

Seafaring and Shipwreck Archaeology

Jeffrey P. Emanuel

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Edited by Brian R. Doak and Carolina López-Ruiz

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Abstract and Keywords

Perhaps no civilization in history is as associated with the sea as the Phoenicians, whose ships and seafaring ability allowed them to travel, trade, and establish colonies across the Mediterranean. Search and survey operations in the Mediterranean have resulted in the discovery of a limited number of Canaanite, Phoenician, and Punic shipwrecks, which have been found in both deep and shallow water. These assemblages provide valuable evidence of this culture's critical maritime component, improving our knowledge and understanding of Phoenician and Punic seafaring, while also helping us better understand the written accounts we do possess about these mariners and their activities. Within the last decade in particular, the excavation of the shipwreck at Bajo de la Campana (Spain) has shed new light on Phoenician seafaring and ship construction, while the discovery of the Xlendi Gozo wreck (Malta) has provided new evidence for Phoenician activity in the central Mediterranean. Survey and excavation off the northwest coast of Sicily, in turn, has provided a remarkable material counterpart to the textual evidence for the events at the end of the First Punic War. When combined with the deep-water wrecks off the coast of Ashkelon and the smaller, locally oriented wrecks off the coast of Mazarrón (Spain), a more coherent—albeit still very incomplete—picture of Phoenician and Punic activity begins to take shape.

Keywords: shipwreck, naval warfare, Battle of the Egadi Islands, First Punic War, metals trade, ship construction

NO OTHER civilization in history is perhaps as strongly associated with the sea as the Phoenicians, whose ships and seafaring ability allowed them to travel, trade, and establish colonies across the Mediterranean Sea. However, though they were known as the “rulers of the sea” (Ezekiel 26:16) and were “famed for their ships” (Hom. *Od.* 15.415), and despite evidence for colonies and entrepôts from the Levantine coast to Africa and to the farthest western reaches of Europe, relatively little information is actually known about the lives and activities of their seagoing population, or about the development, construction, and use of their ships. They left behind almost no descriptions of their ships or seafaring activities, relegating us to rely on third-party accounts—Egyptian, Greek, Assy-

ian, and Hebrew—and a limited iconographic corpus, including Assyrian and Egyptian relief, along with representations on smaller media such as Phoenician coins and cylinder seals from Persepolis (Basch 1969; Casson 1971; on the loss of Phoenician literature, see also López-Ruiz, Chapter 18, this volume). Because of the limited scope of documentary and iconographic evidence, close study of ancient shipwrecks has greatly improved our knowledge and understanding of Phoenician and Punic seafaring. Well-preserved deep-water wrecks, like those off Ashkelon, can provide the opportunity for contextual and spatial study (Drap et al. 2015), while shallow-water wrecks can provide evidence for specific activities, such as local exchange and naval warfare (see below).

Canaanite Seafaring and Maritime Innovation

Though use of the term “Phoenician” is generally restricted to the first millennium BCE, the seafaring roots of these people extend at least into the Bronze Age. The best-known (p. 424) vessel from this period sank off the coast of Uluburun in the last years of the fourteenth century BCE with a cargo that included glass ingots, elephant and hippopotamus ivory, ostrich eggs, Syro-Canaanite jewelry, faience, and other valuable items, as well as Assyrian and Kassite seals and a gold scarab of the Egyptian Queen Nefertiti (Bass 1997). The staple of the vessel’s fifteen-ton cargo was ten tons of copper ingots and another of tin. The second-largest cargo item by volume was terebinth resin, one and a half tons of which was aboard the Uluburun ship in at least 149 Canaanite jars. This resin was used as incense in Egypt, and it may have been added as a preservative to jars whose primary contents were wine (Pulak 1998). Also on board were large pithoi full of Cypriot ceramics, likely intended for a less elite market segment.

Aside from illustrating the high-value exchange so vividly described in the fourteenth century BCE letters from the Amarna archive in Egypt, the Uluburun shipwreck also provides important evidence for an important development in ship construction, as it serves as the earliest physical example of pegged mortise and tenon joints used to fasten together hull planking. This technique, which replaced sewn-plank joinery, consisted of linking planks (mortises) by their edges via a tenon, which was inserted into the two connecting planks and secured with a wooden peg or nail—an edge-to-edge fastening method commonly used in the ancient Mediterranean. While mortise-and-tenon joinery would become common in the first millennium BCE (and would be known into the Roman period as *coagmenta punicana*, “Phoenician joints”; Sleswyk 1980), the Uluburun shipwreck demonstrates its developed use on a vessel likely of Syro-Canaanite origin at a much earlier date (Pulak 1997).

