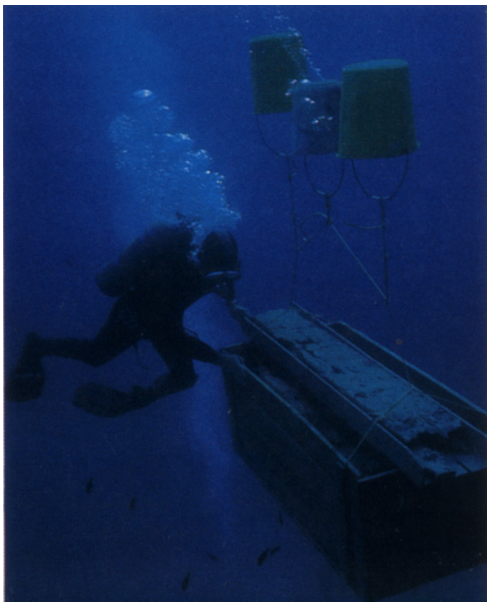
Film Guide *for Ancient Mariners*

Tales From an Ancient Ship



A diver ascending to the surface uses a crate to carry the fragile remains of a wrecked ship;s wooden hull.

What would the map look like if Columbus had not sailed for the Indies? How would we live today if oil could not circle the globe in supertankers? People have been venturing across open water for at least thirty thousand years, and seafaring has shaped the world as we know it. The evolution of seafaring is a special interest of nautical archaeologists, who examine what is left of ancient ships, harbors, and ports. When a ship sinks, it carries within it evidence of the crew who sailed it, the trade it was plying, and the way the shipwrights worked who built it. Excavation of a sunken ship thus contributes to our knowledge of bygone civilizations - their societies, their arts, their politics, and especially their economies, for ships have played a major role in trade. It has always been cheaper to move heavy or bulky cargoes over water than over land. It cost less to ship a load of grain from one end of the Roman Empire to the other by sea than to haul it only seventy-five miles by cart.

By excavating a seventh-century A.D. shipwreck off the coast of Yassi Ada, Turkey, I and many of my colleagues were able to expand our knowledge about the economics of Byzantine seafaring. Though only 10 percent of the ship's wooden hull was preserved -the rest having been devoured by shipworms - enough was left for Frederick van Doorninck to reconstruct the ship on paper and for Richard Steffy subsequently to construct scale models. These reconstructions and the hundreds of artifacts found with the wreck-including personal possessions of the ship's crew and the cargo of over nine hundred large amphoras or two-handled jars-have involved dozens of archaeologists and students in fifteen years of analysis in preparation for publication. Together with historical documents and knowledge about the period gained by other scientists and historians, our analysis produces a vivid picture of one ship's life from the day its keel was first laid to its last voyage.

We know that the merchant ordered his ship built small. Capable of carrying only sixty tons of cargo, it was tiny compared to the great freighters found in state merchant fleets of the past. Like many independent ship-owners, whose numbers increased in the seventh-century Byzantine Empire, the merchant could not afford a larger vessel.

The seventh-century shipwrights did not, as we would today, first build a complete skeleton by adding frames to the keel, then cover the frames with planking. Neither did they follow the practice, customary in earlier centuries, of first building the hull by fastening its planks edge-to-edge with a series of mortise-and-tenon joints and then adding the frames. Seventh-century construction fell somewhere between these two methods. It continued a trend, starting two or three centuries earlier, that reflected improved technology and also cut down the investment in labor and wood required to build hulls in the earlier Greco-Roman style - perhaps another indication of the modest amounts private entrepreneurs could invest in shipping.

