By John Beck

Driven by a passion for archaeology, the team at RPM Nautical Foundation have set out to prove that technology and talent can save undiscovered artefacts from rogue treasure hunters

DIVING into HISTORY

Research vessel

Hercules rolls gently in the swell as it holds position off the Egadi Islands, engines running. Its 37-metre hull is seafoam green and its superstructure is white with a stripe below the bridge. "RPM Nautical Foundation" is painted on the side. The August Sun shines hot, and the crew has retreated from the open back deck, where a thick yellow cable leads from the stern down beneath the surface of the water.

Amidships is the control room. It's nearly dark, filled with the drone of the engines and an air-conditioning unit maintaining 20°C. Today, it's unusually crowded. George Robb sits in the centre, splayed back in his chair with his chin in his left hand and old cream loafers up on the laminate desk next to a pack of Nicorette. Like everyone else, he's fixed on the monitors showing various angles of blue 80 metres below, as well as maps, and a yellow and black, constantly refreshing sonar.

Jonathan Dryden works quietly in the corner, biting his lip as he pilots the submersible feeding video from the other end of the yellow cable. The silver hair of RPM Nautical Foundation's chairman Jim Goold is just visible over the back of another chair to Robb's left; surveyor Mateusz Polakowski sits in the fourth chair with his clipboard and pen. The rest – crew, archaeologists, historians and observers – switch between standing, leaning and a crude wooden stool.

Suddenly, a shape appears on the sonar – an advanced multi-beam model that looks out 30 metres from the remotely operated vehicle (ROV). Dark with a flash in the middle, it's the kind of solid, manmade-looking electronic signature that Robb likes. The ROV moves at just around one knot, so the target forms slowly: a smudge, a shadow, then a solid shape, outlined against the sandy seabed.

"There it is," Robb says. "Put it down here," he tells Dryden with a New York bluntness once used on junior trading-floor employees. The ROV settles in a small cloud of sediment in front of an ancient bronze waterline ram. It's about a metre long and it appears to weigh upwards of 180kg.

Polakowski reaches for his radio. "Back deck, crane down" and a chain ending in a hook lowers slowly into view near the ram. Finally, they must now wait for the divers.

Here, on March 10, 241 BCE, 24 kilometres west of Trapani on the Sicilian coast, around 200 Roman warships ambushed a larger Carthaginian fleet as it attempted to relieve besieged comrades at a nearby port. The Carthaginians had the wind and the numbers, but the Roman oarsmen were better trained and had stripped their craft of masts, supplies and unnecessary bodies, so were more manoeuvrable. Polybius's Histories records that 50 Carthaginian boats were sunk and 70 were captured, along with as many as 10,000 men to the loss of 30 of their own. The Battle of the Aegates was a victory so decisive that it ended the 23-year-long First Punic War. "It is Rome's coming out party as a dominant power", says underwater archaeologist Peter Campbell, with a historian's taste for the present tense.

It is also the only confirmed location of an ancient naval battle. The warm waters quickly rotted the wrecked warships' timbers, but the pottery amphora they carried survived, as did the rams, their primary weapon. These were the peak of naval technology for hundreds of years and turned boats into waterborne projectiles. A far more efficient method than the boarding parties that had gone before, they drowned boatloads of men all at once, rather than stabbing them individually.

Images of the projectiles still persist throughout the Mediterranean, reproduced on centuries-old coins and statues. Real examples have been more elusive. Just three are known to exist outside this site from the whole of antiquity. When RPM arrived in Sicily this summer, 13 had been

PHOTOGRAPHY: JOHN BECK

George Robb (*foreground*) watches a live feed from the ROV in the control room of the *Hercules* research vessel

located in the area, but the most recent was back in 2013.

The current ram on the monitors was found on July 27, a quarter of an hour after Robb had yelled at Polakowski, Dryden and Campbell for suggesting that a quiet day be concluded early so that they could motor back to their berth among container ships and ferries in Trapani, where there would be evening sunshine and local food. The area was an "abyss", Campbell told Robb in attempt to persuade him. There was nothing to find.

