swimmer, which certainly marks it as Egyptian. Nevertheless, the origin of the lidded boxes of wood in the form of ducks and gazelles found in Egypt has yet to be elucidated. Conceptually similar to ivory boxes of the "duck and duckling" type of Levantine manufacture (cat. no. 202 and fig. 107), they were often inlaid with ivory in zigzag patterns, like the pyxides with handles found in Egypt (made of wood) and at Ugarit (made of ivory). The place of discovery of the former could simply correspond to the context most favorable to the conservation of wood: Egyptian tombs. GP-B

1. See also Louvre AO 14778; Gachet-Bizollon 2007.

201

Duck-Shaped Vessel

Ivory (hippopotamus)
Height 7.6 cm (3 in.); length 14.5 cm (5¾ in.)
Minet el-Beidha
Late Bronze Age, 14th–13th century B.C.
Musée du Louvre, Paris, Département des Antiquités Orientales AO14779

Nearly thirty duck vessels and fragments were discovered at Late Bronze Age Ugarit. This example was found in its port at Minet el-Beidha, in Deposit 213, which possibly represented the remains of a rich tomb. Many such containers have been unearthed in the eastern Mediterranean, from Mycenae and Rhodes to inland Syria.

This vessel is made of hippopotamus ivory, specifically the lower canine.[1] One defect of the hippopotamus canine, the commissure or crack that occurs with age, is cleverly concealed along the ridge. Such sophistication in using this material suggests that the container was made by a Levantine craftsman, possibly working at Ugarit.

Duck vessels from the Levant derive from Egyptian prototypes. The model would have been a spoon in the shape of a duck or goose, made in boxwood, ivory, or alabaster, often propelled by a nude swimming girl (see cat. no. 200). Such spoons are typically thought to have been used for cosmetics, but no doubt had a symbolic meaning as well, associated in Egyptian imagery with annual gifts deposited by the river god of the Nile. In the Levant, the motif was adopted and transformed, the lower part of the vessel carved in the shape of a boat. There are several variants.[2] Ducklings may sit on the back of the mother duck (cat. no. 202), the swivel lid may be oval, as here, or in the shape of wings (fig. 106 and cat. no. 199); a fan tail may or may not be included. The lid on this vessel is bordered with holes that originally contained blue pigment, another allusion to water. AC

1. Gachet-Bizollon 2007, no. 22.
2. See W. Adler 1996 and Gachet-Bizollon 2007.

202

Duck-shaped Vessel

Ivory (hippopotamus)
Length 25.1 cm (9⅞ in.)
Kamid el-Loz
Late Bronze Age, 14th–12th century B.C.
Direction Générale des Antiquités, Beirut, Lebanon 24410



201



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Figure 107. Facsimile of wall painting with duck-shaped vessel. Thebes, Tomb of Kenamun (TT 93). Dynasty 18, reign of Amenhotep II. The Metropolitan Museum of Art, New York, Rogers Fund, 1930 30.4.177

The dramatically curved head and neck of a duck serve as a handle for this cosmetic box. The duck is turned to face two ducklings placed on the lid, one made of ivory, the other identified as jade. The receptacle rests on a folded rectangular base carved with two rows of five dot-circles. Its lid was fixed with three mushroom-headed nails, two of which are missing. At one time a fourth nail was also fixed on the body. The duck is incised with three concentric circles at the base and upper part of the neck. The bird's eye is represented as three concentric circles with a hole in the middle.[1]

Carved from a hippopotamus tusk,[2] this remarkable box imitates Egyptian prototypes. Together with other alabaster and ivory artifacts, it was found in the "funerary deposit" inside the palace at Kamid el-Loz and shows the high quality of workmanship that Levantine ivory carvers attained in the Late Bronze Age, especially between the fourteenth and the twelfth century B.C. Such artifacts—illustrated in Egyptian wall paintings (fig. 107)—were widely distributed throughout the eastern Mediterranean, and examples have been found at Byblos, Sidon, and Ugarit and as far north as Alalakh; farther south they were found at Lachish, Megiddo, and Akko, as well as at sites on Cyprus and in the Aegean.

Ivory-working, with elephant instead of hippopotamus tusks, continued to flourish in the Iron Age. Phoenician ivory workshops were famous for the quality of their products, which were disseminated far from their land of origin through the wide trade network established during that era. SH

1. Hachmann in *Frühe Phöniker im Libanon* 1983, p. 119, no. 8; Miron 1990, no. 502, fig. 58, pl. 38:2.
2. Caubet and Poplin 1987, p. 281; Caubet 1998a, p. 89.

203

HANDLE IN THE FORM OF AN ACROBAT

Ivory
Height 4.1 cm (1⅝ in.); width 5 cm (2 in.)
Kamid el-Loz
Late Bronze Age, 14th–13th century B.C.
Direction Générale des Antiquités, Beirut, Lebanon 24394

This exquisite ivory handle in the shape of an acrobat was carved from a hippopotamus tusk. Its body is curved and its legs rest on the figure's head, with the arms extending on either side of a hollow socket. The object to which the handle would have been attached was not preserved. The figure wears a short kilt, and the details of the body—hair, facial features, fingers, toes, and navel—are carved with great precision.

The handle was discovered in the "funerary deposit" of the Levantine palace at Kamid el-Loz together with other ivory objects, including figurines, deity masks, cosmetic containers, and game boxes with their gaming pieces. These finds not only provide insight into the daily life of the royal family,[1] but they also illustrate the mastery of Kamid el-Loz ivory carvers during this period.

Dance and acrobatics were popular in antiquity. In Egypt and Crete there is evidence of both ritual and secular dancing and acrobatic scenes (fig. 108, cat. no. 71). It is difficult, however, to interpret the significance of the Kamid el-Loz acrobat. Similar handles were also found at Byblos, Megiddo,[2] and on the Uluburun shipwreck (cat. no. 204). SH

1. Hachmann in *Frühe Phöniker im Libanon* 1983, pp. 82–84, 114, no. 2.
2. Loud 1939, nos. 182–84, pls. 41, 42.

204

HANDLE IN THE FORM OF AN ACROBAT

Ivory
Height 3.7 cm (1½ in.); width 7.4 cm (2⅞ in.)
Uluburun shipwreck
Late Bronze Age, ca. 1300 B.C.
Bodrum Museum of Underwater Archaeology, Turkey 34.6.98 (KW 5754)

This ivory object is in the form of a contorted human, with legs that bend backward at the knee so that the soles of the feet rest against the head. A solid cylindrical extension protrudes from the chest in place of outstretched arms.[1] The legs, buttocks, shoulders, and facial features are clearly defined, although the figure appears unfinished and coarse around the head and upper legs, perhaps in part from weathering caused by millennia underwater. The gender is difficult to ascertain, but the shorter hair and lack of breasts suggest a male or, less likely, an adolescent female. The protruding cylinder has a slightly narrower and rounder end to allow for insertion into another component, which does not survive. This may explain why the arms were not rendered along its sides, as they would have been concealed. The missing second piece may have been of a perishable material such as wood.[2] The figure was found just aft of amidships, suggesting that it was stored at the stern, where valuable personal and ritual objects were kept.

The carved ivory handle from Kamid el-Loz, also in the form of an acrobat (cat. no. 203), provides the only clear parallel



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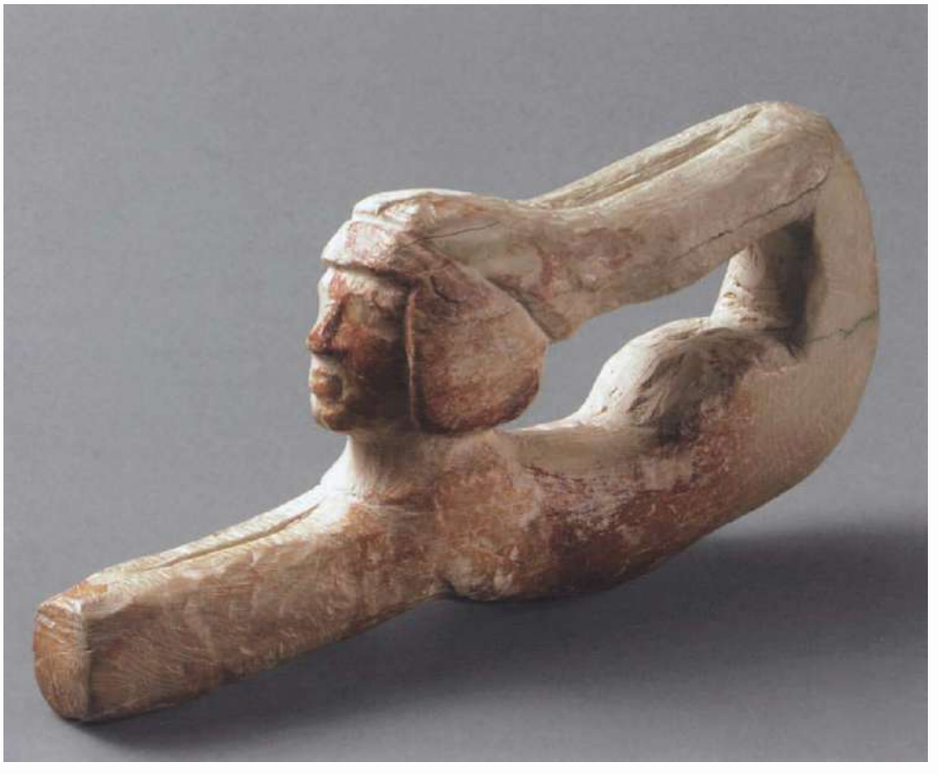
for the Uluburun piece.[3] Although remarkably similar in posture, the Kamid el-Loz acrobat, shown clothed in an Egyptian-style kilt, is more slender, more detailed, with elaborately rendered eyes, fingers, and toes, and more finely carved than the Uluburun piece. The cylindrical protrusion of the Kamid el-Loz example is hollowed out to form a shallow tube in order to receive the complementary component. Unlike the example from Uluburun, however, the figure's arms are carved in relief alongside the cylindrical tube, almost in a gesture of offering. The Uluburun handle's lack of similar details, such as the garment, arm positioning, and hollowed-out protrusion, as well as its bulkier and shorter body proportions and less graceful modeling, point to cruder craftsmanship.

Egyptian artists made little distinction between dancers and acrobats. Depicted in a relief in the Dynasty 18 Red Chapel at Karnak are two pairs of acrobatic dancers performing backbends, accompanied by a man playing a harp.[4] Dancers in similar backbend poses are shown on two later ostraca from Deir el-Medina (fig. 108).[5] In these representations, the acrobatic dancers wear small kilts or loincloths, probably for decoration and ease of movement rather than for modesty.[6] None of the acrobatic dancers display the exact pose of the Uluburun and Kamid el-Loz handles.



Figure 108. Painted limestone ostracon with dancer, detail. Deir el-Medina. Dynasty 19. Fondazione Museo delle Antichità Egizie di Torino c. 7052

Several ivory handles in the shape of human figures from Byblos and Megiddo display the same general spirit in form and function, even though their outstretched bodies do not match the backbend of either the Uluburun or Kamid el-Loz acrobats. The Byblos handle, modeled as a female stretched out on her chest and grasping a cylindrical projection,[7] represents a transition between the acrobatically posed figures of the Uluburun and Kamid el-Loz handles and four others from Megiddo. Nearly identical to one another, the Megiddo handles are carved in the form of human figures lying flat on their stomachs, heads upright, with their bodies supported by arms bent at the elbows. The surviving pair of hands on one example, shown as clenched fists, are vertically perforated, likely for the mounting of a spoon bowl, thus associating the Megiddo handles with the offering gesture of the Byblos, Kamid el-Loz, and Uluburun examples.[8]



While the latter two handles appear to be male figures, numerous iconographic representations associate such gestures of offering with females.[9] These spoons may be related to well-known Egyptian examples of nude females swimming and holding spoons of various forms, each outstretched in a gesture of offering (cat. no. 200).[10] If the female figures, such as that of the Byblos handle, whose gender is clearly indicated by her breasts, are represented nude, then figures wearing kilts, such as the Kamid el-Loz and Megiddo handles, perhaps represent males. The style and other rendered features of the Uluburun acrobat nevertheless suggest a male figure whose kilt simply was not indicated, a theory reinforced by the object's crudely worked, unfinished quality. CP

1. Pulak 2005c, p. 606, fig. 131.
2. Boxwood was the wood of choice for nearly all of the finely carved objects recovered from

the Uluburun shipwreck, including an ovoid box lid, a circular base for a cylindrical container, writing boards, and many other fragments whose function cannot be determined. Had the component been of metal, it would have corroded and stained the ivory.

3. Miron 1990, p. 113, fig. 67, pl. 37.1; Hachmann in *Frühe Phöniker im Libanon* 1983, pp. 82–84, 114, fig. 2.
4. Peck 1978, p. 138, fig. 67; Vandersleyen 1975, no. 282a, b. The Red Chapel dates from the time of Hatshepsut.
5. One of these (fig. 108) is more naturally rendered than the second one (Vandersleyen 1975, pl. 333b; see also Goelet 1993, p. 23, fig. 1). A third is from the Ramesside period (Peck 1978, p. 138, fig. 68).
6. Goelet 1993, p. 28.
7. Dunand 1950, pl. 151:17241.
8. Loud 1939, p. 18, nos. 182–85, pls. 41:182, 42:183–85. The hands reach forward, and the legs stretch backward, terminating in flattened handles perforated vertically at the ends, perhaps for suspension from a cord. They have short hair, wear short kilts, and lack cylindrical protrusions from the upper chest. Although they have no breasts, they have been identified as females.
9. See, for example, much larger ivory spoons depicting outstretched females from Megiddo (Loud 1939, p. 18, nos. 177–79, pls. 40:177, 41:178, 42:179).
10. For the importance and symbolism of Egyptian spoons, see Kozloff 1992, pp. 331–39.



205a, b

205a, b
Cosmetic Spoon and Tube

a. Spoon
Ivory
Length 9.9 cm (3⅞ in.)
23.8.96 (KW 4246)

b. Tube
Bone
Length 8.8 cm (3½ in.); max. diameter 1.5 cm (⅝ in.)
24.8.96 (KW 4251)

Uluburun shipwreck
Late Bronze Age, ca. 1300 B.C.
Bodrum Museum of Underwater Archaeology, Turkey

This ivory Egyptian-style spoon in the form of an extended arm was probably used for applying salve, unguents, or cosmetics.[1] The handle is carved in the shape of a clenched right fist—except for the straight thumb—perforated laterally by a narrow hole. Two bands encircling the wrist represent bracelets. The forearm terminates just below the elbow, and the spoon continues as a straight, narrow cylindrical shaft, gently tapering to form the tiny, shallow spoon bowl. Two small wear marks at the junction of the arm and the spoon shaft suggest that a sleeve or case originally enclosed the spoon and part of the handle, fitting tightly over the widest point. A cord running through the hole of the clenched fist may have secured the spoon to its case or served as a lanyard to be worn around the neck.

Found in an area corresponding to the after half of the ship, the spoon probably belonged to one of the merchants aboard. An undecorated, thin-walled, bone tube found next to the spoon, and of the appropriate length and diameter, may have served as its case.[2] It was cut flat at either end, one of which was probably capped with a wood plug, now lost, while the other accommodated the spoon. It may have been a homemade replacement for the original tube, possibly also of ivory or finely carved wood.

Bronze Age cosmetic vessels, mostly in the form of kohl tubes and commonly found in Egypt,[3] were probably introduced there from the Near East during the time of Thutmose III.[4] Kohl applicators generally took the form of long rods tapering to a blunt tip to facilitate application,[5] making it unlikely that the Uluburun spoon was used for kohl. Nor was it likely to have been used as an ear spoon, which required a smooth, uniformly tapering shaft. Two bronze handles found at Tell Abu Hawam[6] are of slightly larger proportions, but they closely approximate the Uluburun spoon's handle in both design and construction,[7] although the bowl ends do not survive. Several pins from Mesopotamian sites, with heads in the form of clenched fists, are similar to the fist of the Uluburun spoon, although none are pierced (see cat. no. 206).

The use of armlike handles as spoons was quite ancient in Egypt. Two small ivory spoons from Dynasty 3 were modeled as outstretched right arms,[8] each grasping a spoon by its handle; one is shown with a pair of bracelets. On two spoons from the end of Dynasty 6, the hand is positioned in reverse, at the end of the handle intended to be grasped by the user.[9]

Early versions are seen in Dynasty 3 and four depictions of offering tables with votive gifts placed on them. Above the table is a list of offerings, foremost among which is "washing," represented by an outstretched arm presenting water from a jar. A mid–Dynasty 5 offering table labeled with the hieroglyph for "offering" features an outstretched arm hieroglyph, shown with a pair of bracelets and holding a pot of water, providing the closest known link to Egyptian censers that incorporate a hand holding a plain incense bowl.[10] Perhaps the feature of the clenched fist grasping a bowl, common to Uluburun and Tell Abu Hawam handles, echoes the offering concept. If so, the spoons could have been used in personal rituals. CP

1. Pulak 1997, p. 224; Pulak 1998, p. 205.
2. Additional color photographs of the spoon and bone tube are in Pulak 2005c, p. 606, figs. 129, 130, and Pulak 1995, p. 56, fig. 29.
3. Petrie 1974, pp. 27–28, pl. XXII for bone, wood, and reed tubes from Egypt.

4. Ibid., p. 28.
5. See ibid., p. 28, pl. XXII for kohl applicators found in Egypt.
6. Hamilton 1935, p. 59, nos. 367, 368.
7. The longer of the two handles has a swelling two-thirds of the way down, probably serving as the articulation between the arm and shaft sections; the second appears to have a distinct carination between the arm and shaft, although it is much closer to the clenched fist than in either the first handle or the Uluburun spoon. The fists of both Tell Abu Hawam handles are pierced through, and both are shown with a single bracelet.
8. H. Fischer 1963, p. 32, fig. 8:a, b.
9. Ibid., p. 32, fig. 8:d, e, p. 33.
10. Ibid., pp. 30–31.

206
Fist-Shaped Pin

Ivory
Length 7.6 cm (3 in.)
Ashur, Tomb 45
Middle Assyrian, 14th–13th century B.C.
Staatliche Museen zu Berlin,
Vorderasiatisches Museum VA Ass1102



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This delicately carved pin in the form of a fist exemplifies the Middle Assyrian affinity for naturally rendered forms. The fist was carved with great precision and attention to anatomical detail, each knuckle clearly defined both front and back. Even the impression of the fingertips in the fleshy palm of the hand is marked.

The pin was discovered above the head of a skeleton in Tomb 45 at Ashur, prompting the excavator, Walter Andrae, to consider it a hairpin or headdress pin, possibly for a headband found in the same tomb.[1] Alternatively, it may have been used as a pin for clothing. Judging from the grave goods found alongside the skeleton, recent studies have concluded that it was female.[2]

A silver pin in the shape of a clenched fist from an Early Dynastic grave in the Royal Cemetery at Ur is very close in appearance if not in date of manufacture to the Ashur pin,[3] indicating that the use of fist imagery on objects of personal adornment had a long tradition. A fist pin made of bone, less carefully rendered, was excavated in a Mitanni level at Nuzi in northern Mesopotamia and provides a chronologically more appropriate parallel.[4] However, it is the cosmetic spoon of ivory recovered from the Uluburun shipwreck (cat. no. 205) that offers the closest parallel in all respects, save for the fact that it was not found in a burial context.

The meaning of the fist itself is unclear. Andrae suggested that it might be related to the modern Near Eastern gesture of the clenched fist, which is associated with procreation.[5] The fist has also been associated with the manifestation of physical strength,[6] and with the Egyptian hieroglyph for "offering" (see cat. no. 205).

KB

1. Haller 1954, pp. 132–33, pl. 30:h; see also Klein 1992, pl. 169:4.
2. Wartke in *Assyrian Origins* 1995, p. 82.
3. Woolley 1934, pls. 189, 231.
4. Starr 1937–39, vol. 2, pl. 127:z.
5. Haller 1954, p. 132; see also Musche 1988, pl. LVII, for same in the Parthian period.
6. Ebeling 1932, p. 121 (s.v. "Apotropaeen").

207
Horn

Ivory (hippopotamus)
Length 24.3 cm (9⅝ in.); max. diameter 4.2 cm (1⅝ in.)
Uluburun shipwreck
Late Bronze Age, ca. 1300 B.C.
Bodrum Museum of Underwater Archaeology, Turkey 66.7.95
(KW 3526)

This horn was fashioned from a single hippopotamus lower incisor. The exterior of the incisor is carved to represent the natural spiraling of an animal's horn—probably that of a ram[1]—with its pulp cavity forming the horn's hollow bell. A hole, approximately 0.8 centimeters in diameter, was drilled from the tip of the pulp cavity along the full length of the incisor. The spiraling tapers toward the distal end, terminating in a short, narrow, cylindrical shank with a protruding ring or band. A second, similar ring carved on the distal tip of the incisor, about 5 centimeters below the first ring, forms a mouthpiece. The incisor's full length was used to shape the horn, with only minimal trimming at the extremities in order to provide a smooth edge for the bell and flat mouthpiece. A guilloche pattern encircles the edge of the bell. The horn, discovered wedged between bedrock and copper ingots stowed just forward of amidships, was stained light blue from the corroding copper.

Even though the Uluburun ivory horn is carved in the likeness of a natural horn, it does not appear to be long or hollow enough to have produced even the limited range of harmonics one would expect of a sounding horn (like those traditionally used by shepherds). Its presence on board might suggest that it was part of the ship's permanent equipment and was used for signaling purposes, yet a real animal horn would have been more durable and practical for shipboard use and would have performed better than one emulated in ivory.

Because ivory is an exotic material, the Uluburun horn was likely a valued ritual object. It may represent a Canaanite precursor to the shofar, a ceremonial instrument usually made of a ram's horn,[2] and may have had a similar function. Although the modern use of the shofar is much more celebratory,[3] an important early use



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appears to have been as a signaling instrument during wartime;[4] it was also sounded to evoke divine compassion and protect believers, including sailors, from various misfortunes or perils—blown during times of crisis, such as a storm.[5]

A fragmentary object carved from a hippopotamus incisor in a spiraling shape, but missing both ends, was found at Ugarit and previously published as the twisted leg of a statue.[6] Based on the discovery of the Uluburun ivory horn, however, the object has now been correctly reidentified.[7] The bell of the Ugarit horn is also embellished with a guilloche design, but there applied as three separate vertical bands rather than a single one like that encircling the bell of the Uluburun horn.[8] That the horn was discovered in a pit in the Temple of Dagan[9] also hints at its ceremonial use.

Another incomplete object similar to the Uluburun example, presumably also carved from a hippopotamus incisor in the likeness of a twisted animal horn, comes from Tell Abu Hawam, where it was originally identified as an ivory handle.[10] Like the Uluburun horn, the Tell Abu Hawam piece is also decorated around its bell, this time with a band consisting of three closely spaced parallel, incised lines. Because the distal extremity is missing, it is not known whether it carried a mouthpiece similar to that of the Uluburun horn.

It seems likely that the Uluburun horn was not a simple signaling device but an instrument employed in rituals that may have taken place before, during, and after the completion of a journey. Moreover, a pair of small bronze cymbals, or crotals,[11] found at the stern of the Uluburun ship may have also been used during shipboard rituals. Similar bronze cymbals have been found at a number of Levantine sites and on Cyprus. Several pairs from Ugarit were identified as musical instruments that played an important part in the local religion, especially in rites celebrating Baal.[12]

CP

1. Pulak 1998, p. 205, fig. 18; Pulak 1997, p. 245, fig. 14.
2. The word "shofar," generally meaning "ram's horn" but specifically "as an instrument," originated from the Akkadian word *sapparu*, meaning "wild sheep" or "goat." A shofar was not provided with holes, which would have rendered it "invalid" (Wulstan 1973, pp. 21, 29, 41).
3. Werblowsky and Wigoder 1966, p. 358.
4. It is not clear if the shofar was originally used for ritual or for warfare (Wulstan 1973, pp. 31, 41).
5. This use was recorded in the Tosephta, a collection of statements and traditions closely related to the Mishna and compiled about A.D. 200 (Patai 1998, pp. 69, 93).
6. Caubet and Poplin 1987, p. 302, no. AO 14797; Gachet 1992, p. 72.
7. Caubet 1996, pp. 14–15, 30, fig. 10; Gachet-Bizollon 2007, pp. 186–87, fig. 66, p. 395, pl. 45:388.
8. Gachet-Bizollon 2007, p. 187. The guilloche design is also found on bone inlays from Uluburun and on ivories at Samaria (Crowfoot and Crowfoot 1938, p. 41, fig. 12).
9. Caubet 1996, p. 14.
10. Hamilton 1935, p. 61, no. 376, pl. 32:376.
11. Bass 1986, pp. 288–90, ill. 28.
12. Caubet 1996, p. 10; Koitabashi 1992; this particular type of cymbals occur only as pairs (Wulstan 1973, p. 44).

208a, b

Vessels

Faience

a. Ram-headed vessels

Length 20.1 cm (8 in.); diameter 7.9 cm (3⅛ in.)

16.5.87 (KW 707)

b. Female-headed vessel

Height 10.1 cm (4 in.); diameter 7.6 cm (3 in.)

2006/4/31A (KW 5919)

Uluburun shipwreck

Late Bronze Age, ca. 1300 B.C.

Bodrum Museum of Underwater Archaeology, Turkey

Four ram-headed faience cups and one female-headed example were excavated from the Uluburun ship. (see p. 342)[1] Found in the after half of the ship, they were stored at the stern, along with the other fragile and valuable objects aboard, both of commercial and personal nature.

