

Appalachia: Artifacts, Coal Mining, and Protest

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Scholars aboard the research vessel *Hercules* (above) have identified the site of the third-century B.C. Battle of the Egadi Islands. The key to pinpointing the location has been the discovery of bronze rams on the ocean floor (right) that were once attached to a ship's prow and used to cripple an enemy ship.





The Weapon That Changed History

Evidence of Rome's decisive victory over Carthage is discovered in the waters off Sicily

by ANDREW CURRY

IN HIS WORK *The Histories*, the second-century B.C. Greek historian Polybius chronicles the rise of the Romans as they battled for control of the Mediterranean. The central struggle pits the Romans against their archenemies the Carthaginians, a trading superpower based in North Africa. For 23 years, beginning in 264 B.C., the two rivals fought what became known as the First Punic War.

As Polybius tells it, the war came to a head in 242 B.C., with both powers exhausted and nearly broke after two decades of

fighting. The Carthaginian general Hamilcar Barca—the father of a later adversary of Rome, Hannibal—was pinned down on a mountaintop above the city of Drepana, now the Sicilian town of Trapani. As the Carthaginians assembled a relief force, the Romans scraped together the money for a fleet to cut them off. According to Polybius, in March 241 B.C., the two sides met in between the Egadi Islands, a trio of rocky outcrops a few miles off the coast of Sicily. The clash brought hundreds of ships and thousands of men together in a battle that helped shape the course of history.

A STRING OF DISCOVERIES just a few miles off the coast of western Sicily are now supplying new evidence of that war and the battle that brought it to a close. Working from a well-equipped research vessel, a team from the United States and Italy has located what can only be artifacts from what is now known as the Battle of the Egadi Islands.

It's the first time archaeologists have gone looking for and successfully uncovered evidence of a particular ancient naval battle. While ancient accounts often exaggerate the numbers of men or weapons involved in a battle, or are vague about their exact locations, Polybius turns out to have been fairly reliable. His basic report about the Battle of the Egadi Islands has been confirmed. "Ships met in a battle, and ships sank," says Jeff Royal, the director of the Florida-based nonprofit RPM Nautical Foundation, which is leading the work.

In Polybius' description, the two sides were wildly unmatched—not in numbers, but in terms of battle readiness. Traditionally a land power, the Romans had learned a great deal over the course of the war with Carthage. They arrived ready to fight, their new quinquiremes—fast warships powered by rowers during combat—stripped for battle. Any extra weight would have been left on shore. "The Roman ships were loaded with well-trained troops and no extra stores," Royal says. "They were ready for business."

The Carthaginian fleet, on the other hand, was burdened by supplies and troops intended to relieve the besieged Hamilcar. "For the first time, the shoe's on the other foot," Royal says. Polybius is unsparing in his criticism of the Carthaginians. "Their ships, being loaded, were not in a serviceable condition for battle, while the crews were quite untrained, and had been put on board for the emergency, and their marines were recent levies whose first experience of the least hardship and danger this was," the historian wrote decades after the battle.

As dawn broke on March 22, 241 B.C., the Roman com-

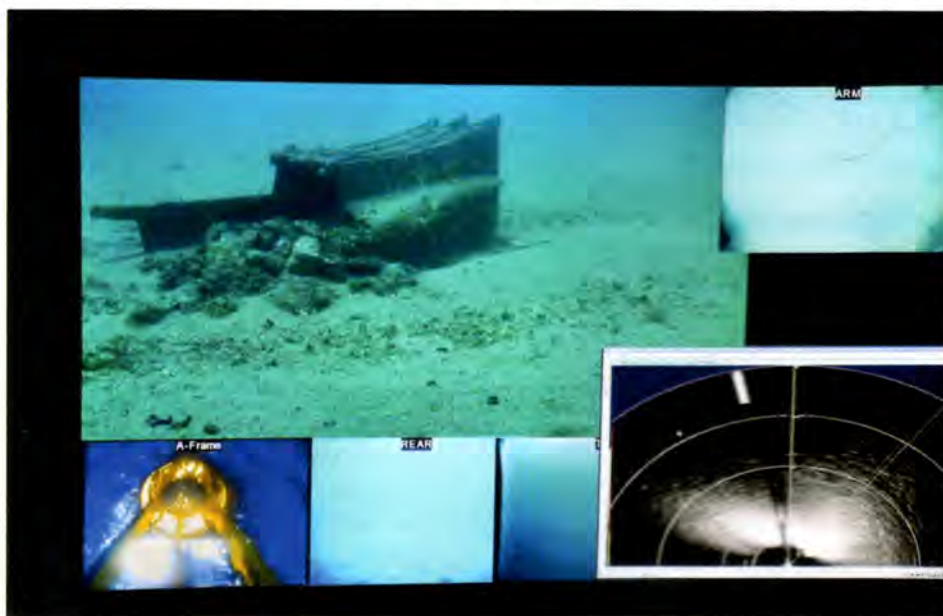
mander Lutatius faced a difficult choice. The seas were stormy and the wind was against him—not ideal conditions for a naval assault in the age of sail. But Lutatius knew this was his best chance to intercept the Carthaginians and catch them at a disadvantage. "He therefore decided not to let the present opportunity slip," Polybius writes. An order sent dozens of Roman ships sitting at anchor along the shore of Levanzo, the northernmost of the Egadi Islands, surging toward the Carthaginian fleet.

