

A needle in a haystack. Have you ever really thought about trying to find a *needle* in a *haystack*? It's not just that you're seeking a very small target in a very broad field, it's that every single piece of hay looks like your needle. How would you go about it? Is there a strategy to it? Is the needle more likely to filter its way down to a certain part of the haystack? Does the search disturb the needle more? Do you methodically sift through each and every blade of dried grass until your fingers close around something metallic? Do you just tear at it? Go to town on that hay bale? Are there any tools you could use? Where would you even start? The bottom? The top? Do you focus on one section of the stack before moving on to another? Do you make horizontal passes? Kinda zig-zag your way through it? And there are other variables. Does being in the haystack transform the needle, perhaps slowly eroding it with small amounts of mud and rainwater or dew? Is time on your side or is there a clock ticking down to some uncertain time? Do you slowly lose your mind when faced with the futility of it all? Does it even matter if you find the needle at this point? Do you even want to?

Okay, you understand what I'm getting at here... how do you find a 270 meter ship in a 106 square kilometer ocean? Hell, even narrowing that down to ten or twenty square kilometers, you're looking at astronomical odds. And yet, in 1985, after more than 73 years on the ocean floor, *Titanic's* final resting place was found.

My name is Amanda Hootman and this is a story that represents the culmination of seven decades of technological progress and even promises its fair share of crackpot theories, scientific rivalries, and covert naval operations. This is the story of how the once great White Star Liner was lost and found again, "after *Titanic*".

Finding the wreck of the *Titanic* was first proposed within days of the sinking. Vincent Astor suggested finding the wreck near its last reported position by using "soundings", and then using explosives to free his father's body which he'd assumed was tangled somewhere within the wreckage. Luckily, JJ Astor was found floating in his lifebelt soon after, no explosives needed.

Following the outbreak of the First World War, interest in *Titanic* waned (to be fair, people had bigger issues to worry about) until the Post War period. In 1953, a Southampton-based salvage company, Risdon Beazley, Ltd., launched the first serious - albeit unsuccessful - attempt to locate the *Titanic* wreck site. And in 1955, Walter Lord published *A Night To Remember*.

A Night To Remember, which spawned both film and television adaptations of the same name, was the first "definitive" book on the *Titanic* disaster. For six decades, it was considered the titanophile's bible. The publication of 2013's *On A Sea Of Glass* introduced *Titanic* nerds to a new bible and now *A Night To Remember* and *On A Sea Of Glass* are like the Old and New Testament.

Growing interest in *Titanic* throughout the 1960s and into the 1970s spawned renewed plans and attempts to locate and salvage the wreck, from the legitimate to the cockamamie. A British titanophile, Douglas Woolley, announced plans to locate and salvage her using a bunch of nylon balloons. Four years before the wreckage was actually found, Woolley claimed that he actually

filed for the salvage rights with the British Board of Trade, but the legality of his claims didn't seem to be taken very seriously.

As early as 1973, a PhD candidate working with Woods Hole Oceanographic Institution, Robert Ballard, expressed *his* desire to locate the infamous wreck site.

Robert Duane Ballard was born in landlocked Kansas, but when he was still a toddler, his family moved to California where he spent his childhood marveling at the tiny worlds he observed in his local tidepools. He was in love with the ocean. The first time he saw the 1954 film adaptation of *20,000 Leagues Under the Sea*, little Robert Ballard decided that that's what he wanted to be when he grew up – Captain Nemo. As a high school junior, he was awarded a scholarship to a summer research program with the Scripps Institute of Oceanography.

While achieving his Bachelors in chemistry and geology at UC Santa Barbara, Ballard - son of a military man, himself - participated in the Reserve Officer Training Corps. While at the University of Hawai'i, pursuing his Masters in geophysics, he went out one night with one of his Army friends on leave from Vietnam. After a few beers, the friend described to Ballard the act of gunning down Vietnamese civilians from helicopters. Ballard was horrified. After this, Ballard put in a request to be transferred from the Army to the Navy reserves. When he was eventually called to active duty, in 1967, it was as an oceanographer.