Mortise-and-tenon joinery was also a feature of a ship that foundered a century later, ca. 1200 BCE, off of Cape Gelidonya in southern Anatolia. Discovered in 1954 by a local sponge diver and excavated in 1960, this small vessel’s cargo included copper ingots and tin bars, as well as a quantity of scrap metal likely intended for recasting. The stone pan-balance weights on board were based on Near Eastern standards, and personal items found among the wreckage suggested a Syro-Canaanite origin of the vessel and its crew.

This was a paradigm-shifting discovery: while it had been assumed up to that point that maritime trade in the eastern Mediterranean was conducted almost entirely by Mycenaean, and that Canaanites had not taken to the sea with purpose until the first millennium, the Gelidonya shipwreck provided a heretofore unrecognized Bronze Age background for the Phoenicians' Iron Age maritime activity (Bass 2012) (for the Canaanite background of the Phoenicians, see chapter 4, this volume).

The development of mortise-and-tenon joinery is a microcosm of the accelerated innovation in maritime technology that marked the end of the Bronze Age in the eastern Mediterranean. Many of these innovations likely originated in the pre-Phoenician seafaring communities of the Syro-Canaanite littoral (Emanuel 2014). Perhaps most important was the loose-footed sail and brailed rig, a system by which the sail could be raised, lowered, and adjusted like a Venetian blind, allowing vessels to sail more closely to the wind than their boom-footed square sail-rigged predecessors. The earliest evidence for this rig, found in secondary deposition at Saqqara, is an Egyptian relief of cargo being unloaded from two Syro-Canaanite vessels, while the most famous second millennium (p. 425) depiction can be seen in the naval battle relief on the walls of Ramesses III's mortuary temple at Medinet Habu (Emanuel 2014). As Shelley Wachsmann has noted, "this rig, more than any other single factor, permitted the remarkable 'explosion' in vastly extended sea routes and long-distance colonization that we witness beginning in the early first millennium BC" (Wachsmann 2000: 234).

The Iron Age: Iconographic Evidence

While Bronze Age Syro-Canaanite vessels were frequently depicted in Egyptian art, Assyrian reliefs provide Iron Age iconographic evidence for Phoenician ships and seafaring. Schematically represented Phoenician vessels featuring horse heads (*hippoi*) on both bow and stern finials bearing tribute are depicted on the Balawat gates of Shalmaneser III, ca. 850 BCE (King 1915). No rigging is shown; instead, they are depicted as being propelled only by oars. A wall relief from the palace of the late eighth-century Assyrian king Sargon II at Khorsabad features similar craft, but with *hippoi* only at the bows, and with the rowers facing fore instead of aft (Casson 1971; McGrail 2004).

The most detailed representations of seagoing Phoenician ships come from the palace of Sennacherib at Nineveh (figure 27.1). In a relief depicting the Tyrian king Luli's waterborne flight to Cyprus in 701 BCE, two types of ships are shown: sleek galleys and round merchantmen (Wachsmann 1998). The warships feature sharp-edged waterline rams and brailed sailing rigs, while the round ships' rigging is not depicted. Both feature twin banks of oars, and may be intended to represent ships as large as fifty-oared *pentekontors*, although only nine to eleven rowers are depicted per side, as the figures are presented at a much larger scale than the ships.



Figure 27.1 Relief from the palace of Sennacherib at Nineveh showing the waterborne flight of the Phoenician king Luli, along with merchantmen and warships filled with the men, women, and children of Tyre, ca. 701 BCE.

Source: After Layard 1849–53: pl. 71 (public domain).

The Iron Age: Shipwreck Evidence

Though small in number, notable Phoenician and Punic shipwrecks have been discovered across the Mediterranean, from Ashkelon on the Levantine coast to the region of Murcia on the southeast coast of Spain. Together, they provide a picture—albeit an incomplete one—of several aspects of travel, trade, and combat, including open-water voyages, cabotage, and warfare on the open sea.

