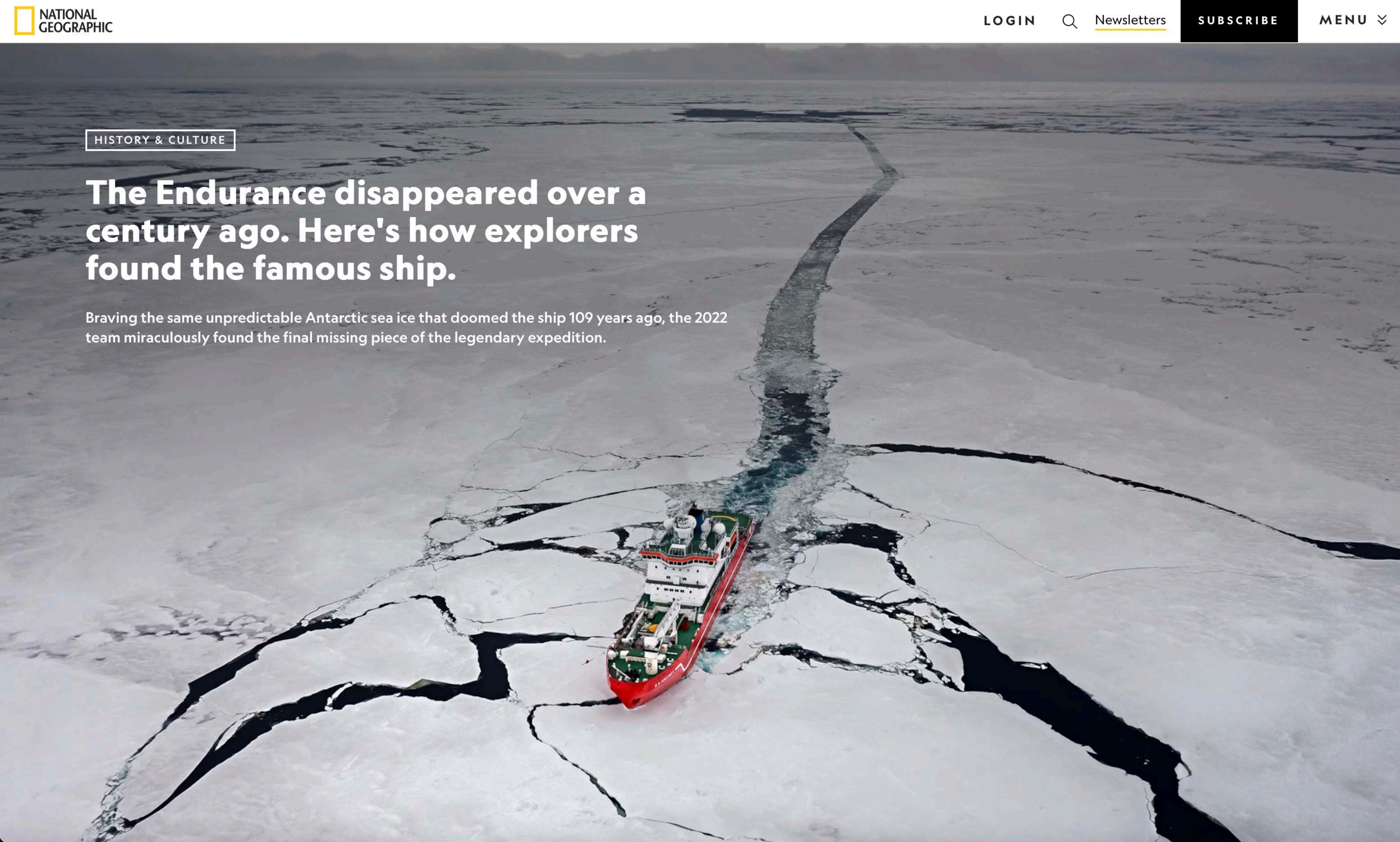


HISTORY & CULTURE

The Endurance disappeared over a century ago. Here's how explorers found the famous ship.