Robert Ballard had originally intended on Scripps for his graduate degree, the marine institute he'd studied with for a summer in his teens. His GPA during his final semester in undergrad at UC Santa Barbara was only around a 3.0, but Ballard was certain that his high school internship combined with his interdisciplinary major at UCSB, and his ROTC designation as a Distinguished Military Graduate were enough for the admissions board to overlook the odd D grade here and there. His admissions interview was with the director of the Marine Physical Laboratory at Scripps and later director of the Institution as a whole, Fred Spiess.

The interview did not go well, and when Robert Ballard's rejection letter came, it was from Dr. Spiess, himself.

Thus began a (perhaps one-sided) rivalry between Ballard and Spiess, whom Ballard frequently refers to in various biographies as his "nemesis". Ballard went on to complete his Masters at the University of Hawai'i before beginning his PhD in marine geology at the University of Southern California, which he ultimately completed at the University of Rhode Island after being called to active duty with the Navy. The relatively small oceanographic community meant that Dr. Ballard and Dr. Spiess regularly came into contact with one another through competing and sometimes joint expeditions and, according to Ballard, a "friendly rivalry" broke out between the two. They even occasionally talked about teaming up to find the *Titanic*.

Through his career in the Navy, Ballard became inextricably linked with the Woods Hole Institute, Scripps' East Coast rival. Luckily for Ballard, Woods Hole had one thing that Scripps didn't: *Alvin*.

Alvin is a crewed, deep-sea submersible and at the time it was the only one of its kind in the United States. Also, I say “is” because *Alvin* is still in operation. That submersible was commissioned in 1964 and *Alvin* is still trucking. As part of his PhD research, collecting data to document the theory of plate tectonics, Ballard regularly took *Alvin* out to the bottom of the Gulf of Maine, and he accompanied a team of researchers to the Mid Atlantic Ridge as part of “Project FAMOUS”, the first manned mission to explore the tectonic plate boundary. Still a graduate student at the time, Ballard described himself in his memoir, *Into the Deep*, as “the only ‘Mr.’ in the group”.

Though *Alvin* is an extraordinarily well-built submersible - so much so that it’s seen more than 60 years of service - it constantly occurred to Ballard what kind of danger manned deep sea missions posed. One tiny accident or mistake could result in a catastrophic implosion that would kill everyone aboard the submersible within fractions of a second. Ballard wondered if there wasn’t a safer way. If the solution didn’t lie in the then-nascent field of robotics... could an unmanned submersible controlled by a team at the surface not do all of the work they were putting their lives at risk to do?

The search for *Titanic*’s wreckage had long been many a marine archeologist’s white whale. By 1977, Dr. Robert Ballard was a professor at Woods Hole on track for tenure. He had also advised on a number of *National Geographic* pieces and documentaries, including one about the hunt for the Loch Ness monster, so a number of Woods Hole officials reminded Dr. Ballard that a search for the famed lost ship might be “beneath the dignity of a serious research institution.” But Woods Hole’s director, Paul Fye, took another position on the matter; *Titanic* was located somewhere in the northwest Atlantic, basically Woods Hole’s backyard. It would be terribly embarrassing for the institute if the California-based Scripps launched a mission to find her and were successful.

So, Dr. Ballard sought out the aluminum company, Alcoa, to ask permission to borrow a ship, *Seaprobe*, that had originally been built to search for ancient shipwrecks in the Black Sea. Dr. Fye, who was just about to retire, gave Ballard the greenlight to test out *Seaprobe* at Woods Hole for the express purpose of a mission to find *Titanic*. Ballard borrowed over \$600,000 of additional equipment - cameras, a sonar system, et cetera - from Westinghouse, the Navy, and a Massachusetts-based oceanographic instruments company called Benthos, and set sail into the Atlantic in October, 1977. On *Seaprobe*’s very first sonar run, a connection between two pipes broke and all \$600,000 worth of equipment plummeted to the sea floor.