Ashkelon

In 1997, while searching for the lost Israeli submarine *INS Dakar*, the U.S. Navy research vessel *NR-1* discovered **two ancient shipwrecks off the coast of Ashkelon**, Israel (figure 27.2). Christened *Tanit* and *Elissa* by their excavators, the two vessels, (p. 426) which date to the **eighth century BCE**, were found lying upright at a depth of 400 m (Ballard et al. 2002). Each wreck featured nearly 400 visible torpedo-shaped amphorae, and residue analysis on vessels recovered from the wreckage indicated that the main cargo was likely wine, perhaps destined either for Carthage or for Egypt. They were identified as Phoenician based on the form of the amphorae, which is well known from the Phoenician coast and from Carthage, and on petrographic analysis demonstrating their origin on the central Lebanese coast (Ballard et al. 2002).

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With their beam approximately one-third their length, these vessels are likely to have been closer in form to the round ships of Sennacherib's relief than to longer, sleeker galleys. Along with being the earliest vessels discovered in deep water, *Tanit* and *Elissa* provide evidence for seafaring at some distance from the coast in the early first millennium BCE (p. 427) (p. 428) while their proximity to each other suggests that they were sailing together—perhaps as part of a larger fleet, owing either to the size of the delivery or for mutual protection—and foundered in the same nautical event. The presence of cooking pots and bowls supports an image of life at sea in which the preparation and consumption of food—in particular, fish-based “one-pot stews”—was carried out on board cargo vessels during long journeys, particularly when sailing at some distance from shore (Ballard et al. 2002). (For the Phoenicians in the Levant, see chapter 30, this volume.)

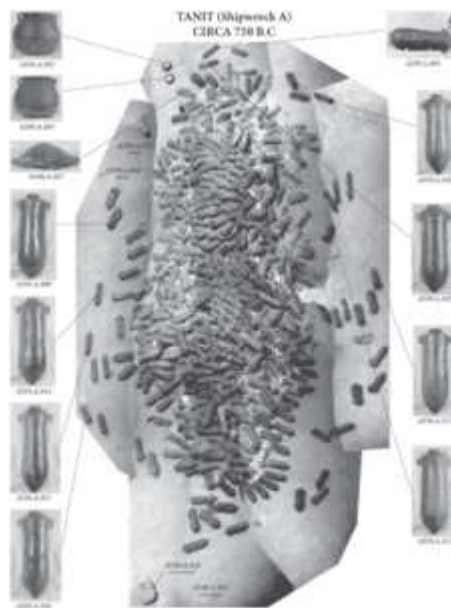


Figure 27.2 Amphora pile from the *Tanit* shipwreck (ca. 750 BCE), one of two Phoenician shipwrecks found in deep water off the coast of Ashkelon.

Source: Courtesy of H. Singh, J. Howland. © WHOI, IFE, Ashkelon Excavations.

Malta

Diodorus Siculus characterized the harbors of Malta and Gozo, and the islands' position in the open sea, as reasons for the establishment of Phoenician colonies on them (Diod. Sic. *Library* 5.12.1–4). In recent years, material evidence for Phoenician and Punic shipping has been discovered on the sea floor near Xlendi Bay, on the western side of Gozo. In 1961, a team of divers from the British vessel *HMS Falcon* discovered a trail of artifacts spread across the bay; since then, several Phoenician vessels have been found in the area, including one amphora that dates as far back as the seventh century BCE and many more from the later first millennium (Azzopardi 2013). In 2001, during remote-operated vehicle operations near the entrance to Xlendi Bay, a massive amphora scatter covering 4

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square km was discovered. Resting at a depth between 100 m and 130 m, the scatter contained thousands of vessels of at least seven different dates and types, including Punic amphorae dating to the third century BCE. Following this, during a 2008 survey of the Maltese archipelago, another shipwreck was located **off the coast of Xlendi**. The oldest known shipwreck in the western Mediterranean, **this Phoenician vessel sank in the early seventh century BCE**, resting on a submerged plateau at a depth of 110 m. Protected by sand, which likely covered the ship's remains shortly after it sank, the ship's cargo remains tightly clustered in the shape of the original vessel, with a length of 12 m and a beam of 5 m. The primary cargo was two layers of amphorae, which were of mixed Phoenician and Tyrrhenian origin (Drap et al. 2015). (For the Phoenicians in Malta, see chapter 36, this volume.)