Braving the same unpredictable Antarctic sea ice that doomed the ship 109 years ago, the 2022 team miraculously found the final missing piece of the legendary expedition.



The 440-foot-long icebreaker S.A. Agulhas II pushes through the Weddell’s pack ice during the second hunt for the Endurance. The first search for the wreck, in 2019, came up empty.
PHOTOGRAPH BY JAMES BLAKE THE FALKLANDS MARITIME HERITAGE TRUST, NATIONAL GEOGRAPHIC

By Joel K. Bourne, Jr.
Photographs by Esther Horvath
October 31, 2024

Facebook, X, Email, Link

The Weddell Sea hides its secrets well. John Shears and Mensun Bound knew that better than anyone—at least anyone alive. The two men had spent years searching for the Weddell’s greatest treasure. Now, standing on ice amid the brutal polar sea, they were ready to admit defeat.

They had climbed from their massive icebreaker to take a walk and have a brief chat. And discuss how to break the news to the world that they’d failed again.

The treasure they were hunting was the famous *Endurance*, the three-masted barkentine that carried Ernest Shackleton and his 27-man crew to Antarctica in 1914, before being crushed by pack ice and swallowed by the Weddell. The failed expedition—Shackleton meant to land the ship and cross the continent on foot—instead became a saga of survival and one of the best documented tales of the great age of polar exploration. Shackleton, as we know by now, rallied his shipwrecked crew, and together they battled blizzards, frostbite, and dwindling supplies. They all survived, and their story inspired countless books and movies. But it was the stricken ship that became the symbol of their epic adventure.



The *Endurance* is shown with square sails set, four days before it became trapped in ice on January 18, 1915.
PHOTOGRAPH BY HISTORY AND ART COLLECTION, ALAMY STOCK PHOTO

Shears, a 25-year veteran of the British Antarctic Survey, and Bound, a renowned Oxford maritime archaeologist, had already come up empty in a previous expedition to find the ship. That hunt, in 2019, yielded painful lessons—but also critical insights that they now employed on their return to the waters off Antarctica. Yet once again, their experience in the Weddell was echoing that of Shackleton, who had failed three times to reach his grail of the South Pole.

Unlike the *Endurance*'s expedition leader, the two had at their disposal such modern tools as satellite ice forecasts, heavy-lift helicopters, and the latest underwater robots with side-scan sonar. They also had the 440-foot steel-hulled icebreaker S.A. *Agulhas II* and its skilled crew. Even so, Shears and Bound recognized that time was running out. Their expedition had already been granted one extension, but winter was closing in; the same pack ice that had imprisoned the *Endurance* could swiftly freeze up around the *Agulhas II*. They both knew that in two days the icebreaker would have to start its escape or risk getting trapped.



Known as the Boss, Anglo-Irish Ernest Shackleton remains one of Britain's most beloved explorers for his incr... [Read More](#)✓

PHOTOGRAPH BY FRANK HURLEY/SCOTT POLAR
RESEARCH INSTITUTE, UNIVERSITY OF
CAMBRIDGE/GETTY IMAGES

A nautical marvel, the 144-foot-long *Endurance* was said to be among the strongest wooden ships of its day. It was built of massive beams of Norwegian fir, sheathed with dense greenheart, and finished with a seven-foot-thick keel of solid oak. Strong as it was, the ship was designed for comparatively leisurely pursuits—to carry rich sportsmen to the edge of the Arctic ice for polar bear hunts. After purchasing the vessel, Shackleton modified it to accommodate the expedition's cargo and crew, adding kennels to house several dozen sled dogs and changing the name on the stern. After nine months stuck in the pack, the *Endurance's* rudder and sternpost were wrenched away by the pressure of the ice, opening holes for water to pour in.

At 5 p.m. on November 21, 1915, the men, encamped on an ice floe and watching in horror, spotted the stern rise into the air. “She’s gone, boys,” was all Shackleton could muster as the ship slid down to her frigid grave.

