

# 'We Couldn't Believe Our Eyes': A Lost World of Shipwrecks Is Found

Archaeologists have found more than 40 vessels in the Black Sea, some more than a millennium old, shedding light on early empires and trade routes.

By WILLIAM J. BROAD NOV. 11, 2016

The medieval ship lay more than a half-mile down at the bottom of the Black Sea, its masts, timbers and planking undisturbed in the darkness for seven or eight centuries. Lack of oxygen in the icy depths had ruled out the usual riot of creatures that feast on sunken wood.

This fall, a team of explorers lowered a robot on a long tether, lit up the wreck with bright lights and took thousands of high-resolution photos. A computer then merged the images into a detailed portrait.

Archaeologists date the discovery to the 13th or 14th century, opening a new window on forerunners of the 15th- and 16th-century sailing vessels that discovered the New World, including those of Columbus. This medieval ship probably served the Venetian empire, which had Black Sea outposts.

Never before had this type of ship been found in such complete form. The breakthrough was the quarterdeck, from which the captain would have directed a crew of perhaps 20 sailors.

"That's never been seen archaeologically," said Rodrigo Pacheco-Ruiz, an expedition member at the Center for Maritime Archaeology at the University of Southampton, in Britain. "We couldn't believe our eyes."

Remarkably, the find is but one of more than 40 shipwrecks that the international team recently discovered and photographed off the Bulgarian coast in one of archaeology's greatest coups.

In age, the vessels span a millennium, from the Byzantine to the Ottoman empires, from the ninth to the 19th centuries. Generally, the ships are in such good repair that the images reveal intact coils of rope, rudders and elaborately carved decorations.

"They're astonishingly preserved," said Jon Adams, the leader of the Black Sea project and founding director of the maritime archaeology center at the University of Southampton.

Kroum Batchvarov, a team member at the University of Connecticut who grew up in Bulgaria and has conducted other studies in its waters, said the recent discoveries "far surpassed my wildest expectations."

Independent experts said the annals of deepwater archaeology hold few, if any, comparable sweeps of discovery in which shipwrecks have proved to be so plentiful, diverse and well preserved.

"It's a great story," said Shelley Wachsmann of the Institute of Nautical Archaeology at Texas A&M University. "We can expect some real contributions to our understanding of ancient trade routes."

Goods traded on the Black Sea included grains, furs, horses, oils, cloth, wine and people. The Tatars turned Christians into slaves who were shipped to places like Cairo. For Europeans, the sea provided access to a northern branch of the Silk Road and imports of silk, satin, musk, perfumes, spices and jewels.

Marco Polo reportedly visited the Black Sea, and Italian merchant colonies dotted its shores. The profits were so enormous that, in the 13th and 14th centuries, Venice and Genoa fought a series of wars for control of the trade routes, including those of the Black Sea.

Brendan P. Foley, an archaeologist at the Woods Hole Oceanographic Institution on Cape Cod, Mass., said the good condition of the shipwrecks implied that many objects inside their hulls might also be intact.

“You might find books, parchment, written documents,” he said in an interview. “Who knows how much of this stuff was being transported? But now we have the possibility of finding out. It’s amazing.”

Experts said the success in Bulgarian waters might inspire other nations that control portions of the Black Sea to join the archaeological hunt. They are Georgia, Romania, Russia, Turkey and Ukraine.

Dr. Foley, who has explored a number of Black Sea wrecks, said the sea’s overall expanse undoubtedly held tens of thousands of lost ships. “Everything that sinks out there is going to be preserved,” he added. “They’re not going away.”

For ages, the Black Sea was a busy waterway that served the Balkans, the Eurasian steppes, the Caucasus, Asia Minor, Mesopotamia and Greece. It long beckoned to archaeologists because they knew its deep waters lacked oxygen, a rarity for large bodies of water.

The great rivers of Eastern Europe — the Don, the Danube, the Dnieper — pour so much fresh water into the sea that a permanent layer forms over denser, salty water from the Mediterranean. As a result, oxygen from the atmosphere that mixes readily with fresh water never penetrates the inky depths.

In 1976, Willard Bascom, a pioneer of oceanography, in his book “Deep Water, Ancient Ships,” called the Black Sea unique among the world’s seas and a top candidate for exploration and discovery.

“One is tempted,” he wrote, “to begin searching there in spite of the huge expanse of bottom that would have to be inspected.”

In 2002, Robert D. Ballard, a discoverer of the sunken Titanic, led a Black Sea expedition that found a 2,400-year-old wreck laden with the clay storage jars of antiquity. One held remnants of a large fish that had been dried and cut into steaks, a popular food in ancient Greece.

The new team said it received exploratory permits from the Bulgarian ministries of culture and foreign affairs and limited its Black Sea hunts to parts of that nation’s exclusive economic zone, which covers thousands of square miles and runs up to roughly a mile deep.

