

DIVERS FINDING TREASURES IN THEIR OWN BACKYARDS!

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Prospecting for treasure

SO WE'RE ABOUT TO GO TO PRESS, and then Captain U-Turn announces that England is to enter full lockdown again, belatedly following the other parts of the UK that had already taken their own more drastic steps to counter Covid-19.

I won't dispute that the measure is necessary, as scientific advisors had been insisting for at least a month, but this column was meant to start with a welcome for the fact that, a few days before the announcement, the Maldives and Canary Islands had been moved to the sunny end of new travel corridors.

This had been very good news for UK divers as winter approached, the Indian Ocean destination in particular being a favourite luxury escape, and the Atlantic islands a more readily affordable one.

I'm sure many divers were quick to book holidays accordingly – a move now thrown into disarray if their departure date was imminent. Talk about lack of joined-up thinking at governmental level!

As dive travel has contracted, now almost to vanishing point, **DIVER** has continued to reflect places you *might* be if you weren't at home. But this month we had already decided to shift the focus a little to "backyard diving".

By that I don't necessarily mean diving in the UK, just the sorts of things divers get up to wherever they happen to be based in the world.

Take commercial diver Ben Dunstan and his friends. When the weather dictates they spend their spare time diving abandoned mines, but otherwise relish combing Cornish gullies for shipwrecks.

Recent finds include a musket from long-lost 19th-century barque the *Boyne* – and Ben isn't the only diver to call in a gun find this month. Directly south in Portugal, Pedro Mota describes discovering a 19th-century shotgun, possibly from English steamboat the *Tiber*. Guns in the season of goodwill? Well, these weapons are harmless now.

SO WE'RE LOOKING AT SUBMERGED treasures this month, in their many forms. Technical wreck-hunter Tim Lawrence is based in Thailand, and his own backyard has just yielded an 80m-deep shipful of Ming pottery, which could prove a valuable find.

It was Federica Squadrilli Carr's dad Bruno who discovered extensive submerged Roman remains off southern Italy half a century ago, and though she's based in the UK she managed a recent trip to dive them.

John Christopher Fine leaps back in time too, to recall meeting the treasure-hunters of Bermuda and telling the tale of the most valuable single object ever found on a wreck. For CCR diver Sonia Rowley her back-garden treasures in Hawaii are otherwise-unseen giant seafans – but she has to dive regularly into the 100m zone to study them.

Finally, a true **DIVER** gem is Alex Mustard's monthly compendium of photographic advice *Be The Champ!*, and this December's is a very special one because it's his 100th. How many divers have been helped to competition success as a result of reading the preceding 99?

To celebrate, Alex has invited fellow-photographers to pitch in with their own top tips for success, and if the result isn't a treasury of wisdom, I don't know what is.

It's difficult to predict what this Christmas will be like but, wherever you find yourself, have as cheerful and festive a time as you can. Here's to better days next year!

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the magazine that's straight down the line...