No one ever expected to see the stout little ship again. Even as deep-ocean wrecks like the *Titanic* or the *Bismarck* were discovered with increasingly advanced subsea technology, the extreme expense and technical challenge of exploring beneath the Weddell’s ice made any attempt to find Shackleton’s barkentine wishful thinking. That is, until 2018, when the Flotilla Foundation, a Netherlands-based marine protection organization, announced it was funding the first ever mission to uncover the *Endurance*. Shears was appointed as the expedition’s leader and Bound as the director of exploration, with the mission set to begin in early 2019.

(Shackleton's legendary ship is finally found off the Antarctic Coast, a century later.)



Photographer Frank Hurley documented the *Endurance*'s final days and the crew's journey of survival. On November 14, 1915, Hurley wrote, "One cannot conjecture that the mass of tangled wreckage was once the *Endurance*." The ship slipped into the depths a week later, after 10 months ensnared by ice.
PHOTOGRAPH BY RGS-IBG



After abandoning ship, the crew set up camp on the ice, which drifted north for five months. As the floes broke up, the men boarded lifeboats for the harrowing voyage to Elephant Island.
PHOTOGRAPH BY RGS-IBG

Even with the latest underwater vehicles from the marine robotics company Ocean Infinity, the crew barely made headway in the Weddell, one of the most inhospitable places on the planet. Tracking the pattern of ice floes and the direction and speed of pack ice year to year was still equal parts science and guessing game. And determining the right section of the seafloor to comb required placing faith in century-old coordinates.

That first expedition taught Shears and Bound to answer a pair of critical questions that would help them organize their next hunt. Were they using the right tools? Were they searching in the exact right spot? The expedition was arduous from the start.

Even before the team could reach the search area, they were waylaid by malfunctions. During the first deepwater trial of their remotely operated vehicle (ROV)—a tethered submersible carrying cameras that would survey the wreck—the electronics capsule imploded. The team wasted most of a week waiting at an airstrip for spare parts that never came. They gave up the wait and headed for the search area, where they had time for just two dives with their main undersea bloodhound—a bright orange, state-of-the-art autonomous underwater vehicle (AUV), called Hugin 6000, that had been configured to search the seabed under the ice with powerful side-scan sonar. It made a beautiful start, covering seven of the 11 preprogrammed lines within the search box that Bound believed contained the *Endurance*. Then the six-million-dollar robot vanished without a trace, taking all its precious data—and the team's chances for success—with it. Shears, Bound, and the crew admitted defeat.

In the Grip of a Frozen Sea



In August 2020 Shears received a phone call from Donald Lamont, former governor of the Falkland Islands and then-chair of the Falklands Maritime Heritage Trust, an organization in the United Kingdom tasked with preserving the history of the islands and their adjacent seas. To Shears's amazement, Lamont said his group could fund another attempt. Shears and Bound recognized they needed to change their approach. The trust engaged Nico Vincent as deputy expedition leader and subsea project manager.

One of the most experienced subsea engineers in the business, Vincent has helped locate hundreds of sunken ships and aircraft with teams of subsea experts.

(What we've learned—and lost—since the Titanic wreck was found.)

After Vincent was invited to join the expedition, he and his team began poring over the detailed report of the 2019 effort drafted by their colleague Claire Samuel-Martin. One pressing conclusion: The team needed to use a different underwater vehicle.

“The Hugin 6000 is the most effective [subsea] vehicle in the world,” says Vincent, but it wasn’t right for a job in this extreme frozen environment. “When you drive to the top of a mountain where you have ice and snow, you don’t go there in a Formula One; you go in a four-wheel drive.”



| The S.A. *Agulhas II* tears through a storm in the Weddell Sea, a region so remote and perilous, few ships have ever ventured there. Record-low ice extent and thin first-year floes aided the search for the *Endurance* in 2022.