This nearly complete ram-headed cup is the only one to survive intact. The other, fragmentary ram-headed cups appear to have been of the same general size and shape and may have been formed in a common mold (fig. 109). They are rendered in a detailed and naturalistic manner, the only stylized feature being the slightly bulging, circular eyes. For practical reasons, certain features, such as incised growth rings on the horns and details of the eyes, mouth, and nostrils, were probably worked in afterward. The protruding tips of the relief-modeled, close-adhering horns and the small ears also must have been added after the cup was formed. The original glazing has long disappeared, but a vestigial patch in the folds of one eye and the overall hue of the intact cup suggest that it was yellow in color.[2] A crack that extends from the rim of the cup approximately halfway down to the arc of the left horn probably occurred during drying or firing. It was repaired in antiquity with a white pastelike filling, and then refired without glazing.

The female-headed cup originally had a flat-footed base attached to the neck and, unlike the ram-headed cups, was free-standing. The lower half and base are missing. The head made up the body of the cup, and a tall, inverted conical crown positioned on heavy plaits of hair formed the upper portion and rim. Fine details were incised after the cup was formed. A faint yellowish hue on some of the crown fragments is the only surviving indication of that portion of the cup's color. The overall artistic style of production and similarities in the rendering of the rams' horns and female's hair strongly suggest the same production center or workshop for the Uluburun cups.

Zoomorphic and anthropomorphic cups were common in the Near East during the second and first millennia B.C. (see cat. nos. 209–11).[3] Because of their stylistic similarities, it has been suggested that they could have been made in a single center,[4] either in Cyprus,[5] Syria,[6] or northern Mesopotamia.[7] It is more likely, however, that they came from several local production centers in the Levant.[8] Made of metal, faience, and ceramic, animal-headed and female-headed cups constitute an important aspect of Syro-Canaanite art and cultic practice.

The Uluburun cups are paralleled in examples at Enkomi (cat. nos. 209, 210)[9] and Tell Abu Hawam.[10] Additional parallels for the female-headed cup are found at Ugarit (cat. no. 211),[11] Ashur,[12] and possibly Rhodes,[13] and, for the ram-headed cup, at Kition.[14] An approximately contemporaneous counterpart of the ram-headed cups, albeit in bronze, displaying similar V-shaped nostrils, was found at Qatna.[15] The closest matches to the Uluburun cups, in overall shape and style, are from Tell Abu Hawam.[16]

Animal-headed cups, or *bibru*, were used as gifts in diplomatic exchanges among Late Bronze Age courts.[17] Thus, the cups on board could indicate that the ship's cargo was not merely commercial but also, at least partially, intended for "gift exchange." Such gifts, however, were generally of silver or gold,[18] and animal-headed cups were found for the most part in temple and tomb contexts. Their ritual function appears to be demonstrated by a clay cup from Ugarit carrying a dedicatory inscription to the Canaanite god Reshef.[19]

Further, many ram-headed cups dating to the fourteenth and thirteenth centuries B.C. have been found together with female-headed cups,[20] suggesting that the two cup types were used together for ritual purposes.[21] In the temple at Tell Abu Hawam, they were found with a gilded-bronze figure of an enthroned male deity with the left hand clenched and the right hand open, palm downward.[22] This gesture is similar to that of the partially gilded female deity (cat. no. 212) found, like the Uluburun cups, near the stern of the ship.[23] That the Uluburun finds appear to replicate the temple context at Tell Abu Hawam in form and proximity suggests a similar ritualistic function for them. Consequently, the presence of four ram-headed cups, concurrent with the presumed number of merchants on board, supports the possibility that the cups and statuette were used in shipboard rituals intended to ensure a safe and productive voyage. CP

1. Bass 1986, pp. 290–91, pl. 17:5, 6; Pulak 1988, p. 32, fig. 40; Bass et al. 1989, p. 8, fig. 12; Pulak 1997, p. 244.
2. Whether the cups were originally polychrome, with certain features highlighted by additional glaze or underglaze colors, cannot be determined.
3. Tuchelt 1962, pp. 40–60.
4. Frankfort 1970, pp. 274–76.
5. L. Åström 1972, p. 595.
6. Culican 1971, pp. 86–89, nn. 19–22.
7. Tuchelt 1962, pp. 55ff.
8. Zevulun 1987, p. 104.
9. Murray, Smith, and Walters 1970, p. 33, fig. 61.1212, pl. III.
10. Hamilton 1935, p. 65, nos. 425–29, pls. XXVII:427, 429, XXX. Of the distinct three-color glazing scheme used on the Tell Abu Hawam cup—golden yellow for details, pale pinkish white for the face, and yellowish white for the crown and hair—the last color is in keeping with that suggested for the Uluburun cup's crown.
11. Schaeffer 1933, p. 105, pl. XI, p. 106, pl. XII; Caubet and Pierrat-Bonnefois 2005, pp. 49–50, and figs. 98, 99.
12. Hall 1928, pp. 64–74; Andrae 1935, pp. 78–80 ("Funde aus dem Tukulti-Ninurta-Bau"), fig. 62; Bossert 1951, pp. 24, 102, no. 343.
13. Frankfort 1955, p. 161, cites an unverified reference to a female-headed faience goblet from Rhodes.
14. Peltenburg 1985, pp. 258–59, pls. X:1131, XXXIX:1131.
15. Du Mesnil du Buisson 1928, p. 19, pl. XVI:1. Although this cup's head is perpendicular to its neck, unlike the straight-necked cups under consideration, it is nevertheless a representative of this category of vessels, and is the only published example in metal.
16. The preserved ram's eye of fragment 429 from Tell Abu Hawam closely approximates those of the Uluburun ram-headed cups; the Uluburun female-headed cup and cup 425 are so similar, and skillfully modeled, that both may be products of the same craftsman or workshop. See Hamilton 1935, p. 65, no. 425, pls. XXVIII:427, 429, XXVII:429, XXX.
17. An Amarna Letter refers to silver stag and ram vessels sent by the Hittite king Suppiluliuma I to the Egyptian pharaoh (EA 41:39–43; Moran 1992, p. 114); and earlier texts from Mari mention vessels in the form of animals, of which at least seven are animal-headed cups, but none of them rams (Limet 1986, p. 275, n. 82); Zevulun 1987, p. 100; Peltenburg 1991, pp. 168, 170.
18. See Moran 1992, p. 114; for a bronze example from Qatna, see note 15 above. See also Zevulun 1987, pp. 100–101.
19. Zevulun 1987, p. 100.
20. Pulak 1997, p. 244.
21. Zevulun 1987, pp. 92–93, 100, 102.
22. Hamilton 1935, p. 60, no. 370, pl. XV:2. The gold foil has largely fallen off, but the face, neck, back of left upper arm, and feet are still covered.
23. The clenched and open hands of the Uluburun statuette appear in reverse.

209
Ram-Headed Vessel

Faience
Height 11.3 cm (4½ in.)
Enkomi, Tomb 86
Late Bronze Age, 14th–13th century B.C.
The Trustees of the British Museum, London
1897.4-1.1212

210
Female-Headed Vessel

Faience
Height 15.7 cm (6¼ in.)
Enkomi, Tomb 19
Late Bronze Age, 14th–13th century B.C.
The Trustees of the British Museum, London
1897.4-1.875

The vessel in the form of a ram's head from Enkomi, on Cyprus, is endowed with magnificent curling horns. The face is naturalistically rendered, with folds above the eyes and indications of curly fleece. Yellow and white color is preserved on the face and on a thick yellow band near the rim. Like the head of the goddess, the vessel was made in a mold, with incised details added.[1]



208a



208b

Figure 109. Fragmentary ceramic ram-headed vessels. Uluburun shipwreck. Bodrum Museum of Underwater Archaeology 2006/4/4A, (KW 565), 2006/4/5A (KW 42)







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Presumably used as a drinking cup, the vessel has similarities with the animal-headed rhyton, or ritual sprinkler, that was common in the Aegean world (see cat. no. 170). The mouth of the rhyton, however, was always pierced to allow liquid to pass through; here, the mouth is not pierced, which suggests that it was used for drinking.

Tomb 86 at Enkomi was a chamber tomb, disturbed when found but nonetheless rich in content. Other finds included gold and silver jewelry, faience and carnelian beads, a stamp seal, and pottery, including imports from the Aegean and Egypt.

The goblet in the form of a female head is probably the representation of a goddess. She wears a tall cylindrical headdress with a spray-shaped ornament in front; her hair is visible beneath, swept back and caught up in a net. Elaborate ornaments adorn the top of her ears, and a necklace fits closely around her neck. While the eyes are prominent, the facial features were likely even stronger when the original color was fresh.

The goblet was made in a mold, with the details then incised in the surface. The white glaze of the face, ears, and neck is well preserved but other colors have largely disappeared. The vessel may originally have been yellow or brown, with the facial features painted in brown glaze. Traces of blue survive on the necklace. The semicircular fittings with drilled holes on the inside of the rim were perhaps designed for the attachment of another element or a lid, which has not survived.[2]

Tomb 19 at Enkomi was seemingly disturbed. It was nonetheless a rich chamber tomb that had been used for successive burials throughout the Late Cypriot period. Finds included goldwork and silver jewelry, local and imported pottery, ivories, and a lapis lazuli cushion-shaped seal. A set of hematite weights is also associated with this tomb, perhaps the property of a wealthy artisan or trader, providing a possible context for the arrival of this object at Enkomi.

Polychrome glazed objects may owe something to the Minoan Cretan elaboration of a craft tradition originally invented in Egypt. By the Late Bronze Age, head vessels in the form of females and animals seem to have been a specialty of Syrian workshops, where complex shapes rather than colorful effects were most highly desired. It is not certain whether such pieces were always imported, or whether some were made on Cyprus itself. JLF

1. For further reference, see Murray, Smith, and Walters 1900, pp. 22–23, 33, fig. 61:1212, pl. III; Courtois, Lagarce, and Lagarce 1986, pp. 155–56, pl. XXVII:7, 10; and Peltenburg 1991, esp. p. 165.
2. For further reference, see Murray, Smith, and Walters 1900, pp. 22–23, 33, pl. III; Peltenburg 1972; Courtois, Lagarce, and Lagarce 1986, pp. 152–55, pl. XXVII:7; and Peltenburg 1991, esp. p. 165.

211

Female-Headed Vessel

Faience
Height 12.9 cm (5⅛ in.)
Minet el-Beidha, Tomb VI
Late Bronze Age, 14th–13th century B.C.
Musée du Louvre, Paris, Département des Antiquités Orientales AO15732

Faience face vessels count among the most charming artistic creations of the Late Bronze Age. These high-footed conical cups present a female head molded in relief. More rarely, as in this example, two heads are joined back to back.[1] One example from Ugarit preserves their main characteristics: thick black contours of the eyes and brows under an elaborate braided coiffure and a hooked lock falling in the middle of the forehead, its black color contrasting with the pale skin. Two more locks are painted on the cheeks.[2]

The chemical composition of the glazes points to production by a Levantine workshop. The decorative style, using broad bands of yellow and light green, with a transparent glaze over the light color or the underlying siliceous paste, is also typically Levantine.

Other such vessels have been found over a wide geographic area, from Cyprus (Enkomi) to Ashur and the southern Levant (Tell Abu Hawam). The vessel from the Uluburun shipwreck (cat. no. 208b) is evidence for the overseas trade in these artifacts. Several come from Ugarit, such as this one from a rich tomb at the harbor of Minet el-Beidha. Double-headed vases from southwestern Iran, though related to this group, are technically different.

The female face motif was frequently used to represent the divine powers of love and fecundity. It appears on a number of artifacts used by women, such as gold and faience pendants. The emphasis on black hair and locks—the equivalent of the upturned locks on females depicted on ivory reliefs from Ugarit (see cat. no. 261) and Mycenae—was an expression of seduction and may be compared with images on a number of Minoan wall paintings from Crete and Thera.[3] A similar concept is represented in Egypt by the thick, curly wig worn by the goddess Hathor. In the Levant, artifacts decorated with Hathor masks combine the mask motif with luxuriant hair.

The purpose of these face vessels is still a matter of speculation. They were frequently found in conjunction with other faience vessels in the shape of heads of animals—horse (Enkomi), ram (Enkomi, Uluburun), or lion (Hazor)—animals more often associated with males. They were part of the same assemblage as the flower bowls (see cat. nos. 276–277). Those from Ugarit are similar in style and chemical composition. Unlike the face vessels and flower bowls, the animal-headed cups, like rhyta, were not made to stand and were probably used in libation rituals. It is possible that different categories of faience vessels were intended for different genders, to be used in complex symbolic ceremonies. AC

1. See Matoïan in Caubet 2007, no. 206.
2. Caubet and Pierrat-Bonnefois 2005, p. 149, fig. 98.
3. Immerwahr 1990, pl. 21 (West House, Akrotiri); pl. 43 ("dancing lady," Queen's Megaron, Knossos).

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Nude Female Figure

Bronze, gold
Height 16.4 cm (6½ in.); max. width 6.1 cm (2⅜ in.)
Uluburun shipwreck
Late Bronze Age, ca. 1300 B.C.
Bodrum Museum of Underwater Archaeology, Turkey 52.7.95
(KW 3680)

This bronze figure of a youthful nude female in frontal pose may have been one of the most precious objects on board the Uluburun ship.[1] The slender figure, with outstretched arms bent at the elbow, a clenched right fist and an open left hand with the palm facing down, small breasts, and a distinctive pubic triangle, was cast by the lost-wax method. The head, face, hair, hands, ankles, feet, parts of the arms, and a collar around the neck are all covered in sheet gold.[2] An irregular pattern formed by the gold surviving on the left upper arm suggests that the statuette was originally clad mostly or entirely in gold. On the other hand, the uniform edges of the gold foil covering the bare feet and collar may indicate that the rest of the body was clad in some other material, such as silver,[3] or even dressed up as part of a ritual activity.[4] The figure's hair is arranged in shoulder-length twisted plaits on either side of the face, with a central braided lock that terminates in a loop halfway down the back and is perforated with a hole at the center. The head is adorned with a simple, narrow headband. The tenon protruding from under the feet would have affixed the figure to a base, now lost, probably of wood.

Although the type is unique, the style, craftsmanship, and theme are typically Canaanite and can be compared with other goddess figures from the Levant.[5] Several parallel figures (see fig. 110) and a gold plaque from Lachish display similar hairstyles.[6]

While the Uluburun figure wears only a simple headband and no crown, she is adorned with a broad multi-strand collar worked on the gold foil covering her upper shoulders. Such multi-strand collars of beads and amulets in precious materials are depicted in Egyptian art, usually worn with cuff bracelets and armlets on deities as well as on rulers and nobles.[7] Solid and plated gold figures in the likenesses of royal wives and daughters are mentioned



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212, back



Figure 110. Ivory figure. Megiddo, Palace Treasury. Late Bronze Age. The Oriental Institute Museum, University of Chicago
OIM A 22257

in the Amarna Letters as Egyptian gifts to Kassite and Mitanni rulers,[8] but it would be unlikely for a noblewoman to have been represented in the nude.[9]

The archaeological contexts in which most such anthropomorphic figures have been found suggest that they were votive offerings placed in temples and sanctuaries.[10] That the Uluburun figure also represents a deity is suggested by the peaceful gesture of the hands.[11] In the seated and standing male and female deity figures, the extended or raised open hand is associated with the act of blessing, an attitude recognized as a gesture of peace through all ages and across cultures.[12] In these figures the clenched right hands are often pierced, suggesting that they originally held a shafted device such as a scepter, symbolizing divine power.[13] Although the clenched fist of the Uluburun figure is bare, it is not known whether it is perforated to hold a shaft because of the crumpled gold covering.

Although divine images are abundant, it may not be possible to ascertain their specific identities because of the near absence of named representations.[14] While the identity of the Uluburun figure and the message it carried must have been known to the ancients, it continues to elude us today.[15]

A gold-clad bronze figure of an enthroned male deity with the same hand gesture, but in reverse form to that of the Uluburun female, was found in a temple at Tell Abu Hawam, along with faience ram-headed and female-headed cups, both types also represented on the Uluburun ship (cat. no. 208a, b). Therefore, it is likely that the female figure, the faience cups, and other objects, such as an ivory horn (cat. no. 207), were brought on board to ensure a safe and productive passage. The presence of images of deities on seafaring vessels is vividly described in the early eleventh-century B.C. story of the priest Wenamun, who sails to Byblos to procure lumber for the bark of Amun-Re. Wenamun's remarkable tale involves diplomacy, sailing, shipbuilding, hazards of navigation, theft, and attempted murder. During the ordeal, Wenamun carries a small figure of Amun-Re, of great personal value to him, which he hides while aboard ship.[16]

Although the Uluburun figure was located on the seabed in an area outside the limits of the ship's hull, near the forward half of the ship, its trajectory indicates that before rolling down the slope, when the ship broke apart, it had been placed at the stern.[17] Most likely, it was brought on board to guard against the very fate that befell the ship, its crew, and its passengers.

CP

1. Pulak 1997, p. 246, fig. 15; Pulak 1998, p. 207, fig. 20; Pulak 2001, pp. 22–28.
2. Judging from a New Kingdom text in which Re is described as having "bones being of silver, his flesh gold, his hair true lapis lazuli," the use of specific ritually charged materials may have been deliberate (Lichtheim 1976, p. 198).
3. Many such figures are partly or fully covered in gold but some in silver; see, for example, Seeden 1980, p. 34, nos. 56, 56A, 59, 105, 108. An unpublished bronze figure from Ugarit, also modeled nude, is completely sheathed in silver (Ella Dardaillon, personal communication).
4. Linen-swathed painted wood images, some also with gilded faces and feet, were found in the Tomb of Tutankhamun (Allen and Allen 2006, p. 49, fig. 37, p. 61, fig. 49, pp. 72–73, figs. 61, 62). For a discussion of garments and cults in later Mesopotamia, see Zawadzki 2006, pp. 153–207 (chap. 7).
5. See Negbi 1976, pp. 86–95, and Seeden 1982, pp. 117–19. All of these figures have the same general hand gestures of the Uluburun figure: an extended arm with an open hand, and a clenched fist usually, but not always, extended outward.
6. Clamer 1980, p. 153, fig. 1, pp. 155, 157. For a close parallel to the coiffure of the Uluburun figure, see Negbi 1976, no. 1563 on pp. 70, 73, 181, pl. 42.
7. Patch in *Hatshepsut* 2005, pp. 198–99. A collar-type necklace is seen on a nude Syrian figure (Negbi 1976, pp. 86–87, no. 1632, fig. 99).
8. Figures of royal family members are mentioned in EA 14 (Moran 1992, pp. 28, 29); EA 24 (Moran 1992, p. 68); EA 27 (Moran 1992, p. 87), but other figures were also given as gifts, some of silver and stone (see, for example, EA 14, Moran 1992, pp. 28, 33).
9. Goelet 1993, p. 21.
10. Seeden 1982, pp. 119–20; Seeden 1980, pp. 95–96; Negbi 1976, pp. 2, 141–42.
11. The gesture of the clenched left hand and the open right hand, usually shown angled, with the palm facing out but also facing down, as in the Uluburun example, is relatively common in Levantine figures; see examples in Seeden 1982, p. 116, figs. 20, 23–25, and Schaeffer 1966b, pp. 6, 7, figs. 2, 3, pls. II, III. However, the positions of the hands on the Uluburun figure are in reverse, like those of a seated male deity from Qatna (see cat. no. 22).
12. Seeden 1982, p. 119. A large late thirteenth-century B.C. bronze male cult statue wearing a horned helmet was found in the Sanctuary of the Horned God at Enkomi. The statue is shown with the right hand open, palm facing down, in a gesture of blessing, and the left hand clenched into a fist and bent toward the chest (Karageorghis 2002, p. 97, fig. 196, p. 98). For a general discussion of the identification of this god, see Hadjioannou 1971, pp. 33–42, and Karageorghis 1998, pp. 30–33.
13. A standard of embossed sheet gold with a four-pointed star is preserved in the clenched left hand of a gold-covered seated male figure from Megiddo (Negbi 1976, p. 50, no. 1453, p. 51, fig. 59.1453, p. 172, no. 1453, pl. 33.1453).
14. Cornelius 2004, p. 5.
15. Brody (1998, p. 68) suggests that the figure represents Asherah, since she is the only Late Bronze Age goddess who protected Canaanite sailors. Cornelius (2004, p. 100), however, argues that the image of Asherah is that of a more senior female, which the Uluburun female does not appear to represent.
16. Wenamun refers to the figure several times, and twice calls it "Amun-of-the-road" (Goedicke 1975, pp. 45, 110).
17. The tradition of housing representations of guardian deities on board ships in Roman times is demonstrated by a reference to an image of Libyan Amun placed at the stern of a Punic war galley (Silius Italicus *Punica*, 16.436–40, 458–61; also cited in Brody 1998, p. 68), and a stele from Carthage that depicts a small shrine housing a figure placed at the stern of a vessel, aft of the quarter rudders (Brody 1998, pp. 71, 135, fig. 19, p. 164, fig. 69).

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Pendant with Nude Female

Gold
Height 9.1 cm (3⅝ in.); width 4.7 cm (1⅞ in.); max. thickness 0.9 cm (⅜ in.)
Uluburun shipwreck
Late Bronze Age, ca. 1300 B.C.
Bodrum Museum of Underwater Archaeology, Turkey 1.5.87
(KW 703)



Found on the Uluburun ship were pendants of well-known Syro-Canaanite types and styles. One of the most impressive, made of a single sheet of gold, depicts a nude female.[1] Its wide, ribbed bail or suspension loop, typical of Syro-Canaanite jewelry, was formed from an extension of the pendant that was folded over the edges twice for reinforcement and then rolled forward and backward on itself. The pendant is roughly triangular, or piriform, tapering toward the bottom, with rounded corners and edges folded over from the front to the back and crimped. The central nude female is worked in repoussé, with certain details incised on the obverse. The figure appears as a mature female with a rounded belly, full breasts, and a pubic triangle, depicted by dots. Her well-defined feet are oriented toward her right, unusual for pendants of this design, which usually show the feet facing left or forward.[2] Her arms are bent at the elbow, and in either hand she clutches an upright horned gazelle, forming an addorsed symmetrical composition. She wears a cylindrical crown delineated by a pair of parallel horizontal lines at the base and a single one at the top, with paired vertical striations between rectangular spaces (see also fig. 110).[3] The hair or wig under the crown hangs down as five twisted locks on either side of her face, partly covering her shoulders; her ears protrude from between the locks. Three horizontal bands below the chin represent strands of a beaded collar or choker.[4] She wears four bracelets on each wrist and a pair of anklets. The pendant was found at the stern of the ship with most of the other valuable objects. Its weight corresponds to one shekel (9.46 g).

The Uluburun figure recalls the nude goddess depicted on a group of Egyptian votive stelae, shown frontally standing on the back of a lion, and wearing a Hathor wig with spiraling curls and usually a Hathor headdress. Her outstretched arms clutch lotus flowers in one hand and snakes in the other. The figure is identified by the accompanying hieroglyphs as "*kdsh/kdsht*, the lady of heaven."[5] She resembles images on pendants of sheet gold, bronze, faience, and glass, as well as on terracotta plaques found from Syro-Cilicia to the southern Levant.[6] Unlike their Egyptian counterparts, however, these figures are usually shown clutching only lotuses or long-stemmed flowers (or papyrus), and only a few of them stand on lions.[7] They undoubtedly represent one or more goddesses, but none are found with identifying texts. The overlapping attributes and functions of three major goddesses—Asherah, Anat, and Astarte—among others, appear to have caused frequent confusion even in antiquity, making their identification on plaques and other objects uncertain.

The image of a female holding a horned animal in each hand—limited to the Uluburun pendant and three others from Ugarit[8]—is usually connected with the Mistress of Animals motif. Generally associated with Astarte,[9] she is sometimes also identified with Asherah, who is often shown with lions. Even among this group, the Uluburun goddess is unique in that she wears a crown instead of a Hathor headdress. Of the five known gold pendants depicting a full-length standing female deity, the one closest to the Uluburun figure in shape and overall design is from Minet el-Beidha (cat. no. 214).[10] Based on Ugaritic texts, she may represent Astarte and Shapash.[11] It has also been suggested that such imagery may have originated to the north, where the Hurrian goddess Shaushga represents another variant of Ishtar as a fertility deity.[12] Perhaps the piriform shape of the pendants evokes a stylized pubic triangle and, therefore, symbolizes fertility and fecundity.