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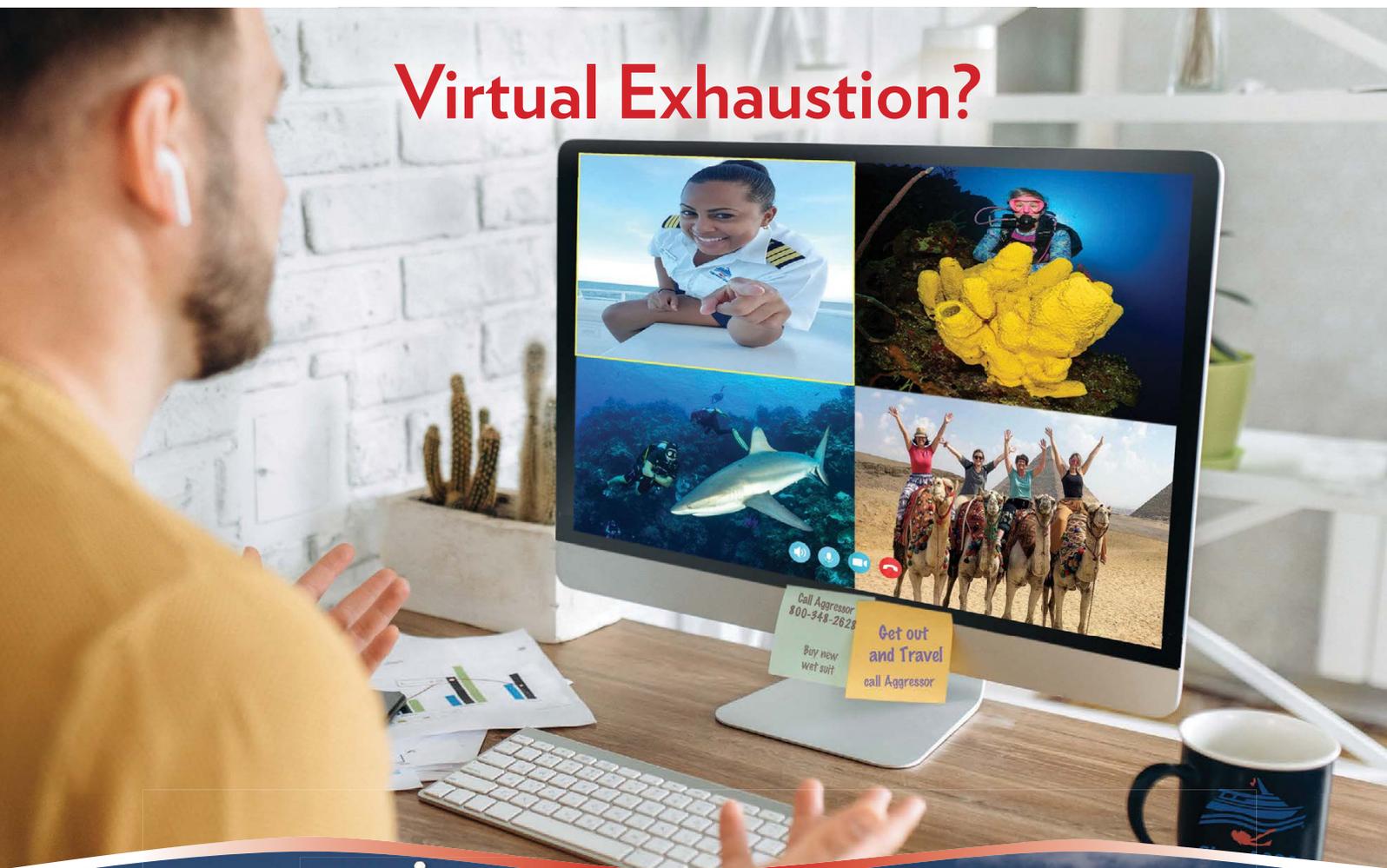
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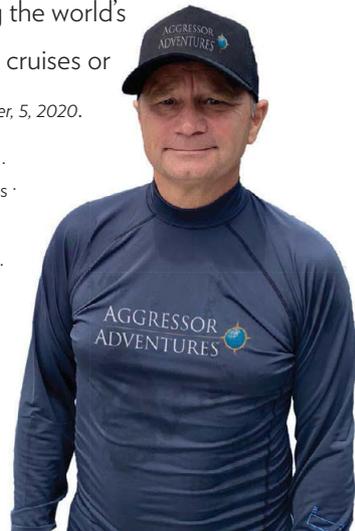


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Safety board blames operator for Conception blaze

MAJOR SAFETY improvements for dive-boats and other small passenger vessels have been called for by the USA's National Transportation Safety Board (NTSB) in its report into last year's devastating fire aboard the *Conception* liveaboard in California, which killed 34 people.

The details of the fire and its aftermath have been extensively reported in **DIVER**. The 23m *Conception* had completed a weekend dive-trip and was anchored off Santa Cruz Island when the fire broke out in the early morning of 2 September, 2019.

All 33 passengers, who were sleeping below in a single communal bunk-room, and one of the six crew who was with them, were trapped and died of smoke inhalation.

Both exits from the bunkroom led to the fire- and smoke-filled saloon area above, and the emergency exit was directly above bunks. Contrary to previous reports that the victims had been overcome by fumes while still asleep, it now seems that most had awoken but were unable to escape.

The NTSB has blamed the tragedy on the failure of *Conception* owner-operator Truth Aquatics to provide

effective oversight of its vessel and crew operations. This included the requirement to maintain a nightwatch – the captain and crew had been asleep in the wheelhouse at the time of the fire – the lack of required smoke-detection in all accommodation spaces and, contributing to the high loss of life, the inadequate escape provisions.

The *Conception* had smoke-detectors in the bunkroom but these were not connected to each other or to the wheelhouse. There were none in the saloon above the bunkroom where investigators believe the fire started.

The dive-boat burnt to the waterline before sinking, leaving little physical evidence to help investigators establish how, when and where the fire started.

But they believe it originated in the aft section of the saloon, the most likely ignition sources being the boat's electrical distribution system, unattended batteries being charged, or discarded smoking materials.

The NTSB is now calling for all US liveaboards similar to the *Conception* – under 102 tonnes but with overnight accommodation for as many as 49 passengers – to have



The *Conception* liveaboard, burnt to the waterline last year.

interconnected smoke-detectors in all passenger areas. It also recommends that the primary and secondary means of escape should lead into separate spaces.

The board wants the Coast Guard to implement an inspection programme to verify that overnight crew patrols are carried out.

It says that the absence of such a watch on the *Conception* was likely to have delayed detection of the fire until it grew out of control, directly leading to the high death-toll.

"The *Conception* may have passed all Coast Guard inspections, but that did not make it safe," said NTSB Chairman Robert L Sumwalt.