PHOTOGRAPH BY ESTHER HORVATH, FALKLANDS MARITIME HERITAGE TRUST, NATIONAL GEOGRAPHIC

For the next expedition, two Saab Sabertooths, smaller vehicles that would stay connected to the ship with a Kevlar-wrapped fiber-optic cable, were chosen by Ocean Infinity. The subsea team visited the Saab test facility in Sweden for training and testing of the Sabertooths. There, Vincent took note of the high-tech winch system, which would be used to deploy them and pay out the fragile cable. But as he walked around, he also spotted under a tarp an old winch that had been retired by the Finnish Navy. The unit was 20 years old, but it was tried and true. When he asked the Saab engineers to clean it up and send it along, they balked. Unrelenting, Vincent demanded the old winch be included in their deal for the Sabertooths as “the spare of the spare.”

Another question concerned where the expedition would deploy the Sabertooths. Shears asked for a reassessment of the search box, with the hope of being as precise as possible in establishing where they would scan the seabed. To do so, they would reach back in history and reanalyze the records made by the *Endurance*’s captain, Frank Worsley, and the ship’s physicist, Reginald James.

(Retracing the final days of a doomed 175-year-old Arctic expedition.)

Even though the *Endurance*’s skipper left precise coordinates of the ship’s last location before it sank, it was really just his best estimate, says Frank Reed, a celestial navigation expert affiliated with Mystic Seaport Museum in Connecticut, who was tasked with checking the accuracy of Worsley’s position. The pack ice that ensnared the ship had been moving at a speed of about four nautical miles a day, swept north by a current called the Weddell Gyre. But the *Endurance* was blown back south by strong northerlies two days before it sank—when Worsley couldn’t see the sun. His coordinates for the *Endurance*’s last position were taken the day after the ship sank from the crew’s camp on the ice a mile and a half away. Worsley’s measure of longitude also depended on the ship’s chronometers, only one of which was working properly by the time the ship sank. Researchers have long believed even that chronometer was off, creating a potential margin of error of several miles.



| The expedition supported research on the Weddell Sea ecosystem. Here, on behalf of the Alfred Wegener Institute, field scientists Stefanie Arndt and Jakob Bünger slice an ice core sample for later analysis.

PHOTOGRAPH BY ESTHER HORVATH, NATIONAL GEOGRAPHIC

But Worsley went beyond his normal navigational duties, says Reed. At James’s suggestion, the two men corrected the chronometer error with occultations using the ship’s small telescope to mark the precise time known stars would disappear behind the moon.

Occultations, says Reed, had typically been used by land-based astronomers, not mariners. “It was hard and fairly long work. It might have taken them two or three hours to work up an occultation to get a time out of it.” But time they had. Reed’s analysis of their work led him to estimate the ship’s true position roughly three nautical miles southeast of Worsley’s estimate. Vincent’s team used Reed’s report to draw the final box 15 by eight nautical miles—relatively small compared with Vincent’s past searches.

Once the Weddell began throwing ice blocks in their way, though, even that area began to seem a vast, daunting void.

Vincent likes to say that he never devises a plan B but rather a plan 2.

Having a plan B, he thinks, invokes the alphabet and insinuates a limit of only 26 options. When the *Agulhas II* sailed to the Weddell Sea in 2022, Vincent was already on his third plan as the Sabertooth splashed into the frigid open water to begin the hunt.