Although the team's official name is the **Black Sea Maritime Archaeology Project**, or Black Sea MAP, it also hauls up sediments to hunt for clues to how the sea's rising waters engulfed former land surfaces and human settlements.

Team members listed on its website include the Bulgarian National Institute of Archaeology, the Bulgarian Center for Underwater Archaeology, Sodertorn University in Sweden, and the Hellenic Center for Marine Research in Greece.

The project's financial backer is the Expedition and Education Foundation, a charity registered in Britain whose benefactors want to remain anonymous, team members said. Dr. Adams of the University of Southampton, the team's scientific leader, described it as catalyzing an academic-industry partnership on the largest project "of its type ever undertaken."

Nothing is known publicly about the cost, presumably vast, of the Black Sea explorations, which are to run for three years. The endeavor began last year with a large Greek ship doing a preliminary survey. This year, the main vessel was the *Stril Explorer*, a British-flagged ship bearing a helicopter landing pad that usually services the undersea pipes and structures of the offshore oil industry.

Instead, archaeologists on the ship lowered its sophisticated robots to hunt for ancient shipwrecks and lost history.

In an interview, Dr. Pacheco-Ruiz of the University of Southampton said he was watching the monitors late one night in September when the undersea robot lit up a large wreck in a high state of preservation.

"I was speechless," he recalled. "When I saw the ropes, I couldn't believe my eyes. I still can't."

Dr. Pacheco-Ruiz said the vessel hailed from the Ottoman Empire, whose capital was Constantinople (today Istanbul), and most likely went down sometime between the 17th and 19th centuries. He said the team nicknamed it "Flower of the Black Sea" because its deck bears ornate carvings, including two large posts with tops that form petals.

In an interview, Dr. Batchvarov of the University of Connecticut said most of the discoveries date to the Ottoman era. So it was that, late one night, during his shift, he assumed that a new wreck coming into view would be more of the same.

“Then I saw a quarter rudder,” he recalled, referring to a kind of large steering oar on a ship’s side. It implied the wreck was much older. Then another appeared. Quickly, he had the expedition’s leader, Dr. Adams, awakened.

“He came immediately,” Dr. Batchvarov recalled. “We looked at each other like two little boys in a candy shop.”

Dr. Batchvarov said the wreck — the medieval one found more than a half-mile down — was part of a class known by several names, including *cocha* and “round ship.” The latter name arose from how its ample girth let it carry more cargo and passengers than a warship.

Dr. Adams said the remarkable color images of the lost ships derived from a process known as photogrammetry. It combines photography with the careful measurement of distances between objects, letting a computer turn flat images into renderings that seem three-dimensional.

He said tethered robots shot the photographic images with video and still cameras. The distance information, he added, came from advanced sonars, which emit high-pitched sounds that echo through seawater. Their measurements, he said, can range down to less than a millimeter.

A news release from the University of Southampton refers to the images as “digital models.” Their creation, it said, “takes days even with the fastest computers.”

Filmmakers are profiling the Black Sea hunt in a documentary, according to the team’s website.

Another part of the project seeks to share the thrill of discovery with schools and educators. Students are to study on the Black Sea, the website says, or join university scientists in analyzing field samples “to uncover the mysteries of the past.”

The team has said little publicly on whether it plans to excavate the ships — a topic on which nations, academics and treasure hunters have long clashed. Bulgaria is a signatory to the 2001 United Nations convention that **outlaws commercial trade in underwater cultural heritage** and sets out guidelines on such things as artifact recovery and public display.

Dr. Pacheco-Ruiz said the team had so far discovered and photographed 44 shipwrecks, and that more beckoned.

Which was the most important? Dr. Adams said that for him, a student of early European shipbuilding, the centerpiece was the medieval round ship. He said it evoked Marco Polo and city states like Venice. The ship, he added, incorporated a number of innovations that let it do more than its predecessors had and paved the way for bigger things to come.

“It’s not too much,” he said, “to say that medieval Europe became modern with the help of ships like these.”

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A photogrammetric image of the stern of the Ottoman-era ship showing coils of rope and a tiller with elaborate carvings. A lack of oxygen at the icy depths of the Black Sea left the wrecks relatively undisturbed. Expedition and Education Foundation/Black Sea MAP





A photogrammetric image of a ship from the Ottoman era that most likely went down between the 17th and 19th centuries. The discoverers nicknamed it the Flower of the Black Sea because of its ornate carvings, including two large posts topped with petals.

Expedition and Education Foundation/Black Sea MAP





An illustration of what the research team believes the medieval ship found in the Black Sea looked like during its heyday.

Jon Adams/University of Southampton/Black Sea MAP