"Our new recommendations will make these vessels safer, but there is no rule change that can replace

human vigilance."

The board also reiterated a call for a management system to improve safety culture among small-vessel owners and operators. It has no enforcement powers but can make recommendations to bodies such as the Coast Guard which, it seems, has brought no action against a small-boat operator for failing to mount a roving patrol for almost 30 years.

The families of 32 victims have now filed legal claims against Truth Aquatics and its owners Glen & Dana Fritzler, although they in turn were quick following the fire to file a claim under a maritime law that limits liability for vessel-owners.

Criminal charges are also expected to be brought. ■

VENTURA COUNTY FIRE DEPARTMENT

Towering unknown reef surprises scientists in GBR

THE GREAT BARRIER REEF has not lost its power to surprise and overwhelm the senses, it seems. Australian scientists have just discovered a detached coral reef so tall that it dwarfs skyscrapers such as London's Shard – and it's the first such feature to be discovered for more than 120 years.

The blade-like, 500m-high reef was found in the northern Cape York area of the GBR on 20 October by an international scientific team, led by marine geologist Dr Robin Beaman at James Cook University, Townsville.

They were working from the Schmidt Ocean Institute (SOI)'s research vessel *Falkor*, now in the last month of a year-long seabed-mapping expedition in the seas

around Australia. On 25 October the team followed up with a live-streamed dive using the institute's underwater robot *SuBastian*. A four-hour recording of the high-resolution footage obtained can be seen on YouTube (*ROV Dive 401*).

The base of the reef is 1.5km wide and at its peak it reaches to within 40m of the sea surface. Seven other tall detached reefs were already known about in the GBR by the late 19th century, including Raine Island, considered the world's most important green turtle nesting area.

"We are surprised and elated by what we have found," commented Dr Beaman. "To not only 3D map the reef in detail, but also visually see this discovery with *SuBastian*



The newly discovered 500m-tall detached reef is seen on the right.

is incredible."

"This unexpected discovery affirms that we continue to find unknown structures and new species in our ocean," said SOI co-founder Wendy Schmidt. "Thanks to new technologies that work as our eyes, ears and hands in the deep ocean, we

have the capacity to explore like never before. New oceanscapes are opening to us, revealing the ecosystems and diverse life-forms that share the planet with us."

The California-based SOI is a private non-profit foundation established to advance

MICHAEL ASTON



'Abnormal' shark behaviour closes Red Sea sites

Oceanic whitetip shark.

RAS MOHAMMED national park in the northern Red Sea was closed indefinitely for recreational activities from 28 October following a rare shark attack on a group of snorkellers.

Egypt's Environment Ministry and the Chamber of Diving & Water Sports (CDWS) were conducting an investigation following the incident at Ras Mohammed on 25 October, in which a 12-year-old boy lost a forearm and sustained bites to his back, his mother suffered deep bite wounds and their Egyptian tour-guide lost his leg.

The mother and son, on holiday from Ukraine, had been staying in Sharm el Sheikh. They had gone to Shark Reef on a dive-boat with

a mixed group of scuba-divers and swimmers, and while snorkelling in a group of six had been attacked by what was believed to be a 2m oceanic whitetip shark.

They had attempted to swim away when the shark appeared but it had followed before launching the attack.

An underwater video later appeared on social media showing a female oceanic whitetip said to be in the same area and acting in a hostile manner. The investigators were tasked with determining whether this was the same shark and the reason for its "abnormal" behaviour.

The victims were treated at Sharm International Hospital, and Environment Minister Dr Yasmine

Fouad ordered Ras Mohammed to be closed to access by land or sea as a precaution pending the results of the investigation.

DIVER correspondent and shark-diving specialist Ekrem Parmaksiz had been diving in Egypt at the time, though further south at well-known shark location the Brothers Islands – which he reported had also been closed to divers for three days.

"I had many interesting encounters with oceanic whitetip sharks at the Brothers and Daedalus and shot many frames of them showing noticeable behavioural changes," he told **DIVER**.

"I had never seen them so agitated before. I talked to many experienced dive-guides, and the common perception was that extreme water temperatures could explain their behaviour.

"We have also observed bleaching in most of the corals from Hurghada's to Daedalus' reefs over the past two years. Normally Red Sea corals are extremely resilient, but consistent rises in water temperatures have been affecting them quite badly."

The CDWS has instructed all dive operators to review shark-awareness guidelines before operations resume.

They are asked to discourage snorkelling and entry-level diving in areas in which it is not permitted and, where it is allowed, to conduct proper safety briefings, have first-aid equipment available and ensure that guides always enter the water first.

To avoid attracting sharks, no fish-feeding or fishing should take place with people in the water and no food-waste should be disposed of at sea. ■

★ Ekrem Parmaksiz reports on his Red Sea trip in **DIVER** next month.