Spain

Mazarrón

The southeastern coast of Spain features several natural harbors, as well as access to the region's rich metal supply, which has been exploited since the Bronze Age (for metallurgy, see chapter 26, this volume). Material evidence has been found for Phoenician traffic in the area from the seventh century BCE, with over 50 percent of the numerous ceramics found in the shallow waters off the coast of Playa de la Isla, having been identified as Phoenician or Punic (Abdelhamid 2015). In the late twentieth century, the construction of a seawall for the marina at Mazarrón stripped away the **(p. 429)** seabed in the bay at Playa de la Isla, revealing **two seventh-century shipwrecks** that had previously been covered by sediment (Negueruela et al. 1995). The vessels, called Mazarrón-1 and Mazarrón-2, were small craft, perhaps engaged in a local cabotage circuit. Amphorae found in the Mazarrón-1 assemblage were primarily Trayamar-1 type, characteristic of Phoenician cargoes in the western Mediterranean from the eighth century BCE. The remains of the vessel itself, which included a complete keel 4.5 m in length, were raised in 1995 and transferred to the Museo Nacional de Arqueología Subacuática in Cartagena (Negueruela Martínez 2014). The Mazarrón-2 shipwreck, excavated from 1999 to 2001, was almost completely preserved. The vessel was 8.15 m long with a beam of 2.2 m, and was filled with just over three tons of locally mined, bun-shaped lead ingots, which it may have been transported across the bay or along the coast on a voyage of local supply. The vessels are similar in size and dimension, and both were constructed shell first, with mortise-and-tenon joinery and sewn frames (Negueruela Martínez 2014). Given their small size, the nature of their cargo, the Mazarrón vessels were likely engaged missions of local trade and supply, rather than open-ocean travel. Similar activity in metals trade is also reflected in a late seventh-century BCE shipwreck at Rochelongue, on the southern coast of France, where copper ingots, weapons, and other bronze objects provide evidence for the recovery and transport of objects for recasting and later use (Aubet Semmler 2002).

Bajo de la Campana

Three further assemblages were discovered northeast of Cartagena, at the submerged site of Bajo de la Campana. These include the remains of a late seventh-century BCE Phoenician vessel, a second-century BCE Punic vessel, and a Roman shipwreck from the first century CE. Only the earliest of these has been excavated; it carried raw ivory, including over fifty elephant tusks, seven of which bore Phoenician inscriptions, as well as raw metals. Approximately one ton of lead ore was on board, as were ingots of copper and smelted tin. The raw materials, combined with other items on board (ivory-handled knives or daggers, an antler pin, double-ended boxwood combs, bronze furniture elements, and decorated ostrich eggshells) were typical of those exchanged with ore-rich indigenous populations, and may suggest that the vessel was on a supply or trading mission, perhaps to the colonial trading port of La Fonteta approximately 45 km up the coast. Only a small fragment of the hull was recovered, including a portion of one mortise, thus confirming that the hull of this vessel, too, was connected via mortise-and-tenon joinery (Polzer 2014). (For the Phoenicians on the Iberian Peninsula, see chapter 38, this volume.)

Sicily

Marsala (Lilybaeum)

In the early 1970s, two shallow-water Punic shipwrecks were surveyed and excavated near Marsala, on the west coast of Sicily near the ancient city of Lilybaeum. Only the stern remained of the first ship, which was discovered in 1969 and excavated between 1971 and 1974. The freshness of its pigment and tool marks suggests that the vessel was still very new when it sank, while inclusions in the luting (putty used to fill gaps in the hull planking) attests to the celerity with which it was constructed; these come from the leafy dunnage that served as a buffer between ballast and hull and from wood shavings from superstructure construction, which seems to have been ongoing as the luting and dunnage were laid (Frost 1982).

One of the most remarkable aspects of this vessel was the presence of Punic characters, written in black on the yellow pine wood of the ship's keel and planking. Variations in script suggest multiple literate hands at work, while the "pre-fab" nature of Punic vessels supports accounts of the swiftness with which they could construct large numbers of ships (Frost 1982). It may also help explain how the Romans, according to Pliny (*HN* 16.192) and Polybius (1.20), could have been able to quickly assemble a fleet using a single Punic ship as a model.

Of the second vessel, discovered in 1972, only the bow remained, complete with a pointed timber ram similar to those depicted in the aforementioned reliefs of Sennacherib. The ram, which was formed by nailing two upward-curving timbers to either side of the keel, mounting a central timber at the front of the stempost, and perhaps sheathing the entire apparatus in bronze, may have been designed to break off upon impact (Basch and Frost 1975). A Punic character was inscribed on the ram's starboard timber.

The combination of the ram, the absence of amphorae in the wreckage, and the presence of ballast stones for offsetting the force of the wind on the sail marked the Marsala vessels as **warships** (Basch and Frost 1975; Tusa and Royal 2012). The lack of natural hazards in the area, combined with the angle at which the first wreck's keel had been driven into the ocean bottom and the second wreck's keel snapped from a violent force amidships, led their excavator attribute their sinkings to acts of war, perhaps as part of the First Punic War (Basch and Frost 1975). (On the Punic Wars, see chapter 13, this volume.)