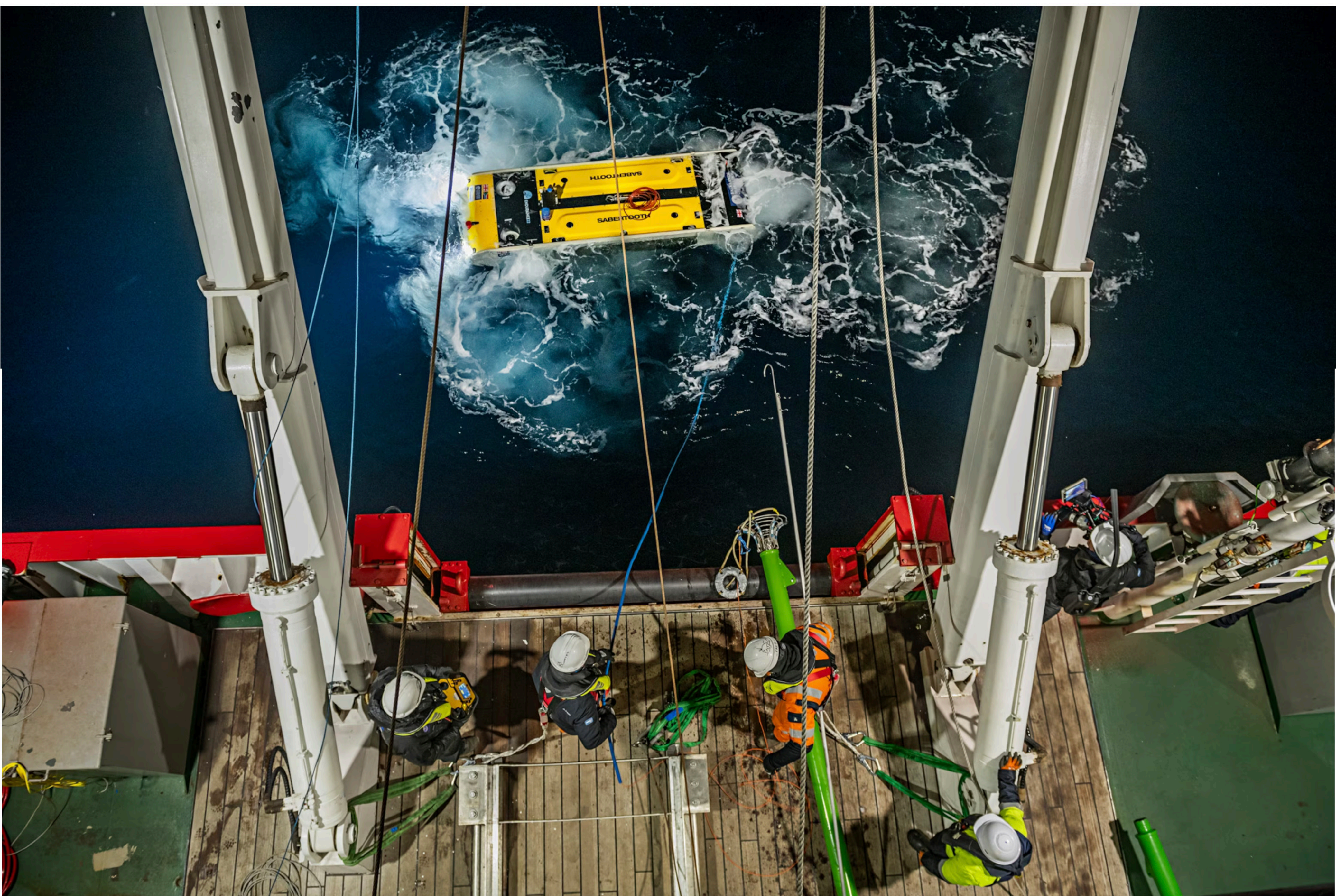
(What it's like to cross Antarctica's Weddell Sea.)

Almost immediately, the vehicle's major failure alarm sounded. One of the AUV's six thrusters was inoperable, hampering the sub's ability to maneuver. Up it came, thruster replaced, batteries charged. The next day, the Sabertooth plunged down again. The batteries, meant to last nine hours, were drained in five. Like a fishing rod with the drag cranked down too tight, the new winch was putting too much pressure on the AUV's tether. Then the winch failed altogether. The crew brought out the backup, but similar issues ensued.

Finally, JC Caillens, a former French Navy captain and the offshore manager on Vincent's team, suggested bringing out the old Finnish winch. It worked like a charm, dropping the tension on the tether and extending the AUV's battery life while making only one simple ask.

"The old lady didn't like the cold," says Vincent. "So we were obliged to build a tent over her and put a heater in there."