Huge rockfall closes Thai reef

A **CORAL REEF** in the Andaman Sea in southern Thailand that was damaged by a massive rockfall in mid-October has been closed off to divers for at least two years.

Koh Mae Urai in Phang Nga Bay, between Phi Phi island and the Krabi mainland, had been a popular dive-site, but part of the towering island sheared off and fell into the sea during the night of 15 October in stormy conditions.

The collapse deposited an estimated 30-50,000 tonnes of limestone rock onto the reef.

A Phi Phi National Park patrol reported the collapse the next day. The fallen rock had itself broken in half, with the two detached sections resting on the 16m-deep reef and protruding above the surface.

The two sections were each reckoned to measure about 50 by 70m when divers from the national park and the Ministry of Natural Resources & Environment inspected the area on 27 October, according to local press.

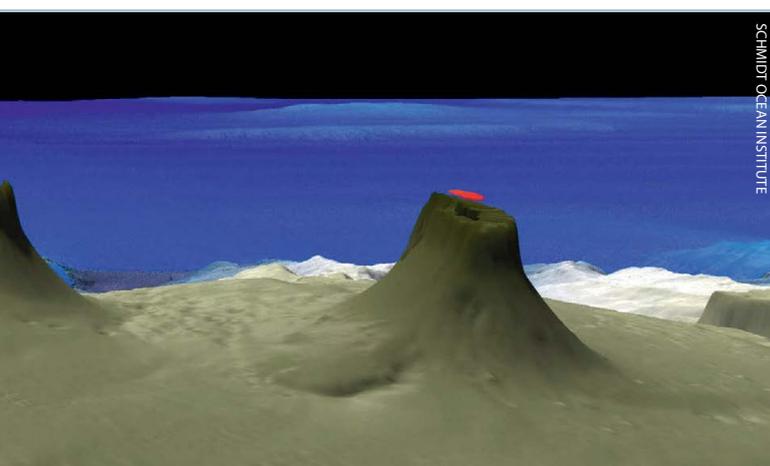
Hampered by poor visibility on the two dives, the divers reported that some 300sq m, or a fifth of the reef, had been damaged, affecting among other species staghorn, star, ring, floral and brain corals.

Heavy rainfall in the preceding two months might have contributed to the rockfall, officials believe.

They said that closure of the reef was for the safety of tourists and local fishermen, because it was feared that further collapses could occur. The area was cordoned off to boat-operators, and patrols were to be carried out.

The Koh Mae Urai dive-site is described as a group of soft-coral-covered pinnacles of similar height surrounding the main island, and is noted for its swimthroughs and seahorses living in yellow seafans.

A project to restore the reef was due to begin in November. ■



SCHMIDT OCEAN INSTITUTE

oceanographic research.

This year in the course of the expedition it has discovered deep-sea coral gardens, the longest recorded sea creature – a 45m siphonophore – and up to 30 new species off western Australia. To the east it has found five undescribed

species of black corals and sponges and made the first sighting of a rare scorpionfish in Australian waters.

The *Falkor's* voyage was set to continue until 17 November, with the extensive seabed maps created to be made available through the Ausbed programme. ■



Koh Mae Urai and its two breakaway sections.

DEPARTMENT OF NATIONAL PARKS

Clearance divers spared as Tallboy bomb blows



Above: A Tallboy bomb is loaded onto a 617 Squadron Lancaster bomber.

Pictured: The bomb goes off – 75 years late.

A PLANNED FIVE-DAY diving operation to defuse a WW2 Tallboy bomb in north-west Poland came to a premature end when the device exploded suddenly three days in, on 14 October.

Fortunately the divers were not working at the 12m-deep site at the time, and a bridge half a kilometre away that had been feared to be at risk in the event of an explosion was unscathed.

There were no reports of any injuries or damage to infrastructure in the area, a canal leading into the Baltic Sea near the port city of Swinoujście.

The operation was claimed to be the first-ever attempt to defuse a WW2 deep-penetration bomb under water.

Working at a depth of 12m, the divers had planned to use a “deflagration” technique, by which a remotely controlled device is used to pierce a shell and burn away the charge without causing it to explode.

All but the nose of the 6m-long bomb had been buried, and the

clearance divers from the Polish Navy’s locally based 8th Coastal Defence Flotilla had started the delicate work of exposing the body, only the nose of which had been visible – aware that any small vibration could detonate the device. This stage was expected to last three days.

“The deflagration process turned into a detonation,” reported a spokesman for Poland’s Ministry of National Defence, who said that the bomb could now be “considered neutralised, and would not pose any more threat to the Szczecin-Swinoujście shipping channel.”

He said that “there had been no risk to the individuals directly involved”

A 10-mile exclusion zone had been declared around the site and some 750 nearby residents had been evacuated during the operation.

During the war, as Swinemunde, Swinoujście was the site of one of the German navy’s major Baltic bases.

