

# wreck rap



A warship ram is an appurtenance fixed to the front of the vessel and designed to damage enemy ships when struck. It was possibly first developed by the Phoenicians as early as 1200 B.C., but its importance was most clearly emphasized in Phoenician, Greek and Roman galleys (seagoing vessels propelled primarily by oars).

Text by Amanda White

Photos courtesy of Mario Arena, Peter Brandt, Kirill Egorov, Ali Frkee, Luca Palezza, Claudio Provenzani, Derk Remmers, Craig Walker, The Egadi Project and RPM Nautical Foundation

Since 2017, a team of divers from Global Underwater Explorers (GUE), along with Soprintendenza del Mare (Superintendent of the Sea) and the RPM Nautical Foundation, has been involved in archaeological investigations at the site of the Battle of the Egadi Islands in Southern Italy.

The Battle of the Egadi Islands (also known as the Battle of the Aegates) was fought between the ancient Roman and Carthaginian naval fleets on March 10 in 241 B.C. The battle between the two fleets involved more than 500 ships and ended with a decisive victory for the Romans. It was also the last battle of the First Punic War, which had lasted 23 years.<sup>1</sup>

<sup>1</sup> RPMNAUTICAL.ORG/PROJECTS/EGADI-ISLANDS-PROJECT



# Battle of the Egadi Islands

— Ancient Discoveries Off Sicily

DEREK REMMERS

During the past five years, the GUE Egadi Project dive team has completed 32 missions. During this time, they have made 101 team dives and 263 individual dives, which is equivalent to about 10 days of bottom time and about 38 days of decompression time. That's a lot of time underwater!

I recently had a chat with Mario Arena, one of the project leaders alongside Chicco Spaggiari, about their ongoing underwater efforts to recover a key part of human history.

*AW: How did you both get involved in the Battle of the Egadi Islands research?*

MA: Chicco and I have collaborated with the Sicilian archaeological authorities (Soprintendenza del Mare/SOPMARE) for twenty years, and we have participated in several significant projects together. We knew about the impressive discoveries at the site of the Battle of the Egadi Islands, and it was a dream come true for us to

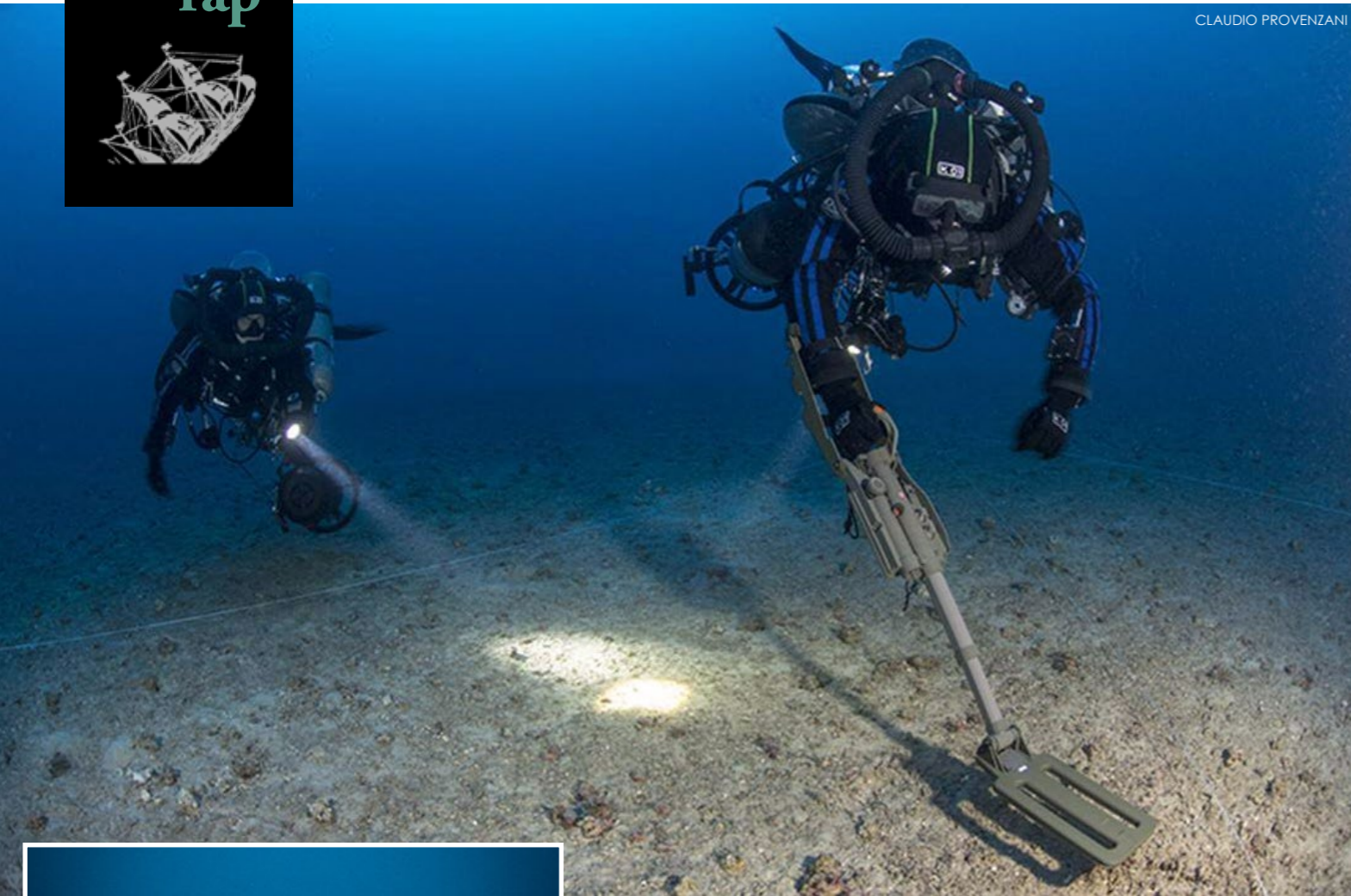
contribute to this research. The opportunity began when a specific artifact, a bronze warship ram, needed to be lifted. It was mostly buried and challenging for RPM's ROV (remotely operated vehicle) to dig out. Chicco was maintaining subtle but constant pressure on the archaeologists to involve us in the Egadi battlefield,