Intuitive as Vincent's call had been, the triumph was brief. The ensuing 17 days resulted in a string of fruitless searches along the seafloor. February turned into March. The weather deteriorated rapidly, with windchill on the back deck of the *Agulhas II* plummeting to -14°F, raising the threat of frostbite and hypothermia. And now a massive floe of hard multiyear ice containing an iceberg had moved into the area, covering a third of the search box. The Weddell was baring its teeth.



Under the *Agulhas II*'s blazing lights, the **subsea team** retrieves the Saab Sabertooth AUV, dubbed Ellie. Working 12-hour shifts, 24 hours a day, for nearly three weeks, the team surveyed more than a hundred square miles of seabed before spotting the *Endurance*.
PHOTOGRAPH BY ESTHER HORVATH, NATIONAL GEOGRAPHIC



Senior members of the 2022 expedition—from left, JC Caillens, offshore manager; Nico Vincent, deputy expedition leader; Mensun Bound, director of exploration; and John Shears, expedition leader—compare Ellie's images of the *Endurance* with Frank Hurley's photos of the 1914-16 journey.
PHOTOGRAPH BY ESTHER HORVATH, THE FALKLANDS MARITIME HERITAGE TRUST, NATIONAL GEOGRAPHIC



For 106 years, the *Endurance* sat undetected at the bottom of the Weddell—until March 5, 2022, when the expedition team found the wreck and several days later produced this mosaic of high-frequency sonar images.
PHOTOGRAPH BY FALKLANDS MARITIME HERITAGE TRUST



Antarctic sea life take a turn at the helm of the *Endurance*, which was discovered in 2022 in remarkable shape, 9,869 feet deep in the Weddell Sea.
VIDEO STILL BY THE FALKLANDS MARITIME HERITAGE TRUST, NATIONAL GEOGRAPHIC

“No, no, no, no, no!” Vincent said. “I want to see wood with the camera. Until we see wood, we have clues but no proof.”

McGunnigle reluctantly brought the Sabertooth around for another pass, switching out the lights and video camera. For the next 30 seconds, all Vincent could hear was the whir of computers and his own heartbeat as the scene 10,000 feet below him unfolded. Years of planning and preparation by Shears, Bound, and Vincent and two of the largest nongovernmental Antarctic expeditions ever launched—all hung on what they would see next.

Out of the abyssal darkness, a century’s worth of wonder, history, and legend filled the screen. The port side of the *Endurance*, still resplendent in black-and-white paint as if it sank yesterday, emerged from the gloom. Vincent reveled in the historic moment. Then everything went dark.



Frank Wild, Shackleton’s fiercely loyal second-in-command, was one of six crew members assigned to oversee the expedition’s sled dogs. Wild sported distinctive buckled leather boots—one of which may now rest on the *Endurance*’s deck.
PHOTOGRAPH BY RGS-IBG (LEFT) AND PHOTOGRAPH BY THE FALKLANDS MARITIME HERITAGE TRUST (RIGHT)



Twenty-five thousand photos in 4K resolution were used to create digital 3D photomosaics of the *Endurance*. Frigid, low-oxygen water helped preserve the wreck in pristine condition.
COMPOSITE IMAGE BY THE FALKLANDS MARITIME HERITAGE TRUST



From left, chief scientist James Wordie, third officer Alfred Cheetham, and ship surgeon Alexander Macklin scrub the *Endurance*’s galley. Remains of the linoleum floor can be seen in deck of the *Endurance*.
PHOTOGRAPH BY THE FALKLANDS MARITIME HERITAGE TRUST (LEFT) AND PHOTOGRAPH BY RGS-IBG (RIGHT)



The survey of the wreckage revealed artifacts thought to be visible in Hurley’s images. A wooden ladder observed in 2022 (bottom row, left) may be the same as one used by crew taking sled dogs down to the ice for exercise in August 1915.
PHOTOGRAPH BY THE FALKLANDS MARITIME HERITAGE TRUST



PHOTOGRAPH BY RGS-IBG

The AUV crew wanted to celebrate, but Vincent wouldn't have it. The clock was ticking, and they had 48 hours to swap out the Sabertooth's sonar package for an ultrahigh-definition camera and a laser scanner that was later used to create a 3D facsimile of the wreck with one-millimeter resolution—and conduct one of the most important maritime archaeological surveys in recent history. Vincent ordered that no word of the discovery leave the container. He composed himself and climbed to the bridge with the high-res sonar image on his phone.