At this point Paul Fye had already retired and Woods Hole’s interim team were prepared to make Robert Ballard, a professor of marine geology on a professor’s salary, pay for the lost equipment. Luckily, Alcoa swooped in with an insurance policy that covered the borrowed instruments, but Woods Hole’s new director, John Steele, informed Ballard that he was not to do anything else under the institute’s name that had anything to do with *Titanic*.

Dr. Robert Ballard was not easily dissuaded. He might not be able to use Woods Hole's name, equipment, or facilities to find *Titanic*, but the institute couldn't prevent him from his own private pursuits. He formed a company called Seaonics International in partnership with *Titanic* expert Bill Tantom, photographer Emory Kristof, and film producer Alan Ravenscroft with the express purpose of raising the funds to develop deep-towed visual-imaging vehicles in order to locate the *Titanic*.

A brief word about Bill Tantom – William Tantom was very much the heart and soul of Seaonics. Until he met Bill, Robert Ballard's interest in finding *Titanic* was rooted in the challenge and academic merit such a discovery would bestow upon the scientist or adventurer who'd first made it. He likened *Titanic* to the Mount Everest of marine archeology, and wished to be the first to summit.

Bill Tantom had had a love affair with *Titanic* since he was about 6 or 7 years old. Bill and his father were passengers aboard the Canadian Pacific steamer, *Duchess of Atholl*, in 1937 when she collided with the Danish collier, *Maine*. The *Duchess* only sustained minor damage but when the passengers, clad in their lifejackets, mustered at their stations, little Bill heard the names of famous ships and the stories of their infamous disasters uttered for the first time: *Empress of Ireland... Lusitania... Titanic...*

As Bill Tantom grew, so did his obsession with *Titanic*. By the time he and Dr. Ballard met, Bill was considered to be one of the world's foremost experts on the ship, garnering the nickname "Mr. *Titanic*". Through his friendship with Bill, Bob Ballard developed a newfound respect and reverence for the great oceanliner. To find her wreckage would not only be to find the answer to a great mystery, but to bring a sense of closure to an incalculable tragedy. Bill believed wholeheartedly that Ballard would be the one to find the wreck and provide a much needed epilogue to the story of *Titanic*. He believed in Ballard, even at times Ballard didn't believe in himself. Ballard's quixotic ambitions suddenly had very real stakes.

One by one, each of Seaonics International's potential investors - including Roy Disney - turned down the project, citing the enormous capital it would take to fund the mission. Well, almost every investor turned down the project... Texas oil magnate, Jack Grimm, was very interested in funding a *Titanic* expedition.

Jack Grimm was, as they say, "an eccentric". He made his millions drilling wildcat oilwells and used his fortune to fund expeditions in search of the Loch Ness monster, the Abominable Snowman, and Noah's Ark. With the search for *Titanic*, he at least set his sights on something that definitely existed. But a few negotiations between Emory Kristof and Jack Grimm left the Seaonics crew feeling uneasy at the prospect of working with the oil tycoon.

In 1979, plans to mount a *Titanic* expedition were placed firmly on the backburner, as the team at Seaonics, alongside some of Emory Kristof's colleagues from *National Geographic*, quietly tinkered away at developing new cameras to use at depth. Bill Tantom, only about 50 years of age, was already beginning to see his health fade, though his passion for the *Titanic* project

never did. But the project was indefinitely stalled for lack of funds. To make matters worse, Jack Grimm announced that he'd be teaming up with Lamont-Doherty Geographical Observatory and Scripps to mount an expedition in search of *Titanic*. Leading that expedition would be none other than Ballard's personal nemesis, Dr. Fred Spiess.

In June of 1980, a stroke killed Bill Tatum, and for a while the dream of finding *Titanic* went with him. That same year, Jack Grimm and the Scripps team departed on their expedition in search of the ship and Robert Ballard quietly packed away any hopes that he and the team over at Seaonics would prevail in their own mission to find her.