The use of metal detectors by the divers (below) has been a game-changer for finding artifacts that not only would have been missed by the sonar but also would have been missed by the diver's surveys.

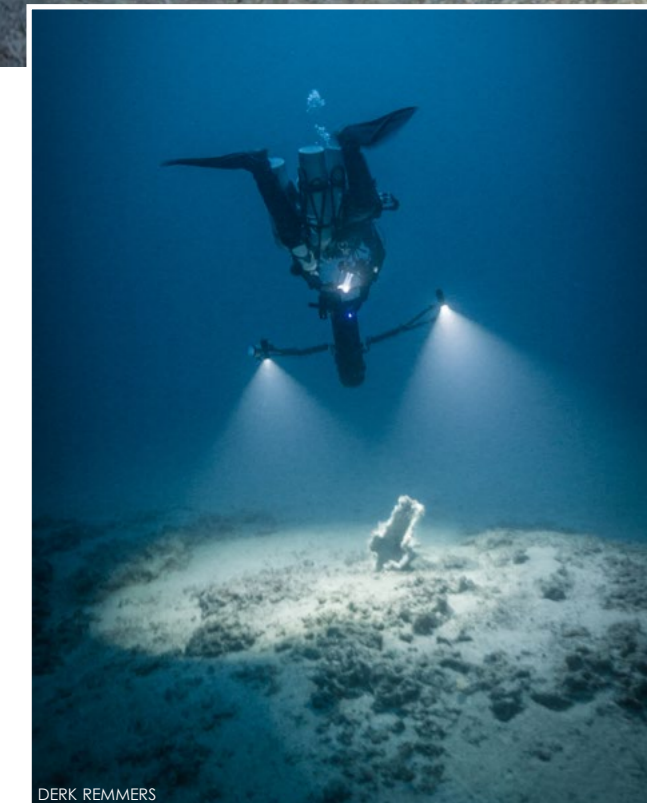
CLAUDIO PROVENZANI



Egadi

MARIO ARENA

There is something very magical about discovering pieces of ancient human history (above). The use of modern technology (rebreathers) collides here with the technology of 241 B.C. (the ram).



DERK REMMERS

Each artifact is carefully photographed before being removed. Here we can see a ram jutting up out of the sand

so when the day came that they finally asked, we were happily onboard.

*AW: Why is the Battle of the Egadi Islands such an important moment in history?*

*MA: The archaeological site is of incredible importance since it is the only ancient (over 2,000 years old) battlefield, terrestrial or naval, that has been discovered to date. It offers a unique opportunity to learn about the military culture of the time. The battlefield also represents an important moment in Roman history, since Rome—which at that time was still an emerging power—prevailed in a 23-year-long war against the Carthaginian Empire, the predominant power at the time. Even more importantly, it signaled Rome's complete dominion over the sea. This was the event that enabled Rome to build the incredible empire we all know. It is also the first time*

that historical sources narrating huge and significant battles can be confirmed with sound archaeological evidence.

*AW: How has RPM's work benefited from having a team of highly skilled divers to assist them?*

*MA: Let me first say that RPM's underwater archaeology operation is incredibly efficient. They use state-of-the-art technology, they work with some of the best marine archaeologists in the world, and they had the stubbornness to keep searching the area for years before finally discovering the battlefield site. Italy and the whole field of archaeology owe them immense gratitude for what they did and for what they are still doing on this site.*

Our GUE divers' contributions help the operation in several ways: First, we can offer a better eye for discovering

artifacts in areas where the electronics lose most of their efficiency, like in rocky areas and under the sediments. In these conditions, the artifacts are hidden to the long-range "eyes" of electronics, which means they cannot be targeted for investigation with the ROV.

*AW: How do the divers find things? It sounds like a lot of scootering.*

*MA: The teams of divers systematically explore the seafloor, visually or with metal detectors. Divers are more efficient, quicker and more delicate than the robotic arms and tools of the ROVs in uncovering artifacts that are partially or completely buried and preparing them to be lifted to the surface.*

We are also more efficient in setting up grids and sectors, performing photogrammetry—artistic pictures and videos offering quality documentation



CRAIGH WALKER

A diver hammers in a starting point for the transect along the seafloor to look for relics from the battle. The dive team is trained to systematically search areas of the ocean floor.





It is very exciting when discoveries like this one are made, and the item is almost fully intact. Here a helmet has just been brought to the surface (above); Two divers work together to recover a bowl, using a lobster's net to ensure its safe recovery (left).