Robb is rangy and habitually hunched, with still-dark hair that he lets grow out with an indifference also applied to new clothes, regular mealtimes and manners. He enjoys being right and winding people up, so was happy with ram 15. It was a significant find – and a way to needle Campbell for at least the rest of the season.

They formed a plan to raise it with the help of local Italian divers. Goold, an enthusiastic, slightly breathless 67-year-old who also serves as RPM's legal counsel, pushed for the day to be named "Operation Rostra" – after the Latin for naval rams. No one objected.

The grey motorboat of the Guardia Di Finanza – the Italian law enforcement agency under the authority of the Minister of Economy and Finance – approaches on roughly the same intercept course as the Romans used, then moors alongside the *Hercules*. Thankfully, it's not here to arrest anyone – they're just ferrying the team of Italian technical divers who are working with the RPM crew. Even for such skilled divers, 80 metres is deep, requiring a mix of breathing gasses, complex gear, multiple decompression stops and a backup team. If something goes wrong, a direct ascent to the surface will not be possible. The Italians expect to have 20 minutes at the bottom, then more than two hours of decompression time on the way up.

The divers lower the emergency tanks, then gear up and step backwards into the water, reappearing on the ROV's remote screens three minutes later, close to the ram and the dangling crane hook.

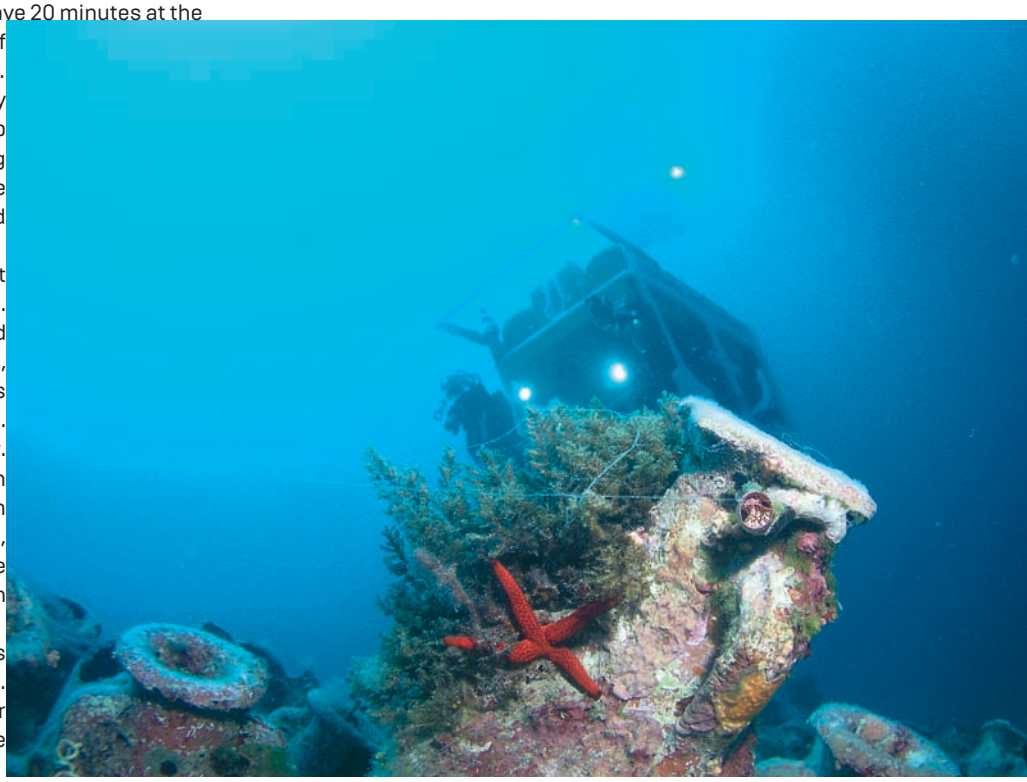
They work hard to dig the ram out and manoeuvre a sling underneath it. The ram is quickly hidden in a cloud of sediment, from which torch beams, bubbles and flippers emerge. It's apparent that the divers are struggling.

The divers then move out of view. Those in the control room exhale with disappointment. Perhaps it won't happen today. Then, instead of ascending, the divers swim back into view, loop the sling over the crane hook and give an "OK" sign to the ROV cameras.