The 5-tonne Tallboy deep-penetration bomb was a British device. It had been dropped during

a raid by 18 Avro Lancaster bombers from the RAF’s 617th “Dambusters” Squadron on 16 April, 1945.

The bombers dropped 12 Tallboys in an attempt to sink the German cruiser *Lutzow*, which had been active in holding up the Russian advance, but one of the bombs was reported at the time as having failed to explode.

One Lancaster crashed with the deaths of all seven crew, but the *Lutzow* survived the raid.

Tallboys were designed to penetrate a target and trigger shockwaves as they exploded to maximise destruction levels.

The 6m bomb containing 2.4 tonnes of explosive was found last year during dredging work.

MEANWHILE IN Australia an unexploded 45kg bomb of unknown origin was reported in April by an angler fishing on one of the world’s southernmost coral reefs – biodiverse Elizabeth Reef, north of Lord Howe Island and 340 miles off New South Wales.

The device was declared to pose a “significant risk” to the public, but amid Covid restrictions the authorities had closed the reef to visitors until the bomb could be dealt with in late September.

Royal Australian Navy clearance divers aboard HMAS *Adelaide* lifted the device to the surface, but rather than risk defusing it the ship took it further out to sea and dropped it into 550m-deep waters where no deep-sea trawling is permitted.

The bomb’s age could not be determined because of deterioration, but devices of that size had been deployed by aircraft against enemy submarines during WW2.

“The device was regarded as live by the Navy and the consequences could have been quite frightening,” stated Environment Minister Susan Ley. “Thankfully the reef’s precious ecosystem is safe and, most importantly, so are future visitors.” ■

RINGNECK BLENNY POPULAR CHOICE AT TORBAY SPLASH-IN

THE FOURTH ANNUAL Splash-in underwater photography competition run by the Torbay branch of the British Sub-Aqua Club took place in challenging weather conditions on 19 September.

The divers were competing in four categories: Beginner, Compact Camera, Wide-Angle and Close-Up/Macro. At the end of the day 49 photos were submitted by 12 of the 19 registered competitors, and shown that night at a dinner at the Royal Torbay Yacht Club.

The Popular Vote was for this shot of a

ringneck blenny by Simon Temple. “I decided to dive Eastern Kings reef in Plymouth,” he said.

“Big spring tides over the competition weekend meant that I had to dive at high water and, even then, there was little or no slack water.

“Visibility was not ideal – 2-3m at best and lots of sediment in the water. The blennies were generally very nervous of divers, more than normal, which made it hard to approach them.

“I used an 85mm macro lens, which allows me to capture lots of detail without getting too close.” ■



SIMON TEMPLE



DIVERS FIND FIRST WW1 SUB OFF TUNISIA

Pictured: Open engine compartment hatch on the wreck of the *Ariane*.

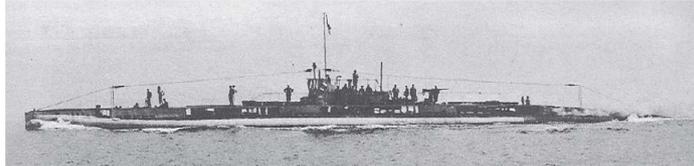
Below: Sister-submarine *Andromaque*.

TUNISIAN SCUBA-DIVERS have discovered the almost-intact wreck of French submarine wreck the *Ariane*, sunk during World War One.

Launched in 1914, the 54m *Ariane* (Q100) was one of eight Amphitrite-class submarines built for the French Navy before the war.

She was torpedoed at the surface on 19 June, 1917, by Imperial German Navy minelaying submarine *UC-22*, with the deaths of 21 of the 29 crew.

The *Ariane* was found off the Cape Bon peninsula in north-east Tunisia on 21 September by divers from the two-year-old Ras Adar Dive Centre, based in the town of El Haouaria. Checking possible locations for new wreck-sites to visit, they came across the sub on their first dive, at a depth of 50m.



Maritime-history experts later advised that the submarine could only be the *Ariane*, which had been based at the former French port of Bizerte during the war.

It is the first WW1 submarine to have been found off Tunisia, and only the third submarine from either war.

French submarines of the time were relatively crude submersibles that spent most of their time at the surface, and lacked sleeping quarters or sanitary arrangements.

They would dive only for a few

hours at a time during attacks, in which time all the crew would have to occupy the engine-room.

Many thousands of Tunisians and Algerians were mobilised to fight or labour in French factories during WWI.

German submarines such as *UC-22* operating off North Africa were tasked with cutting France off from its African colonies, to prevent such reinforcements and supplies crossing the Mediterranean. *UC-22* was credited with sinking 23 ships during 15 patrols, and survived the war. ■

BASQUE DIVERS EXPLORE BRITISH SHIPWRECK

THE WRECK OF a 19th-century British cargo ship that had been carrying bags of cement for an imperial infrastructure project has been identified in the Bay of Biscay by a joint French-Spanish archaeological team.