A buried and broken helmet that once belonged to a soldier is documented before it is recovered. It is interesting to see how other sea matter, such as shells, collect around or on the artifacts.

of the artifacts on site—and managing the operations. These are all important contributions to the archaeologists' investigations.

*AW: How have metal detectors changed the way your dive team works underwater?*

*MA: They shifted a lot of our attention to what is below the sediment, opening a new frontier for the investigation of this site. We rely on metal detectors mostly for smaller items, like helmets, swords, parts of armor, coins, nails and other less visible artifacts. It is true that bigger artifacts, like warship rams or anchors, could be found completely buried. But you never know, since a few rams were found buried up to 80 or 90 percent of their volume. It is very thrilling.*

*AW: Was there a lot of trial and error involved in finding the best way to search for possible artifacts?*

*MA: Let's say that we had to invent and test a lot. The nature of this site is very different from a simple wreck. Here, we were working on an area that measures at least 4km (2.48mi) by 3km (1.86mi), and the battle's debris is spread throughout this area with no logical order. Such a site would present archaeological challenges on dry land, and it was even more difficult in the middle of the sea at a depth of 80m (263ft).*

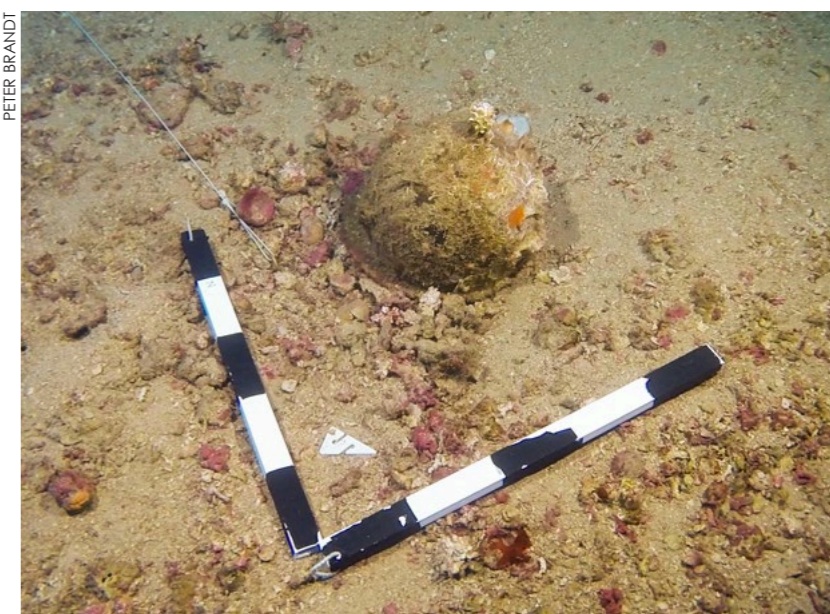
*AW: Can you describe the process of artifact recovery?*

*MA: It varies according to different artifacts and depending on the conditions in which they are found. Generally speaking, it is very important to record*

the artifacts' positions and to document their status when found before moving or removing them. It is also important to have a stabilization and preservation plan ready before recovering an artifact.

*AW: I understand that you used a dredging tool called the SUEX-Rosa. Can you explain how it works and how it helped with the archeological recoveries?*

*MA: It is a great tool that allows us to vacuum the sediment of the sea bottom away from an artifact. The concept was invented by a project team member, Cristiano Rosa, and then refined and developed by SUEX, an Italian company and leader in*



Artifacts are documented thoroughly by the divers before any removal takes place. Here the Montefortino Helmet is being photographed by the team for the researcher before being taken to the surface.

manufacturing underwater propulsion vehicles. Its working principle is based on the use of a DPV and the suction that the propeller creates on the front side, opposite the propulsion side. This suction is conveyed through flexible piping used for vacuuming the sedi-





Can you spot the ram? The dive teams have been trained to know what to look for as often the artifacts are buried in the sand partially and/or covered with sea life, as they have been on the ocean floor for almost 2,200 years.

ments. It is pretty effective, and an incredible feature is that it is self-contained and can be carried by divers. Normally a dredge would require a pontoon, with a four-point mooring or a dynamic positioning system, and dozens of meters of piping connecting to the surface. Cristiano invented a brilliant tool.

*AW: What were the feeling and mood when that well-preserved and finely decorated helmet was found last year?*

*MA: These kinds of finds are incredible and unexpected. The most excit-*

*ing thing is that you really do not know what else will be discovered at that site. I think that we still have plenty of impressive artifacts to find.*

*AW: How has the environment of the battle location impacted the project?*

*MA: Well, it is a very challenging environment. Besides the depth, it is in the middle of the sea in an area where strong currents are always present. We keep trying to refine procedures, but the very high skill level of the divers involved is integral to getting the job done.*

*AW: Has photogrammetry helped with studying the artifacts?*

*MA: Photogrammetry is an important tool for the archaeologists, as it enables them to see the artifacts from any perspective and to measure dimensions and distances. It is much more than a simple picture; it is a scaled 3D model of the object.*

*AW: Where do the recovered artifacts go? Are they being studied or are they publicly displayed?*