Shears and Bound, out on the ice, had been making their way back to the ship. As soon as their feet hit the deck, they heard the ship's loudspeaker: “Shears and Bound to the bridge. Shears and Bound to the bridge.”

They raced there, only to find Vincent looking utterly dejected.

“What? What happened?” Shears said.

Vincent stood up and smiled, holding up his phone with the sonar image. “Gents, let me introduce you to *Endurance*!”

Shears was stunned. He dropped his English reserve and gave Vincent a bear hug. The men returned to the operations container to review the video footage and later made their way to the rear deck to watch the retrieval of the Sabertooth. When it was finally winched on board, cheers echoed across the ice.

During their practice runs in the months leading up to the discovery, an AUV retrieval and sonar-to-camera swap took them 36 hours. That day, the subsea crew did it in 13. The swift transition allowed them to make two dives, giving them eight hours with the wreck. The resulting images were so detailed, researchers could pick out a flare gun on the deck.

(These images were almost lost to icy waters—instead they made the Endurance crew legends.)



Hummocks of sea ice thrown up by colliding floes reveal the intense pressure that ultimately crushed the *Endurance*. Hurley used a series of flash powder charges to create this ghostly scene in the darkness of the Antarctic winter.
PHOTOGRAPH BY RGS-IBG

Even though Bound had predicted the wreck would be well-preserved, he wasn't prepared for the pristine condition of the ship on the screen. At one point they saw leather boots that possibly belonged to Frank Wild, Shackleton's right-hand man. Then they hovered over the three holes that the ship's carpenter Henry “Chippy” McNish and photographer Frank Hurley had cut in the deck to retrieve several tons of supplies before the ship sank—provisions that saved the crew's lives.

“It was just mind-blowing,” Bound said of seeing the ship, which lay within an extended area of his 2019 search box. “The absolute pinnacle of my life.” On the way back to its home port in South Africa, the *Agulhas II* was given special permission to make one more stop—at the now abandoned whaling station of Grytviken on South Georgia island, where, in 1922, Shackleton was laid to rest after suffering a massive heart attack during his final expedition, an attempt to circumnavigate Antarctica. It was noted that the *Endurance* had been found a hundred years to the day after the great polar explorer was buried.

(Who really discovered Antarctica? Depends who you ask.)

The expedition team made the pilgrimage to the graveyard, as did many of the ship's crew—a polyglot group of global mariners. The expedition principals said a few words, and Shears, in particular, thanked the team for their tremendous efforts. “I think Shackleton realized that to be successful, to achieve things, you can't just do it on your own,” says Shears. “That's the big lesson for me. You're only as good as the team around you.”

The hard-won discovery of Shackleton's ship by such a tenacious team seemed a fitting tribute to the man who did so much to hold his men together—whose family motto was “*Fortitudine Vincimus*, By Endurance We Conquer.”



The National Geographic Documentary Film "Endurance" will premiere November 1st on National Geographic and will stream the next day on Disney+ and Hulu.

This story appears in the January 2025 issue of *National Geographic* magazine.

Order the book “[Endurance: The Discovery of Shackleton's Legendary Ship](#)” by John Shears and Nico Vincent, available Nov. 5, 2024.

A former National Geographic senior editor, **Joel K. Bourne, Jr.**, frequently writes about water issues.

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An earlier version of this story incorrectly described how Nico Vincent was hired to join the expedition. The article has been revised to provide additional context and clarity around some events.