The divers are hoping to learn more about the vessel, the *Criterion*, with the help of British archives and maritime historians.

The shipwreck was found near the French resort of St-Jean-de-Luz, which lies near the border with Spain, and surveyed as part of the Urpeko Ondarea Project, mapping sites of interest along the Atlantic coast to promote Basque maritime history.

The dives were carried out following a tip-off from a local man



St-Jean-de-Luz harbour.

who had come across the wreck-site in the 1970s and taken off it some metal bars that he still used to prop up garden plants.

The *Criterion* sank while in harbour on 11 February, 1882, with Captain William Patterson and seven crew aboard. Along with three other ships she had broken free of her moorings in heavy seas and been propelled towards the rocky shoreline.

Rescuers from the town managed

to position a boat so that they could fire arrows attached to lines towards the *Criterion*. Succeeding at the third attempt, they were able to stretch the line between her mast and the boat over a 100m distance, and succeeded in bringing all the sailors to safety.

The dives were carried out by members of two Basque-country marine archaeological bodies engaged in the project – Itsas Begia, based in the nearby French town of Ciboure, and the INSUB Underwater Research Cultural Society of San Sebastián in Spain.

The cement had been imported for use in Emperor Napoleon III's plan to erect a seawall to protect St-Jean-de-Luz, a resort then popular with both the French and Spanish aristocracy. ■



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Blackwater shot scores at WPY

CHINESE UNDERWATER PHOTOGRAPHER Songda Cai's image *The Golden Moment* (right) won in the Underwater category of the Wildlife Photographer of the Year 2020 competition. It was one of the 16 winners selected from more than 49,000 entries from 86 countries.

The names were revealed during an online awards ceremony livestreamed from the Natural History Museum in London on 13 October. The NHM developed and produces the annual competition.

The winning blackwater night-dive picture shows a diamondback squid paralarva stop hunting for an instant when caught in Songda's light beam.

"From above, Songda captured the fleeting moment when, hovering in perfect symmetry, the diamondback paralarva turned to gold," said the jury. The photographer was diving in deep water far off Anilao in the Philippines where, each November, hundreds of the diamondback squid gather to spawn.

He used a Nikon D850 camera with 60mm f2.8 lens in a Seacam housing with Seaflash 150D strobes and Scubalamp lights, 1/200th @ f/20, ISO 500.

The other underwater photograph among the 16 winners was taken by Sam Sloss (Italy/USA) and topped the 11-14-years-old category. On a diving holiday in Indonesia's North Sulawesi he had been watching a group of clownfish in their anemone home, intrigued by the expression of one that kept its mouth open.

Rather than following the flitting



The Golden Moment.

SONGDA CAI, WILDLIFE PHOTOGRAPHER OF THE YEAR 2020



A Mean Mouthful.

SAM SLOSS, WILDLIFE PHOTOGRAPHER OF THE YEAR 2020

featured remote Fakarava Atoll in French Polynesia, where large topshells, a traded species now in decline, hide by day in coral crevices on the outer fringes of the reef, withstanding the strong currents and surf.

At night, the molluscs emerge to graze on algae. Cruising behind them in the photo was a 2m grey reef shark. Ballesta framed the night life stirring beneath the reflections of the reef, using a Nikon D4S camera with 17-35mm f/2.8 lens, a Seacam housing and strobes, 1/250th @ f/11, ISO 800.

fish in his viewfinder, Sam positioned himself where he knew that it would swim back into the frame.

On downloading his photos he saw the tiny eyes inside the fish's mouth and realised that they belonged to a "tongue-eating louse".

The parasitic male isopod had

swum in through the fish's gills, changed sex, grown legs and attached itself to the base of its tongue, sucking its blood and replacing the tongue as it withered and dropped off. Though an isopod's presence can weaken its host, the clownfish could still feed.

A Mean Mouthful was taken using a Nikon D300 with 105mm f2.8 lens in a Nauticam housing with two INON Z-240 strobes, 1/250th @ f18, ISO 200.

Before the awards ceremony the NHM had also released a preview of "Highly Commended" photographs from each of the 16 categories.

Only one of these was diving-related, and it came from the Under Water category – *The Night Shift* by French photographer Laurent Ballesta.

The wide-angle image

Competition entries are judged anonymously based on innovation, narrative and technical ability.

The 100 shortlisted images from which the winners were chosen are set to be showcased in lightbox displays at the annual exhibition at the NHM until 6 June next year.

This later goes on tour across the UK and to venues in Australia, Canada, Denmark, Germany and elsewhere.

Tickets for the NHM show have to be booked in advance, but because of lockdown the museum is not set to reopen before early December.

Meanwhile the 57th WPY competition is open for entry to professionals and amateurs of all ages and abilities until 10 December, via nhm.ac.uk. New categories focusing on humans' impact on the planet have been included.