Although the Uluburun pendant is highly wearable, it may have been kept with the rest of the gold at the ship's stern also to be used as bullion if required during the voyage.[13] Its ritual significance may be suggested by a hoard of gold pendants found at Ugarit, one with a stylized female figure and others in forms symbolizing the major Canaanite pantheon. Such an assemblage was also found on the Uluburun ship (see cat. no. 217 and fig. 111). CP

1. Bass et al. 1989, pp. 2, 4–5, and fig. 3; Pulak 1997, pp. 243–44; Pulak 1998, p. 206, fig. 19; Pulak 2005c, p. 595, fig. 104.
2. In a comprehensive list of sixty-six items representing a "naked woman holding objects [Qedeshet, see note 5 below]," assembled by Cornelius (2004, pp. 45–48), which also includes the Uluburun pendant, twenty-three are incomplete or damaged so that the direction of the feet can not be ascertained. Of the remaining figures, only five show the feet facing right, and none are found on pendants.
3. Although the name of this distinctive headdress is not known, Barnett (1975, pp. 104–5) likens it to a Greek *polos*, which he notes was derived from this eastern prototype. A fragmentary glass plaque from Megiddo shows a female head with a headdress marked by parallel vertical flutings, again probably representing the same kind of crown, McGovern 1985, p. 30, pl. 5; Loud 1948, pl. 241:1 (misidentified as faience), also a clay example on pl. 241:6. Crowns of this type are commonly shown on female figurines carved in ivory, from ninth- to eighth-century B.C. Nimrud (see Barnett 1975, pls. LXXII:S192–96, S198, S200, S201, LXXXIII:S197, S202, S203, S206, LXXIV:S207, S208); the coiffure of these ivory figures is also remarkably similar to that of the Uluburun figure. See also Maxwell-Hyslop 1971, pl. 233.
4. Barnett (1975, p. 105) notes that in Syria the necklace was a feature of an Ishtar-like cult figure and, perhaps, of her devotees. Multistrand necklaces are shown on the necks of nearly every ivory female from Nimrud; see, for example, ibid., pls. LXX–LXXVI.
5. Cornelius 2004, pp. 45, 83–84. Of these stelae, seven are clearly inscribed *kdsh* or *kdsht* (vocalized for convenience as Qedeshet), along with other attributes including "lady of heaven"; one inscription reads "Qedeshet, Astarte, Anat" (ibid., p. 84, no. 5.16). From these inscriptions, it is clear that *kdsh(t)* is a proper divine name in Egypt, unlike in the Levant, where it was used as an epithet or a title.
6. These pendants have been considered by Maxwell-Hyslop under her "pictorial" group (1971, p. 139), and by Negbi in her "pictorial '*qudshu*' group (Negbi 1976, pp. 99–100). McGovern, who treats pendants of various materials from the Levant, lists few examples found under his "type II.B.1" pendants in human form (1985, pp. 30–31). He further notes that these pendants (his type II) are clearly related to terracotta figurine plaques found throughout Mesopotamia and the Levant. The most recent and extensive study of the iconography of the Levantine goddesses represented on these pendants is Cornelius 2004.
7. A gold appliqué shows the figure standing on a horse (Clamer 1980, p. 153, fig. 1; Cornelius 2004, pl. 5.22).
8. These are collected in Cornelius 2004, pls. for nos. 5.20, 5.20a, and 5.27. A standing nude female figure on a Late Bronze Age cylinder seal (pl. 5.11) from Cyprus holds two horned animals, one by the legs and the other by the horns. For the gold pendants, see also Schaeffer 1932, pl. IX:1 (fourth from left); Maxwell-Hyslop 1971, pls. 106, 107.
9. Cornelius (2004, p. 91) notes that representations of Astarte bearing weapons may be compared with the Mesopotamian Ishtar. Several pendants carry rosettes, perhaps also representing the star disc of Ishtar. See ibid., pls. 5.23, 5.28, and 38. This is contra Cornelius (ibid., p. 91) who proposes that the Qedeshet figure represented on many of these Syro-Canaanite pendants is a separate entity.
10. Also in Maxwell-Hyslop 1971, pl. 106.
11. Schaeffer 1939a, p. 62, pl. XXXII.
12. Maxwell-Hyslop 1971, p. 140.
13. Pulak 2001, p. 24.

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Pendant with Nude Female

Gold
Height 6.5 cm (2⅝ in.); width 2.8 cm (1⅛ in.)
Minet el-Beidha
Late Bronze Age, 14th century B.C.
Musée du Louvre, Paris, Département des Antiquités Orientales AO14714

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Pendant with Nude Goddess

Gold
Height 7 cm (2¾ in.); width 4 cm (1⅝ in.)
Minet el-Beidha, "Depot d'enceinte" (dépot 11)
Late Bronze Age, 15th–14th century B.C.
National Museum, Aleppo, Syria M10450

Several gold pendants representing a nude goddess were found at Ugarit and its port of Minet el-Beidha. Most of them are composed of a fairly thin gold sheet with one end rolled into a ring for hanging. The decoration is in repoussé, with details chased or punched. The pendants are different in form, more or less oval or round, and display an iconography that was traditional in the Levant and variously represented in a schematic, symbolic, or realistic manner.[1]

Many pendants represent a star, symbol of the planet Venus and goddess of love and life. Others depict the goddess in human form. Her distinguishing features are nudity, frontality, a dominant stance, and an emphasis on her hairstyle. Whether she is shown in part—reduced to a few anatomical details as face, breasts, or pubic triangle—or in full, this deity is nearly



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always surrounded by patterns of globules that indicate her heavenly origin.

The nudity and frontality in images of female deities is characteristic of divine representations in the Levant during the second millennium B.C. At the same time, the hairstyle of the images from Ugarit attests to the close relations with Egypt, which led to religious syncretism. Accordingly, the Levantine goddess was given certain attributes that relate her to Egyptian deities, in particular the symmetrically disposed locks of hair that frame the face and end in prominent curls, an attribute of Hathor, goddess of the Nile.

The forms of the pendants that show the goddess in full length are fairly homogeneous, with the authoritative bearing being a constant feature. The imagery through which this trait is expressed—domination over the wilderness (represented by animals) and over plant life—however, varies considerably. These variations complicate our interpretation of the nude goddess with Hathor locks. Indeed, while the domination of plant life can be explained by Ugaritic mythology, the deity's power over serpents and her association with lions connect her more with the Egyptian goddess Qadesh and recall deities from the Aegean world, especially Knossos, where the taming of snakes was the prerogative of certain female deities. SC

1. For further reference, see Schaeffer 1932; Schaeffer 1949, p. 36, fig. 10; Barrelet 1958; Caubet 1990, p. 33, no. 67; Caubet 1999c, pp. 32–38; and *Le royaume d'Ougarit* 2004.

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Pendant with Schematic Nude Female

Gold
Height 3.5 cm (1⅜ in.); width 2.1 cm (⅞ in.)
Tell el-'Ajjul, Hoard 277
Middle/Late Bronze Age, 17th–15th century B.C.
The Trustees of the British Museum, London
130761

This pendant depicts a highly stylized frontal nude female with Egyptianizing features. It is of a general Syro-Canaanite type that is related to pendants found on the Uluburun ship (cat. no. 213) and at Minet el-Beidha (cat. nos. 214, 215). Like those examples, it is constructed from a single sheet of gold with the top rolled up and forward into a suspension loop. The figural details are executed in repoussé with some chasing and punching, while the border is decorated with incised cross-hatching.[1] The craftsmanship, while casual, is in keeping with works of Levantine manufacture (see pp. 101–3).

The form of the pendant comprises the entire female figure, schematically rendered to emphasize face, breasts, navel, and pubic triangle to the exclusion of other anatomical details. The overall shape of this and similar pendants is most often described as piriform when, in fact, the reference to the pubic area that is so dramatically featured on the plaque itself seems obvious. As such, it reflects a remarkably sophisticated use of conceptual self-reference, a representational scheme not uncommon in the ancient Near East.[2] For this reason, among others, it has been suggested that such ornaments may not have been necklace pendants at all but plaques suspended from pelvic girdles.[3]

Because these ornaments so clearly accentuate the life-giving aspects of the female anatomy, they are often labeled "Astarte" plaques to suggest a link to the Canaanite goddess of fertility.[4] Other divine associations are also possible (see cat. nos. 213–215). There is, however, no obvious marker of divinity on this particular example. Ambiguous representations, often schematic, of nude females in various media have a long history in the ancient Near East and have yet to be fully understood. Whatever the ultimate identification of the females depicted, this pendant



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and others like it should not be considered simply decorative; rather, they must have been charged with sexual and procreative power and possessed of potent agency.

The present example comes from an important hoard of jewelry found at Tell el-'Ajjul, a site in the Levant possibly associated with ancient Sharuhen, the last stronghold of the Hyksos (see pp. 108–10). The hoard was one of several at the site, all of which included sizable assemblages of gold ornaments. Why these items were hidden away, and whether they were made at the site or brought there by itinerant craftsmen or merchants, remains open to debate.[5] On purely technical grounds, however, the jewelry seems typical of a local Canaanite style of manufacture. KB

1. Petrie, Mackay, and Murray 1952, pls. VI:13, VIII:1, B:17; Negbi 1970, p. 42, no. 130; McGovern 1985, pp. 32, 114, no. 74, pl. 6, II.B.2.b 74.
2. Bahrani 2002.
3. Platt 1976.
4. For examples, see Maxwell-Hyslop 1971, pp. 138–40; Lilyquist 1993, p. 49; Pulak 1998, p. 206; and Cornelius 2004.
5. See cat no. 220 and Politis 2001 for a discussion of various interpretations.

217a, b

Pendants with Rayed Stars

Gold

a. Medallion with four-rayed star and four curved rays
Height 10.3 cm (4 in.); width 11 cm (4⅜ in.); thickness 0.1 cm (1/16 in.)
2.5.90 (KW 1672)

b. Medallion with four-rayed star and eight curved rays
Diameter 7.5 cm (3 in.); thickness 0.2 cm (1/16 in.)
68.31.84 (KW 138)

Uluburun shipwreck
Late Bronze Age, ca. 1300 B.C.
Bodrum Museum of Underwater Archaeology, Turkey



217a

Four gold Canaanite medallions in the form of thin roundels were found on the Uluburun ship.[1] They were each fashioned from a single sheet of gold, with a cylindrical bail or loop at the top for suspension formed by rolling forward an extension of the roundel that had been reinforced by folding over the edges. Two of the roundels show edges folded back and crimped irregularly on the reverse, and those of the other two appear to have been left unaltered. Their decoration consists of a four-rayed star with opposed, curved rays in between, all worked in repoussé and defined on the obverse by incision.

There are two variations of this design. The largest (this page), which is also the largest example of its type known in gold,[2] and the smallest medallion in the group (KW 756; not on exhibition) have a single curved ray between each pair of straight rays, for a total of eight rays. The other two (opposite page, above, and KW 1512, not on exhibition) are similar to one another in both size and design, each bearing a pair of opposed, curved rays between the pair of straight rays, for a total of twelve rays. At the center of each medallion, and also centered in the fields between each of the rays, are single bosses in the first type, and repoussé dotted rosettes in the second type in imitation of gold granulation. In the latter design there are also four repoussé-dotted "triangles" pendant from the rim between the pairs of opposed rays. The peripheral edges of the roundels are milled in repoussé dots.[3]

Although one of the medallions was found farther down the slope than the others, it is likely that all four were originally kept at the stern of the ship together[4] with most of the other gold pendants and objects. These and other symbolically charged pendants are impressive pieces of jewelry and were probably intended for personal adornment. Some, however, were associated with scrap gold and silver jewelry (fig. 114), all of which was probably kept in one or several pouches at the stern, suggesting that, if required, they could also have been used as bullion during the voyage.

Pendants with star motifs, found in many varying forms with or without curved rays throughout western Asia, probably originated in Mesopotamia, where they were known since the Akkadian period. The star disc as a symbol of Ishtar, the sun disc in the form of a four-rayed star with undulating rays between them as Shamash, and the lunar crescent as Sin are found in Mesopotamia throughout the Bronze Age. Ishtar, the goddess of love and war, was manifest as Venus, the morning and evening star, and was often represented as a disc inscribed with an eight-rayed star, but sometimes also with fewer rays.[5]

The hoard of jewelry presumably found at Dilbat (cat. no. 4) also includes several medallions. One of these is somewhat similar in its design and execution to catalogue number 217a, apart from the extra pairs of rays and the presence of undulating instead of curved rays in a reversed orientation.

In Anatolia, the eight-pointed star is associated with the goddess Shaushga, the Hurrian form of Ishtar.[6] The Hittites were strongly influenced by Hurrian cults and adopted Hurrian gods and goddesses; the sun disc, known as the *sittar*, reflects this influence.[7] One of the two variants of the so-called Cappadocian symbol occurs in the form of a four-rayed star with curved rays between them, and bosses centered in the field between all the rays.[8]

Pendants with star motifs were also used throughout the Bronze Age Levant.[9] The motif with the single curved ray (cat. no. 217a and KW 756), however, is found mostly along the Levantine coast. Although gold pendants with only the star motif



217b

(generally with eight rays) have been found at Ugarit,[10] Tell el-'Ajjul,[11] and elsewhere, the sun-disc motif of straight and opposed curved rays was also used at Ugarit from the first half of the fourteenth century B.C. It appears on the famous ivory bed panel, carved with an image of a goddess displaying Hathor locks and with a sun disc between the bovine horns on her head (see fig. 80),[12] and also on a silver-plated bronze disc, which may have been part of a divine headdress.[13] Several partly gilded ivory discs of this design, perhaps used as furniture inlays, are known from approximately the same period at nearby Alalakh.[14]

Although of a much smaller size, two gold disc pendants with the star-and-curved-ray motif, found discarded along with a group of other gold pendants and jewelry pieces at Shechem,[15] have a design similar to that of catalogue number 217a. The same motif is found on the three considerably smaller disc pendants from Kamid el-Loz and one from Qatna (cat. no. 218).[16] A parallel in both dimension and design is seen in a silver medallion from Shiloh.[17] A stone jewelry mold for a disc pendant with a similar motif was found at Megiddo,[18] which also yielded a gold pendant of the same design from an Early Iron Age context;[19] a mold for the same type of disc pendant is known from Tell el-Amarna in Egypt.[20]

Disc pendants bearing the opposed, double curved rays framed by straight rays also occur as representations. Sun- and star-disc pendants are shown around the necks of bearded Asiatics with short kilts on wall paintings depicting foreign tribute bearers and prisoners in the tombs of Puimre and Kenamun.[21] Disc pendants, one of which bears a pair of opposed rays, are seen on the necks of vanquished and captured Syro-Canaanites, worked in relief on the side of a chariot body from the Tomb of Thutmose IV, of Dynasty 18.[22] Carved on a wood ceremonial footstool from the Tomb of Tutankhamun are four of Egypt's enemies, including a Syrian captive wearing a clearly depicted sun-disc pendant with a pair of opposed, curved rays between each pair of straight rays of the type on cat. no. 217b from Uluburun.[23] Although their motifs are not indicated, disc pendants are also shown in the Tomb of Kenamun around the necks of the bare-chested crew aboard the Syrian ships arriving at an Egyptian port (fig. 98).[24] The merchants on the ships do not appear to wear any medallions, though it is likely that they were hidden from view beneath the merchants' robes.

A hoard of gold pendants found at Ugarit, including six-rayed and four-rayed star-disc pendants, as well as two crescent pendants and one of a stylized female, suggests a group of goddess, solar, and lunar divine symbols. Ugaritic texts refer to these types of pendants as Astartes, suns (Shapash), and moons (i.e., crescents).[25] Perhaps the most complete textual reference to pendants can be found in the Old Testament. The term "little sun," interpreted as a star disc, appears with "crescents" and "drop pendants" (triangular goddess pendants?) as part of the catalogue of finery that the Lord will take from the "haughty daughters of Zion."[26] It is therefore noteworthy that a pendant depicting a nude goddess (cat. no. 213), a pendant shaped like a crescent (fig. 111), and also sun-disc pendants (but none with only the eight-rayed star motif) found together on the Uluburun ship perhaps replicate the symbols of the Canaanite pantheon.

The Syro-Canaanite disc pendants with the four-rayed star and opposed single or double curved rays between them, as represented on the Uluburun medallions, are difficult to attribute to a specific deity. Although they appear to be related to the symbol of the sun god Shamash, the opposed curved rays shown between the



Figure 111. Gold pendant in the form of a crescent. Uluburun shipwreck. Bodrum Museum of Underwater Archaeology 7.5.87 (KW892)

four-rayed star are unlike the undulating rays typical of this motif, and might represent the double lightning bolts of the Mesopotamian god Adad. Perhaps in the Syro-Canaanite region, the double lightning, which is also the symbol of the Hurrian god Teshshup, replaced the undulating rays of the original Shamash symbol and was joined with the four-rayed Shamash star to represent both deities, thereby combining their apotropaic aspects.[27] Alternatively, rather than representing lightning bolts, the curved rays may resemble bovine horns, in which case they are to be associated with the goddess Hathor, who is often shown wearing a headdress formed of a wig, horns, and sun disc. Either way, because the medallions with the curved-ray motifs appear to have a more widespread distribution in the Levant, they may represent the Canaanite version of a symbol for syncretic deities.

In view of the importance of both sun and star symbols in the Semitic, Hurrian, and Hittite religions, disc pendants may be regarded as amulets bearing divine symbols. They were transportable versions of the large cult symbols and were charged with their apotropaic powers. As such, the pendants were an essential part of personal equipment, representing both the gods and goddesses in the temple, and probably also the king.[28] CP

1. Bass 1986, pp. 289–90, pl. 17:4; Bass et al. 1989, p. 4, fig. 4; Pulak 1997, p. 244, fig. 12; for color photographs, see Pulak 2005c, p. 596, figs. 105–8.
2. Pulak 1997, p. 244; Pulak 2001, p. 24.
3. Catalogue no. 217a weighs 46.2 grams and catalogue no. 217b weighs 10.11 grams; these weights probably correspond to 5 and 1 shekels, respectively, although the latter weight is on the high side, based on a unit of 9.3–9.4 grams.
4. Pulak 2001, p. 24.
5. Maxwell-Hyslop 1971, pp. 141–42. This star symbol was at times juxtaposed with the image of an armed goddess, probably representing Ishtar standing on a lion; see Barrelet 1955, pl. XXI:4.
6. Maxwell-Hyslop 1971, p. 143.
7. Texts from Boğazköy mention *sittar* of metal, at least one of which was worn as a pendant on a necklace. Maxwell-Hyslop 1971, p. 146.
8. Wainwright 1956, pp. 137–38; Maxwell-Hyslop 1971, pp. 146–47, pl. 115. Assyrian connections may be seen in the eight-pointed gold star pendants of fourteenth-century B.C. Tell al-Rimah and on a limestone relief carving of Ashurnasirpal (Maxwell-Hyslop 1971, pp. 177–78, 241, pls. 130, 220).
9. See McGovern 1985, pp. 75–77.
10. Schaeffer 1932, pl. XVI:2; Maxwell-Hyslop 1971, p. 141, pl. 109; Negbi 1970, p. 32.
11. The star on the Tell el-'Ajjul disc pendant has eight straight rays with bosses between the rays (Maxwell-Hyslop 1971, pp. 140–41, pl. 108). A type of star pendant in which the stars are cut out from a piece of sheet gold also occurs. In Tell el-'Ajjul these cutout star pendants are found in earlier deposits than the disc-star pendants (Negbi 1970, p. 31).
12. Schaeffer 1954, pp. 54–55, 58–59, pl. VIII; Gachet-Bizollon 2007, pp. 137–38, with pls. 26:269 no. 2/H, 80:269, 82:269 no. 1/K. Gachet-Bizollon proposes a date in the first half of the thirteenth century B.C. for the panels (p. 146).
13. Schaeffer 1931, pl. XIII:4.
14. Woolley 1955, p. 290, AT/38/79, pl. LXXVII:A; Woolley 1939, p. 12, pl. XIV:4B (AT/8/79).
15. Maxwell-Hyslop 1971, p. 144, pl. 115:d, e; an eight-rayed star pendant is also represented in this group; see pl. 115:c.
16. W. Adler 1994, pp. 84–85, figs. 21–23.
17. Finkelstein, Bunimovitz, and Lederman 1993, pp. 243–44, fig. 9.12:1–2.
18. Lamon and Shipton 1939, pl. 105:6.
19. Guy and Engberg 1938, p. 162, fig. 169, p. 163, pl. 166:8.
20. Petrie 1894, pl. XVIII:440.
21. Davies 1922–23, pp. 90–91, pl. I.
22. Yadin 1963, pp. 192–93. The disc pendant shown around the neck of the figure indicated as no. 1 has the double opposed rays of catalogue. no. 217b but lacks the straight star rays between them, undoubtedly stemming from the Egyptian craftsman's poor understanding of the symbolism. Another disc pendant around the neck of the figure indicated as number 2 has the single curved ray between the pairs of straight rays, as in catalogue no. 217a.
23. Desroches-Noblecourt 1963, p. 51, fig. XI:a, p. 296:XI.
24. Davies 1963, pp. 14–15, pl. XV; Davies and Faulkner 1947, pp. 40ff., pl. VII.
25. Dussaud 1931, p. 375; Jack 1935, p. 45.
26. Isaiah 3:18–23; Platt 1979, pp. 72, 80–81.
27. Maxwell-Hyslop 1971, p. 147.
28. Ibid., p. 142.

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Pendant with Rayed Star

Gold
Diameter 3.9 cm (1½ in.)
Qatna, Royal Tomb
Late Bronze Age, 15th–14th century B.C.
National Museum, Damascus, Syria
MSH02G-i0829

This round pendant displays an astral motif consisting of a four-pointed star with four curved rays inserted between the points.[1] The motif, symbol of the solar disc, is associated with the sun god Shamash.[2] Gold solar discs were widespread in the ancient Near East and were particularly popular in Late Bronze Age Syria and neighboring regions, with examples known from Kamid el-Loz,[3] Ugarit,[4] and the Uluburun shipwreck (cat. no. 217). A suspension loop is always attached to the edge so that the disc could be worn as a pendant on a necklace. Most likely, they



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had both decorative and apotropaic functions. This example, from the Royal Tomb at Qatna, was obviously long in use before it was deposited as a grave good. The original loop was broken off and replaced by a gold melon bead soldered on to the edge of the pendant. Additionally, a small strip of gold was soldered onto this weakened spot to stabilize the connection with the new loop.

The pendant is carefully decorated both in repoussé and with granulation. The star and the rays are worked in repoussé from the reverse, as are the eight rounded projections between the rays and the points of the star. On the front, fine granulation follows the center lines of the points of the star, encircles each of the projections, and highlights the perimeter of the disc. With these lavish embellishments, the Qatna solar-disc pendant is one of the finest examples of its type. PP

1. See Dohmann-Pfälzner and Pfälzner 2006, p. 97, fig. 29.
2. This sun symbol should not be confused with the star symbol of the goddess Ishtar, which consists of eight straight rays; compare Black and Green 1992, p. 16, fig. 7, p. 168, fig. 140, p. 169, fig. 143.
3. *Frühe Phöniker im Libanon* 1983, pp. 154–55, no. 90, fig. on p. 176.
4. *Le royaume d'Ougarit* 2004, p. 242, no. 269, p. 266, no. 312.

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Chalice

Gold

Height 13.1 cm (5⅛ in.); diameter of mouth 11.2 cm (4½ in.); diameter of base 6 cm (2⅜ in.); max thickness 0.1 cm (1/16 in.)

Uluburun shipwreck

Late Bronze Age, ca. 1300 B.C.

Bodrum Museum of Underwater Archaeology, Turkey 47.31.84

(KW 99)

This biconical chalice is the largest gold object from the wreck (fig. 112),[1] yet one of the few Uluburun artifacts to have defied convincing attribution. It is crafted from three components: a nearly conical bowl with a slightly flaring rim, a conical pedestal base, and a small collar covering the junction where the bowl and base are joined by three gold rivets clenched in the base. The bowl lacks handles and is full bodied, with two repoussé bands; the upper is pronounced and rounded in section, and the lower, directly below it, is carinated. The bowl section is thicker than its pedestal base and was shaped from a single sheet of gold hammered from the inside out. The chalice was discovered at the stern of the vessel near the gold falcon pendant (cat. no. 220) and one of two small bronze cymbals, or crotals, which probably were for ritual use.

Although the Uluburun chalice has no exact parallels in the Aegean,[2] the resemblance of its cup section, with its general profile and pronounced rounded band, to well-known gold cups from that region[3] has led to suggestions of an Aegean origin.[4] The orientation and appearance of the second carinated band, as well as the plain conical pedestal base, however, set the Uluburun chalice apart.[5] The Uluburun chalice has neither a ring handle nor a full handle, both types of which are found on Aegean cups. Such handles are fastened with multiple rivets, yet there are no rivet holes on the Uluburun chalice to indicate that it ever carried a handle. Nor is there any evidence to suggest that it was formed by modifying another cup type.

Handleless, pedestal-footed chalices or goblets of pottery and stone, usually alabaster, occur commonly in the Levantine region. Although the bowls of these chalices are embellished with two or three bands or ribs located on the rim, midbowl, and bowl skirt, the bands are thin and the bowl is cylindrical in shape, having a diameter wider than the bowl's height, which makes their proportions unlike that of the Uluburun chalice.[6]

A type of biconical chalice or goblet of pottery and faience, with a bell-shaped bowl often painted to represent a stylized lotus bud and a conical stem and ring foot, is known from Egypt.[7] Such vessels, along with two faience examples from Minet el-Beidha,[8] probably of Egyptian origin or Egyptian-inspired local production,[9] are similar in their general profile to the Uluburun chalice but lack its banding.

As with several other objects on the ship, the unique Uluburun chalice may be seen as a hybrid vessel or a version of the typical banded Levantine cylindrical-footed stone vessel, which incorporates the form of Egyptian lotus-shaped vessels. Biconical chalices or goblets, usually of pottery but sometimes of other materials, also occur on the Levantine coast.[10] All these vessels, however, have a single band of rounded or angular section located slightly above the bowl-base juncture and lack the second carinated band of the Uluburun chalice. It may then be suggested that the Uluburun chalice was made in the Levant or at least modified there. This attribution is also supported by its weight of 236.8 grams, which rather closely corresponds to 25 units of a shekel, or half a mina, based on a unit of approximately 9.3–9.4 grams, the mass standard predominantly represented by the weights aboard the Uluburun ship (see cat. no. 235).[11]

The chalice may have been a valued personal possession of the ship's captain and/or head merchant or it may have been a prestige gift to be presented at the ship's destination. Conversely, it may have been an item of ritual or cultic use for ceremonies conducted on the ship when setting out on a journey and also upon reaching shore safely. Pictorial and artifactual evidence have shown that chalices were used as incense burners in the Levant. A wall painting in the Tomb of Kenamun in Thebes (see fig. 98) depicts a fleet of Canaanite ships arriving and docking in Egypt, where the captain of one ship holds a raised tall cup (or chalice) in one hand and incense burners in the form of a chalice in the other.[12] The captain of a second ship also raises an incense burner, while a second man on the same ship holds in



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219, detail of interior

raised hands a tall offering cup and a carinated bowl. Several bronze chalices of Late Bronze IIIB, used for burning incense, have been found at the coastal site of Tel Nami, and more than 50 chalice-shaped pottery incense burners have been excavated from the Late Bronze Age anchorage of Tell Abu Hawam.[13] A chalice-shaped pottery incense burner has also been found on an eighth-century B.C. shipwreck off Ashkelon.[14] While the Uluburun cup could have been used as an incense burner aboard the ship, biconical incense chalices generally have flatter bowls.