*MA: Both. They undergo a process of stabilization and restoration first, and*



DTX

WYLOTECH

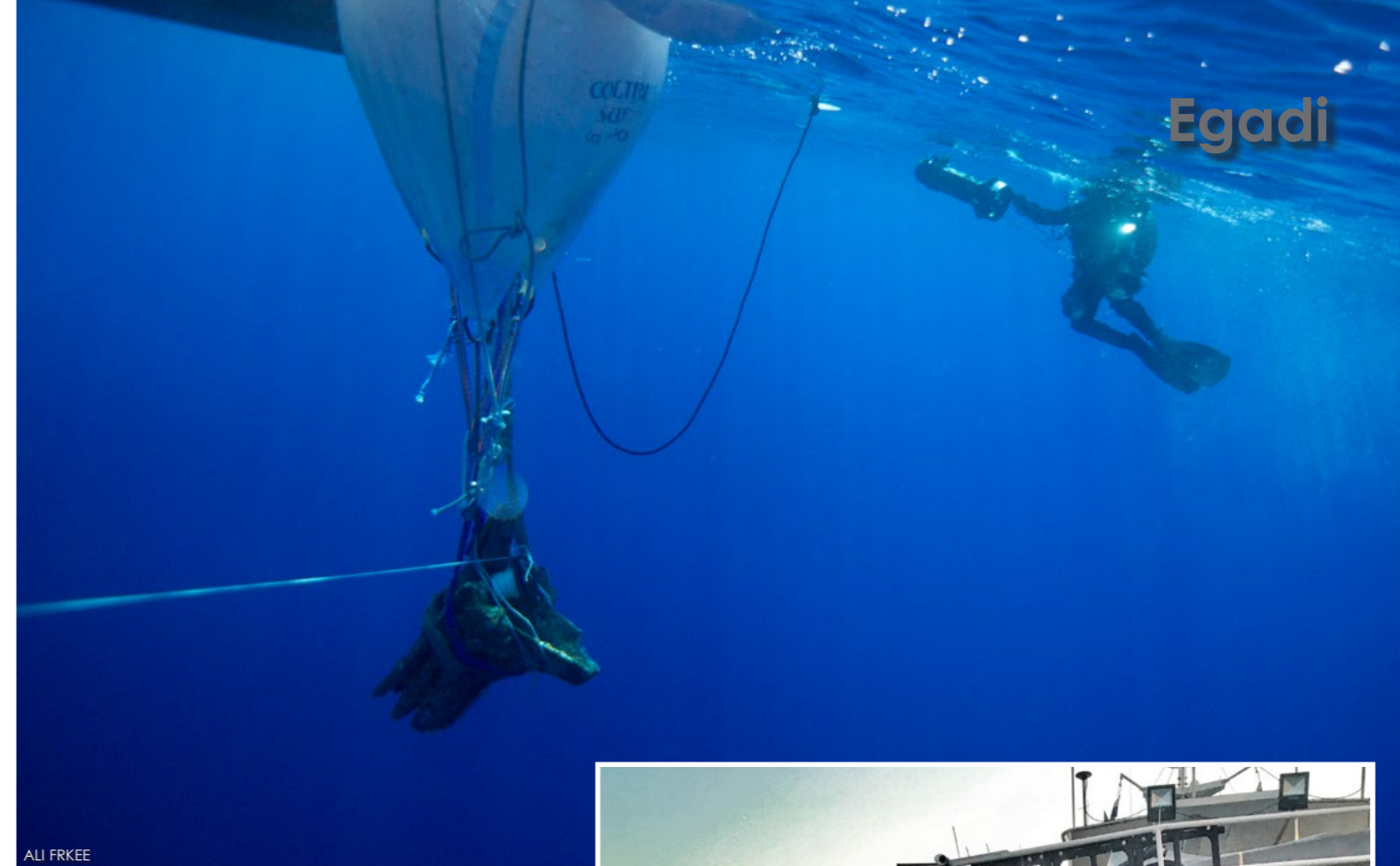


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KIRILL EGOROV



ALI FRKEE

The rams are brought to the surface using rope netting and a giant lift bag (above); CCR diver Derk Remmers prepares this ram to be lifted out of the water so that it can be studied by SOPMARE (left).



EGADI PROJECT

Most of the helmets discovered from the battle are not fully intact. The artifacts have a beautiful way of looking both human-made and part of the sea.

then are (or will be) analyzed and studied by scholars and specialists in different disciplines. The final destination is the Museum of the Tonnara of Favignana, which is a spectacular facility that we hope will someday include the Museum of the Battle of the Egadi. The most magnificent artifacts, like the warship rams and the best-preserved helmets, for example, are often on tour, being displayed in dedicated exhibitions in museums all around the world.

AW: Can you describe what a typical day on the project is like from start to finish?

MA: It is a demanding routine. We normally meet around 7:30 a.m., after breakfast, to refine a plan for the day and complete preparations. We load the boat at 8:30 and try to leave the dock between 9:00 and 9:30. We are on site by 10:30, and divers hit the water around 11:00. Dives last for four to five hours, so we are out between 3:00 and 4:00 p.m.

and are back in the harbor and unloaded between 4:00 and 5:00 p.m.

At that point, we still have to fill tanks, conduct rebreather checks, charge batteries, unload and organize the team reports, discuss the results and plan for the next day. Then we eat, sleep (hopefully by 10:00 p.m.) and then repeat.

Ideally, we would like to do three days on and one off, but we typically go anytime the weather allows. Last year, we did two days of diving and one day off, seven days of diving and three days off, and then five days of diving. I have lost 5kg (11 lb) of weight as a result!

AW: What was one of your favorite moments in the past few years of this project?

MA: I love when we sail out to the site at high speed with the team. It feels as if I am going to battle. Also, the days when we recover rams to the surface are special.