The ram looks solid, but if it's cracked, movement could tear it apart.

"My recommendation is recover immediately," Robb says. "It's time to make a call. Up?" They all nod.

PM has worked on this site nearly every summer since 2005, part of Robb and Goold's drive to discover, map and research maritime heritage all across the Mediterranean from the Malta-based *Hercules*. The artefacts they occasionally recover are priceless, but RPM are no treasure hunters. They collaborate with local authorities – which often don't have resources to operate their own vessels – and specialist scholars on every project. The information they provide helps each



The ROV approaches a field of Roman amphorae, which have lain in place for at least two millennia. Visible on the ROV's side is a utility arm which includes a blower for clearing sand and sediment

country protect its underwater cultural heritage from illegal salvage operations or accidental damage in nets and other fishing operations.

It is an ethos that has driven Goold since the 70s. He started diving when he was a teenager and began pursuing nautical archaeology soon after, working under George Bass, one of its earliest practitioners. Things were different then. Underwater archaeological sites were often curiosities to be profited from, not preserved. Opportunistic divers would loot wrecks of anything they could find, selling amphora to local cafes, coins and pieces of WW2 wrecks to beachfront stalls. Today, the Mediterranean coast is mostly stripped clean at recreational scuba depth.

Within days of getting his law license, Goold began working pro-bono with the Institute of Nautical Archeology (INA) and other non-profits to protect wrecks from the Turks and Caicos to Maine's Lake Sebago. In the late 90s, new technology, particularly ROVs, made time and money the only barriers to stripping historic sites.

A number of countries were becoming increasingly concerned, including Spain, which contracted Goold on a series of cases involving its sunken ships. In 1999, Madrid awarded him the Knight's Cross of the Order of Isabella Cattolica for his services.

Around that time, Robb was beginning to think of a life away from the New York Stock Exchange trading floor. The original RPM was Robb Peck McCooey Financial Services (RPMFS), a specialist firm run by George's father and associates, and his grandfather before that. Robb started working there as a teenager and, in 1985, aged 29, managed to raise enough capital to buy out the older generation for $35 million. RPMFS grew fast, ultimately increasing in valuation many times over. Robb did things his way there. He abandoned his suit and tie and indulged a love of the sea that had begun while catching red snapper as a child. He was soon leaving the office for weeks at a time to fish marlin and sailfish from ever-larger yachts based in the Florida Keys.

Divers looted wrecks – the Mediterranean coast is mostly stripped clean at scuba depth

But by the late 90s, sport angling was boring. "I got tired of killing fish," he says. "I went to catch-and-release, but I thought, why am I putting these poor animals through all this, y'know?"

There were salvage and treasure-hunting operations working out of the same harbours in the Keys. Robb noticed them and thought amateur archaeology could be a new challenge.

Multibeam sonar wasn't available then, but he coupled a side-scan model with a magnetometer and commissioned software that pulled the data

together for a comprehensive view of the bottom. He would survey sites in the afternoons, look over the findings, then dive the next day, matching the physical object with its electronic signature.

Goold, then on the INA board, heard from an associate that a financial guy from New York was busily buying up sophisticated surveying gear for archaeological use off Florida. In Robb, he saw a like-minded ally.

"I thought, if he likes doing this stuff, he's worth getting to know," Goold says. He called Robb and suggested he join an INA executive meeting in New York, then, in case that sounded dull, visit the Metropolitan Museum of Art, where a colleague was refurbishing Panathenaic amphora. It worked, Robb still remembers the "gorgeous" pots.

They two men liked each other immediately. Goold visited the Keys, then Robb joined the INA board and began supplying boats – modified fishing yachts mostly – for projects from Morocco to Israel.

Robb sold RPMFS in 2001 for $180 million, married, and looked for his next project. Robb had seen enough not to even attempt archaeology as a business venture, but at Goold's suggestion, founded a non-profit named for his old business and funded with an endowment from its sale.

The concept was to operate a boat purpose-built for nautical archaeology that could systematically search large, below-diver-depth areas.