Battle of the Egadi Islands

Beginning in 2005, the Soprintendenza del Mare of the Regione Siciliana and RPM Nautical Foundation conducted a survey of the ocean bottom around the Egadi Islands off northwest Sicily. Finds from this area have provided material support for the documentary evidence for the battle traditionally held to have been site of the final battle of the First Punic War in 241 BCE (Polyb. 1.59–61). Surveys of this area have turned up a number of significant finds, including at least eight bronze helmets, several hundred Punic and Greco-Italic amphorae, and various other objects. In Polybius's account, the wind was high and the sea was rough at the time of the Egadi Islands battle, and the Carthaginian warships were crewed by inexperienced sailors and overloaded with supplies intended for the garrison at Eryx, near Drepana in western Sicily (Polyb. 1.60–61). According to Polybius, the results were disastrous, and the material evidence found thus far supports this account. The presence of helmets and the **(p. 431)** distribution of amphorae on the sea floor attests to the load these vessels were carrying at the time of their demise (Tusa and Royal 2012).

The most remarkable finds in this area are **eleven inscribed bronze rams from Roman and Punic warships** (Tusa and Royal 2012; figure 27.3). Classical in form, unlike the "tusk"-shaped Marsala ram, which curved upward from the keel, the Egadi rams were formed of three fins, wale pockets, and a vertical cowl. They were molded directly onto the ramming and wale timbers on the ship's bow via the lost-wax method, and affixed with bronze spikes (Steffy 1991; Tusa and Royal 2012). Seven rams bore inscriptions in Latin, one in Punic, and three have not been identified (Prag 2014). At least two show damage that may have been caused by violent collisions (Tusa and Royal 2012). The fact they remained attached to their bow timbers demonstrates that the rams sank with their attached ships, rather than breaking off and sinking on their own. (For the Phoenicians in the Sicily, see chapter 35, and for the Punic Wars, see chapter 13, this volume.)

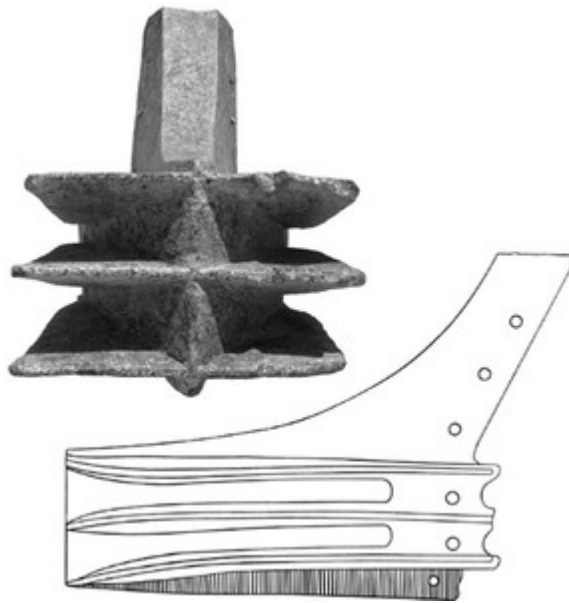


Figure 27.3 Frontal view and profile of the Punic warship ram *Egadi 3*, discovered in 2010, third century BCE.

Source: After Tusa and Royal 2012: fig 6 (with permission).

(p. 432) Conclusion

Though small in number, the Phoenician and Punic shipwrecks found and excavated thus far provide valuable evidence of this culture's critical maritime component. Within the last decade in particular, the excavation of the Bajo de la Campana shipwreck has shed new light on Phoenician seafaring and ship construction, while the discovery of the Xlendi wreck has provided new evidence for Phoenician activity in the central Mediterranean, while survey and excavation in Sicily have provided a remarkable material counterpart to the textual evidence for the events at the end of the First Punic War. When combined with the deep-water wrecks off the coast of Ashkelon and the smaller, locally oriented Mazarrón wrecks, a more coherent—albeit still very incomplete—picture of Phoenician and Punic activity begins to take shape. The limited documentary and iconographic evidence makes material remains particularly valuable, and, we can be optimistic ongoing survey and excavation across the Mediterranean basin will bring more evidence to light in future years about this seafaring people's maritime activities.

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Jeffrey P. Emanuel

Harvard University, Cambridge, Massachusetts