The Scripps team used Deep Tow, a near-range sonar system that was towed along behind a mothership at extreme depths to comb the area for objects that could be *Titanic*. The mission was plagued with bad weather and an even worse angel investor who demanded on calling the shots. For Jack Grimm, the hunt for *Titanic* was as much a publicity stunt as it was an academic pursuit. He hoped that his search, if successful, would result in at least one film adaptation and arranged for a monkey to point at a spot on a map where the *Titanic* could be, so that he could send his team to comb the monkey spot. Because he thought that that would be more interesting for the movie. When the scientists on the mission objected to the monkey plan, he threatened to fire the scientists. Ultimately, however, common sense prevailed and the monkey idea was dropped.

When 14 objects large enough to be *Titanic* were detected by Deep Tow, Jack Grimm demanded that the Scripps team announce to the press that they had found her. Dr. Spiess, and Dr. Bill Ryan of Lamont-Doherty, declined to do so until each of the 14 targets could be confirmed or ruled out. And they all were. Ruled out. Just big undersea rocks. All 14.

In June of 1981, Jack Grimm and the Scripps team launched a second expedition in search of *Titanic*. On this expedition, Grimm claimed that they discovered one of *Titanic*'s propeller blades. A mosaic image of what looks very much like a propeller blade from a steamship was produced, although no other wreckage or evidence was found.

Could she be nearby? Perhaps buried under layers of silt and mud, a result of the 1929 Grand Banks earthquake that had rocked the area? Spiess and Ryan were not convinced that the "propeller" was even that, but Grimm ran to the media with his claim that he had found *Titanic*, or at least part of *Titanic*, and the media ran with it.

Robert Ballard read about Jack Grimm's discovery in the papers, his hopes of finding *Titanic* all but dashed.

Ronald Reagan had just taken office. There was a Cold War. Dr. Robert Ballard had been a military man himself. He knew that if you were looking for someone to sponsor scientific research, the United States military had deep pockets and an interest in technology.

He sought the backing of the Office of Naval Research for the development of two pieces of deep-sea visual imaging hardware: *Jason* and *Argo*, named after the Greek mythological hero, Jason, who departed on a quest to seek out the Golden Fleece on his ship, *Argo*.

Jason (the robotic submersible, not the man) would be a vehicle fitted with hydraulic arms, lights, and a camera for surveying the ocean floor. *Jason* would ride down to the ocean floor on *Argo*, a sled also mounted with a film camera, and tethered to a mothership at the surface.

Deploying a fair bit of salesmanship, Dr. Ballard pitched deep sea exploration to the Navy as a matter of national security. Afterall, the planet's oceans also contain some of its largest mountain ranges... could the Soviets not hide enemy submarines in these mountains and crevasses that Americans were neglecting to explore?

Enemy submarines, as it turned out, were not the Navy's chief concern... rather, the Navy concerned Bob Ballard with a couple of missing American submarines, USS *Thresher* and USS *Scorpion*.

Thresher and *Scorpion* were both nuclear submarines that went down in the 1960s. Searches after their disappearances proved fruitful and the Navy knew where both vessels lie, but they needed Ballard and his team to produce more sophisticated images of the wrecks than the Navy had been capable of nearly two decades earlier, and, more importantly, they needed Ballard's team to survey the wreck of *Scorpion* for any leaked radiation and environmental damage potentially caused by the sub's nuclear reactors and nuclear tipped torpedoes.

The military needed all of this to be done in secret, and Bob Ballard's not-so-secret obsession with finding *Titanic* proved a perfect cover story. The Navy and Dr. Ballard could simply claim that the military was sponsoring his search for *Titanic* in some vague pursuit of technological advancement. In reality, the survey of *Thresher* and *Scorpion* would be Ballard's primary aim, and once he fulfilled his assignment, he would be allotted the remaining time and budget to look for *Titanic*.

Many of Ballard's own crew weren't even aware of the classified naval assignment, which meant he and the few crewmembers with security clearance had to play dumb when they were "searching for the *Titanic*" near the Azores.