They acquired the *Hercules* as a mud-boat hull, then built it back up with the latest sonar gear, a dynamic positioning system to keep it steady while they worked, and an ROV – 500kg, 1.7 metres long and with two manipulator arms and a suction/blower tool able to clear off artefacts.

The boat, and its crew, is key to RPM. Academics don't have the money to run a ship, while vessels with comparably advanced survey equipment are usually operated by navies or oil firms and cost upwards of £10,000 per day to charter. The *Hercules* is in the archaeological sweet spot between overheads and capability.

Their first major project was a 2004 attempt to locate the remains of sunken warships from the Battle of Trafalgar in time for its bicentennial. It was, Goold remembers wryly now, a "learning experience". They found promising sonar signatures but were never able to actually see them – the rivers emptying into the Bay of Cadiz washed in vast volumes of silt that rolled along the seabed and reduced visibility to nothing.

The following year, they chose the Egadis more carefully, a sandy floor without too many rocks to give false signatures and no river mouths nearby. They were already pretty sure that the Battle of the Aegates had taken place in at least the general vicinity, because Sicilian fishermen dragged up a ram in their nets in 2002.

When Robb first talked about searching it, archaeologists laughed at him – a cocky Wall Street trader trying to do something that they couldn't. The way he tells it, that was just more motivation to prove the value of new technology to unimaginative scholars. Even with the electronics and the submersible, there were years of nothing. Underwater surveying is shining a flashlight into the depths to reveal a tiny segment of seabed. An artefact could be five metres out of sonar range, or hidden just beneath shifting sands.

Mostly they just found what everyone in the *Hercules* control room knows as "bags of rocks": rope and fishing net weighted with stones that have been discarded or lost from boats still working what's left of the area's now-collapsed fish stocks. There is other debris down there too, most of it useless; broken engine parts, WW2 naval mines, diving gear, bottles.

Then they found amphora, whole and in fragments, usually guarded by territorial comber fish that stare down the ROV. There were just six in a two-month season of hunting in 2006, eight the next. It took even longer to find a ram. "You gotta want it" Robb answers every time someone asks if it was frustrating. And he does. After nearly 20 years searching seafloors, he still gets butterflies every time the ROV hits the water.

***Left*: bronze naval ram 15 being hauled up by crane from water off the coast of Sicily**
***Above*: Jim Goold, RPM's chairman, on the deck of the R/V *Hercules*, inspects ram 15**

A map in the control room spans the years since then that RPM has spent crawling the site, little black lines marking every transect and the location of each artefact. There are circles for the different types of amphora: red for Greco-Italic, white for Punic, yellow for Punic-African. Much rarer yellow triangles mark the rams, most of which have now been raised and are on display at a museum on the island of Favignana. Campbell and historian William Murray visit them there when possible to make 3D scans and take samples.

Preparation for the ram recovery is delayed by technical problems. Bosun Gerry Villanueva, who has been with RPM since shortly after its founding, is shocked by a leak in the Kevlar and rubber-coated tether carrying 500 DC volt and 660 AC volts down to the ROV. Robb decides it needs a total refit. That's a day stuck in port, possibly two.

Dryden sets to it, along with Howard Phoenix, the son of a nuclear plant technician who grew up everywhere in the US there was a reactor, learned electronics and engineering, then taught himself to dive from a Navy manual. He also joined RPM at the start, and even got married at Robb's mansion.

A ram discovered by the RPM team, now restored and on display at the Archaeological Museum of Favignana, sited in the former Florio tuna factory

Downtime hits every season, either through weather – the ROV cannot be safely launched or recovered in any more than a 1.5-metre swell or 20-knot wind – or because something breaks. Often it's both and it's always frustrating. In an attempt to ward off bad luck, the crew have got into the habit of throwing coins and biscuits overboard as an offering to the sea gods. It began as a joke but has now become a half-serious superstition.

Robb usually kills time on the bridge drinking cups of Earl Grey tea – milk and three sugars, despite Dryden's attempts to wean him down to two. Goold works on his laptop in the forecabin. In June, as they were waylaid in Albania with malfunctioning sonar and buffeted by days of powerful winds, he ran through PowerPoint presentations of his high profile cases on one of the big TVs. Most of the crew had already seen them, but they sat through anyway.