If not an incense burner, perhaps the Uluburun chalice served as an offering cup onboard, as seen with the two men clutching such cups aboard their ships in the Kenamun wall painting. Although much later in time, Thucydides writes of shipboard libations offered in silver and gold cups before departing on a voyage.[15] Polemon, too, tells of such offerings, though after the offering was made, the cup was tossed into the sea.[16] CP



Figure 112. Author excavating gold chalice on seabed. Uluburun shipwreck.

1. The weight of the cup, 236.8 grams, may be approximately 1 gram heavier owing to a small patch of encrustation preserved inside the base. A total of approximately 530 grams of gold in the form of various objects, an ingot, and scrap were found on the Uluburun ship; this chalice accounts for half the total weight. See Bass 1986, pp. 286, 289, ill. 24; Pulak 2005c, pp. 67, 594.
2. For Middle Minoan III–Late Minoan I chalices of a variant form found in ritualistic contexts, see Wright 1996, pp. 289–93; Warren 1969, pp. 36–37, pls. 392, 393.

3. See, for example, gold cups nos. 102, 108–12, 185, 196, 197, and especially the plain-bodied cup no. 136 in E. Davis 1977.
4. Lolos 1989, pp. 8–9.
5. Pulak 1997, p. 244.
6. A few examples of this type include an alabaster group of differing sizes and banding arrangements found together with other stone and pottery vessels in a storeroom at Minet el-Beidha (Schaeffer 1932, p. 6, pl. VIII:1), and a small, two-banded version with separately made bowl and pedestal from Gezer (Seger 1988, p. 196, no. 10, pls. 13:10, 73:B).
7. For faience examples, see Caubet and Pierrat-Bonnefois 2005, p. 74, fig. 200, p. 62, fig. 142; for those of pottery, see Rose 2007, p. 214, no. 263, p. 218, no. 293, p. 266, no. 557.
8. Schaeffer 1929, p. 288, pl. LII:6; Schaeffer 1932, pp. 6, 12, fig. 8; Caubet 2007, pp. 226–27; for a color photograph of one of the cups, see Caubet and Pierrat-Bonnefois 2005, p. 62, fig. 142.
9. Schaeffer (1932, p. 6) surmised a Cypriot origin for a similar footed cup found at Minet el-Beidha, although he did not discount the possibility of Syrian manufacture.
10. Among others, pottery examples of biconical bowls with banding have been found at Lachish (Tufnell, Inge, and Harding 1940, pl. XLVIIA, B:222, 232); Hazor (Yadin et al. 1960, p. 57, pl. CXIII:21); Gezer (Macalister 1912, pp. 163–64, fig. 325); an earlier chalice of Middle Bronze IIC period at Tel Dan (Biran 1994, p. 101, fig. 68:9); Samaria (Crowfoot and Crowfoot 1957, pp. 175–76, fig. 25:1, 2, 4, 7, for some examples), and in alabaster at Shiloh (Finkelstein, Bunimovitz, and Lederman 1993, p. 249, fig. 19.15:4, p. 252, fig. 9.18:2, p. 255, no. 19). Early copper examples of this general type have been found in the royal tombs of Dynasty 1 in Egypt. See Petrie 1901, pl. IXa:3.
11. A text from Ugarit (RS 11.732) mentions a gold cup to be sent as a gift to the Hittites as weighing a Ugaritic mina of 50 shekels, which is twice the weight of the Uluburun chalice, suggesting that vessels of precious metals were made according to specific weights; see Parise 1984, p. 128.
12. Davies 1963, pp. 14–15, pl. XV; Davies and Faulkner 1947, pp. 40ff., pl. VII; see also Brody 1998, p. 79.
13. Yoselevich 2006, pp. 27–28.
14. Ballard et al. 2002, p. 158, fig. 8, p. 159, fig. 9:2, p. 163.
15. Thucydides 6.32.1–2.
16. Athenaeus 11.426.

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Falcon Pendant

Gold
Height 3.5 cm (1⅜ in.); width 6.3 cm (2½ in.)
Uluburun shipwreck
Late Bronze Age, ca. 1300 B.C.
Bodrum Museum of Underwater Archaeology, Turkey 45.31.84
(KW 94)

A gold pendant in the form of a falcon is one of the most elaborate pieces of jewelry discovered on the Uluburun shipwreck.[1] The falcon is depicted with its head facing front, outstretched wings, and legs spread on either side of the tail feathers, with the talons of each foot clutching a hooded cobra. The pendant, with two small hoops attached to the upper edge for suspension, is made of two sheets of gold, with the back sheet folded over the front sheet and crimped around the edges. The body is worked in repoussé. The falcon is distinctive both in form and in the use of fine granulation, which covers the entire body and wing coverts of the bird, as well as the addorsed cobras. Lines of larger granulation define the outline of the pendant, the body of the bird, and the flight feathers of the wings and tail.[2] The granulation appears to be sweated in place, but further analysis is needed to confirm the metalworking method used to affix the granules to the gold sheet.

The somewhat crude craftsmanship of the pendant suggests that it was probably of Syro-Canaanite make and design, as the pendant does not display the level of skill commonly associated with Egyptian and earlier Mesopotamian goldwork.[3] Its granulation, however, exploits the reflective qualities of gold and was an elite metalworking technique that displayed power and prestige.[4] The Uluburun pendant was found in the part of the site corresponding to the stern of the vessel, the same area where much of the gold jewelry and gold scrap were found, suggesting that these pieces, no matter the quality, were kept together and used as ready bullion when necessary.

Because some of the granulation has been lost, the original weight of the falcon can only be estimated at approximately 12.5 grams, which may correspond to 1.5 units of the Mesopotamian shekel of about 8.4 grams or possibly one unit corresponding to the lighter end of a mass standard based on the Egyptian gold *dbn*.[5]

The pendant is evocative in subject of the well-known falcon earrings from the hoards at Tell el-'Ajjul (cat. no. 221),[6] but a closer stylistic parallel can be found in a pair of matching earrings in Leiden,[7] which are also thought to come from Tell el-'Ajjul.[8] A falcon earring in the Musée du Louvre is virtually identical to the Leiden pair, and may have come from the same original source.[9] The Leiden earrings are closest to the Uluburun pendant: the falcon's head faces front and the talons are shown clasping cobras. The Leiden earrings are also made from two sheets of gold, with the features raised by repoussé and outlined with gold granules, and are more elaborately decorated than the Uluburun pendant. While the falcon is a common symbol in Syro-Canaanite iconography, the presence of the hooded cobra in both the Leiden earrings and the Uluburun pendant may reflect contemporary Egyptianizing tastes.

Goldwork found in tombs at Byblos may represent an earlier stage in the use of granulation and other techniques (see cat. no. 25).[10] Gold funerary collars from these burials introduce falcon imagery into the Levantine jewelry repertoire (see cat. no. 28). Middle Kingdom collars and pectorals are the most likely sources of inspiration.[11] It is believed that by the early fifteenth century B.C., the goldworking tradition may have moved from Tell el-'Ajjul to another center, such as Ugarit, where it lasted until the late fourteenth century B.C.[12] Recently, other areas of influence suggested for the Tell el-'Ajjul goldworking tradition have included Ebla and Megiddo.[13]

The earrings from Tell el-'Ajjul were also found in association with other pieces of gold in hoards, which have been identified as the possessions of itinerant craftsmen or peddlers.[14] It is probably through such individuals that the styles and techniques of goldworking were spread throughout the ancient Near East. Goldworking techniques from the Near East may have reached the Aegean through intact jewelry, like this pendant, and scrap jewelry, represented on the Uluburun shipwreck by cut-and-folded granulated pendants and other pieces (see fig. 114). These imports supplied Aegean craftsmen with raw materials and exposed them to Near Eastern artistic styles.[15] CP



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1. Bass 1986, pp. 287–88, pl. 17, fig. 3; Pulak 1998, p. 206; Pulak 2005c, p. 597, fig. 110.
2. Bass 1986, p. 287.
3. Politis 2001, pp. 174–77, 180.
4. Ibid., pp. 161, 180–81.
5. The pendant presently weighs 12.08 grams; granulation has been lost, especially from the body of the cobra clutched in the falcon's left foot.
6. The four falcon-shaped earrings from Tell el-'Ajjul, along with other gold objects from the hoards, have been dated to between about the mid-sixteenth and the early fifteenth century B.C. by Negbi (1970, pp. 29, 36–37). For the Tell el-'Ajjul falcon earrings, see ibid., pp. 26, 38–39, nos. 14–17, pl. I:1; Maxwell-Hyslop 1971, pp. 117–18, pl. E; Tufnell 1983, pp. 61–63, pl. XXI.
7. Tufnell 1983, pp. 63–64, pl. XXII.
8. Maxwell-Hyslop 1971, p. 117, Tufnell 1983, p. 64.
9. Lilyquist 1994, p. 27, figs. 46, 47. Lilyquist (ibid., p. 28) suggests that both the Leiden earrings and the example at the Louvre were found in Egypt.
10. Maxwell-Hyslop 1971, pp. 103–4, 107–9; Lilyquist 1993, p. 41, fig. 13.
11. Negbi 1970, p. 26.
12. Ibid., p. 37.
13. Politis 2001, pp. 171–75; Lilyquist 1993, pp. 44–47.
14. Politis 2001, p. 176; Petrie, Mackay, and Murray 1952, pp. 8–10; others understand them as being hidden by their owners in times of stress (Tufnell 1983, p. 60; Negbi 1970).
15. Pulak 2001, p. 24; Politis 2001, pp. 177–80.

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Falcon Earring

Gold
Height 1.4 cm (⅝ in.); width 1.3 cm (½ in.)
Tell el-'Ajjul, Hoard 277
Middle/Late Bronze Age, 17th–15th century B.C.
The Trustees of the British Museum, London
130764

This ornament has been interpreted as both a pendant and an earring. The latter identification, however, would seem more appropriate, as a nearly identical piece, now in the Fitzwilliam Museum, Cambridge, was discovered in the same hoard at Tell el-'Ajjul.[1] The shape is that of a bird of prey, the body and tail feathers depicted frontally, the head in profile. Constructed from sheet gold worked in repoussé, the ornament was then decorated with granulation and wires to demarcate



Figure 113. Drawing of gold earring inlaid with stones, glass, and faience from the Tomb of Tutankhamun. Dynasty 18. Egyptian Museum, Cairo JE 61969



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the head, eye, neck, body, and tail feathers. While the body is rendered in a more or less realistic manner, the wings are embellished with granulation in purely decorative triangular and circular patterns.

The bird is generally described as a falcon, which has both royal and divine associations in Egypt and is frequently portrayed on pectorals going back to the Middle Kingdom, as well as on objects produced at contemporaneous Levantine sites with strong Egyptian connections (see cat. no. 28). It has also been suggested that the bird is a wryneck, primarily because its beak is straight rather than hooked.[2] In its anatomical details, the Tell el-'Ajjul bird can be linked to those depicted on the well-known examples belonging to Tutankhamun (fig. 113).[3] While the connection between the two sets of earrings is apparent, the falcon as a symbol for a royal personage such as Tutankhamun is better documented and more appropriate, supporting the identification of both sets as falcons.

It would, however, be impossible to attribute to the two sets of earrings the same level of craftsmanship. As is typical for Levantine manufacture (see pp. 101–3), the Tell el-'Ajjul earring is worked in a rather crude and casual manner, with granules of uneven size and imprecise placement, edges inexact and poorly finished, and evidence of overheating. While the iconography may ultimately derive from Egypt, the workmanship is not on the level of that found on pieces of Egyptian origin, or on material produced at Ebla or in Mesopotamia.[4] Quintessentially Canaanite or Levantine, the ornament, despite its less than expert execution, is pivotal to our understanding of both the goldsmith's art and the use of shared imagery throughout the Near East and eastern Mediterranean in the second millennium B.C. KB

1. For both earrings, see Petrie, Mackay, and Murray 1952, pl. VI:1, 3; Negbi 1970, p. 38, nos. 15, 16; McGovern 1985, p. 36, no. 78.
2. Tufnell 1983, esp. p. 64 for a discussion of beak types.
3. Ibid., p. 58, fig. 1.
4. See also Lilyquist 1993, p. 50; Ziffer in *At That Time the Canaanites Were in the Land* 1990, pp. 54–55; Politis 2001, pp. 170–74.

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Bracelet

Silver
Diameter 8.7 cm (3⅜ in.); thickness 0.8 cm (⅜ in.)
Uluburun shipwreck
Late Bronze Age, ca. 1300 B.C.
Bodrum Museum of Underwater Archaeology, Turkey 14.1.2000 (KW 92)

A total of four intact, wearable silver bracelets, and seven others, consisting of crumpled specimens and cut fragments of scrap metal ready for the melting pot, were excavated from the wreck.[1] This bracelet, weighing 69.5 grams,[2] consists simply of a solid bar of silver,[3] circular in section and bent round in a circle, leaving a gap of 1.6 centimeters between the two flat ends. The ends are ornamented with five to six incised parallel lines or threading, followed by a wide band of double chevrons, a motif seen on some of the other bracelets.[4] One other bracelet is identical in shape, size, and decoration, and the two were probably a matching pair. Another, with plain ends, is much smaller, and was likely intended for a child. A unique bracelet fragment is made of a copper alloy sheathed in silver.

This silver bracelet was found at the stern end of the wreck, along with most of the other silver and gold jewelry, scrap pieces of silver and gold, and pieces of silver and gold ingots (fig. 114). It would thus seem likely that the precious metals aboard the ship, along with other valuables, were stored in a bag of cloth or leather, or



Figure 114. Gold and silver scrap. Uluburun shipwreck. Bodrum Museum of Underwater Archaeology



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perhaps in a small wood chest, now lost, in a compartment at the ship's stern. That readily usable intact jewelry was kept alongside scrap jewelry and other bits of silver and gold suggests that the intact examples, in addition to their use as a means of personal adornment, could have served as a supply of ready bullion for use when needed. One of the complete bracelets was crumpled, rather than cut into manageable smaller pieces, as was the case with two gold medallions (whose matching halves were recovered) and fragments of other silver bracelets, indicating that the intended value of much of the hoard was monetary rather than one of adornment.[5]

Originally, such bracelets were mostly worn after the fashion of the multiple bracelets represented on some of the "Astarte" pendants (cat. no. 213) and plaques. Bracelets with thread-ornamented ends, with or without chevrons, are paralleled in gold and silver in Late Bronze Age contexts at Tell el-'Ajjul[6] and on Cyprus,[7] gold at Megiddo,[8] silver at Ugarit,[9] Gezer,[10] and Amarna,[11] and bronze at Byblos.[12] A bronze bracelet of a different form but with threaded ends and double chevrons similar to the examples from Uluburun was found at Beşik-Tepe in the Troad.[13]

CP

1. Bass 1986, p. 288, ill. 27; Pulak 1988, pp. 25–26, figs. 29, 30.
2. Another, nearly identical, silver bracelet is lighter, at 60.6 grams. A third bracelet, complete but crumpled, weighs 68.7 grams.
3. Analyses by Zofia Stos-Gale using ED XRF indicates the silver is 96.3% pure, and lead-isotope compositions using TIMS are consistent with lead-silver ores from south-central Turkey's Bolkardağ in the southern Taurus Mountains (personal communication).
4. This decoration is one of four different varieties seen in the Uluburun shipwreck assemblage; two other bracelets have cross-hatching at their ends with a band of double chevrons above it. One bracelet fragment has an end with a wide band of cross-hatching bordered by a row of dotted circles, framed with a pair of parallel lines on either side above which are triple chevrons embellished with the same circles both inside and outside the chevron field. A good parallel for this type of decoration is seen on a silver bracelet from Cyprus (Marshall 1969, p. 39, no. 607, pl. v:607).
5. Pulak 1988, p. 26, n. 153; Pulak 2001, pp. 24–25.
6. Petrie 1932a, p. 6, pl. II; Petrie 1932b, pp. 44–45, fig. 5; Petrie 1934, pp. 5, 7–8, pls. XII, XV, XVI:68, XIX, XX:155–58; Negbi 1970, pp. 48–49; Maxwell-Hyslop 1971, pp. 123–24, fig. 88, pl. 90.
7. Lassen 2000, pp. 242–43 fig. 16.3; Marshall 1969, p. 39, no. 607, pl. v:607.
8. Loud 1948, pl. 226:3.
9. Schaeffer 1939a, pp. 42–44, fig. 31.
10. Macalister 1912, pp. 98–100, fig. 286.
11. Pendlebury 1931, p. 236, pl. LXXIII:3.
12. Dunand 1939, p. 174, pl. LXXII:2540, 2542.
13. Lassen 1994, pp. 132–35, ill. 3.

223
Nefertiti Scarab

Gold
Height 0.5 cm (¼ in.); width 1 cm (⅜ in.); length 1.4 cm (⅝ in.)
Uluburun shipwreck
Late Bronze Age, ca. 1300 B.C. context
New Kingdom, Dynasty 18, reign of Amenhotep IV–Akhenaten, ca. 1353–1336 B.C. manufacture
Bodrum Museum of Underwater Archaeology, Turkey 6.5.87 (KW 772)

The decline in the production of royal-name scarabs during the Amarna Age was a result of Akhenaten's proscription of all deities except for the Aten; this ban included the god associated with the scarab-headed solar deity, Khepri. This scarab recovered from the Uluburun shipwreck is the only extant gold specimen attested with the name of Akhenaten's wife, Nefernefruaten Nefertiti.[1] Because of the scarab's small size, the signs forming the name were packed close together onto three lines rather than the usual four. The scarab shows evidence of considerable wear, especially on the back, though the wing cases retain a series of thin ribbed lines like those on the back of an equally fine gold scarab of Akhenaten in The Metropolitan Museum of Art (fig. 115).[2]

The original owner of the scarab is likely to have been an official (or spouse) of the Amarna era who disposed of it after the royal couple's death, when an object naming a member of the widely despised royal family could no longer be displayed safely in public. The owner may have sold it to a merchant who kept it for himself or planned to peddle it at one of the ship's Mediterranean stops for its metallic value or for reuse in jewelry. The scarab provides a terminus post quem for the date of the Uluburun wreck as the post-Amarna phase of late Dynasty 18, that is, the end of the fourteenth century B.C. JMW



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223, back



Figure 115. Gold scarab with inscription of Akhenaten. Dynasty 18. The Metropolitan Museum of Art, New York, Purchase, Edward S. Harkness Gift, 1926 26.7.201

1. Weinstein 1989, pp. 17–29. The normal practice in the Amarna period was to show the god's name, Aten, in the top line facing the seated-queen determinative at the bottom. On this scarab, the reed leaf (the Egyptian letter *i*) in the god's name is reversed and faces away from the queen.
2. Ibid., p. 19, fig. 31, with previous bibliography.

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Plaque with Heads of Akhenaten and Nefertiti

Limestone
Height 15.7 cm (6⅛ in.); width 22.1 cm (8¾ in.)
Egypt
New Kingdom, Dynasty 18, reign of Akhenaten, ca. 1349–1336 B.C.
Brooklyn Museum, New York 16.48

This plaque is carved in sunk relief with representations of the heads of Akhenaten and his queen, Nefertiti.[1] The couple are portrayed in the style developed toward the end of their reigns, with features far less exaggerated than in earlier years. That is particularly true of the king, whose earlier representations depicted him with heavy-lidded eyes, drooping lips, elongated chin, and two fleshy creases on the front of his neck. Although those peculiarities are only hinted at here, he is also recognizable by his headdress, the baglike royal *khat* that he often wore.

Nefertiti's headdress, which was worn by no other queen, is a bulbous cap. In painted examples, it is shown as blue. Her earlobe is pierced for earrings, as is the king's, and the front of her neck is marked by a single fleshy crease. Her facial features are more regular than those of her husband, and they subtly suggest a woman who, though still beautiful, is no longer young. Note, for example, her rather gaunt cheek and the hint of a double chin.

This small relief is clearly the work of a master sculptor. The hole at the top indicates that it was meant to be hung on a wall, probably to serve as a guide to lesser artists. Other comparable three-dimensional sculptors' models have been excavated at Tell el-Amarna, including the famous head of Nefertiti in Berlin, which represents her wearing a cylindrical blue crown.

This relief is often referred to as the Wilbour Plaque, named after the early American Egyptologist Charles Edwin Wilbour, who purchased it in 1881 near the site of Tell el-Amarna, the city founded by Akhenaten. There, temples decorated with reliefs showed the king, Nefertiti, and their daughters worshipping his sun god, the Aten. It was at Tell el-Amarna that this relief was doubtless made and used. ERR

1. This plaque has been frequently discussed and illustrated; see, most recently, Arnold in *Royal Women of Amarna* 1996, pp. 79, 90, fig. 81; Fazzini, Romano, and Cody 1999, p. 101, no. 54; and Fazzini in *Pharaohs of the Sun* 1999, p. 245, no. 135.





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Ring Fragment

Electrum
Height 1.6 cm (⅝ in.); width 1.4 cm (½ in.); length 1.6 cm (⅝ in.)
Uluburun shipwreck
Late Bronze Age, ca. 1300 B.C. context
New Kingdom, Dynasty 18, 14th century B.C. manufacture
Bodrum Museum of Underwater Archaeology, Turkey 83.24.86 (KW 603)

This Dynasty 18 signet ring fragment, made of a gold and silver alloy, has suffered significant wear and chipping, and chisel marks along the break at the bottom edge show that it was deliberately cut in half. The lower half of the bezel and most of the hoop are gone, leaving the remaining segment as little more than a piece of scrap metal eventually to be melted down for reuse.

Of the three surviving signs on the upper part of the bezel, only the neatly cut ostrich feather on the left, symbol of Maat, the Egyptian goddess of truth and justice, is completely legible. The figure in the center is a vulture with carefully detailed plumage and a head which may be that of a vulture or of a human. If the former identification is correct, the bird could possibly represent Nekhbet, the vulture goddess of Upper Egypt; if the latter, then a better connection might be to a royal statue of probable Middle Kingdom date in Cairo that has a female human head on the body of a vulture.[1] The partially preserved, more roughly cut figure on the right is difficult to identify. It appears to be the upper part of a seated woman possibly wearing a crown, but an inverted triangular chip, perhaps deliberately cut out of the face of the bezel above the head, has obliterated nearly all of what was once there. Overall, the signs on the bezel seem to relate to a woman, specifically a queen, but the exact significance of the composition remains elusive. JMW

1. Keimer 1935. See also Weinstein 1989, pp. 22–23.

226
Scarab

Amethyst
Height 0.8 cm (⅜ in.); width 1.5 cm (⅝ in.); length 1.9 cm (¾ in.)
Uluburun shipwreck
Late Bronze Age, ca. 1300 B.C. context
Middle Kingdom, Dynasty 12–13, 19th–18th century B.C. manufacture
Bodrum Museum of Underwater Archaeology, Turkey 4.6.98 (KW 4851)

The scarabs found in the Uluburun shipwreck come from a variety of periods and places. The earliest is this one, made of amethyst. Like most amethyst scarabs of the early second millennium B.C., it has a plain base, with the side and back features of the beetle defined only perfunctorily.[1] The legs are rendered as several short lines down the sides between two horizontal lines; on the back are three lines carved in the form of the Roman numeral I, with the top line delineating the back of the head area and a line near the base perhaps for the back of the wing cases. The head area is blank, and no prothorax is indicated.



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Amethyst is a translucent variety of quartz whose purplish color comes from ferric-oxide impurities. The amethyst used by Egyptians during the Middle Kingdom comes from deposits at Wadi el-Hudi, about 35 kilometers southeast of Aswan, in Egypt's Eastern Desert.[2] Inscriptions left by pharaonic expeditions in this mining region attest to the widespread exploitation of the amethyst deposits from late Dynasty 11 through the late Middle Kingdom, during which the use of this gemstone in Egyptian jewelry and seals—for both royal name and private name and title scarabs—reached its peak. The hardness of amethyst made it much more difficult to work than softer materials, yet this very quality also explains why many amethyst scarabs created in the early second millennium B.C. have been found in archaeological deposits dating hundreds of years later. JMW

1. E.g., A. Rowe 1936, pls. 10, 11, and passim; Tufnell 1984, p. 39, fig. 15, nos. 1–18.
2. Sadek 1980–85; Shaw and Jameson 1993.

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Scarab

Gold, faience
Height 1.9 cm (¾ in.); width 1.8 cm (¾ in.); length 2.5 cm (1 in.)
Uluburun shipwreck
Late Bronze Age, ca. 1300 B.C. context
Second Intermediate Period, 17th century B.C. manufacture
Bodrum Museum of Underwater Archaeology, Turkey 28.24.86 (KW 338)

This scarab is an heirloom of Levantine rather than Egyptian manufacture. The design on the base is of a type that initially appeared in the seventeenth century B.C. on scarabs in the southern Levant. It still occurs occasionally in the early sixteenth century B.C. but is rarely seen on contemporary Second Intermediate Period scarabs in Egypt or Nubia.[1] The hieroglyphs are arranged in three vertical columns, with the central column of signs set within a "shrine," above which is a winged sun disc. The four signs in the two flanking columns are identical. The signs on the base



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227, back



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228, back

are purely decorative and amuletic in nature; their arrangement does not form a comprehensible text.