After completing the surveys of *Thresher* and *Scorpion*, the team had only 12 days to conduct their actual search. Ballard's team aboard the RV *Knorr* were joined by a team of French colleagues, headed by oceanographer Jean-Louis Michel.

The French team would first conduct a sonar search, and the Americans would follow with a visual search using *Jason* and *Argo*. Sonar was the traditional way of searching for undersea objects, but it had its drawbacks. Where *Titanic* was eventually found, for example, was an area near a deep canyon. Canyons create echoes which can muddy sonar images and disguise

wrecks within. Sonar is also best for locating large, recognizable objects. But things can get iffy when you're not looking at a single, intact piece of wreckage.

When Ballard and his team were collecting data on the two submarines, *Thresher* and *Scorpion*, Ballard noticed how the implosions of both vessels scattered pieces of wreckage across a massive debris field. Submarine implosions are sudden, violent events. Matter implodes, then explodes, then implodes again very suddenly, creating an enormous field of debris. A ship sinking wouldn't scatter debris nearly as far... but some debris *would* scatter. Ballard recalled survivor Jack Thayer. The academic consensus was that *Titanic* sank in one piece, but several witnesses to the sinking insisted that the ship broke in two. Jack Thayer, one of the last survivors to leave the ship, described the split to a passenger aboard the rescue ship, *Carpathia*, who sketched a series of images on a napkin, depicting the liner sinking in two halves.

If *Titanic* did split open before she sank, then she would have left a significant debris field, perhaps more than a mile across. When the French team's sonar failed to find the wreckage, Ballard adjusted the target for the *Argo* team: they wouldn't look for a ship, they'd look for debris.

This was a task that only a visual search could accomplish. Debris on sonar just looks like rocks on the ocean floor. Or nothing at all. But with *Jason* and *Argo*, Ballard and his team could cast a wider net. They didn't need to find the ship, just the debris, which they could follow like breadcrumbs to the rest of the wreckage.

Jean-Louis Michel was in charge of the watch around 1:00 am on September 1, 1985, when Bill Lange and Stu Harris spotted something odd on the video monitor. The sleepy night watch suddenly became alert, then seconds later the images on *Argo's* cameras became clear: *wreckage!*

The watch team began to shriek with glee. *Argo* and *Jason* had found a ship's boiler, identical to the ones that had been fitted to *Titanic*. Afraid to take their eyes off the monitor, someone sent the ship's cook to retrieve Bob Ballard from his cabin. Moments later, Ballard bounded into the room. The crew sipped on fizzy Portuguese wine as the first images of *Titanic's* hull came into view.

The entire expedition broke into a chaotic, jubilant hullabaloo. The American and French teams hugged and congratulated one another on their combined victory. And then someone, no one remembers who anymore, let the air out of the room like a helium balloon... they recalled that it was nearly 2:00 am. It was almost the time *Titanic* sank.

Twenty minutes later, Dr. Robert Ballard raised the Harland & Wolff flag on the fantail of the *Knorr*. The crew that discovered the wreck of the *Titanic* observed a moment of silence for each of the 1500 souls lost in that very spot 73 years earlier.

The discovery of the wreck of *Titanic*, lying in two distinct pieces more than half a kilometer apart, proved once and for all that the ship split before she sank. Even after her discovery, *Titanic*'s allure still has a hold on the public. She is the most studied shipwreck in the world, and has been the subject of dozens of manned and unmanned expeditions and hundreds of objects have been salvaged from her wrecksite... but that's a story for another episode.

Following the discovery of *Titanic*, Dr. Robert Ballard became a celebrity in the world of oceanography, and the hard sciences overall. Weird story: in the immediate aftermath of the discovery, Ballard was invited to a formal White House dinner. He had no idea how to behave at a White House event, so he asked his good friend... Shirley Temple Black. As in *Shirley Temple*. The Shirley Temple. And after she told him what to wear and where to stay and how to behave, Ballard attended said White House dinner... which just so happened to be the same dinner where Princess Diana danced with John Travolta in that unbelievable blue velvet dress. Like, it was the most iconic dinner of the '80s.