Polakowski and Dryden, crew members who are both in their 20s and joined RPM four years ago after begging to be taken on as unpaid interns, watch films if they can. *The Life Aquatic with Steve Zissou* is an enduring *Hercules* favourite and received four screenings this season, including once for Murray – known by everyone as Bill – because it seemed wrong he had not seen his namesake's most nautical work. The crew reference it constantly, Polakowski plays the soundtrack in the control room for Dryden's birthday, Robb jokes about jaguar sharks and Phoenix replaces his lopped-off sunhat with a Zissou-style red beanie when it's cold.

The morning of Operation Rostra begins with drizzle, but by 7.30am it's already heating up. Sicilian authorities send an observer on every recovery operation – and for a ram, they send three. The excited crew is up earlier than normal to prepare, topping a wooden pallet with coiled rope and a white shower curtain for the recovered ram, and donning RPM T-shirts in the same shade as the *Hercules*'s hull. Goold's is green with the old logo and Robb has added a straw hat, coming apart at the rim, to his usual ragged shirt.

Three women from the Soprintendenza del Mare come aboard the *Hercules* in a cloud of perfume just before 8am. Robb welcomes them with a handshake, Goold with a kiss on each cheek.

The Guardia Di Finanza appear soon after, carrying relaxed-looking divers in shorts and Havaianas, and stressing Phoenix out by looping a rope around part of the *Hercules*'s railing instead of a bollard. They talk strategy with Robb, examine the ROV, then cast off to reconvene in the bay.

The *Hercules* stations itself 50 metres off from the ram, and Phoenix tosses a dive guide rope weighted with concrete over the side, then helps launch the ROV. Dryden pilots it down.

Visibility is bad and they don't notice the dark shape looming out of the sediment until they're nearly on it. It's a *different* ram.

The odds of finding a ram like this are incredibly small. It had lain just beyond sonar range on their last pass of the area. "How the fuck did we miss that?" Robb asks disbelievingly. There is a helmet at its base too, and what Campbell thinks are ballast stones.

PHOTOGRAPHY: JOHN BECK

The RPM crew in the ROV control room on the *Hercules* research vessel. *L-R*: William Murray, Mateusz Polakowski, George Robb, Peter Campbell

But they need to prepare for the divers, so Polakowski notes the co-ordinates and Dryden pulls away.

Half an hour later, ram number 15 is slung up and ready to be raised.

The ram quickly moves out of the ROV's view and breaks the surface for the first time in two millennia; huge, dark and trailing seaweed. Phoenix helps pull it back on to the palette.

The crew take turns to pose for photos while they wait for the divers on their slow way back. It really is big – a sturdy lump covered in dead oyster shells, tubeworms and pulsating green tongue. The front is chipped, likely damaged by whatever ship it took on before going down.

The divers surface exhausted, wrestling with heavy gear and blowing snot from their noses. Villanueva and Phoenix winch in a concrete-weighted guide line that the divers were using. It snags and Robb goes to help. As he leans over the edge of the deck, his new iPhone falls out of his pocket. He almost saves it with a quick swipe, but it goes overboard, sinking fast. He looks forlorn.

A local television crew are waiting at Trapani and clamber aboard to get shots of the ram. Goold shakes hands and poses for the cameras, then cheerily discusses the operation. Tourists look over and one family stops to ask about the ROV, ignoring the ram, which is still on the pallet.

The new discoveries suggest theories as to how the ancient battle unfolded. Perhaps the Carthaginians were disorganised and strung out, perhaps bunched up into lines, Murray says. When RPM began working here, no one really knew where the fighting happened. Years of work are now taking them closer to saying how.

The day after Operation Rostra, they revisit the ram they dropped in on the day before, moving in a series of transects across a grid and following up on any likely sonar signature. During the survey, they find yet another ram. "Best season ever," Dryden says. They chat about the emails they will send to doubters, in particular, the historian who told Robb to "come back when he'd found 19 more rams". They're nearly there.

John Beck wrote about improvised weapons in Mosul in 10.17