In the 1970s, divers working for local tuna fisheries told Sicilian archaeologist Sebastiano Tusa that fragments of lead anchors were a common find along the rocky coast of Levanzo. That led Tusa to speculate that the island may have been where Roman ships waited to ambush the Carthaginians. Perhaps, he says, the Romans cut their anchors loose as they prepared to attack. "That would have made a ship much lighter—each anchor weighed 600 pounds," says Tusa, who is now superintendent of archaeology for Trapani. Freed of their last loads, ranks of Roman rowers, moving in carefully practiced concert, propelled the sleek wooden ships across the blue water.

ON A WARM DAY in August 2011, RPM's turquoise-and-white painted research vessel floated where the Romans and the Carthaginians clashed more than 2,000 years ago. The ship, dubbed *Hercules*, used a combination of GPS and computer-controlled thrusters to hover in place. Nearly 300 feet straight down was the evidence the ship was seeking.

As Tusa and local dignitaries watched from the deck and wetsuit-clad Italian coast guard divers slid from a nearby motorboat into the water to film the proceedings, the *Hercules'* crew used a crane to lower a cage the size of a small car, containing a remotely operated submersible vehicle (ROV), into the water. In an air-conditioned control room sandwiched between the ship's galley and the crew's lounge, racks of servers named after the Greek gods Artemis, Dionysius, and Zeus hummed softly.

Lit by a wall of blue-tinted video screens that display images from the ROV's camera, the control room is the heart of RPM's operation. *Hercules* is equipped with some of the most sophisticated sonar imaging equipment in the world, capable of creating computerized, three-dimensional relief maps of the ocean floor accurate to within a few feet. The ship spends months each year sailing back and forth across the Mediterranean, mapping out areas that might have shipwrecks. In the last seven years, the team has located dozens of ships off the coasts of Albania and Montenegro ("The Adriatic's Uncharted Past," March/April 2011).



Images stream into the *Hercules'* control room from a remotely operated submersible vehicle during the discovery of one of the rams.



Thus far five rams have been recovered and numbered by the team, including Egadi 4 (top), being examined by project leader Jeff Royal in 2011; Egadi 2 (above), being examined by Royal and Sebastiano Tusa in 2008; and Egadi 3 (right), being raised in 2010.

RPM began searching for finds off the Egadi Islands in 2005, after Royal and Tusa made an educated guess on the general location of the battle based on Polybius' accounts. Because the flat parts of the seafloor have been so thoroughly disturbed by bottom-dragging nets, the team first mapped the seafloor to find underwater areas with lots of rocks. They hoped more artifacts would have been preserved intact in places the trawl nets couldn't tear up.

Once they created an accurate map of the undersea geography, they began "flying" over it with their submersible robot, looking for artifacts that had been left behind or lost during the Egadi Islands battle. In 2008, a ship's bronze ram was spotted sitting on the seafloor and recovered using an ROV. In 2010, they located another ram and brought it to the surface. A year later, they were back to retrieve yet another artifact, spotted months earlier.

With a crowd of local archaeologists looking on, a professional ROV pilot on loan from a Swedish oil pipeline project

maneuvered the craft to within a few inches of one of the rams. The ROV's thrusters sent clouds of sand billowing up, occasionally obscuring the view of the partly buried chunk of bronze. After two tense hours, with RPM founder George Robb controlling the robot's gripper arms and Royal looking on nervously, the ram was finally hoisted to the surface.

As it lay dripping on the deck, the ram's features were easier to make out. A triple stack of two-foot-wide blades swooped back into a fitting that once snugly capped a ship's prow. The ram rode just at the waterline, designed to splinter the planks of an enemy vessel on impact and cripple it. More like an arrowhead than a blunt battering ram, weighing in at 600 pounds, it was the pointed end of a larger weapon—the ship itself. "With these, the ship provides 99.9 percent of the mass, and thus the force, that's coming at you," Royal explains. "Without the ram, you could conceivably still hit another ship and sink it. But you could do that only a certain number of times."

Once the *Hercules* docked in Trapani, the small Sicilian city that serves as a launching point for ferries to the Egadi Islands, Royal began measuring and cleaning the ram, scooping handfuls of dark mud from the inside and sealing them in plastic bags for later analysis. Because this ram was the fourth such ram discovered here, Royal dubbed it Egadi 4. Egadi 2 was recovered in 2008, Egadi 3 in 2010. Both are now in a tuna



The names of the Roman officials who oversaw the ships' construction are visible on two of the Egadi rams (top and middle). Both also carry an image of Victoria, the Roman goddess of victory. Egadi 3 (bottom) came from a Carthaginian ship and carries an inscription in Punic.

plant-turned-local museum on the island of Favignana. Egadi 1—the ram that tipped Tusa off to the possibility that there might be something worth looking for on the ocean floor—turned up in a dentist's office in Trapani in 2001. Local fishermen pulled the ram up in their nets and traded it for dental care before Italian police seized it and turned it over to Tusa.