RPM NAUTICAL FOUNDATION

Chicco Spaggiari (left) and Mario Arena (right) the two leaders of the dive team project have dedicated themselves to the success of this research for the past five years.



DERK REMMERS



EGADI PROJECT

It takes an entire team of divers to make projects like this one work safely and effectively (above). There are rebreather divers, photographers, boat captains, surface support, gas fillers, safety divers, and others who help.

Diving in the open sea can be complex for the team during the project (above). Often the dive teams have to miss days due to the conditions; Chicco (left) and the late Dr Tusa (right) bond over the discoveries (left inset).

like planning to run the New York City marathon. You have to prepare for it, seriously, and train for it the whole year. For working on the bottom, we seek GUE rebreather divers with solid experience diving at sea."

Standardization of equipment and procedures are important in such a complex and challenging operation. We prioritize photographers and videographers, people with expertise in photogrammetry, survey methods, fixing equipment, and those kinds of engineer-type skills. Medical backgrounds are also a plus, as well as a boat license.

We would also like to have more safety divers, and for this role, we require a GUE Tech 1 or 2 certification, or new GUE rebreather divers.

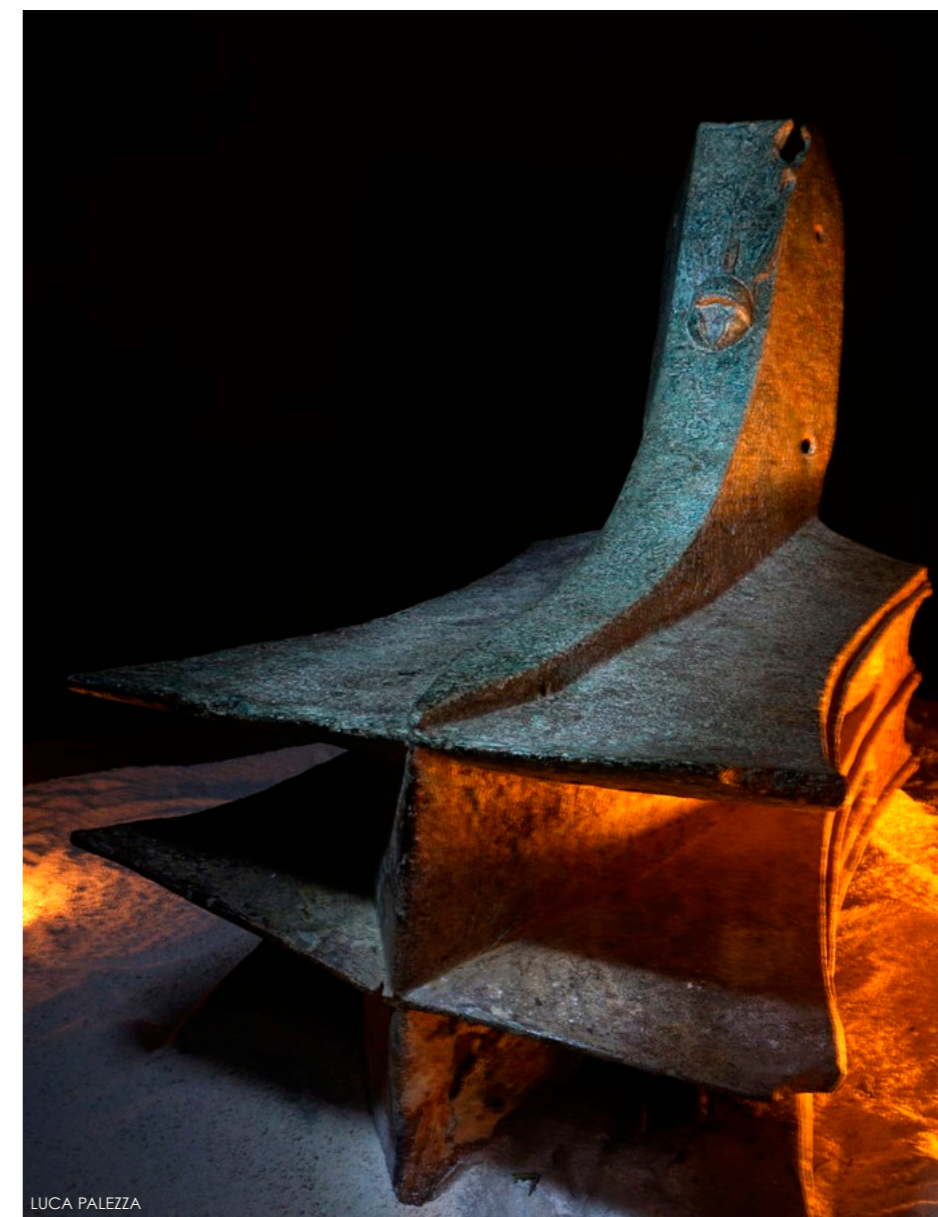
*AW: How has the pandemic impacted the Egadi project?*

MA: Of course, it impacted the project, but we have been very happy to be able to make it run, even if we had a reduced team. Chicco and I just kept our heads down and stayed motivated to try to make it happen. All the team members from outside Italy were not able to join, and we had a total of six divers during the three weeks of operation in 2020. Nonetheless, it has been a very successful campaign.