The beetle's back is executed in a highly schematic fashion typical of the period. The trapezoidal head has double side lines and a simple open clypeus (the shieldlike plate at the front of the head). A single horn protrudes from the center of the head, and small squared eyes flank the base.[2] The rest of the back is blank except for a single small notch along each side to indicate the division between the prothorax and the wing cases. The thin gold mount and attached tubular endings were made separately, after which the endings were soldered to the band. The scarab was probably threaded with gold wire to create a finger ring. JMW

1. D. Ben-Tor 2007, pp. 87, 135, 168, pls. 58, 86; cf. Tufnell 1984, pp. 123–24, pl. 20.
2. Tufnell 1984, p. 34, fig. 12 (head type D6). A good illustration of the head appears in *Das Schiff von Uluburun* 2005, p. 599, no. 113.

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Scarab

Maroon jasper with inclusions of quartz
Height 0.7 cm (¼ in.); width 1.3 cm (½ in.); length 1.8 cm (¾ in.)
Uluburun shipwreck
Late Bronze Age, ca. 1300 B.C. context
New Kingdom, Dynasty 18, 15th–14th century B.C. manufacture
Bodrum Museum of Underwater Archaeology, Turkey 45.7.95 (KW 3699)

The baboon was an exotic creature that the Egyptians obtained from the land of Punt, in the area of northern Ethiopia, or Eritrea.[1] Together with the ibis, it was a sacred attribute of Thoth, whose numerous identities in Egyptian mythology included god of writing, god of justice, and god of the moon. In his capacity as the moon god, Thoth is depicted as a baboon wearing a crescent moon and a full lunar disc on his head.

Steatite scarabs inscribed with designs that incorporate representations of baboons were quite numerous in both Egypt and the Levant during the New Kingdom.[2] This is a rare example made of maroon jasper, a semiprecious stone that occurs geologically in a variety of colors at several places in Egypt's Eastern Desert.[3]

Many New Kingdom scarabs show a baboon placed variously on a stool or a standard, or in the hieroglyph *neb*, and facing—sometimes in a pose of adoration—the name of a king.[4] The baboon on this very fine scarab sits on a stool, with the crescent moon and lunar disc on his head; he holds between his paws what appears to be a *wedjat*, in Egyptian mythology the eye of Horus stolen by Seth and retrieved by Thoth. The animal is cut in simple outline form with no delineation of the interior details of the body. JMW

1. Houlihan 1996, index s.v. "baboon."
2. E.g., Petrie 1925, pp. 16, 19, 23, pl. 13, nos. 840–46; Hornung and Staehelin 1976, p. 107, nos. 244, 265, 266, 401, 664, 697, 744, 747, B30, D3, MV6. On some of these pieces, the baboon hieroglyph actually substitutes for the Egyptian *Djehuti* (Thoth).
3. Aston, Harrell, and Shaw 2000, pp. 29–30. Scarabs made of jasper are rare prior to Dynasty 18.
4. The two kings most often named on these objects are Thutmose III and Ramesses II; see, e.g., Jaeger 1982, pp. 79, 151, ills. 158, 159, 430, 537, 591, 594, figs. 85, 96.

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Scarab

Green stone
Height 0.9 cm (⅜ in.); width 1.4 cm (½ in.); length 1.5 cm (⅝ in.)
Uluburun shipwreck
Late Bronze Age, ca. 1300 B.C. context
Cypriot or Levantine manufacture
Bodrum Museum of Underwater Archaeology, Turkey 46.5.90 (KW 2012)

This enigmatic scarab, originally located toward the stern area of the ship along with other glyptic and jewelry, has certain features typical of New Kingdom and later scarabs. These include V-shaped nicks (the humeral callosities) marking the shoulders on the back, and the incised lines radiating out across the beetle's clypeus (the latter trait common only starting in Dynasty 19). Nevertheless, the piece is clearly of non-Egyptian manufacture.



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229, back

It is nearly circular in shape with somewhat flattened ends, quite unlike the typical Egyptian scarab which is more elongated and has rounder ends. In addition, the oversized V-shaped nicks and the schematically rendered beetle legs on the sides suggest an origin outside the Nile Valley, as does the very non-Egyptian design engraved on the stamping surface.

A roaring lion with raised tail strides to the left. Its head is well defined, with the eye formed as a dot within an almond-shaped depression creating an angled profile from the ear and forehead to the nose, with a raised area for the cheek and a gaping jaw. The animal's heavily muscled but lithe body is captured in this rendering both by its posture and by the use of strong curves and high modeling for the belly, rump, and thigh areas. The lower limbs are, by contrast, formed of thin double lines, perhaps to indicate leg tendons; the lines thicken and bend to evoke such features as dewclaws and paws.

Various aspects of this image can be paralleled in glyptic representations of felines from Cyprus and Ugarit. The posture of the animal—with all four legs placed firmly on a groundline, the (partially missing) rear leg nearest the viewer extending backward, and the tail raised and curled over the back—as well as such details as the placement of one foreleg in line with the chest curve, can be compared with images on seals and seal impressions found at Ugarit (some of them attributed to Cypriot manufacture).[1] While individual features such as the linear depiction of the legs occur on seals from Syria,[2] others such as the form of the head and eye are found on Cyprus.[3] The treatment of the body as a sum of parts rather than as an organic whole places this representation outside the Aegean world. However, both the rendering of individual elements and the overall sense of movement suggest that it was made by a seal carver working on Cyprus or at Ugarit, where Aegean traditions were embedded into local styles.

JMW/JA

1. See two ring impressions on tablets from Ugarit: RS 17.141, showing a griffin with the far foreleg emerging from the chest and front hind leg extended back, and RS 16.400, depicting a lion in a similar posture, which Beyer (1997, p. 175, fig. 24) attributes to possible Cypriot manufacture; a steatite rectangular prism seal from Ugarit: AO 28277: RS 10.001, depicts a similar though fuller, treatment of the head, chest, and forelegs, but with the foreground rear leg kicked forward in the Aegean manner, perhaps indicating Cypriot manufacture; for a steatite scarab from Kition with a striding griffin, its foreground rear leg extended back and far foreleg also emerging from the chest, see Karageorghis 1980, pp. 784–85, fig. 66; by contrast, note the more characteristically Aegean posture of the lion on a gold ring from Enkomi (Karageorghis 1968, pl. XXXVII:5, 6) with a natural transition from chest to far foreleg and rear leg nearest the viewer kicked forward; see also felines incised on ivories from Megiddo: Loud 1939, pl. 52:266, 228.
2. Hammade 1987, fig. 159.
3. Karageorghis 1968, pl. XXXVII:3.

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Cylinder Seal

Hematite
Height 2.9 cm (1⅛ in.); diameter 1.2 cm (½ in.)
Uluburun shipwreck
Late Bronze Age, ca. 1300 B.C. context
Old Babylonian manufacture,
18th century B.C.
Middle Assyrian recarving, 14th century B.C.
Bodrum Museum of Underwater
Archaeology, Turkey 11.5.87 (KW 881)

This seal was probably first carved in Babylonia during the second half of the eighteenth century B.C., when the cutting wheel was used for the deep grooves that form the basis of the figures, and recut on several occasions.[1] The initial design was one of the most popular in the Old Babylonian period. The so-called king with a mace faces the suppliant goddess who raises both hands in intercession for the owner of the seal. The bearded and kilted king wears the round-brimmed Babylonian royal headdress and holds a mace at his waist. The goddess wears the horned headdress of a deity (see cat. no. 7), has looped hair, numerous necklaces (now barely visible), a necklace counterweight down her back, and a tiered, flounced robe. Between the figures are a star disc and a crescent above the small figure of a kilted priest holding a cup and, originally, a small bucket for libations.

The seal must have been extremely worn when, at some later date, the king's beard was partially recut, his kilt altered, his cup recut, and his bucket erased; the priest was given a headband. The original owner's three-line cuneiform inscription



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was also erased so that only illegible traces remain, and over it a four-winged lion-demon was cut with considerable expertise. Two stars and two rosettes further mask some of the cuneiform signs (perhaps the rosettes and the circular drillings between the original two figures at left were added at the same time, as both appear to have been cut with a worn tubular drill). The lion-demon stands upright, its beaklike jaws open to reveal fangs and a pointed tongue, its staring eye set below a sharply angled brow. A mule's ear rises from its head, and small drill holes indicate nipples. Its arms and legs end in talons, two wings rise from its shoulders, and two hang down. The recutting of earlier seals was frequent in the Late Bronze Age, and the lion-demon addition can be securely dated to the second half of the fourteenth century B.C. by comparing similar creatures on seal impressions used on clay tablets from the reigns of the Middle Assyrian kings Eriba-Adad I (cat. no. 124) and Ashur-uballit I. There follows a hiatus in the archival evidence until the reign of Adad-nirari I (ca. 1305–1274 B.C.); by then the lion-demon had disappeared from the repertoire.

The final change to the seal was the insertion of a thin, kilted figure behind the interceding goddess. He faces left, raises his right hand, and holds a sickle sword in his lowered left hand. His dress, particularly the two tabs at the back of his cap, identify him as the so-called Assyrian hero, who appears in this posture after Ashur-uballit's reign but not later than 1290 B.C. His presence supports a date for the final recutting of this seal between about 1320 and 1290 B.C., which fits perfectly with a date of about 1300 B.C. for the wreck of the Uluburun ship.[2] DC

1. The material of the seal is probably hematite, but it has not been analyzed and could be magnetite or goethite, as all three iron oxides were used.
2. For further reference, see Collon 1987, no. 570; Collon 1989, pp. 14–16, figs. 26–28; Matthews 1990, no. 285; Collon 2005a, no. 570; Collon in *Das Schiff von Uluburun* 2005, pp. 110–11, no. 125, and p. 603.



231a



231b

231a, b

Cylinder Seals

a. Rock crystal, gold
Height 2.8 cm (1⅛ in.); diameter 1.1 cm (⅜ in.)
2.5.87 (KW 714)

b. Rock crystal
Height 2.2 cm (⅞ in.); diameter 1 cm (⅜ in.)
10.19.90 (KW 2159)

Uluburun shipwreck
Late Bronze Age, ca. 1300 B.C. context
Kassite manufacture, 14th century B.C.
Bodrum Museum of Underwater Archaeology, Turkey

The two seals seen here were probably cut shortly before 1300 B.C., as they were newly made at the time of the shipwreck. They were worked with cutting wheels and drills of different sizes on very clear rock crystal, and both have slightly convex ends.[1] Over the ends of the first seal (cat. no. 231a), strips of gold were roughly shaped and braised together to form rudimentary caps about 7 millimeters high; they hide the upper and lower parts of the design.[2] Depicted are three bearded male figures, probably gods, approaching a fourth, probably a royal worshipper, in postures and garments characteristic of Kassite procession scenes (see fig. 116, here possibly as dignitaries). Each of the first three figures stands with one foot forward and left arm bent; the first approaching figure holds a short bow in his lowered hand, but the other two are empty-handed. All three wear globular headdresses and robes with double diagonal hems. The fourth figure is smaller and wears a flatter headdress. The hem of his long robe is indicated by two heavy lines meeting at a slight angle; his right arm is bent, and his left hand is raised in greeting. Various symbols are inserted between the figures, and linear borders encircle the top and bottom of the seal. The symbols may identify the gods: the cross could be an abbreviated star indicating an astral deity; a diagonal



Figure 116. Suggested reconstruction of designs on glass beakers from Hasanlu. Kassite period. Extant fragments: University of Philadelphia Museum of Archaeology and Anthropology 65-31-403, 65-31-404, 65-31-405

V might be a fish, signifying the water god; the crescent could stand for the moon god; and the sideways V, which may represent a fly, symbolizing courage and victory, is appropriately placed next to the deity with a bow—presumably a warrior god. The lozenge and eye shapes are probably the same symbol (known as the *rhomb*) placed on either side of the worshipper for good luck; this symbol is found on royal and other seals from Babylonia during this period but seems to have been absent in northern Mesopotamia.

The second seal (cat. no. 231b) is slightly flattened on one side, although there is no indication of earlier cutting and erasure. A small chip at the lower end, probably caused during manufacture, was filed down and polished. The design shows a standing bearded worshipper facing right, with one hand raised before a seated, bearded king (or god?) who holds a cup beneath a star; behind the king is a suppliant goddess of Old Babylonian type. All three figures are robed, and they wear their hair in buns beneath their domed headdresses. At the end of the scene stands a frontal nude figure with her head turned toward the right. Linear borders circle the top and bottom of the seal.

Although both seals incorporate Babylonian motifs belonging to earlier periods, there are several indications that these seals were not cut in Babylonia. The figures on catalogue number 231a are paralleled on seals of what is known as the First Kassite Style of fourteenth-century B.C. Babylonia, but those seals are rigidly conventional. They generally depict only one or two figures, and are inscribed, often with long prayers. This seal is unusual, therefore, in that it is uninscribed and depicts four figures. The posture adopted by the first three figures is that of the "king (or god) with a mace" of Old Babylonian seals (see cat. no. 230), a figure that seems to derive from the victorious warrior king and that probably represented a beneficent being. The posture of the fourth figure is that of the king in ceremonial robes, found on Mesopotamian seals from the late third millennium B.C. into Kassite times. Deities normally face left when a seal is impressed; as a king, therefore, he should face right. On the present seal, however, the scene is reversed: the more imposing size, headdress, and stance of the three advancing figures, and the attitude of worship of the fourth, suggest three gods approaching a worshipper, perhaps a king. The reversed design may, therefore, indicate that the seal cutter was copying seal impressions rather than an actual seal.

Seated deities appear frequently on seals of the First Kassite Style, but the composition on catalogue number 231b derives from much earlier seals of the Third Dynasty of Ur and early Old Babylonian period (2100–1850 B.C.); on those seals, the suppliant goddess is sometimes replaced by a goddess who leads the worshipper. The nude female appears on Old Babylonian seals made predominantly between about 1820 and 1740 B.C., but it is only on Late Bronze Age examples that she turns her head to one side. Such figures are often referred to as "nude goddesses," but they may be priestesses or apotropaic figures, as they never wear the horned headdress of deities. On First Kassite seals, the nude female would be shown smaller than the other figures; the suppliant goddess would be in front of, and not behind, the god; and a star would be most unusual. The theme of a figure standing before a seated figure with a globular cup is found on pseudo-Kassite seals from southwestern Iran about 1300 B.C.

There is yet another reason for suggesting that the seals probably originated outside Babylonia. Although rock crystal is an extremely hard form of quartz, few Kassite cylinder seals were made from it, possibly because it fractures easily when drills and cutting wheels are used. Therefore, to avoid overheating the drill bit, rock-crystal seals were always perforated from each end, and this can clearly be seen here through the translucent material. In addition to cylinder seals, the Uluburun ship carried a number of predrilled rock-crystal beads and amygdaloid seal blanks suitable for the Mycenaean market (cat. no. 189), suggesting that the rock crystal came from or via the Levant. The Uluburun rock-crystal seals may, therefore, have been imitations of Babylonian seals made in the Levant to satisfy a demand for Kassite seals. Indeed, genuine Kassite seals excavated at Thebes in Boiotia testify to this demand (see cat. no. 177).

Although the two seals may have been products of the same workshop, we know they were not produced by the same seal carver because of differences in the way various features were cut; for example, the

bodies on catalogue number 231a are outlined, but on catalogue number 231b they are recessed on the seal. The designs of both seals were based on Old Babylonian prototypes, but the techniques used were later, and thus the designs are archaizing. Furthermore, had the seals been produced in Babylonia in the fourteenth century B.C., they would have been cut in one of the Kassite styles then in vogue, but this was not the case. These two seals are more closely related to each other than to any other Kassite seals. DC

1. For further reference, see Collon 1987, no. 571; Collon 1989, pp. 12–15, figs. 24, 25; Matthews 1990, no. 124; Collon 2005a, no. 571; Collon in *Das Schiff von Uluburun* 2005, pp. 110–12, nos. 123, 124, and pp. 602–3.
2. The caps are easily removed, allowing the whole design to be studied.





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Cylinder Seal

Orange, yellow, and brown faience
Height 2.6 cm (1 in.); diameter 1.1 cm (½ in.)
Uluburun shipwreck
Late Bronze Age, ca. 1300 B.C. context
Syro-Mitanni manufacture,
ca. 1500–1320 B.C.
Bodrum Museum of Underwater
Archaeology, Turkey 56.7.95 (KW 3405)

This is one of two seals from the Uluburun wreck that belong to a distinctive workshop of faience seals in the Mitanni Common Style[1] and are a counterpart to the rock-crystal pair (cat. no. 231a, b).[2] This seal depicts a figure who faces right in the impression and grasps a horn and the beard of a rampant goat that stands in front of a stylized tree and looks back over its shoulder at its assailant. On the other side of the tree is a seated deity facing left, wearing a horned headdress, with one hand extended toward the tree and holding one of its branches. Standing behind the seat, an attendant holds a staff or mace in his right hand and a curved sword by his side. The two standing figures wear globular brimmed headdresses, and all three wear fringed robes. Linear borders ring the top and bottom of the seal.

Once glazed in bright colors, faience seals were mass-produced in several centers between about 1500 and 1320 B.C. and were traded in large numbers. Because they were so common, they were seldom kept as heirlooms and are therefore useful for dating the houses and burials in which they have been excavated. Seals from this particular workshop are unusual in that they show heroes fighting animals—a subject rarely depicted on Mitanni seals. Products of this workshop have been excavated at sites that span a vast area of the Levant, from Tell Kazel and Tell al-Hamidiya to Kamid el-Loz, Hazor, Beth-Shan, and were also found at Dhekelia on Cyprus. Three have been excavated in northern Mesopotamia, at Tell Mohammad ʿArab, Tell Billa, and Ashur. There are also many unprovenanced examples. All these seals show heroic figures with similar round double-brimmed hats and huge noses, either nude or wearing fringed, open robes.

With the exception of an unprovenanced example in a private collection that provides a very close parallel, this is the only seal to show a seated figure. The tree on this seal is also closely paralleled on many other seals from this workshop and on related seals from Beth-Shan, Tell Abu Hawam, and Lachish, on the Kamid el-Loz seal, and even on a seal from Marlik, near the Caspian Sea in Iran. The provenanced examples from this workshop have been found over such a wide area that it is unfortunately impossible to establish their place of manufacture. The form of the tree indicates close links with sites in the southern Levant, and a workshop in that area is possible. DC

1. The other Mitanni Common Style seal from Uluburun, KW 4266, is not included here.
2. For further reference, see Collon in *Das Schiff von Uluburun* 2005, pp. 112–13, no. 127, and p. 604.

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CANAANITE DAGGER

Bronze with ebony and ivory inlays
Max. height 4.1 cm (1⅝ in.); length 34.6 cm (13⅝ in.); max. thickness of blade 0.6 cm (¼ in.)
Uluburun shipwreck
Late Bronze Age, ca. 1300 B.C.
Bodrum Museum of Underwater Archaeology, Turkey 30.1.2000 (KW 1393)

Among the bronze weapons found on the Uluburun wreck were a flanged-hilt short sword and two daggers, the shorter of which is pictured here.[1] The pointed, slender blade is leaf-shaped, widening along the middle of its length and tapering slightly toward the hilt.[2] A band of decorative punched dots at the base of the blade forms three transverse parallel lines. Between the hilt and the three punched lines is an incised zigzag motif filled with punched dots. At its juncture with the blade, the hilt forms protuberances, or "horns," on either side, which serve as a handguard or quillon. At the opposite end of the hilt is an integrated pommel of an inverted crescent shape. The hilt edges are raised to form flanges for the insertion of ivory and ebony inlays, probably originally affixed with an adhesive and fully preserved on one side. The grip is inlaid with ebony, the pommel and quillon with ivory, and each end is separated from the grip plate by four bands of alternating strips of ivory and ebony.

A second flanged-hilt dagger is similar to the first, except that it is longer (39.3 cm), and poorly preserved, and its hilt plates are completely missing. Still longer is a unique short sword, one of four found on the Uluburun ship but the only one of Canaanite origin. Both the daggers and the sword were cast in one piece, a manufacturing technique that strengthens the integrity of the weapon while allowing it to remain narrow.[3] With a length of 45.7 centimeters, the sword is similar in size to the shorter of the two Mycenaean swords found on the ship (cat. no. 238a). This is the only known example of a flanged-hilt Canaanite sword of its type.[4] Its leaf-shaped blade is decorated with two transverse bands across the base, each composed of three finely incised longitudinal grooves; the flanged hilt is inlaid with ivory and ebony.[5]

There were either three or four Canaanite merchants on board the Uluburun ship (see pp. 301–2).[6] The larger size and the high quality of craftsmanship of the only Canaanite sword found on the vessel suggest that it probably belonged to the chief merchant,[7] who may also have been the ship's captain. Although the present dagger may have been a companion piece also belonging to the captain, the discovery of additional bronze daggers of various types indicates that each merchant carried a weapon. All four Uluburun swords were found at the stern of the ship, while one flanged-hilt dagger was located just aft of the mast and the second was found among the copper ingots near the ship's bow. Clearly, at least one and perhaps both of the daggers were originally located in the stern half of the ship but possibly somewhere forward of the swords. If so, the placement of personal possessions in different areas of the ship may reflect a social hierarchy observed among those on board, with the higher-ranking individuals bearing swords using the stern of the vessel and the subordinate merchants perhaps using the area around the mast or just aft of midships.

While these weapons would have provided a measure of personal protection for the merchants and the truncated size of the swords would have been more practical for shipboard activities, their primary function was probably as an indicator of status. Daggers were common weapons on the Levantine coast in the Bronze Age, but flanged-hilt daggers were considered a luxury item.[8] The Uluburun examples, with their inverted crescent-shaped pommel, leaf-shaped narrow blade, and rivetless construction, are typical products.[9]

Flanged-hilt daggers of various types are found on Cyprus,[10] along the Levantine coast,[11] and at sites farther inland,[12] but the closest parallels to the Uluburun



flanged-hilt daggers and sword come from sites such as Tel Dan, where two daggers with pointed, leaf-shaped blades decorated at the base and crescentic handguards and pommels were found in a fourteenth-century B.C. tomb.[13] Two flanged-hilt daggers, with partly preserved less exotic wood hilt inlays, were found in fourteenth-century B.C. tombs, near the Persian Garden at Akko, thought to belong to wealthy merchants.[14] Similar examples are seen at Ugarit,[15] Shechem,[16] Beth-Shan,[17] Fara (Beth-Pelet),[18] and Tel Aphek.[19] Some of these daggers retain remnants of their hilt plates, all of which are reported to be of wood, but without mention of any ivory inlays. This points to the unique nature of the Uluburun pieces.[20] CP

1. Pulak 1988, pp. 20–23, figs. 20–24; Pulak 1997, pp. 246–47, fig. 16.
2. The hilt is the handle of the dagger and consists of three parts: the handguard, the grip, and the pommel. The handguard is a widening of the hilt at the juncture with the blade, the grip is the middle section of the hilt where the dagger is held, and the pommel is a widening at the end of the hilt, usually for balance and ease of grip.
3. Maxwell-Hyslop 1946, p. 33.
4. Using an arbitrary length of about 45 centimeters to distinguish between daggers and short swords, among the Bronze Age flanged-hilt bladed bronze weapons cast in one piece found on the Levantine coast, only the Uluburun specimen would qualify as a short sword. Only three daggers exceed 40 centimeters in length: Shechem (43.8 cm), Megiddo (40.0 cm), and Beth-Shan (43.9 cm); Shalev 2004, p. 43, no. 143, p. 46, nos. 147, 148, pls. 14:143, 15:147, 148.
5. Pulak 1988, p. 20, fig. 20; Pulak 1995, p. 50, fig. 11, pp. 54–55; Pulak 1997, pp. 246, 248, fig. 16.
6. Pulak 2000a, pp. 247–66; Pulak 1998, pp. 209–10.
7. Pulak 2001, p. 45.
8. Biran and Ben-Dov 2002, p. 121. Chavane 1987, p. 366, figs. 27–29. This type also approximately corresponds to Shalev's Type 7 daggers; Shalev 2004, pp. 41–54, pls. 14–18. The Uluburun daggers and sword fall into Maxwell-Hyslop's Type 31 category of Asiatic weapons: "flanged-hilt" swords and daggers. These bronze weapons are cast in one piece and the edges of the hilt are flanged to receive hilt inlays, either of wood, ivory, or bone, held in place by adhesives or rivets; see Maxwell-Hyslop 1946, pp. 33–36, pl. IV:31A.
9. Maxwell-Hyslop's suggestion that flanged-hilt swords are Aegean in origin has since been refuted: Maxwell-Hyslop 1946, p. 34; Sandars 1961, p. 22; Catling 1964, p. 129.
10. Flanged-hilt daggers found in Nicosia on Cyprus are attributed to Syro-Canaanite origins. (Catling 1964, pp. 128–29, pl. 15:i–l).
11. Petrie 1934, pl. XXVIII:295; Guy and Engberg 1938, fig. 171:8, pl. 149:8; Yadin 1963, pp. 187, 209; Schaeffer 1936a, figs. 13, 22A; Schaeffer 1939a, pp. 67–68, fig. 63u.
12. Medvedskaya 1982, pp. 68–70, figs. 9.8–9.13.
13. Biran and Ben-Dov 2002, pp. 120–21, figs. 2.88–2.90:117–18.
14. Ben-Arieh and Edelstein 1977, pp. 33, 36, 40, figs. 18:1, 18:3. Two tanged-dagger types from the tombs are also similar to one found on the Uluburun ship (ibid., pp. 33–41, fig. 19:1, 2).
15. Chavane 1987, pp. 364–67, figs. 19, 20, 27–29.
16. M. Tadmor 1970, p. 63.
17. James and McGovern 1993, pp. 212–13, fig. 159:5, pl. 51:h; Rowe 1940, p. 9, pls. XXXII:3, XLIXA:6. A second flanged-hilt dagger with a more slender form was found at Beth-Shan; Shalev 2004, p. 53, no. 163, pl. 18:163.
18. MacDonald 1932, pls. XLVII, XLVIII:2; Shalev 2004, p. 52, no. 162, pl. 18:162. In this example, the arch of the pommel is a full semicircle, and the entire weapon is of a more slender form, but the decoration at the base of the blade is somewhat similar to that of the Uluburun dagger.
19. Kochavi 1977, p. 9.
20. While other flanged-hilt daggers have been found with preserved hilt inlays of wood, those of the Uluburun weapons are the only ones identified as ebony. Variants of some flanged-hilt daggers from Gezer, Fara (Beth-Pelet), and possibly Megiddo retain ivory or bone hilt plates, but the use of ornate alternating ebony and ivory hilt inlays are peculiar to the Uluburun weapons.