BY THE TIME *HERCULES* finished its season and headed to its home port in Malta a few weeks later, Royal and the RPM team had recovered two more rams, for a total of six. Before this discovery only four warship rams from this period had ever been found. Add to that more than half a dozen helmets and about 200 amphorae, and RPM has strong evidence that an ancient naval battle took place here. "It sounds plausible—helmets and rams together say there's military equipment in the area," says ancient ship expert Ronald Bockius, a curator at the Roman-Germanic Central Museum in Mainz. "The number of rams is an indication for me that these artifacts are related to a battle. The more that are found, the more clear it seems."

Others scholars are less reserved. William Murray, an archaeologist at the University of South Florida and author of the new book *The Age of Titans: The Rise and Fall of the Great Hellenistic Navies*, calls the finds "a technological, methodological, and scientific tour de force. For the first time, people went to find things from a naval battle and actually found them. They've demonstrated without a doubt the location of the last battle of the First Punic War," says Murray.

The finds promise to do more than just pinpoint the location of a battle that took place two millennia ago. Until now, archaeologists studying ancient warships often had to rely on artifacts and structures found on land, such as the covered "ship sheds" that housed warships in port. "That's like trying to find out how big the car was by looking at the garage," Royal says.

There are major holes in archaeologists' knowledge of naval warfare in the classical world. Classicists and historians are often baffled by ancient accounts of naval battles, which are filled with everything from familiar triremes to the more exotic-sounding quadriremes, quinqueremes and penteconters. "We know a lot about ancient warship names, but we know much less about the character of the actual ships," Murray says. "It's like not knowing what a cruise missile or a drone is. When the battle actually begins and a heptareme attacks a quinquereme and is sunk by a *lembos*, what does that mean?"

The Egadi rams may help sort things out. Ancient craftsmen shaped them using what's called the "lost-wax" method. After the ship was built, a complete ram was sculpted out of beeswax directly on the prow. The wax ram was then carefully removed and encased in clay, creating a mold. Molten bronze was poured into the mold, melting and replacing the wax. When the bronze cooled, the clay was cracked off and the bronze ram—a perfect copy of the wax original—could be mounted on the ship.

For archaeologists, each ram is a cast of the business end

of an ancient warship—invaluable information for those who want to know how naval battles were fought in antiquity. “We can get a sense of where the ship’s wooden timbers were by looking at the hollow cavity inside the ram,” says Murray. “That allows you to make certain suppositions about what the physical characteristics of the warships were.”

ONCE RETRIEVED FROM THE Mediterranean, the rams are stored in deionized water to remove the salt from their surface, and are then dried and painstakingly cleaned with dental picks and drills. The patina (the green film that makes weathered bronze so distinctive) is left to protect the metal underneath. Finally, the rams are covered in a wax coating to seal and protect them.

The rams bear the scars of battle. Dents abound and even entire fins are sheared off, most likely from head-on collisions with other rams. As conservators in Trapani clean and restore the artifacts RPM has found over the last four seasons, new details about them are being revealed. Egadi 3, which likely belonged to a Carthaginian ship, bears an inscription in Punic, the Carthaginians’ language, dedicated to the god Baal: “We pray to Baal that this ram will go into the enemy ship and make a big hole.”

Just weeks after they were lifted from the sea floor, two of the rams found in summer 2011, Egadi 4 and 6, yielded identifying details as well. Both carry images of Victoria, Roman goddess of victory in battle, in relief on their upper surfaces. Below the goddesses there are names, perhaps belonging to Roman *quaestors*, officials who oversaw and organized the ships’ construction. “Because the names on both rams are the same, it’s likely this was part of a larger building program,” Royal says. Evidence for this program may also be found in Polybius’ account, where he writes that with the Carthaginian army pinned down on a Sicilian mountaintop in 242 B.C., the Senate pressed Rome’s 200 richest families to sponsor warships. In less than a year, the new fleet was organized and sailors were trained and equipped. “This was their last-ditch effort,”

In addition to the rams, the team has also recovered several Montefortino-type bronze helmets (below, alongside Egadi 5). At the local maritime archaeology museum, Egadi 3 (right) is displayed on an ancient ship replica.



Royal says. “If it had failed, it might have meant another five to ten years of stalemate before Rome could get the resources together to try again.”

Instead, the Roman fleet was victorious, forcing Carthage to sign a ruinous peace deal with Rome, effectively ending the longest sea war in Roman history in one day. The battle’s impact rippled far beyond the waters of Sicily. As part of the



treaty that Carthage agreed to in the battle’s aftermath, Rome gained its first overseas possessions. In one fell swoop, all the islands of the Mediterranean, from Sicily to Sardinia, were in Rome’s hands. “They took the shot, rolled the dice, and won the damn thing,” Royal says. “It was a huge watershed moment.” ■

Andrew Curry is a contributing editor at *ARCHAEOLOGY*.