*AW: What are your future plans for the project? What remains to be done?*

MA: We hope to keep being involved in the investigation of this site for many years to come, and we have already organized a 2021 campaign. I think we have only scratched the surface on this site, and that discoveries will keep surprising us for years to come. There is still a lot to learn. ■

For more information, please contact Mario Arena at [mario@gue.com](mailto:mario@gue.com) or Chicco Spaggiari at [chic-cospaggiari@gmail.com](mailto:chic-cospaggiari@gmail.com). Learn more and follow along with the developing discoveries at: [facebook.com/BattleofEgadi](https://facebook.com/BattleofEgadi).



LUCA PALEZZA

A ram on display at the Museum of Favignana



EGADI PROJECT

*AW: How can divers get involved with the project? What are you looking for in team members?*

MA: Chicco put it nicely this year saying, "We want you all, but planning to participate in this project is

# Salvage operation leads to large haul of blue-and-white porcelain

Amongst the artefacts recovered from two wrecks in Singapore waters is the world's largest haul of blue-and-white porcelain recovered from a documented shipwreck.

In 2015, commercial and salvage diver Ahmad Qamarulhazman was clearing debris underwater near Pedra Branca island, 24 nautical miles east of Singapore, after two bulk loader cranes that were in danger of toppling were blown up.

On his final dive of the operation, he spotted something wedged between rocks 8m deep. His trained eye told him that it was not something natural, but it was tough to see what it was as it was encrusted with algae, molluscs and organisms.

After their work, some of the divers returned to the site and retrieved several ceramic plates, not knowing what they were. The next day, after reading a newspaper report, Ahmad realised that the plates they recovered resembled a plate found at an archaeological dig in the mainland.

His find that fateful day eventually led to the discovery of not one but two ship-

Octagonal serving dishes in perfect condition from Shipwreck 2



Diver with Longquan Ware (right); Range of artefacts from Shipwreck 2 (below)



wrecks in the vicinity—and the world's largest haul of blue-and-white porcelain from a documented shipwreck.

## Recovering the artefacts

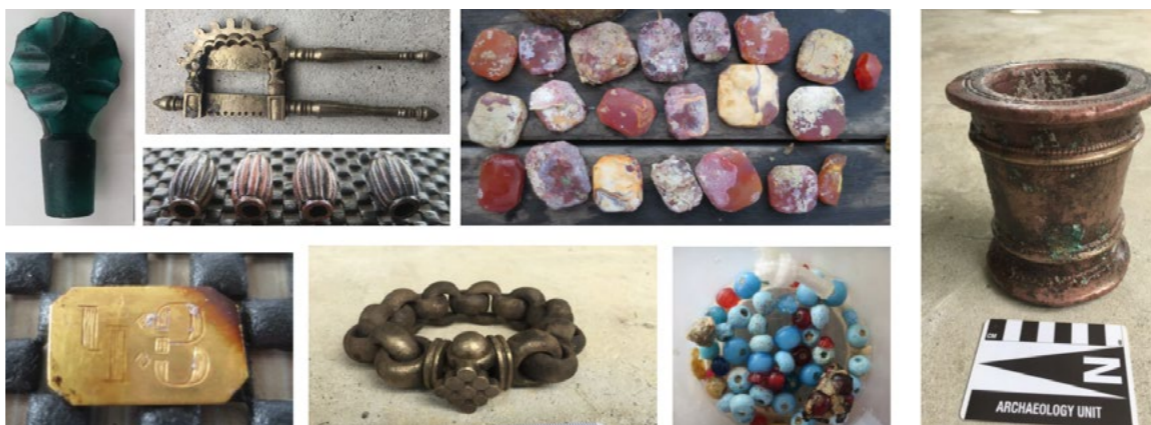
Teams from the Archaeology Unit of the ISEAS-Yusof Ishak Institute were sent to investigate and survey the site, and to conduct salvage operations of the artefacts, which turned out to be from a shipwreck 100m northwest of Pedra Branca.

This wreck was named Shipwreck 1, and was found to contain Chinese ceramics that possibly dated back to the 14th century.

The salvage operations took place over several years. Things moved slowly but steadily, as the divers had only a window of several hours of diving time in a day, and this was still dependent on weather and oceanic conditions.

At a press conference in June 2021, Dr Michael Flecker, a visiting fellow at the Institute, said that the shipwreck seemed to be contemporary with 14th century Temasek (old name for Singapore).

He added, "Apart from a large cargo of Longquan green-ware and other ceramics, she carried more Yuan Dynasty blue-and-white porcelain than any other



documented shipwreck in the world. Many of the pieces are rare, and one is believed to be unique."

The artefact he was referring to was an intact blue-and-white bottle with a flanged straight neck.

## Second wreck found

In 2019, further detection surveys revealed the existence of another shipwreck, located 300m east of Pedra Branca. Named Shipwreck 2, this was believed to be the Shah Munchah, a merchant vessel built in India that sank in 1796.

The artefacts retrieved from Shipwreck 2 included Chinese ceramics and non-ceramic artefacts such as copper-alloy, glass and agate objects, as well as the ship's anchors and cannons. These were recovered from 2019 to mid-2021.



Blue and white bottle from Shipwreck 1



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SOURCE: ISEAS-YUSOF ISHAK INSTITUTE



## New Wisconsin Shipwreck Coast National Marine Sanctuary established by NOAA

NOAA has designated Wisconsin Shipwreck Coast National Marine Sanctuary – USA's 15th and newest national marine sanctuary. It is located in Lake Michigan along the coast of Wisconsin. It was created to protect shipwrecks considered nationally important archaeological resources.