Directed By Sam Low

Color 59 Minutes, 1981
Available in DVD/VHS/16mm

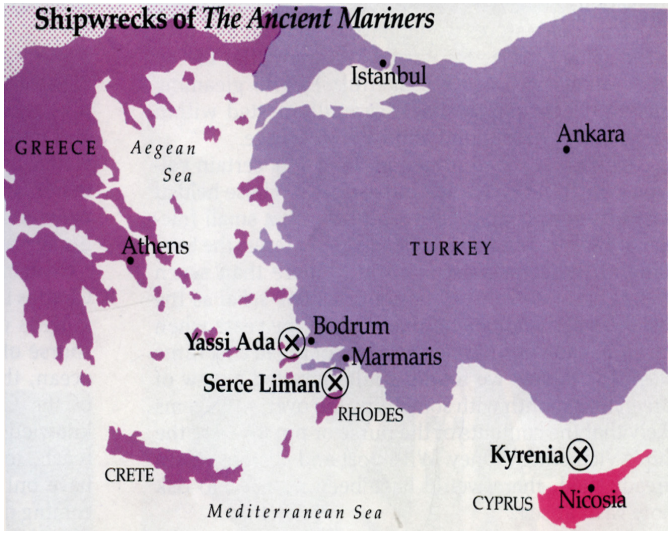
Text by George F. Bass

Study Guide Design by Mike Berendsen

Even before our excavations, archaeologist's knew from the Rhodian sea law, a seventh-century maritime code, who the various members of a contemporary crew might be - captain, helmsman, prow officer, carpenter, boatswain, sailors, and the poorly paid *parascharetes* (literally, "the one by the grill") -and each one's legal share of the profits from a successful voyage. We know that the captain of the Yassi Ada ship was named George because a steelyard or scale uncovered during excavation is inscribed with his name. Since the scale is an item of merchant's equipment, George may also have been the ship's owner and a merchant-venturer as well as captain.

The rest of the crew is anonymous, but we have evidence that several others were aboard. Accurate plans of the ship's fragmentary remains show where the helmsman stood to man a pair of great steering oars. The carpenter's tool chest, stored in a locker between the ship's cargo hold and the galley or cooking area near the stern, carried everything (except the wood) needed to build an entirely new ship. The boatswain stored his iron foraging tools for shore parties, with a small anchor for the ship's boat, in a locker at the very stern of the ship. The prow officer may have had charge of the eleven large iron anchors found near the ship's prow - one pair ready for use on each side and the other seven stacked forward of the mast. (The anchors and other iron implements had actually rusted away centuries before our excavation began, but we could reconstruct them because marine concretions had formed natural molds of the once-solid objects.)

The *parascharetes* must have been the cook or a ship's boy, for the remains of an iron grill over a tile firebox were found in the tile-roofed galley, which was crammed with cooking and eating utensils



along with a variety of pantry wares. George evidently did not lag behind the fashions of the day: Four of his bowls are the oldest precisely dated examples of Byzantine lead-glazed pottery.

We can calculate with some confidence the total investment in the ship and all its stores. The Rhodian sea law indicates that the seventh-century cost of a fully outfitted ship ran about 50 *solidi* (gold coins) per 61/2 tons of capacity. On this basis the cost of building and outfitting the Yassi Ada ship would have been some 460 *solidi*, a substantial sum in times when a shipyard caulker might earn 18 *solidi* for a year's work and less-skilled laborers might receive only 7 or 8.

As the Yassi Ada ship was being prepared for her last voyage, a procession of porters would have carried aboard the cargo of nine-hundred-odd amphoras and passed them down through the hatch into the hold. Most of the storage jars were large and globular, but some were smaller and more elongated. The large jars could hold as much as forty liters of liquid, the small large jars held wine; unfortunately, the mud contents of none of the smaller amphoras were sieved at the time of excavation.

The cook's stores would have been loaded at the same time as the cargo. We know that his fresh rations included a basketful of dark, gleaming mussels: Their empty shells, carefully nested within one another, were found amid the wreckage.

The captain had placed in the galley certain valuables, including a money purse or two. These held at least fifty-four copper *folles* (coins worth a small fraction of a *solidus*) and sixteen small gold pieces; the total value of the coins was just a little more than seven *solidi*. One sixth-century figure gives five *solidi* as the cost of a year's rations for one man; in the years when our ship made its final voyage a loaf of bread cost three

folles. The money we found would have fed a crew of fifteen for a month with something left over, so it seems likely that the contents

of the purse or purses were the ship's victualing money. With port and customs taxes already paid, there would have been no need to risk more cash at sea.