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Writing Board

Boxwood, ivory
Height 9.5 cm (3¾ in.); width 13.5 cm (5⅜ in.); thickness 0.9 cm (⅜ in.)
Uluburun shipwreck
Late Bronze Age, ca. 1300 B.C.
Bodrum Museum of Underwater Archaeology, Turkey 61.1.2000 (KW 737)

Reassembled from more than twenty-five fragments, this boxwood writing board[1] consists of two rectangular leaves of similar dimensions, originally joined on their longer sides with a cylindrical ivory hinge.[2] The hinge's missing central segment was longer than the preserved hinge segments on either side. The three hinge segments rotated around small wood dowels, and each was affixed with two small wood pegs to the grooved edges of the leaves forming the board's spine. This method of hinging allowed the writing board to lie flat when open. Two small holes on one leaf and a small depressed area and a hole on the inner-margin edge of the opposite leaf originally accommodated a fastening device for folding the two leaves tightly together when not in use.[3] The innermost margin corner of one leaf was incised with geometric marks, which may have been repeated on the opposite corner. The recessed areas, incised with irregular cross-hatched lozenge patterns, would have been filled with wax held securely in place by the incisions. The writer would press the tip of a stylus into the wax surface. After the writing was registered, the wax surface could easily be modified or smoothed out, probably with a flattened, spatula-shaped back end of the stylus, for repeated use.[4] The wax surfaces and any texts have disappeared over time.[5]

The writing board was found in a large pithos that had contained whole pomegranates, a fortuitous situation that prevented complete destruction by marine organisms. Although the outer surfaces are heavily eroded, the interior is fairly well preserved, possibly because the board was closed when it was buried. Another boxwood leaf from a second writing board was found nearby.[6] Surviving holes on the edge of the leaf indicate that there were three hinge segments, each affixed with small wood pegs. Found elsewhere on the site were two disarticulated ivory hinge segments, one incomplete, probably belonging to this writing board, although damage to the hinge edge and the absence of the second leaf make this difficult to verify.

While no trace of the wax survived on this writing board either, the surfaces of both would have been prepared probably with beeswax mixed with a bulking and coloring material such as orpiment (trisulphide of arsenic).[7] Quantities of arsenic were found on the Uluburun ship,[8] although it is unlikely that the preparation of the boards actually would have occurred on the ship.

The written surfaces once may have recorded the ship's manifest, perhaps a list of the intended destination and designation of the cargo, or even a message from one court to another.[9] After the text had been inscribed, the writing board would have been closed, tied with string attached to the clasp, and sealed in order to prevent any unauthorized alteration to the original message. Removing the string to open the writing board would have required breaking the sealing.[10]



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The Uluburun writing boards are the only known examples of their type from the Bronze Age. Archaeological examples of similar boards are not found until the end of the eighth century B.C.[11] That they were used elsewhere in the Late Bronze Age, however, is revealed by surviving texts[12] as well as the discovery of perforated cylindrical hinge segments, most of ivory, similar to those used on the Uluburun writing boards, at Megiddo, Byblos, and Ugarit. This suggests that these writing boards with wax surfaces were of Near Eastern origin and were used in the Levant during the Late Bronze Age.[13] They are mentioned by Homer in his only reference to writing, when Bellerophon, who had been sent from Greece to Lycia, carried a folded tablet bearing baneful signs (*Iliad* 6:178–80).[14]

A Neo-Assyrian letter from the eighth century B.C. seems to fit the context of the Uluburun writing board remarkably well: "The goods of *Umbakidini* which *Rashisi-ilu*, the third messenger brought down by boat, they checked in the city of Sudanina according to the writing-board and accepted them. Everything was intact. There was nothing missing."[15] CP

1. The term writing board rather than writing tablet is used here in keeping with recent epigraphical terminology; see Symington 1991.
2. Pulak 1998, p. 216; Pulak 1997, pp. 252–53, fig. 21; Bass 1990, pp. 168–69; Bass et al. 1989, pp. 10–11. For the identification of the wood, see Warnock and Pendelton 1991, pp. 107–10. Detailed physical study of the writing board is in Payton 1991, pp. 99–106.
3. Each central section has a carved recess 2 millimeters deep, with borders 0.8 to 1.0 centimeters wide on all sides.
4. Symington 1991, pp. 114–15.
5. Bass et al. 1989, p. 10.
6. This one is more slender (5.7 cm), slightly longer (12.4 cm), and of about the same thickness (max. 1.0 cm) as the first board.
7. An eighth-century B.C. writing board discovered in a well at Nimrud still retained traces of beeswax bearing cuneiform inscriptions. Analysis of the beeswax showed it to be mixed with about 25 percent orpiment (Mallowan 1954, p. 99; Wiseman 1955, pp. 5–6). For the likely use of orpiment, see also Symington 1991, p. 114.
8. Bass 1986, p. 278; Pulak 1988, p. 11.
9. Pulak 1998, p. 216; Symington 1991, pp. 111–23.
10. Symington 1991, pp. 120–21.
11. For multileaved writing boards of wood and ivory from Nimrud, see Mallowan 1954, pp. 98–99; Wiseman 1955, pp. 3–6.
12. Symington 1991, pp. 111–12.
13. Two of the four Megiddo hinges still retain their attachment pins or pegs (Loud 1939, p. 20, nos. 305–8, pl. 58:305–8). There are fifteen cylinders from Ugarit (Gachet-Bizollon 2007, p. 401, pl. 51:434–44), most of which are hinge components but a few are of unknown purpose. Two hinges from Byblos are said to be of bone, and a third of ivory (Dunand 1954, p. 16, no. 6853, fig. 12, pp. 103, 135, no. 7469, and fig. 127:7469, p. 425, fig. 451:11466, p. 450, no. 11466). Although found near a box, an ivory hinge segment from Hala Sultan Tekke on Cyprus is more likely from a writing board than an element from a box hinge or a furniture component (Niklasson 1983, p. 16; Gachet-Bizollon 2007, p. 213). This type of hinge is not found in the Mycenaean realm.
14. For the possible use of similar wood writing boards in the Aegean, as suggested by the discovery of small bronze hinges associated with burned wood found amid clay tablets at the palaces of Pylos, Knossos, and Zakros, see Shear 1998, pp. 187–89.
15. Refer to Symington 1991, p. 123.

235 a–f

Selection of Zoomorphic Weights

Bronze

Clockwise from left:

a. Sphinx-shaped weight
Height 2.7 cm (1⅛ in.); width 1.7 cm (⅝ in.); length 5.6 cm (2¼ in.); weight 80.7 g
55.24.86 (KW 468)

b. Lioness-shaped weight
Height 2.3 cm (⅞ in.); width 2.3 cm (⅞ in.); length 4.2 cm (1⅝ in.); weight 26.8 g
3.1.94 (KW 3081)

c. Duck-shaped weight
Height 1.7 (⅝ in.); width 1.6 cm (⅝ in.); length 2.2 cm (⅞ in.); weight 8.3 g
29.24.86 (KW 350)

d. Bull-shaped weight
Height 1.3 cm (½ in.); width 1.1 cm (½ in.); length 2.3 cm (⅞ in.); weight 5.2 g
41.1.2000 (KW 4504)

e. Frog-shaped weight
Height 1.5 cm (⅝ in.); width 1.3 cm (½ in.); length 2.2 cm (⅞ in.); weight 6.6 g
39.1.2000 (KW 237A)

f. Fly-shaped weight
Height 0.5 cm (¼ in.); width 1.4 cm (⅝ in.); length 1.8 cm (¾ in.); weight 1.2 g
40.1.2000 (KW 2128)

Uluburun shipwreck
Late Bronze Age, ca. 1300 B.C.
Bodrum Museum of Underwater Archaeology, Turkey

The balance weights excavated from the Uluburun wreck were well-used, personal weights belonging to the merchants aboard the ship.[1] Evidence suggests that, in addition to the weights, at least three sets of balances were also on the ship. Surviving are two pairs of nested pans or scales from handheld beam balances, one of which is still partly preserved in its walnut sleeve-type case, and fragments of a third pair.[2]

Of the 149 weights found on the ship, 78 were fashioned from hematite or similar iron-bearing minerals, 38 are of bronze, 25 of diorite, steatite, or limestone, and the remaining eight of lead. The hematite and other stone weights were for the most part carefully shaped and polished, but a few are minimally worked chunks.[3] The corpus of the Uluburun balance weights can be divided into morphological groupings. The great majority represent the two most common balance-weight shapes found during the Bronze Age: sphendonoid (oblong, with rounded or pointed ends) and domed. Zoomorphic weights and a few disc-shaped weights make up the rest. The zoomorphic



group consists of 19 bronze balance weights, some hollow cast, with lead cores.

Bronze weights recovered from marine environments are usually severely altered or deformed because of corrosion and are always considered underweight.[4] While many of the zoomorphic pieces are seemingly well preserved, it is apparent that they have lost an indeterminate amount of mass as a result of metal leaching. A few weights are seriously damaged, and the animal shapes they represent are uncertain. Because the hollow-cast weights were significantly damaged by the expanding lead core, which shattered the weight's bronze shell, their unit attributions are extremely difficult, if not impossible, to determine with any degree of accuracy.

Owing to their corrosion resistance in salt water, hence their relatively stable mass, only the non-metallic Uluburun weights were analyzed to determine the mass standards represented. The results revealed that several different weight sets in different mass standards were carried aboard the ship, but the great majority conform to a single mass standard based on a unit of 9.3 to 9.4 grams.[5] This unit of mass undoubtedly represents a shekel of the Syrian standard, commonly used along the Levantine coast, on Cyprus, and in Cilicia,[6] and based on the Egyptian *qedet*. There appear to have been four sphendonoid (for precision weighing) and three domed (for bulk weighing) weight sets aboard the ship conforming to this mass standard, with each merchant probably carrying one set of each weight type. Precision sphendonoid weights with unit masses of about 7.4 grams (most likely the Syro-Canaanite *peyem* standard), 8.3 grams (based on a shekel of the Mesopotamian standard), and 10.5 grams (another norm used in the Syro-Canaanite region) were also carried on the ship, most likely for assaying precious metals or performing conversions to other mass standards.[7] Although the mass standard of the corroded zoomorphic weights cannot be determined with accuracy, these weights, based on the presence of large denominations in the group, probably incorporate at least one additional set based on the 9.3–9.4 gram standard for bulk weighing.

The Uluburun zoomorphic weights take the forms of a fly, two frogs, two ducks, a waterfowl, a recumbent calf and five recumbent bulls, a probable canine head, a couchant lion and lioness, a sphinx, a unique cylindrical weight surmounted by a bucolic scene of a herdsman kneeling before three calves, one of which is lost, and two weights that are too corroded for identification.[8] The Uluburun assemblage constitutes the largest group of such weights from the Bronze Age.[9] The next largest set, a late fourteenth-century B.C. hoard of fourteen balance weights from Kalavassos–Ayios Dhimitrios, includes only eight zoomorphic or anthropomorphic forms.[10]

Of the six zoomorphic weight forms represented here, the recumbent bull (d) is of a type commonly seen in the Levant, Cyprus, and Egypt.[11] The couchant lioness (b) represents another animal shape seen in some numbers, with a similar distribution.[12] Duck-shaped weights, mostly of stone, commonly occur among weights of Mesopotamian origin (see cat. no. 236). Those of bronze are much rarer; the Uluburun ship carried two, the larger of which is shown here (c). At least two bronze examples are known from Cyprus, with other bronze pieces found in Mesopotamia, along the Levantine coast, and in Egypt.[13] The Uluburun sphinx weight (a) is one of the best-preserved zoomorphic weights in the group. Sphinx-shaped weights are otherwise unknown outside of Egypt, except for one from Byblos, covered in gold foil and of uncertain function.[14] A zoomorphic weight unique to the Uluburun group is in the form of a fly (f), also an Egyptian motif. It is the lightest in the assemblage. The smaller of the two frog weights (e) is well preserved, while the larger is badly damaged owing to the expansion of its lead core. Balance weights in the shape of frogs and toads, especially those of bronze, are extremely rare in the Near East and Cyprus, but they do occur in Egypt.[15]

Zoomorphic weights were quite widespread in the ancient Near East during the Late Bronze Age. Their use is depicted in New Kingdom Egyptian tomb paintings, where gold ring ingots are shown in one pan of a balance and animal weights in the other pan.[16] Bronze zoomorphic weights (with and without lead cores) have been found in numbers along the Levantine coast and on Cyprus,[17] as well as in Egypt.[18] To what special purpose these weights may have been put, if any, is now lost to us. The high level of craftsmanship and expense of their materials may hint at their use by the affluent and by elites. On the Uluburun ship, therefore, these weights could have been among the personal possessions of the head or senior merchant, with the simpler weight sets of geometric shapes being used by the lesser or junior merchants. The mass standards of the weight sets on the Uluburun ship provide near-conclusive evidence that Syro-Canaanite merchants were aboard. CP

1. Pulak 2000a, p. 248.
2. Ibid., p. 248, fig. 17.1. The sleeve-type case is the only Bronze Age wood case of this type found outside Egypt, where it is commonly known. For Egyptian balance cases of this type, see Petrie 1974, p. 47, pl. 40, pp. 73–74; Randall-MacIver and Mace 1902, p. 91, pl. 51, D77; Schiaparelli 1927, p. 83, fig. 51; Brunton and Engelbach 1927, p. 18, pl. 13:7; and Bruyère 1937, pp. 199ff., fig. 68.
3. Geometric weights in various shapes from Uluburun are in Pulak 2000a, p. 255, fig. 17.2.
4. Ibid., pp. 253–54.
5. Ibid., pp. 257–60.
6. Petruso 1984, pp. 302–4.
7. Pulak 2000a, pp. 260–63.
8. Ibid., p. 256, fig. 17.3; Pulak 1988, pp. 30–31, figs. 37, 38; Bass et al. 1989, pp. 8–9, fig. 14.
9. Pulak 2000a, p. 262, table 17.1.
10. Courtois 1983, p. 117; Lassen 2000, pp. 235–41.
11. Cypriot examples include one from Maroni (Catling 1964, pl. 44.e; Johnson 1980, p. 25, pl. XXIX), two from Enkomi (Karageorghis 1964, p. 310, fig. 31; Courtois 1984, p. 43, no. 407, fig. 15.36, pl. III), and an example of unknown provenance (Catling 1964, p. 251, pl. 44:d; Karageorghis 1976b, pp. 206–7, fig. 174; Karageorghis and Demas 1985, pp. 130–31, fig. 112). A much corroded, lead-filled bull-calf weight was found at Kition on Cyprus (Karageorghis and Demas 1985, pp. 179, 290, pl. CLII:1267; Buchholz and Karageorghis 1973, pp. 162, 746, no. 1737). Ugarit in Syria has produced more than half a dozen bull weights (Schaeffer 1929, p. 287, fig. 2d; Schaeffer 1937, pp. 148–50, pl. XXIII:4; Schaeffer 1963, p. 209, fig. 25). Others are from Sarepta (Pritchard 1975, p. 69, fig. 62.6), near Akko (Eran and Edelstein 1977, p. 57, with fig. 25:24, p. 62, no. 58), and Tel Nami (Artzy 1993, p. 12).
12. Ugarit has yielded at least three examples of such felines (Schaeffer 1963, p. 209, fig. 25, no. 23-475; Gray 1964, fig. 53). Many more are found farther south: at Akko (Eran and Edelstein 1977, pp. 57, 62, fig. 25.23, pl. XX:37), a lead-filled lioness from Tell Abu Hawam (Hamilton 1935, p. 18, no. 39), a lion cub from Megiddo (Loud 1948, pl. 240:3), one from Hazor (Yadin et al. 1960, p. 159, pl. CXCVI:14), and two others from 'En Shemer (Eran and Edelstein 1977, p. 57). Only a single example is known from Cyprus at Kalavassos (Courtois 1983, pp. 126–27, pl. 17:10; Lassen 2000, p. 236, fig. 16.1, no. 7, p. 241). In Egypt, lion



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weights in both stone and bronze are known: see Petrie 1926, pl. IX; and Roeder 1956, pp. 365–66, figs. 510–13. For two from Tell el-Amarna, see Pendlebury 1951, pp. 109, 125, pl. LXXVII, nos. 32.250, 33.280.

13. Cypriot examples are from Kalavassos and Enkomi (Courtois 1983, pp. 120, 123, pl. XVII:5), several later Mesopotamian ones from Khorsabad (Braun-Holzinger 1984, pl. 74, nos. 387–90), and two from Alalakh (Arnaud 1967, pp. 152, 154, 167). For Egyptian examples, see Petrie 1926, pl. IX:4815; Skinner 1954, p. 783, fig. 569; Skinner 1967, pl. 5; Weigall 1901, p. 386, no. 7056, pl. 5.
14. Dunand 1954, pl. CXVI, no. 14499; Jidejian 1968, p. 24.
15. Petrie (1926) lists two bronze toads (nos. 4986 and 5245) and five frogs (nos. 4775, 4913, 4986, 5083, 5146).
16. For depictions and lists of Egyptian weighing scenes, see, for example, Regling 1926, pl. 98; Petrie 1926, p. 6; Davies 1933, pl. 11; Skinner 1954, p. 784; Eran and Edelstein 1977, p. 57 n. 33; and Cour-Marty 1985, p. 192 n. 22.
17. Courtois 1983, pp. 117–30.
18. Cour-Marty 1990, p. 27.

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Duck-Shaped Weight with Cuneiform Inscription

Diorite
Length 41 cm (16⅛ in.); weight 26.7 kg
Babylon
Late Bronze Age, 13th century B.C.
Eski Şark Museum, Istanbul, Turkey 7878

This weight is in the form of a duck with the head and neck turned back and carved in relief against the body. On the highly polished surface, a cuneiform inscription gives its weight as one "true" talent.[1] A talent was approximately 30 kilograms, and the duck weighs 26.7 kilograms. However, Mesopotamian systems for recording weights and measures often varied. Weights were based on the arbitrary concept of the load, or talent, that could be carried by a man or animal.[2] According to the Sumerian sexagesimal system for counting, the load was then divided into 60 minas, and a mina was divided into 60 shekels.[3]

Zoomorphic weights were widespread in the Near East during the Late Bronze Age, and duck-shaped weights are commonly of Mesopotamian origin. This duck weight, found at Babylon in one of the storerooms on the eastern side of the ziggurat precinct, is dated to the mid-second millennium B.C. on the basis of its inscription.[4] It is one of the rare second-millennium B.C. objects excavated at Babylon because the majority of those levels at the site fall below the modern water table and are largely inaccessible. Stone was preferred for weights of different standards during this period.[5] Although a gradual shift to metal weights occurred in the first millennium B.C., both metal and stone weights were found on the Uluburun shipwreck (see cat. no. 235). JME

1. Koldewey 1908, p. 16.
2. J. Oates 2005, p. 251.
3. Powell 1987–90, p. 508.
4. Koldewey 1913, pp. 185, 187. The inscription reads: "1 true talent belonging to Mushallim-Marduk son/descendant of the (family) of the shangu-priest of Kish. May Shamash take away whoever removes (this weight)."
5. Zeyrek and Kızıltan 2005.

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SCEPTER-MACE

Stone (andesite?)
Max. height 7.8 cm (3⅛ in.); length 19.2 cm (7½ in.); thickness 5.2 cm (2⅛ in.)
Uluburun shipwreck
Late Bronze Age, ca. 1300 B.C.
Bodrum Museum of Underwater Archaeology, Turkey 12.7.92 (KW 2742)

This scepter-mace is carved from a gray-green volcanic stone, probably andesite.[1] The mushroom-shaped butt end is incised with spiraling grooves, most of which radiate from its center and end near the knob's edge. The recessed neck is plain and polished smooth. Beginning at the shoulder, the body is embellished with longitudinal fluting consisting of a pair of raised ridges encircling a central ridge. These run the entire length of the body and terminate at the tip of the blade, which curls back on itself to form a loop with a small hole. At its widest part is a transverse shaft hole parallel to the direction of the curl of the blade. The fine modeling of the curled blade suggests that the form was based on metal types. The shaft itself is missing, an indication that it may have been made of wood that disintegrated over time, although a hole of approximately 1 centimeter in diameter seems somewhat narrow for a wood shaft. This may hint at a symbolic or ceremonial rather than functional use for the weapon. The scepter-mace was discovered far down the steep slope of the wreck site; the direction of spillage indicates that it had originated from an area somewhere aft of amidships, probably near the stern.

The Uluburun scepter-mace discovery is unique for the Aegean and the Mediterranean. Judging from a few similar examples from the Balkans and regions farther north, its presence aboard the Uluburun ship provides an indisputable link for an Aegean connection that extends into these regions.[2] It has long been argued that such a connection existed, which resulted in a flow of materials and influences, especially weaponry but also other goods, between the Aegean and the Mediterranean, and eastern Europe and the Black Sea.[3] This scepter-mace now demonstrates conclusively that such a connection existed from at least the middle of the second millennium B.C.

The Uluburun scepter-mace is a rare variant in stone of a Late Bronze Age bronze axe type found in southeastern European cultures of the Carpathian-Pontic region.[4] In these variants, the blade is drawn out to form a long pick-like spike, which is then rolled into a spiral. As the Uluburun example is fashioned from stone, its blade configuration is simplified to form a single loop rather than an intricate free spiral. Unlike typologically similar counterparts, which are functional axes,[5] these rare scepter-maces were probably of symbolic or ceremonial use—as the Uluburun example must have been—possibly symbols of royal power held by tribal chiefs who may also have been head priests.[6]

A close parallel for the Uluburun scepter-mace, albeit of bronze and with long tubular flanges around the shaft hole, was found in a hoard discovered at Drajna de Jos, north of Bucharest in Romania.[7] A pair of two-part (bivalve) stone molds for casting similar weapons in bronze was found at Pobit Kamuk, near Razgrad in Bulgaria.[8] Another bronze weapon with a partly spiraling blade, but cast with a long cylindrical shaft socket, was found in the Lozovo II hoard in Moldava.[9] These bronze examples, however, probably date to the thirteenth century B.C. or later, slightly postdating the Uluburun example. Stone weapons, however, may have been more common than similar bronze versions in earlier periods.[10] A similar stone example from Bulgaria, near Ljulin, has a fluted blade and a plain mushroom-shaped butt end. Its blade tip, however, is only bent downward, and not coiled into a full spiral (fig. 117).[11] Another stone scepter-mace, similar to the one from Ljulin, but with spiral grooving on the knobbed butt end, was found in southeastern Bulgaria, near Glavan.[12]

Undoubtedly, the Uluburun scepter-mace was not a trade item or an object left on the ship from a previous voyage. It is a carefully worked symbolic or ceremonial weapon for personal use, representing power and prestige for its owner. As such, its presence may help explain several other items aboard the ship: a seemingly anachronistic globe-headed bronze dress pin with southern Greek parallels of sub-Mycanaean dates;[13] solid-socketed spearheads that occur in Macedonia during the Late Helladic IIIA–B period and subsequently farther south[14]; and a bronze sword with central Mediterranean parallels.[15] It is hypothesized that such "northern" dress pins and spearheads were introduced into the Aegean region by emerging contacts with the cultures of the Balkans to the north. While the peculiar Uluburun sword is attributed to southern Italy and Sicily, somewhat similar examples, albeit of smaller, dagger-sized weapons, are also found in Albania.[16] These objects, along with the scepter-mace, may therefore have



Figure 117. Stone mace head. Thrace, Ljulin. Late Bronze Age. National Archaeological Institute with Museum, Bulgarian Academy of Sciences, Sofia 3500



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belonged to an individual from the northern Aegean or the Balkans.[17] This person, of some rank, could have represented northern interests in part of the ship's cargo, especially its metal component. Alternatively, he may have functioned in the role of an elite mercenary for the two Mycenaean messengers or envoys, in whose interest it was to negotiate the Uluburun ship through the dangerous waters of the Aegean and to ward off any potential attack by rogue seafarers.[18] CP

1. The scepter-mace weighs 690 grams. Pulak 2005c, pp. 94, 608; Pulak 1997, pp. 253–54, fig. 22; see also Buchholz and Weisgerber 2005, pp. 149–53.
2. Pulak 1997, pp. 253–54; Buchholz 1999, p. 77.
3. See discussion in Sandars 1983, pp. 43ff., where the emphasis is on weaponry and warfare, although the period discussed is a little later than that of the Uluburun ship. Sandars (1983, pp. 53–55) also notes a close similarity between a spearhead excavated in a grave on the island of Kos and one from the hoard at Drajna de Jos.
4. For this axe type and its variant, see Vulpe 1970, pp. 13–25.
5. The Uluburun scepter-mace and other similar weapons have also been interpreted as deriving from pickaxes rather than bladed axes (Buchholz 1999, p. 74).
6. Tončeva 1982, p. 180; Buchholz 1999, p. 74.
7. Buchholz 1999, pp. 72, fig. 4:b, 75; Vulpe 1970, p. 59, pl. 41:565. This hoard is dated to the Romanian Late Bronze Age (ca. 1300–1200 B.C.), making it a little later than the Uluburun example (Vulpe 1970, p. 59).
8. This hoard is attributed to the Lesura-Verbica group and is dated to the twelfth century B.C. (Hänsel 1976, p. 39, pl. 13). For illustrations and color photographs of the mold, see Buchholz 1999, p. 75, fig. 6:c; Buchholz and Weisgerber 2005, p. 150, figs. 3, 4, where the same mold is illustrated twice. For photographs of both molds, see Venedikov 1988, pp. 70–71, figs. 54, 55.
9. S. Hansen 2005, p. 93; Chernykh 1976, p. 246, fig. XLII:9; Lichardus et al. 2002, p. 159, fig. 6:6, p. 160.
10. Vulpe (1970, p. 24) notes that stone knob-headed axes are found at the very beginning of the Bronze Age in Romania and were more abundant than those in bronze.
11. Lichardus et al. 2002, pp. 158–59, fig. 16:3; Buchholz 1999, p. 76, fig. 6:a; Chernykh in *Gold der Thraker* 1979, p. 62, nos. 81, 82; Tončeva (1982, p. 180) dates the site to the local Late Bronze Age (ca. 13th–11th century B.C.).
12. Unpublished, found in a fill, out of context, but without doubt contemporary with the Ljulin example.
13. Pulak 1997, pp. 254–55; Pulak 1988, pp. 29–30, fig. 36.
14. Pulak 1997, pp. 255–56, fig. 23; Pulak 2005a, pp. 299–300, pl. LXX:d.
15. Pulak 2001, pp. 45–46, fig. 5; Vagnetti and Lo Schiavo 1989, pp. 222–23, fig. 28:2.
16. Bodinaku 1995, p. 268.
17. Another connection through the Balkans is indicated by the presence on the Uluburun ship of beads of Baltic amber, some of which are of shapes seen in the Balkans. These may, however, have been in the possession of the Mycenaeans aboard the ship, who are also known to have commonly used amber beads for adornment; Pulak 2005a, p. 304, pl. LXXI:d; Bass 1986, pp. 286, 289, ill. 25.
18. Pulak 2001, pp. 45–48; Pulak 1997, pp. 254–56.