At the time of its designation in 2021, the sanctuary included 36 known shipwrecks dating from the 1830s to the 1930s, including Wisconsin's two oldest known shipwrecks, the schooners Gallinipper, which was constructed in 1833 and sank in 1851, and Home, which was built in 1843 and sank in 1858.

Spanning the early 1800s through

the 20th century, the shipwrecks represent a cross-section of vessel types that played critical roles in transforming the Great Lakes from a maritime frontier into the nation's busiest waterway. The ships carried grain and raw materials east as other vessels traveled west loaded with coal, manufactured goods, and settlers.

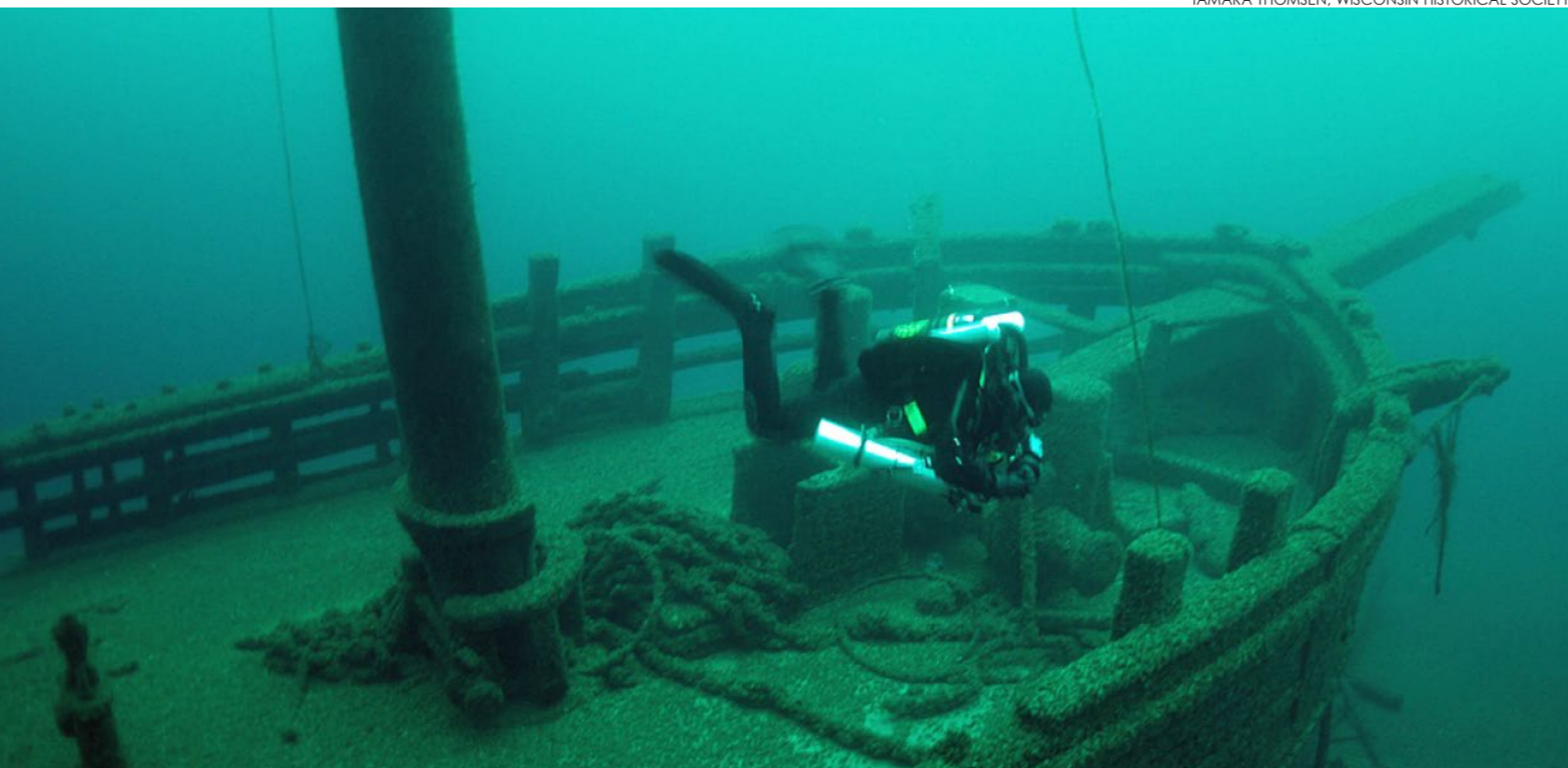
Co-managed with the state of Wisconsin, the sanctuary will also bring new opportunities for research, resource protection, educational programming, and community engagement. In partnership with local communities, the sanctuary will provide a national stage for promoting heritage tourism and recreation. Upon designating the area as a

sanctuary, NOAA announced that it would stay a prohibition on grappling into or anchoring on shipwreck sites in the sanctuary until October 1, 2023.

The delay in the imposition of this regulation was intended to give NOAA time to install mooring buoys that would make anchoring or grappling unnecessary, establish policies allowing access to shipwrecks where mooring buoys would not be installed, and explore the possibility of allowing some diving activities it originally intended to prohibit, such as allowing divers to attach mooring lines directly to some shipwrecks.

Sources: NOAA, Wikipedia

TAMARA THOMSEN, WISCONSIN HISTORICAL SOCIETY



diver swims over the two-masted schooner, Walter B. Allen, which sank in 1880.