Photographers can enter up to 25 images for a £30 fee (£35 in the final submission week), but those aged 17 or under can enter up to 10 images for free. ■



The Night Shift.

LAURENT BALLESTA, WILDLIFE PHOTOGRAPHER OF THE YEAR 2020

FINE FOLLOWS 'GAS-SWITCH TRICK' DIVER DEATH

THE NEW ZEALAND Defence Force (NZDF), which embraces all branches of the country's armed services, has been fined following the death of a Royal New Zealand Navy diver during rebreather training exercises.

The fine amounted to \$288,000 (about £147,000), less than a fifth of the maximum that could have been imposed.

Health & safety body Worksafe had brought charges against the NZDF of failure to ensure the safety of employees, exposing six sailors to risk of death or serious injury.

Proceedings at Auckland District Court on 16 October and at an earlier court of inquiry were reported by New Zealand media website *Stuff*.

Able Diver Zachary Yarwood, 23, died on 25 March, 2019, after an incident at Devonport Naval Base in Auckland. He was taking part in a night-dive with five other trainee divers at the end of the first day of "Endurance Week" – the fourth of an 18-week course.

The day had started with a four-mile run followed by a shallow 180-minute compass swim on oxygen.

The trainees then carried out a deeper nitrox dive, and the fatal dive, a snag-line seabed search in 6m, again meant to be carried out on nitrox, started at the base at 8pm.

The divers were using front-mounted Dräger LAR7000 rebreathers, which combine closed-circuit oxygen and semi-closed-circuit nitrox diving and allow switching between the two modes on a dive.

Yarwood was in one of two groups of three divers. His fellow-trainees



Zachary Yarwood.

were secured about 30m apart on a guideline as he moved between them unsecured, holding the snag-line.

All the divers' individual SMBs should have been monitored by two attendants, but they were absent.

Only a dive supervisor, standby diver and medic were present, and at one point the standby diver had gone to make tea. Neither he nor the supervisor had been fully qualified for mixed-gas diving or instruction.

After 88 minutes an SMB entanglement occurred with the other group, and the supervisor directed all divers to surface.

He and the standby diver were assisting the first group when they noticed that only one diver from Yarwood's group had surfaced, and was indicating a problem.

Yarwood had been found unresponsive on the seabed, having been in that state for as much as 15 minutes. He was brought to the surface and, being entangled in lines, it had proved difficult to recover him to the safety boat and pontoon.

There was a delay in contacting the emergency services but the standby diver performed CPR until Yarwood could be taken to hospital, where he later died from brain damage brought about by hypoxia.

Fellow-trainees later admitted that to save gas and improve their dive durations they had been switching their rebreathers between nitrox and oxygen modes. This unauthorised procedure involved closing the bubble-diffuser and allowing the counterlung to fill, with the diver breathing from the bag while trying not to activate the oxygen demand-valve before switching back.

Yarwood had gone further by turning off his oxygen cylinder to avoid tripping the valve – and it had been turned off when he was found.

The students said they had used their "gas-switch trick" on the second dive of the day to beat their previous duration records, although Yarwood and others had reported feeling dizzy and unwell as a result.

But Yarwood, who had the lowest dive-times on the course and had been struggling with some cardiovascular activities, was said to have felt under particular pressure to improve his underwater endurance.

The students appeared to have been unaware of the high risk, and more concerned about being caught.

A medical expert said that Yarwood had been "on a one-way path to hypoxic loss of consciousness" within 5-10 minutes and that the gas-switching practice was "extraordinarily dangerous".

Yarwood had joined the navy in

2013 and been awarded three medals for work overseas and good conduct.

He was described as highly driven, fit and heavily muscled – which could have increased his body's demand for oxygen when diving. He was also found to have lacked certificates of competence needed for the diving he was doing on the day of the incident.

After the sentencing, Navy chief Rear Admiral David Proctor apologised to Yarwood's family and friends. "The loss of a sailor under training is never acceptable," he said, "Nothing I can do will bring Zach back, but what I can do is commit to putting things right now and into the future."

He said that the NZDF had failed to follow its own procedures. "Our environment is inherently dangerous, and we must look out for those people when they are fatigued, and we did not do that," he said, adding that the culture should be focused more on "professionalism, humility and mission achievement".

The court of inquiry report had noted a lack of governance, a culture focused too heavily on physical prowess, poor risk-assessment and fatigue-management systems, and confusion around dive instructions and policy at the naval dive-school.

The students had been diving for 390 minutes on the day Yarwood died – the maximum for nitrox rebreather diving has since been reduced to 300min.

In the UK, the Health & Safety Executive has recently censured the Ministry of Defence over two separate military-diver deaths. ■

Life-saving diver drowned after rebreather spike

AN OFF-DUTY police officer who died while scuba-diving in the south-east of Ireland last year drowned after sudden convulsions caused his closed-circuit rebreather mouthpiece to fall out, a coroner's inquest has heard.