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SWORD AND SPEARHEAD

Bronze

a. Sword

Length 45.5 cm (17⅞ in.); max. width 7.2 cm (2⅞ in.); thickness of blade 0.7 cm (¼ in.)

16.24.86 (KW 301)

b. Spearhead

Length 25 cm (9⅞ in.); width of blade 4.7 cm (1⅞ in.); diameter of socket 3.4 cm (1⅜ in.)

21.24.86 (KW 309)

Uluburun shipwreck

Late Bronze Age, ca. 1300 B.C.

Bodrum Museum of Underwater Archaeology, Turkey

Mycenaean bronze weapons recovered from the Uluburun shipwreck include ten spearheads and two swords.[1] The swords range in length from 45.5 to 51.3 centimeters, shorter than most conventional examples, and are, therefore, referred to as short swords. Both the swords and spears were found in the after half of the ship.

The two swords have similar single-cast construction, finely grooved blades, flanged hilts, and cruciform handguards with rounded lobes, all features of a type existing during the fifteenth and fourteenth centuries B.C. (conforming to Sandars' Class Di and Kilian-Dirlmeier's Type 1f).[2] Their pommels and the tangs for attaching them are lost,[3] as are their hilt plates, which were probably of wood. Two holes just below the shoulder, and higher up on the hilt of this one, indicate where rivets would have secured the plates. The blades have seemingly convex sections, without true midribs, and with three fine-grooved lines down the center of this one and four in the other. While this blade section differs considerably from the typical high midribbed blade of Di swords, other swords of this class have only a broad flat midrib or convex section without any midrib.[4]

During the fourteenth century B.C., the ornate version of the Di sword type[5] was replaced by more efficient and utilitarian ones, such as those from Uluburun. Although the variants of Di swords without the pronounced midrib are confined



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mainly to weapons shorter than 50 centimeters, the loss of the midrib is recognized as leading to moderately thickened double-convex blades. Typologically, therefore, the Di variants, including the Uluburun swords, mark the end of the ornamental sword-making tradition of the fifteenth and early fourteenth centuries B.C. and a transition to later sword forms.[6]

Of the 22 spearheads found on the Uluburun ship, ten display characteristics of later Mycenaean or Aegean spearheads, which are shorter than the earlier Mycenaean spears.[7] Although the Uluburun spearheads vary in their dimensions, all were cast with distinct, leaf-shaped blades

and, with one exception, had solid-cast, seamless sockets to fit the wood shaft of the spear. The spearheads were secured to the shaft with bronze nails or rivets driven through holes at the base of the blade. Spearheads with solid-cast sockets were probably influenced by spears made in the northern Balkans and eastern Europe, but most examples found in the Aegean are thought to be local products.[8] Nearly all of the spearheads on the Uluburun ship appear to be short, stocky weapons with leaf-shaped blades (Avila's Type VI, which usually have split sockets cast flat and rounded in the forge).[9] The Uluburun spearheads are among the earliest securely dated examples of their type found in an Aegean context.

Solid-cast, seamless-socketed spearheads are rare on the southern Greek mainland and appear rather late, with all securely dated examples coming from the late thirteenth and early twelfth centuries B.C.[10] A similar solid-socket spearhead from a chamber tomb at Antheia near Patras, dated to Late Helladic IIIB or Late Helladic IIIC, is classified as a variant of Type VI, with a "short broad blade."[11] Farther north, solid-socketed spearheads from western Macedonian graves at Áno Kómi and Âani date to the Late Helladic IIIA– Late Helladic IIIB:1 period, as does a stone mold for a spearhead of this type found in Macedonia.[12] A spearhead of similar construction was found at Enkomi, and probably dates to the first half of the twelfth century B.C. Owing to the lack of any close Aegean parallels for the spear, its provenance has been debated.[13] Some of the Uluburun spears, along with the scepter-mace (cat. no. 237), a Thapsos-type sword, and perhaps also a globed cloak pin, may have belonged to the third foreigner aboard the ship, thought to have been an elite mercenary from the central or northern Balkans but associated with the Mycenaeans.[14]

Analysis of wood-shaft fragments preserved within several spearhead sockets reveals the wood to be *Pinus sylvestris*,[15] a pine species whose southernmost distribution in Greece is in the northern Pindos Mountains.

In the Late Bronze Age Aegean, a sword was an object of status symbolizing military standing; in warfare, swords were used by a select few.[16] Spears, commonly used in battle and perhaps the warrior's most effective implement, were also prestige objects, with a similar distribution in Mycenaean burials.[17] Thus, it is likely that the swords aboard the Uluburun ship belonged to two warrior-class or elite Mycenaeans.[18] The swords and the wealth of their other personal adornments suggest that they represented elite or palatial interests and may have been the "messengers" of ancient literary sources, returning from a diplomatic mission to the Near East.[19]

CP

1. Pulak 1988, pp. 20–24, fig. 21; Pulak 1997, pp. 247–48, figs. 16, 17, pp. 255–56, fig. 23; Pulak 1998, pp. 207–8, fig. 21; Pulak 2005a, pp. 298–300, pl. LXX:c, d.
2. Specifically, variant 1f. Sandars 1963, pp. 123–25, 146–48; Kilian-Dirlmeier 1993, pp. 61–62, pl. 25.
3. Pommels are knoblike pieces attached to the end of the hilt in order to ensure a firm grip; they also serve as counterweights for balancing the sword, and are often made of or embellished with precious and semiprecious materials.
4. Kilian-Dirlmeier 1993, pp. 61–62, pls. 25:134, 136–38, 26:140–44; probably also one found at Panaztepe but missing its hilt, see Ersoy 1988, pp. 58–59, 61–64, fig. 3:1, pl. 5. Swords with grooved blades similar to that of sword KW 4193 are found in Mycenae Tomb 91 (Xénaki-Sakellariou 1985, p. 127, nos. 3196, 3197, pl. VIII:3196, 3197) and at Ialysos, Rhodes (Kilian-Dirlmeier 1993, p. 62, no. 139, pl. 25:139). A sword from Khania, Crete, with a slightly different hilt profile but nearly identical blade grooving is similar to catalogue no. 238a (ibid., no. 137, pl. 25:137).
5. The finest specimens of Di swords may have come from Knossos in the Late Minoan II period, but the possibility of other mainland production centers has also been proposed. See Driessen and MacDonald 1984, pp. 64–65, and Sandars 1963, p. 126.
6. Pulak 2005c, p. 298.
7. Ibid., pp. 299–300, pl. LXX:d.
8. Corresponding to Bouzek's Type B3 and Höckmann's Group KII. Bouzek 1985, pp. 138, 141; Sandars 1983, p. 53; Höckmann 1980, p. 69, fig. 15:K18,19, p. 70.
9. Avila 1983, pp. 38–46.
10. Hochstetter 1987, pp. 20–21; Bouzek 1985, p. 139; Höckmann 1980, pp. 20–21, 68, 149, pls. 5:3, 28:7.
11. Avila 1983, pp. 43–44, pl. 15:98.
12. Hochstetter 1987, pp. 20–21.
13. Catling 1964, p. 122, nos. 1, 2, fig. 14:6, 7, pl. 14:e, f.
14. Pulak 2001, pp. 45–48.
15. Nili Lipschitz, personal communication, 2007.
16. Driessen and MacDonald 1984, p. 56.
17. Ibid., p. 58; Sandars 1963, p. 128.
18. Mycenaean swords are rarely found outside the Aegean or in non-Mycenaean contexts.
19. Pulak 2005a, pp. 308–9.

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Mycenaean Relief Beads

Glass

Max. width 1.2 cm (½ in.); max. length 2.9 cm (1⅛ in.); max. thickness 0.4 cm (⅛ in.)

Uluburun shipwreck

Late Bronze Age, ca. 1300 B.C.

Bodrum Museum of Underwater Archaeology, Turkey 2006/4/26A (KW 3498), 2006/4/25A (KW 5753), 2006/4/27A (KW 3344)

Beads of amber, faience, quartz, and glass were among the personal adornments belonging to the two Mycenaeans aboard the Uluburun ship.[1] A total of 17 rectangular, flat-backed, glass relief beads, or plaques, were recovered. These beads are severely weathered and mostly fragmentary, and their original translucent dark blue color, resembling lapis lazuli, has faded. Many more relief beads must have been aboard, but most disintegrated over time in the corrosive seawater.

Of the 17 beads, 12 are of a type adorned with spirals, possibly representing highly stylized hair curls,[2] positioned one above another and separated by a line of dots. They have yet to be studied fully, but the better preserved examples also reveal a ribbed band at the upper end, perforated transversally for stringing, with another perforation on the opposite end through the lowest spiral.[3] Similar relief beads are found in Late Helladic III Aegean contexts, with many examples of the three-spiral variety coming from Rhodes,[4] Crete,[5] and Mycenae.[6]

The remaining five relief beads, three of which are shown here, are of a less common type, adorned with paired horizontal figure-of-eight shield motifs arranged one above the other, separated by a line of dots.[7] Transversally perforated ribbed bands at either end allowed for stringing. Beads with shield designs similar to those from the Uluburun wreck have been found on the Greek mainland at Prosymna[8] and on Rhodes.[9] Both Uluburun glass relief bead types share the common decorative line of dots placed between or on either side of the central motifs, perhaps indicating a common workshop for both.

Iconographic evidence suggests that beads were worn primarily by women, less often by children and men.[10] Found in tombs all over the Mycenaean world,



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glass relief beads are believed to have been used in necklaces, as adornments sewn singly or in groups on garments, or for diadems.[11] These uniquely Mycenaean objects disappeared from the archaeological record with the end of Mycenaean society.[12]

Glass was mass-produced and apparently imported in great quantities to the Aegean as disc-shaped cakes like those found on the Uluburun ship (see cat. no. 187).[13] Along with faience, it probably represented an economical alternative to semiprecious stones such as lapis lazuli and turquoise.[14]

Relief beads are formed by pressing molten glass into open or closed stone molds. Approximately two dozen molds for producing glass ornaments and jewelry have been found in the Aegean.[15] Of these, only one was recovered from a tomb; the majority have been found in two major centers of the Mycenaean world: Mycenae and Knossos.[16] This suggests that the primary, or perhaps the sole, centers of production were in major palatial workshops and that relief beads bearing symbolic motifs may have served as insignias of a certain religious standing, social status, or perhaps official rank. Relief beads do not appear to have been exported as trade items. The few found in graves outside the Mycenaean realm have been associated with Mycenaean individuals.[17] In contrast to the numerous finds of plain globular glass beads in simple pit or cist grave burials for those of humble means—most probably imported from the Levant (see cat. no. 188) or produced locally from imported raw-glass ingots—the glass relief beads occur almost exclusively in elite burials of affluent families.[18]

Thus, the two types of relief beads found on the Uluburun ship were almost certainly used for personal adornment and, hence, are a virtual indicator of the ethnicity and high standing of the two Mycenaeans on board the ship. They also demonstrate that men wore such beads. Moreover, the Uluburun relief beads represent items of everyday life, rather than commercial goods or specific funerary furnishings.[19] CP

1. See Pulak 2005a, pp. 303–6.
2. Yalouris 1968, p. 12; see also Harden 1981, pp. 39, 45.
3. For discussion of relief beads with spiral designs and examples in the British Museum, see Harden 1981, pp. 45–46, nos. 56–59, pl. IV:56, 59; fig. 3.56, 57, 59. Another example is found in Grose 1989, pp. 64–65, 397, fig. 24.
4. Harden 1981, p. 46, nos. 56–60, pl. IV.57, 59, fig. 3:56, 57, 59, with other examples given on p. 45; Benzi 1992, pp. 200, 294, pl. 119:I; Dietz 1984, pp. 49–50, fig. 51.
5. Effinger 1996, p. 36, variant E: nos. Ar 2a, Kal la, Mi 6c, pls. 3:n, 25:d.
6. Xénaki-Sakellariou 1985, pp. 100–101, pl. 26, no. 2373.
7. For a discussion of relief beads with figure-of-eight shield motifs and examples in the British Museum, see Harden 1981, p. 47, pl. V, fig. 3. A photograph of figure-of-eight shield relief bead KW 829 is in Bass et al. 1989, pp. 8–9, and fig. 5.
8. Blegen and Blegen 1937, pp. 62, 305, fig. 121:2.
9. Harden 1981, p. 47, pl. 5:62, fig. 3:62, with other unprovenanced examples on p. 47.
10. Younger 1992, pp. 261–69.
11. Harden 1981, p. 39.
12. Hughes-Brock 1999, p. 291; Grose 1989, p. 57.
13. Bass 1986, pp. 281–82, ills. 15, 16; Pulak 2001, pp. 25–30.
14. Hughes-Brock 1999, p. 285; Harden 1981, p. 39. Analysis by Robert Brill of the Corning Museum of Glass indicated that the chemical composition of the Uluburun cobalt blue glass ingots matches those of contemporary Egyptian core-formed vessels and the Mycenaean glass relief beads, which suggests a common source for the glass from which both objects were made (Bass 1986, p. 282).
15. Tournavitou 1997, pp. 212–29.
16. Hughes-Brock 1999, p. 289.
17. They include a tomb at Kolophon in western Anatolia (Greenwell 1902, p. 6, fig. 6) and two others on Cyprus (P. Åström 1989, p. 47, Tomb 80, no. 321). The second Cypriot tomb, at Kalavassos-Ayios Dhimitrios, containing a group of women and children, yielded relief beads and a single amber bead, which is suggested as marking the identity of those interred as Mycenaean (Hughes-Brock 1993, p. 223).
18. Lewartowski 2000, p. 35; Hughes-Brock 1999, pp. 287–89.
19. This theory has been suggested because the beads have been discovered predominantly in burial contexts. See Panagiotaki 2000a, p. 169.

240
Lentoid Beads

Agate
Max diameter: 2.5 cm (1 in.);
thickness: 0.9 cm (⅜ in.)
Uluburun shipwreck
Late Bronze Age, ca. 1300 B.C.
Bodrum Museum of Underwater
Archaeology, Turkey 78.5.87 (KW 793)

The Uluburun excavation has revealed one dozen lentoid beads. Several were found in the stern half of the ship, while the others were found farther down the slope toward the ship's bow, indicating that they were probably all stored at the stern but spilled into deeper areas of the site after the ship sank. The beads are of varying shapes and sizes, ranging in diameter from 1.5 to 2.5 centimeters and in thickness from 0.6 to 0.9 centimeters. With the exception of a single discoid bead, all are of the same general lentoid shape, with convex faces that curve uniformly to thin flattened or band edges of varying widths, which swell to blunt ends where the stone thickens to accommodate a string hole.[1]

The bead surfaces exhibit swirls and wavy bands of muted colors, alternating among white, yellow, and bluish gray, with various intermediate tones in between. All are smooth and well polished, without any indication of carved or incised surface decoration. It is likely that these beads were originally stored together either in a bag or strung with other stone beads. Three flattened ovoid or amygdaloid beads found in the same general area are of a similar marbled agate, and they all may have belonged to the same necklace.

Aegean lentoid hardstone seals are of similar shape but generally larger.[2] The two Mycenaean soft-stone seals recovered from the Uluburun shipwreck are also lentoid but of much cruder craftsmanship (cat. no. 241). The preferred material for Aegean sealstones was banded agate,[3] and the principal source was Egypt, although it has been suggested that some were imported from the Indus Valley to the Aegean as finished beads and then recut.[4] Whether the Uluburun lentoid beads were personal possessions of the ship's crew or represented gifts or cargo is not known. Regardless of their source, they demonstrate conclusively that at least some lentoid agate beads reached the Aegean on ships like the one that sank at Uluburun.[5]

CP

1. Bass et al. 1989, pp. 7–8, and p. 6, fig. 11, where KW 793 is shown with a smaller lentoid bead, KW 840.
2. Of the twelve agate lentoid beads from Uluburun only six are 2 cm or greater in diameter, whereas of the thirty-seven agate/chalcedony beads listed in Boardman (1970, pp. 95–96, 101–5) for Mycenaean Knossos and the Greek mainland, only six have diameters less than 2 cm, but there are many more lentoid seals of different stone types that have diameters less than 2 cm.
3. Boardman 1970, pp. 47, 57; see also ibid., p. 49, nos. 3 and 12, for agate banding and varying colors similar to those on the Uluburun lentoid beads.
4. Hughes-Brock 1999, p. 284; Younger 1979, p. 42.
5. While lentoid agate beads are uncommon in the Levant, good parallels, albeit of a later date, occur at Hama in Syria; see Riis 1948, p. 161, fig. 203.F.



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241a, b
Mycenaean Lentoid Seals

a. Green steatite
Diameter 2.2 cm (⅞ in.); thickness
0.8 cm (⅜ in.)
7.6.98 (KW 4855)

b. Dark brown-black steatite
Diameter 1.8 cm (¾ in.); thickness
0.6 cm (¼ in.)
63.31.84 (KW 134)

Uluburun shipwreck
Late Bronze Age, ca. 1300 B.C.
Bodrum Museum of Underwater
Archaeology, Turkey

Two fairly worn Mycenaean steatite sealstones of lentoid shape were found in the excavation of the Uluburun ship,[1] at opposite ends of the site. The sealstone (cat. no. 241a) found farther down the slope, just forward of the area corresponding to the bow of the ship, was with a glass relief bead and several other small objects in loose sand, indicating that they were not in situ when found and were inadvertently missed by excavators pushing down sand from areas higher up on the steep slope of the site. In all likelihood, this sealstone was originally located at the stern of the ship, along with most of the objects of Mycenaean origin, including swords, chisels,



241a, b

knives, various beads (see cat. no. 240), and pottery.

The smaller of the two sealstones (cat. no. 241b) is of a brown-black steatite with light brown mottling and a slightly asymmetrical cross section. The flatter face is adorned with a double "triskeles"—three-legged designs with each terminating in drilled points—and incised curved double lines.[2] The seal is slightly ovoid in shape and perforated on its longer axis for a suspension string. Both faces of the seal are worn smooth, with parts of the worked design on the flatter face obliterated as a result. The seal has also been worn down around the perforation, resulting in indentations.

The larger sealstone (cat. no. 241a) is of a green steatite with some brown streaks, polished smooth. One face is significantly more raised, becoming quasi-conical; the engraved flat face, sloping gently toward the sides, bears what appears to be a highly stylized ungulate.[3] The design seems to be bordered by a circle, with a series of short parallel strokes above and below the animal's forefeet. Like the other sealstone, this one is perforated laterally for stringing, and the stone has been ground or worn down around the string-hole.

Aegean lentoid seals were worn on the wrist or around the neck, imparting status to the owner.[4] Their primary use may have been to make the owner's mark if necessary, but they could have also served as amulets, talismans, or simply as jewelry.[5] Although there is no evidence that they were impressed on clay tablets, as in the Near East,[6] they were used to seal bindings around boxes or possibly documents, and to seal clay stoppers in stirrup jars.[7]

Like most Aegean sealstones carved of steatite and bearing schematically rendered designs with little or no modeling, the Uluburun seals belong to Younger's Mainland Popular Group.[8] The type first appears on the Greek mainland in Late Helladic IIIA:2 contexts, and its popularity peaks during the Late Helladic IIIB period, with a great many examples coming from the mainland and, to a lesser extent, from the Cyclades, Crete, other Aegean islands, the Troad, Cyprus, and even fewer examples from outside the Aegean.[9] It may be significant that the smaller Mycenaean sealstone from the Uluburun ship finds its closest parallels at Tiryns and Mycenae, and to a lesser extent at two sites a little farther north in Boiotia and Thessaly.[10]

Because Mycenaean sealstones of the Mainland Popular Group are found predominantly in simple burials,[11] often bear simple carvings, and are fashioned from a common, easily carved stone such as steatite, it is generally agreed that their owners were of humble means.[12] These two seals are therefore at odds with the other personal effects of the two Mycenaeans aboard the Uluburun ship (cat. nos. 238, 239). Had these other Mycenaean objects been recovered from a grave, their owners would have been considered well-to-do elites.[13]

Furthermore, two Late Minoan IIIA burials at Sellopoulo on Crete contain grave goods similar to the Uluburun Mycenaean assemblage, including lentoid sealstones[14] meticulously crafted of hardstone and appropriate to the elite status of their owners. Why, then, were seals of such quality not found on the ship? Perhaps they were lost when the Mycenaeans perished in the shipwreck.

The two steatite sealstones must, therefore, have served a different purpose. Hardstone seals are known from temples and shrines,[15] but soft sealstones of the Mainland Popular Group, well worn rather than pristine, were also deposited as votive offerings at sanctuaries and shrines. Perhaps the Uluburun sealstones were intended as offerings to be made upon completion of a successful crossing or journey.[16] Alternatively, worn soft-stone sealstones have been found in burials strung on necklaces adorning the deceased,[17] and the two steatite sealstones from Uluburun, also fairly worn, could have been part of necklaces belonging to either or both of the Mycenaeans aboard the ship. CP

1. See Pulak 2005a, pp. 305–6, pl. LXXI:f; Bass 1986, pp. 283–85; Dickers 2001, p. 49, pl. 24:6, no. 399; CMS V Suppl. 1B, pp. 453–54, no. 473.
2. CMS V Supp. 1B, pp. 453–54, no. 473, with figure. Dickers 2001, p. 229, pl. 24. The design of catalogue no. 241b is assigned by Dickers to the "triskel" motif, consisting of two subtypes. The Uluburun sealstone conforms to the subtype with finely incised legs terminating in dots, for which there are two examples from Tiryns and one from Mycenae. The two subtypes date to the Late Helladic IIIA–B (Dickers 2001, p. 49, pl. 24.3–6). Paired and antithetical triskeles motifs are seen only on the Uluburun sealstone and one other from Medeon in Boiotia (ibid., p. 49, pl. 25:2, no. 296). Younger (1988, pp. 190–91) places the design in his "5B-animal faces: bucrania" motif.
3. About one-sixth of the seal's edge has broken away, obliterating the hind legs of the ungulate. See Pulak 2004, pp. 651–52, no. 454, with figure.
4. Boardman 1970, pp. 62–63.
5. Betts 1997, pp. 63, 65.
6. Boardman 1970, p. 62; Aravantinos 1984, pp. 41–48.
7. Boardman 1970, p. 62.
8. Younger 1987, p. 65; Younger 1989, p. 106; Younger 1985, p. 290. Within this group, the renderings are so varied that no internal development or workshop attribution can be detected. It may be that this group was produced in many workshops over a relatively short period of time during the Late Helladic IIIA:2–IIIB:1, and that most sealstones from Late Helladic IIIB–IIIC contexts, usually worn from use, were made earlier. See Younger 1985, p. 290.
9. Dickers 2001, pp. 6–9, with map 1.
10. For Tiryns, see ibid., p. 49, pls. 3, 5; for Mycenae, see ibid., p. 49, pl. 4; and for other sites to the north in Boiotia and Thessaly, see ibid., p. 49, pls. 24:7, 9 and 25:1, 2.
11. Ibid., pp. 7, 72–73.
12. Younger 1987, p. 58; Younger 1985, p. 290.
13. Pulak 2005a, p. 307.
14. Burial I of Tomb 4 yielded a gold-capped lentoid seal and Burial II two lentoid seals, one of rock crystal and the other of carnelian. Other grave goods include a jug and a kylix, a Type Di sword, two spears, a razor, and faience and gold-relief beads, and those from Burial II include a conical cup and two kylixes, a Type Di sword, a bronze knife, and relief beads of glass and gold (Popham, Catling, and Catling 1974, pp. 199, 201–2, 224–25, 229, pl. 35d).
15. Dickers 2001, pp. 71–73; Younger 1985, pp. 294–95.
16. Pulak 2005a, p. 306, citing Bachhuber 2003, pp. 126–30.
17. Dickers 2001, p. 76.