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A diver examines the remains of an ancient military vessel discovered in the Mediterranean sunken city of Thonis-Heracleion off the coast of Alexandria, Egypt,

## Egypt finds ancient military vessel

**Divers have discovered a rare military vessel amid the sunken ruins of the ancient Egyptian city of Thônis-Heracleion - once Egypt's largest port on the Mediterranean - and a funerary complex illustrating the presence of Greek merchants.**

Prior to the founding of Alexandria by Alexander the Great in the year 331 BC, Thônis-Heracleion was the largest port city in Egypt, controlling the entrance to the country at the mouth of a western branch of the Nile River and dominating the area for centuries.

Destroyed and sunk along with a wide area of the Nile delta by several earthquakes and tidal waves, Thônis-Heracleion was rediscovered in 2001 in Abu Qir Bay near Alexandria, now Egypt's second-largest city.

The military vessel, discovered by an Egyptian-French mission led by the European Institute for Underwater Archaeology (IEASM), likely sank whilst loading huge blocks from the nearby Temple of Amun when the famed temple collapsed; the remains were discovered beneath 15 feet of clay and debris from the building.

Measuring over 25 m (80 feet) long, the flat-bottomed ship had both oars and a large sail. While built in the classical Greek style, it also incorporates some Egyptian shipbuilding traditions.

In another part of the city, the mission revealed the remains of a large Greek funerary area dating back to the first years of the 4th century BC, Egypt's tourism and antiquities ministry said.

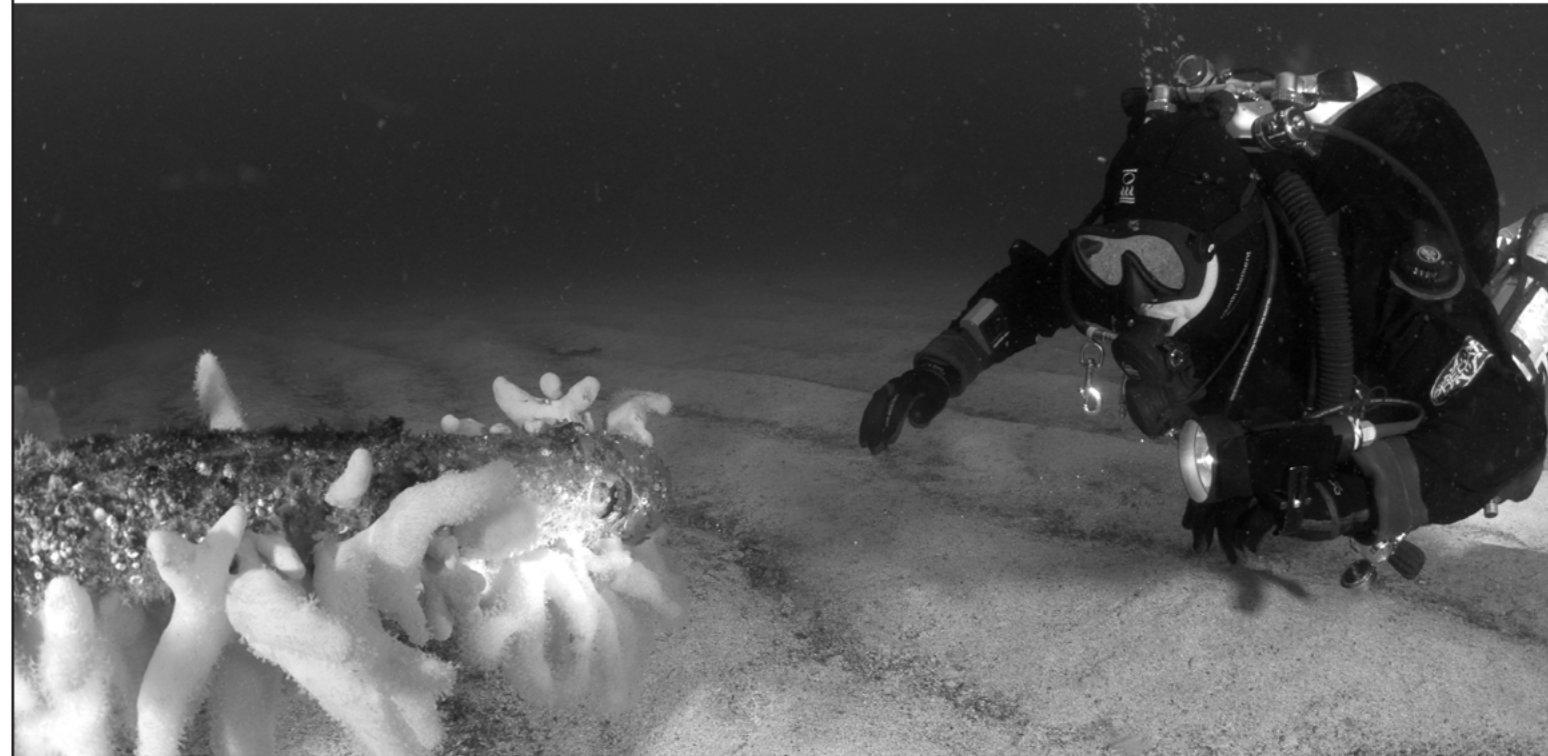
"This discovery beautifully illustrates the presence of the Greek merchants who lived in that city," the ministry said, adding that the Greeks were allowed to settle there during the late Pharaonic dynasties.

Source: Egyptian Ministry of Antiquities

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