Robert Ballard would go on to discover the wrecks of the *Bismarck* and *PT-109*, as well as a number of ancient shipwrecks in the Black Sea, and to survey famous wrecks like *Lusitania*, and serve as an advisor on the 1997 James Cameron film. In 1989, he founded the JASON Project, partly in response to the number of fan letters he received from children following the discovery of *Titanic*. The JASON Project's aims are to inspire children to pursue scientific interests through learning programs and mentorship from real scientists from organizations like NASA and NOAA. The JASON Project's curricula is available for free online.

In 2021, the Navy declassified the details of the *Thresher* and *Scorpion* missions, freeing Bob Ballard to finally discuss the details of his *Titanic* search that wasn't completely a *Titanic* search. There are other Navy missions, so he claims, that remain firmly classified and he is not currently at liberty to discuss.

The loss of the RMS *Titanic* in 1912 was a devastating human tragedy. But since the wreck's discovery in 1985, continued study of the site has revealed that the remains of the ship have enjoyed a second life as the home to many animal species. Stick around after the credits to learn more.

"After *Titanic*" is a podcast by Bash Back Productions. Written, recorded, and edited by Amanda Hootman. Music by Neilly Farrell. Artwork by Paul Scott Canavan. Full cast list, transcripts and sources are available on aftertitanic.com. "After *Titanic*" is supported by our generous Indiegogo backers and patrons. Help support the podcast by heading to Patreon.com/AfterTitanic where you'll get exclusive access to our Discord server, and join an entire community of fellow Titanophiles to hang out with between episodes. I've been your host, Amanda Hootman. Thanks for listening.

When Robert Ballard and his team discovered the wreck of *Titanic* in 1985, they noticed what looked like icicles made of rust hanging from her hull and railings. Ballard fittingly named these "rusticles", and it turns out they are evidence that *Titanic* is teeming with life.

Rusticles are the byproduct of a bacterium, *Halomonas titanicae*, that was first identified at the wreck site. The bacterium feeds on the iron of the ship and is of particular interest to scientists for its potential use in the recycling of decommissioned deep-sea drilling materials. While *Halomonas titanicae* has spent over a century feeding on *Titanic* and hasn't quite managed to turn her into a rust stain on the bottom of the Atlantic, yet, it could be a valuable natural resource for undoing some of the damage of anthropogenic oceanic pollution.

And bacteria aren't the only creatures living on *Titanic*. Rat-tail fish, squat lobsters, bamboo coral, starfish, and many more deep sea species have made their homes amid her ruins. And an overall increase in benthic fauna has been observed since 1985. Bamboo coral, in particular, has seen a substantial increase in colonies since the discovery of the wreck. And squat lobsters (a kind of hermit crab) have been found in greater numbers among *Titanic*'s debris field than in a nearby sea ridge.

Ongoing study of the sealife around the wreck can inform scientists on the management of both ecological and deep sea heritage sites, as well as the population resilience of these enigmatic creatures who have made their homes in the once great oceanliner.

Into the Deep: A Memoir from the Man Who Found Titanic, Robert D. Ballard and Christopher Drew, National Geographic, 2021.

The Discovery of the Titanic, Dr. Robert D. Ballard, Madison Publishing Inc., 1987.

[Astor to Dynamite Titanic](#)

[Finding Titanic: From Search to Seabed - Titanic Stories - History of Titanic - Titanic Belfast](#)

[Epsom's Titanic Ties >](#)

[Iceberg. Right Ahead!: The Tragedy of the Titanic by Stephanie Sammartino McPherson](#)

[TITANIC FIND FLOODED BY LEGAL ISSUES TALK OF SALVAGING HULK TROUBLES SCIENTISTS](#)

[Jack F. Grimm – Texas History Notebook](#)

[Inside the secret US military mission that located the Titanic | CNN](#)

[JASON Learning](#)

[When the Titanic sank 3.800m into the Atlantic Ocean, strange animals moved into the wreck | Discover Wildlife](#)

[New species of bacteria found in Titanic 'rusticles' - BBC News](#)