242a, b

Mycenaean Pottery

Ceramic
a. Kylix
Height 11.7 cm (4⅝ in.); diameter 11.9 cm (4¾ in.)
28.31.84 (KW 57)

b. Stirrup jar
Height 16.8 cm (6⅝ in.); max. diameter 14 cm (5½ in.); diameter of rim 2.1 cm (⅞ in.)
104.31.84 (KW 137)

Uluburun shipwreck
Late Bronze Age, ca. 1300 B.C.
Bodrum Museum of Underwater Archaeology, Turkey



Figure 118. Cemal Pulak holding Mycenaean kylix and Canaanite pilgrim flask (cat. no. 191) during excavation; chalice (cat. no. 219) and Canaanite amphora in foreground. Uluburun shipwreck.

Among the hundreds of ceramic containers that constitute a major portion of the Uluburun ship's cargo are 25 complete or largely restorable vessels that originated in locales around the shores of the southern Aegean. Unlike the scores of Canaanite amphoras designed to transport liquids in bulk (see cat. no. 190), or the dozens of Cypriot bowls and juglets in mint condition that had been packed in a pithos (cat. no. 193) and were evidently being delivered as new tablewares, these Aegean objects served a multiplicity of functions and had seen a fair amount of earlier use before they came to rest on the seabed off Uluburun about 1300 B.C.

Three jugs and three cups were used for drinking.[1] No two cups or jugs closely resemble each other, nor are any jug-cup pairs decorated so similarly as to suggest that they constituted a set. Indeed, each of these six vessels is unique within the ship's cargo in terms of its combination of shape and decoration. Of the three jugs, one unmistakably Mycenaean example is attractively decorated with a painted floral pattern; neutron activation analysis of its fabric identifies it as an Argive product from the northeastern Peloponnese. The two other jugs, both considerably more fragmentary, are likely to have come from coastal regions of southwestern Anatolia. One has a burnished reddish brown surface, a narrow neck, and an angular body profile,[2] the other a brown-slipped but unburnished surface and a shorter and substantially wider neck.[3]

All three of the drinking cups are Mycenaean painted pots, but they differ in shape, volume, and decorative elaboration. The simplest, a banded semiglobular cup, would have held only about a sixth of a liter when filled to the brim. Another is a ladle, or dipper, decorated with the abstract motif known as the N-pattern and would have held about a quarter of a liter; its handle, now missing, would have been sizable and might have been broken off even before the ship sank. The third and most elaborately painted of the cups is the two-handled stemmed cup, or kylix (cat. no. 242a), decorated with two large birds on each side. Unfortunately, after more than three millennia underwater (fig. 118), its painted pattern is not very well preserved. The closest parallels for this distinctively ornamented piece come from cemeteries on the island of Rhodes,[4] and this may well be where this particular cup was produced. It is tempting to link it with the most elaborate of the decorated jugs, leaving the linear cup and the simply patterned ladle to be paired with the two much plainer jugs, and to see in these three jug-cup pairs the personal drinking equipment of a trio of passengers on board the ship: the Mycenaean emissaries and the bearer of the scepter-mace (cat. no. 237). Sadly, there is nothing about the find-spots of these six pots or the details of their decoration to support this interpretation. Mainland Mycenaean drinkers often made use of a large mixing bowl, or krater, to mix wine with water when they drank socially, but nothing remotely resembling an Aegean krater has been recovered from the Uluburun wreck. Perhaps there were not enough Aegean drinkers on board to make one necessary.[5]

A second major group of Aegean vessels from Uluburun consists of nine small- to medium-size containers notable for the slow-pouring design of their spouts and the density of their painted decoration. Eight of the nine are examples of the quintessentially Aegean ceramic form known, by the distinctive design of the handles and solid neck, as the "stirrup" or, alternatively, "false-necked" jar (the ninth is a neck-handled flask). These diminutive vessels,



242a



242b

specially shaped for careful pouring of liquids such as perfumed oils, have capacities ranging from as little as one tenth of a liter to slightly more than 3 liters; the example here (cat. no. 242b) holds approximately one liter. Produced in the thousands by Mycenaean palatial administrations, they dispensed a comparatively high-priced commodity that was widely distributed throughout the eastern Mediterranean.[6] So popular were these gaily decorated stirrup jars among Egyptian and Levantine consumers that they were imitated in more exotic materials, such as, in Egypt, faience and even translucent stones. The decoration of stirrup-jar shoulders with schematic flowers, as on this one, may be an allusion to the fragrance of the perfumed oil within. The number of these small jars from Uluburun, even with a few miscellaneous spout and base fragments added, is far too few to identify Mycenaean perfumed oil as a significant component of the ship's overall cargo. Moreover, the impressive range of different shapes, sizes, and fabrics represented by this small group of jars identifies them as a motley collection, many of them possibly in secondary use, rather than a shipment of freshly made and stoppered perfume vessels. It may be that they, like the Aegean drinking equipment described above, were personal possessions.

Of the ten giant stirrup jars from the wreck, each with a capacity of between 12 and 18 liters, at least half were wheel-made Cretan products decorated very simply with two or three groups of broad bands. Two handmade examples, however, one burnished dark but otherwise plain and the other banded in an atypical fashion, were clearly manufactured elsewhere, possibly along the western coast of Anatolia or on one of the eastern Aegean islands. Four of these large jars bear incised marks on their handles showing that at some point they had passed through the hands of Cypriot middlemen as reusable transport vessels for the shipping of oil and wine in bulk.[7] JR

1. Pulak 1998; Rutter 2005.
2. Compare Günel 1999, pp. 179, 365, figs. 104:1, 2, 158:1, 2.
3. Compare ibid., p. 181, figs. 113:6, 115:6.
4. Benzi 1992, pl. 8a (Ialysos Tomb 7:6).
5. Pulak 2005a.
6. Haskell 1984; Shelmerdine 1985; Shelmerdine 1998.
7. Hirschfeld 1993; Hirschfeld 1999.

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Mycenaean Kylix

Ceramic
Height 17.8 cm (7 in.); diameter of mouth 15.2 cm (6 in.)
Müskebi, Chamber Tomb 12
Late Bronze Age, 14th century B.C.
Bodrum Museum of Underwater Archaeology, Turkey
Müskebi 688 (#23)



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Mycenaean Footed Stirrup Jar

Ceramic
Height 19.5 cm (7⅝ in.); diameter 15.3 cm (6 in.)
Müskebi, Chamber Tomb 15
Late Bronze Age, 14th century B.C.
Bodrum Museum of Underwater Archaeology, Turkey
Müskebi 698 (#43)



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The Late Bronze Age cemetery at Müskebi is on the Halikarnassos (Bodrum) peninsula in southwestern Anatolia, part of the ancient region of Caria. Excavated by the Turkish archaeologist Yusuf Boysal from 1963 to 1966,[1] it was the first cemetery with standard Mycenaean-type chamber tombs—intended to hold multiple burials of what were probably individual families—to be explored on the Anatolian mainland. The tombs are similar to those of contemporaneous burials on the nearby islands of Rhodes, Kos, and Kalymnos, where, by the end of the fifteenth century B.C., Mycenaean culture from the Greek mainland had largely supplanted the earlier Minoan culture of Crete. The same is true of their contents: more than 250 vases and substantial numbers of bronze weapons, jewelry, and miscellaneous other finds. Even though the burials at Müskebi were an unusual mixture of both inhumations and cremations (the latter were not common in Mycenaean cemeteries of this date), most authorities have identified the

tombs as those of a group of Mycenaean colonists who had migrated from the islands of the southeastern Aegean to the mainland early in the fourteenth century B.C.[2] This migration was thus believed to have taken place about a generation before the massive destruction of the hybrid Minoan-Mycenaean palatial center at Knossos. As a result, Knossian cultural dominance throughout the southern Aegean was replaced by a more decentralized Mycenaean hegemony focused on palatial sites on the central and southern Greek mainland, including Mycenae, Tiryns, Thebes, and Pylos.

The high point of the Müskebi cemetery's history occurred in the second half of the fourteenth century B.C.; it was during this time that the Uluburun ship sank with its fabulously rich cargo of metals, incense, glass, and other raw materials. It is therefore not surprising to find examples of southern Aegean ceramic types like those represented on the Uluburun ship also deposited in the tombs at Müskebi. A two-handled drinking cup, or kylix, from Tomb 12 (cat. no. 243) is very similar in shape to the lone kylix found on the wreck (cat. no. 242a), and both were probably produced on Rhodes. The diagonal whorl shells that decorate the Müskebi kylix are much more common on this shape than are the large birds decorating the Uluburun vase, but both motifs are good examples of the simplification and conversion to pure pattern of the far more naturalistic depictions of living creatures that were characteristic of Minoan ceramic ornament during the preceding fifteenth century B.C. It is interesting that the Müskebi kylix was accompanied in its tomb by a plain western Anatolian jug,[3] in much the same way that two of the three Mycenaean drinking cups from the Uluburun wreck appear to have been paired with plain Anatolian rather than pattern-decorated Mycenaean jugs.

The piriform stirrup jar from Müskebi Tomb 15 (cat. no. 244), decorated with intersecting hatched semicircles on the shoulder and with lentoid shapes hatched in a zigzag arrangement on the body below, is closely comparable in shape and date to the single piriform stirrup jar from the Uluburun wreck (cat. no. 242b) and likely to be another Rhodian product. The neck-handled flask and more common small- and middle-size globular stirrup jars from Uluburun, all designed to hold expensive perfumed oils, similarly have close parallels in the Müskebi tombs. Even the giant stirrup jars used for bulk liquid transport—the most common form of Aegean ceramic container found on the Uluburun ship—can also be found at Müskebi.[4] Thus, the entire southern Aegean ceramic repertoire documented on the wreck could easily have been acquired in the eastern Aegean, whether at an inland settlement on the Anatolian mainland, whose inhabitants were buried at Müskebi, or at one of the numerous Mycenaean coastal sites ringing the islands of Rhodes and Kos. JR

1. Boysal 1969a.
2. But see Mountjoy 1998, esp. pp. 36–37, for the possibility of acculturation playing a greater role than simple migration.
3. Özgünel 1996, p. 104, pl. 15:3 (Bodrum Museum 668).
4. Ibid., p. 53, pl. 5:6 (Bodrum Museum 987).

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Dagger

Bronze
Length 32.3 cm (12¾ in.)
Müskebi, Chamber Tomb 11
Late Bronze Age, 14th century B.C.
Bodrum Museum of Underwater Archaeology, Turkey
Müskebi 675 (#18)

This dagger, or dirk, was found in Chamber Tomb 11 of the Late Bronze Age cemetery at Müskebi.[1] It is unique among the limited number of bronze weapons, mostly spears and knives, excavated from the forty-eight Mycenaean tombs at the site.[2] Two Mycenaean vases found in the same tomb date it and its contents to the Late Helladic IIIA:2 period.[3]

The dagger originally would have been longer, probably 34 centimeters or more, but the pommel tang did not survive intact and the tip of the blade was damaged by corrosion. Its unusual hand guard, or "quillon," with horn-shaped projections curving slightly downward at the tips, and the rivetless flanged grip configuration narrowing to an elongated extension for attaching the pommel, now lost, are typical of Sandars's Class H short swords or daggers.[4] The hilt flanges would have retained hilt plates, and the pommel would have been attached to the hilt by the rod-like extension, of which only the base survives.[5] A seam is visible on the horn-shaped pointed ends of the quillon, suggesting that they were shaped on an anvil after the dagger was cast in a mold. The surface of the pointed blade is heavily pitted from corrosion, but four grooves down its center can readily be discerned.

The small group of Class H bronze daggers, according to Sandars, borders the Minoan-Mycenaean worlds in both time and space. These weapons are an amalgamation of Aegean and Near Eastern characteristics: the flat-blade type, although not originally Aegean, had been developing in that direction in Mycenaean swords; the quillon horns were undoubtedly of Aegean origin; and the rod-shaped pommel extension parallels Near Eastern and Cypriot weapons.[6] A dagger, reputed to have been found in a Mycenaean tomb at Siana, Rhodes, together with a knife and spearhead, forms the basis of this class. A second dagger, said to be from Pergamon in northwestern Anatolia, is nearly identical in shape and size to the Siana dagger except for the lines down the blade center, which are worked as grooves on the Siana dagger and as ridges on the Pergamon example. Another example, with the ridges down the blade's center, was found at Pyli on the island of Kos.[7] The grooved blade of the Müskebi dagger, which represents a fourth example of this class, is similar to the one from Siana.

The knife found with the Siana dagger, with its rod-shaped pommel extension, is of similar construction to one found at Troy and to two others, from Ialysos on Rhodes and at Kolophon in western Anatolia. Based on the only datable example from Ialysos, both the knife type and the Class H daggers had been attributed to the Late Helladic IIIB–early IIIC period (late thirteenth–early twelfth century B.C.), characterized by Sandars as a time of confused frontiers and even more confused politics preceding the collapse of nearly all eastern Mediterranean Bronze Age cultures except Egypt.[8] The Ialysos tomb, however, has since been redated to Late Helladic IIIA:2–IIIB.[9] Two unpublished knives found in Tombs 7 and 14 at Müskebi are dated by the Mycenaean pottery found with them to the Late Helladic IIIA:2–IIIB period,[10] as are two



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other examples from tombs T 48 and T 59 on Rhodes.[11] Two incomplete knives from the Uluburun shipwreck are dated to the late fourteenth century B.C.[12] Based on the datable examples, we can infer that the use of these knives spanned the Late Helladic IIIA:2 and most likely the earlier part of the Late Helladic IIIB periods rather than being confined to the end of the Late Bronze Age as previously suggested. Whether the Class H swords have the same date range as that of the knife with rod-pommel extension is not certain, but the similar construction features of both weapons, and the dates of the Müskebi dagger and the knives, suggest that they were both in use during the same approximate period. CP

1. Boysal 1969a, p. 33. The Müskebi tombs and a group of Mycenaean pottery found by locals, as well as initial observations at the site, were first were noted by Bass (1963, pp. 353–56). The tombs were subsequently excavated by Yusuf Boysal, yielding more than 250 terracotta vessels, along with bronzes and jewelry; the last two categories of artifacts have not been published. General discussion of the tombs and their finds are in Boysal 1964 and 1969a.
2. Boysal 1964, p. 83. Mee (1978, p. 137) notes that the bronzes on display in the Bodrum Museum of Underwater Archaeology consisted of seven spears, three knives, a razor, and a dagger, all of which have since been placed in storage.
3. For the two Mycenaean piriform jars found in Tomb 11, see Boysal 1969b, pp. xi, 3, Taf. I:1, 6, V:2, and pls. I:1, V:2; see also Mee 1978, p. 137, no. 1:1–11, p. 139, no. 5:2–11.
4. Sandars 1963, pp. 140–42, pl. 27:52, 53.
5. Mee (1978, p. 137), while correctly attributing the dagger to Sandars's Class H, notes that the dagger is outfitted with a short pommel tang rather than the typical rodlike extension with a square cross section that characterizes this type. The rough edge of the pommel tang indicates, however, that the rodlike extension broke off and was lost.
6. Sandars 1963, pp. 140–41.
7. Kilian-Dirlmeier 1993, p. 49, pl. 18:99, designated as Type 2b.
8. Sandars 1963, pp. 140, 142.
9. Mee 1982, p. 60 n. 5. Discoveries since the original publication have increased the number of known examples of knives of this type to sixteen; even so, only a few are from contexts with useful dates. References are compiled in Pulak 2005a, p. 300 and n. 34, where the number of known knives of this type is given incorrectly as seventeen, and is corrected herewith; Benzi 1992, pp. 177–78; and Ersoy 1988, p. 67 n. 56.
10. One knife (Bodrum inv. no. 676-B), 29.5 cm long, was found in Tomb 7 with a Mycenaean mug and pyxis: Boysal 1969b, pp. xi, 17, pl. XX:6, p. 22, pl. XXV:3, and pls. XX:6,

XXV:3; and Mee 1978, p. 142, no. 20:6, 7, p. 140 no. 25:3–7, where the two vessels are dated to the Late Helladic IIIA:2–IIIB period. The second knife (Bodrum Museum inv. no. 677-B), 27.4 cm long, was found in Tomb 14 with a Mycenaean pyxis and bowl: Boysal 1969b, pp. xi, 22, pl. XXV:8, p. 27, pl. XXXI:5; and Mee 1978, p. 141, no. 31:5–14, p. 140, no. 25:8–14, where the vessels are dated to the Late Helladic IIIA:2–IIIB period. I am grateful to the former director of the Bodrum Museum of Underwater Archaeology, Oğuz Alpözen, for giving me information on and access to these knives.

11. Benzi 1992, pp. 177–78, 334, pl. 179:f (for T 48/15), and p. 360, pl. 179:n (for T 59/C).
12. Pulak 2005a, p. 300, pl. LXXI:a. One of the knives (KW 4452) is missing the rodlike extension at the terminus of the hilt, and the second (lot no. 3242) is missing the entire blade.

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Mycenaean Relief Beads

Glass

Average bead dimensions: length 2.1 cm (⅞ in.); width 1 cm (⅜ in.); height 0.9 cm (⅜ in.)

Müskebi, Chamber Tomb 22

Late Bronze Age, 14th century B.C.

Bodrum Museum of Underwater Archaeology, Turkey Müskebi 711 (#101)

Among the objects excavated from Chamber Tomb 22 in the Late Bronze Age cemetery at Müskebi were glass relief plaques, or beads, a uniquely Mycenaean product that disappeared from the archaeological record with the end of the Mycenaean culture.[1] Of the forty-eight tombs excavated at Müskebi, Tomb 22 is the only one to have contained glass relief beads. The burial is dated to the Late Helladic IIIA:2 period, based on the Mycenaean pottery evidence,[2] and was thought to belong to a woman.[3] Since relief beads do not appear to have been exported as trade items outside Mycenaean society, and occur almost exclusively in monumental and other elaborate burials for affluent families,[4] the individual buried in Tomb 22 must have been an influential member of the Müskebi society.

Inside the tomb were 33 flat-backed relief beads, all made of a translucent, deep blue glass—presumably in imitation of lapis lazuli. Their cream-colored, nonglasslike crust is the result of weathering; they are otherwise in good condition.[5] Cast in open, one-piece molds, probably from imported raw glass, each bead is modeled as a single ornament, likely representing a stylized curl of hair.[6] The curl emanates from a ribbed band or headpiece with a semicircular convex profile, pierced transversally for stringing; a second transverse perforation runs through the center of the curl. The curl itself is highlighted with four curved parallel lines or ridges, the outermost of which ends in a multiwhorled, conical spiral, forming the highest point of the bead.

Objects of glass, such as star-disc pendants and certain beads, were imported to the Aegean during the late sixteenth and early fifteenth century B.C. The deep blue color and unusual material of these fine objects must have delighted the Mycenaeans, who soon began using *kyanos*, as they called the glass, to manufacture objects of their own. The physical and chemical similarity between imported glass objects and those produced locally indicates that the latter were made from imported glass ingots like the deep and light blue examples carried on the Uluburun ship (cat. no. 187).[7] The great majority of Mycenaean relief beads are made of deep blue glass, though light blue or turquoise beads are occasionally found, often with the former, indicating that these two colors were preferred by the Mycenaeans. It is noteworthy, therefore, that all but three glass ingots found on the Uluburun shipwreck represent these two colors.

Relief beads in the form of spiral hair curls are well represented in Late Helladic III contexts in the Aegean. Two classes of relief beads, one with triple spirals positioned one above the other and separated by a row of dots between them, the other bearing a figure-of-eight shield motif, were found on the Uluburun ship (cat. no. 239).[8] The hair-curl motif probably began as a simple, volutelike circular curl emanating from a pierced suspension band.[9] The motif was later modified to include an elongated lock attached to the curl that could be used singly or paired with another one suspended below the first, facing in the opposite direction. At about this time, the single elongated-curl motif was also featured on flat, rectangular, cast plaques. Somewhat later, the end of the hair curl appeared as stylized, multiwhorled, spiral- and plaque-shaped bead forms. The former was ultimately dropped altogether in favor of the plaque-shaped relief bead with two or three superimposed spirals and a lock represented by curved parallel lines or ribs. Eventually, these lines were replaced by simple spirals. In this hypothetical progression, the Müskebi relief beads would thus appear to be early variants of the hair-curl motif, with the Uluburun beads belonging to the later plaque versions having just three spirals to represent the hair lock.

The contents of the Müskebi tombs are typical of contemporary Mycenaean burials on the nearby islands of Kos, Kalymnos, and, especially, Rhodes in the fourteenth century B.C.[10] It is not surprising, therefore, that many relief beads similar to those from Müskebi, including the single- and multiple-curl and the spiral varieties, were found on Rhodes, both in glass[11] and gold,[12] although the suspension band or headpiece for these beads is usually ornamented with designs other than ribbing; furthermore, the borders, and sometimes also the fields between the lines representing the lock of hair, are trimmed with rows of raised dots, perhaps in imitation of gold granulation. Glass examples also occur on the Greek mainland, at Prosymna[13] and Ayios Ilias,[14] with gold versions found at Mycenae[15] and at Thisbe in Boiotia.[16] The Müskebi relief beads are, however, unique. Although no known examples embody all four of their defining features—ribbed suspension band, cutout form, plain line ornamentation without raised dots, and locks with spiral ends—an example from Ialysos, Rhodes, exhibits the cutout form and spiral,[17] and another from an unknown provenance features the cutout form and ribbed suspension band.[18]

Glass relief beads have been found throughout the Mycenaean world, but those recovered in any quantity have come almost exclusively from Mycenaean burials. Although iconographic evidence suggests that beads were worn primarily by women, they were also worn by children and men.[19] The peculiarly Mycenaean glass plaques, with their perforations for stringing, have been interpreted as beads for necklaces, adornments sewn on garments, or for use as diadems.[20] With regard to diadems, two or three chamber tombs near Olympia, one of which may be that of a female, contained relief beads



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with rosettes and ivy-leaf motifs scattered around the skulls; those found in the third burial, of a male, were recovered as an intact diadem on the forehead of the skeleton.[21] The diadem beads display the triple-spiral hair curl, a motif surmised to be particularly appropriate for placement on the forehead. However, no single use can be ascribed to any relief-bead motif. The discovery on the Uluburun ship of relief beads with two different motifs—one with a triple-spiral design—suggests not only that there were two pieces of Mycenaean jewelry on board but also that they were worn by men as necklaces. They represent the only discovery of their kind in a personal, everyday context, suggesting that those from Olympia and Müskebi were not intended exclusively for use as grave offerings. Rather, they would have been used during the owner's lifetime and, in some instances, placed near the skull or on the forehead as a diadem when the deceased was interred. CP

1. Hughes-Brock 1999, p. 291; Grose 1989, p. 57.
2. The eleven Mycenaean vases found in the tomb are in Boysal 1969b, p. xii: five piriform jars (pp. 3–4, 6, pls. I:3, II:2; V:1, 3, 4), four mugs and cups (pp. 17–19, pls. XXI:3, 4, 6, XXIII:6), brazier (p. 27, pl. XXXI:2), and a flask (p. 27, pl. XXXII:1, 3). See also Mee 1978, pp. 137–42, for a listing and discussion of the Mycenaean pottery.
3. A comprehensive list of grave goods and analysis of the tomb itself have not been published. It seems likely, however, that the female attribution is based on the presence of relief beads and the lack of weapons. The spatial relationship of the relief beads to the skeletal remains is not indicated.
4. Lewartowski 2000, p. 35; Hughes-Brock 1999, pp. 287–89.
5. Due to the thick weathering crust on the beads, they were initially reported to be of a stonelike material (Boysal 1964, p. 83).
6. Yalouris 1968, pp. 12–14; see also Harden 1981, pp. 39, 45.
7. Robert Brill of the Corning Museum of Glass, who is analyzing all of the Uluburun ingots for publication, reported that the chemical composition of the Uluburun cobalt blue glass ingots matched those of contemporary Egyptian core-formed vessels and Mycenaean glass relief beads, which suggests both were manufactured from glass obtained from a common source (Bass 1986, p. 282).
8. For discussion of relief beads with spiral designs and examples in the British Museum, see Harden 1981, pp. 45–46, nos. 56–59, pl. IV:56, 59, fig. 3:56, 57, 59. Another example is found in Grose 1989, pp. 64–65, 397, fig. 24.
9. Yalouris 1968, pp. 13–14.
10. Mee 1978, pp. 149–50.
11. Harden 1981, p. 46, nos. a, b, pl. IV:52, 53, fig. 3:52, 53.
12. Benzi 1992, pls. 116:I, 182:1.
13. Blegen and Blegen 1937, p. 305, fig. 300:8.
14. Mastrokostas 1966, pp. 205–7, pl. 17a.
15. Yalouris 1968, p. 13, fig. 13.
16. A. Evans 1925, p. 2, fig. 1:j; Yalouris 1968, p. 13, no. 16, figs. 13–15, for other examples in gold and glass.
17. Harden 1981, p. 46, no. 52, pl. 4:52, fig. 3:52.
18. Goldstein 1979, p. 94, fig. 177, indicated to be from Crete or the Peloponnese.
19. Younger 1992, pp. 261–69. There is no extant pictorial evidence for relief beads.
20. Harden 1981, p. 39.
21. Yalouris 1968, pp. 10–13, and figs. 1–11; the assignation of the burial to a male is made primarily on the presence of weapons, and that to a female, from the lack of such and also on the presence of other grave goods. A burial at Dendra, also containing weapons and relief beads, is that of a male (Wace 1932, p. 193).
22. Yalouris 1968, p. 15.