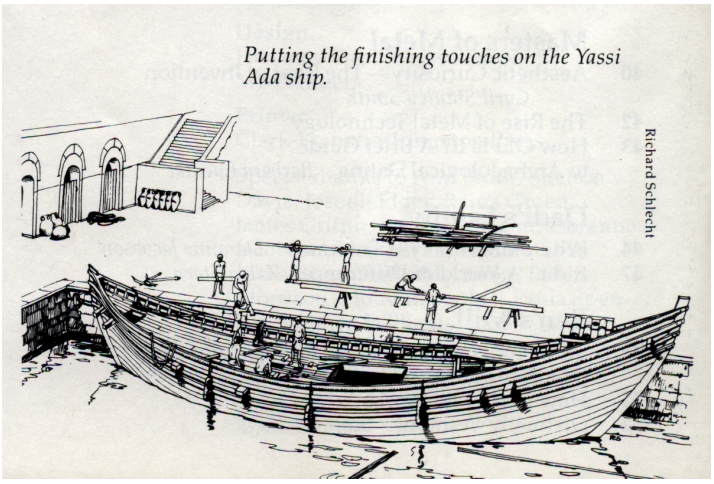
The seventy coins enable us today to pinpoint the date of the voyage at 625 or 626 A.D. Six of the coins were too badly preserved to allow identification. Of the remainder only two were minted earlier than the reign of the Emperor Heraclius (610 - 641 A.D.). The latest coin in the group was minted in the sixteenth year of the emperor's reign, that is, in 625/626 A.D. We may safely assume that the ship last sailed in the same year or quite soon thereafter.

The ship probably sailed south from the northern Aegean Sea, from the Black Sea, or perhaps from Constantinople (now Istanbul). All but one of the coins were minted north of Yassi Ada, and most of the pottery on board also came from the north. And the ship was almost certainly sailing before the prevailing *meltem* wind, in a southeasterly direction.

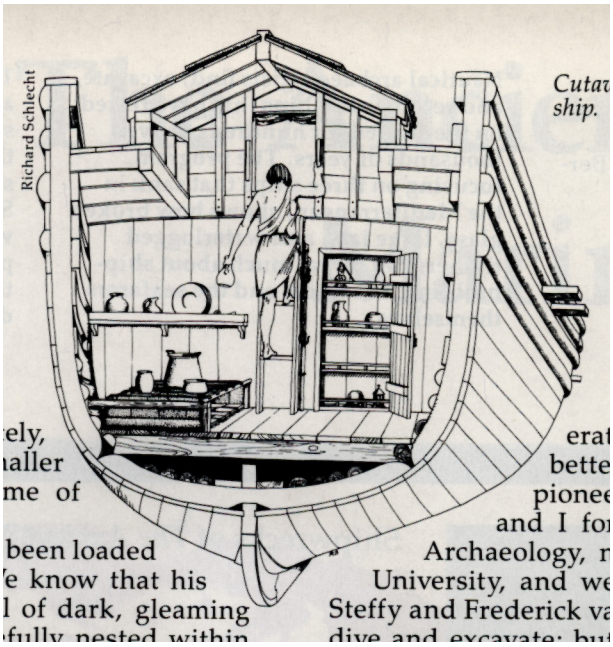
The helmsman may have steered a course that would keep him as near the small, flat island of Yassi Ada as he felt was safe. Whitecaps may have camouflaged the breakers over a reef to the west of the island, so that the helmsman did not see danger. As soon as he felt the bottom hit, he must have steered for the island. But the ship foundered in deep water less than a hundred yards offshore. Planing this way and that, like a falling leaf, it silently drifted downward. It landed on an even keel, still pointing toward the island, and then listed to port. We do not know if George and his crew escaped.

This story can now be told because of the advancements that have occurred in nautical archaeology over the past twenty years - not only in excavation and safety equipment and methods, but also in the training of archaeologists. To ensure that the new generation of nautical archaeologists is better prepared than were we who pioneered in the field, Michael Katzev and I formed the Institute of Nautical Archaeology, now affiliated with Texas A&M University, and we were later joined by Richard Steffy and Frederick van Doorninck. Students learn to dive and excavate; but first they train to understand and interpret their finds (sometimes while still under water) by concentrating on topics like maritime commerce and naval warfare, the theory and history of wooden ship construction, and the conservation of underwater antiquities.

Early in the nineteenth century the geologist Charles Lyell estimated that "a greater number of monuments of the skill and industry of man will in the course of ages be collected together in the bed of the ocean, than will exist at any one time on the surface of the Continents." Much of this great treasure of knowledge is already lost forever to depths beyond our reach, to decay, or to destruction by looters. But we have only begun to examine what remains, and the coming decades should provide our best look yet at the great human accomplishment of seafaring.



Putting the finishing touches on the Yassi Ada ship.



Cutaway ship.

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