Garda Dave Hearne, 47, who had convulsed as a result of inhaling excessive oxygen, had long been hailed as a hero for his numerous feats saving the lives of other.

Garda Hearne came from Co Wexford, where he had been wreck-diving with four other members of Hook Sub-Aqua Club, of which he was chairman. The wreck lay at a depth of 70m, nine miles off Hook Head in the Irish Sea.

Two fellow-divers had found him unresponsive on the seabed. They had brought him back up to the club-boat, but all efforts to revive him had failed.

Rebreather expert Dave Gratton had been asked to examine Garda Hearne's equipment and reported that a number of alarms had been triggered as the result of an "inexplicable" spike in oxygen supply levels, according to an inquest report in the *Irish Independent*. The diver appeared to have had no time to respond before the convulsions occurred.

"You would not have the possibility of maintaining the loop in your mouth," Gratton told

coroner Ger O'Herlihy. "The water would go into your mouth and that would lead to drowning." The coroner confirmed an inquest jury verdict of accidental death.

Garda Hearne, who was married with four children, worked with Waterford Divisional Traffic Corps but had previously belonged to the Garda Water Unit, where his swimming and life-saving skills had enabled him to save the lives of nine people during his career.

He had died unaware that exam results had already secured him his dream promotion to sergeant.

Known as the "Golden Retriever" by fellow-officers for his numerous rescue feats, Garda Hearne had



Garda Dave Hearne.

received a National Bravery Award in 2016 for saving two lives 10 days apart, and a medal for marine gallantry for a double river rescue in 2007. ■

Dive-climber Scott peaks in style

LONGTIME CHARITY champion Lloyd Scott has completed his nine-day Three Peaks Challenge, climbing Britain's highest mountains in quick succession while wearing a 59kg diving suit, helmet and weights.

Celebrating his 59th birthday on 13 October, he declared that the mountain feat would be his last major charitable challenge.

The weather turned against Scott on the final peak, Snowdon. The veteran fund-raiser had to battle through torrential rain, strong winds and near-zero visibility to complete his two-day climb to the summit of Wales' highest mountain by mid-day on 12 October.

Earlier Scott had scaled Ben Nevis, Scotland's highest mountain, followed by England's equivalent Scafell Pike in the Lake District.

He had set off with his support team over the tough terrain of the Scottish mountains at dawn on 4 October, also in testing conditions, completing a seven-hour ascent followed by a night camping on the mountain. The next day he reached the British Isles' highest peak, but it had taken a gruelling 13 hours.



Lloyd Scott completes his last hardhat endurance challenge.

Scott really started to feel the pressure soon after beginning the ascent of Scafell only a day later.

"My legs are pretty smashed," he admitted 45 minutes into the climb.

"It took me two days to get up Ben Nevis and normally after doing that in the diving suit it would take two weeks to recover from."

Despite this he made good progress to the halfway point where he camped overnight, but the next day progress proved difficult over

steep, slippery terrain, with leg-cramps setting in.

However he reached the summit at mid-day on 8 October, and descended for a brief respite before the climax of the challenge – the two-day ascent of Snowdon.

Scott, who has raised £5 million for charities over the course of some 50 campaigns, embarked on his fund-raising career after being diagnosed with leukaemia – by completing the 1987 London Marathon.

He first became associated with hardhat stunts after covering the 2002 London Marathon course dressed in helmet and diving suit, breaking the world record for the longest recorded time to cover the 26-mile course.

The following year he completed the world's first underwater marathon in the suit in Loch Ness – that took 12 days and included a damaging fall off a 5m ledge. He went on to take part in five further marathons similarly attired, most recently in 2012 when he covered the Olympics marathon course in London in only six days.

The Three Peaks Challenge was carried out in aid of youth cricket and disability sports charity the Lord's Taverners, with which Scott has long been associated.

The charity says that the funds he raises – currently around £54,000 – would "help disadvantaged and disabled young people, who are battling loneliness and isolation."

"The Covid-19 pandemic has left them unable to access the charity's vital programmes to meet new friends, socially engage and develop a wide range of personal skills." ■

£9200 FOR DIVER'S SALVAGED WHISKY BOTTLE

AN UNLABELLED BOTTLE of probably undrinkable Scotch has been sold at auction for £9200 – along with the helmet of George Currie, the diver who recovered the bottle from the wreck of the *ss Politician* in Scotland in 1987.

It was the Scottish Maritime Museum that bought the whisky bottle, one of 264,000 that had been packed in 22,000 cases in the steamship's hold number 5.

In February 1941, the 137m vessel was heading from Liverpool to join a convoy bound for Kingston, Jamaica, and New Orleans.

She was carrying not only whisky but cars, bicycles, cotton, medicine, tobacco and Jamaican currency.

Gale-force winds caused Captain Beaconsfield Worthington to change course, and two days out on the morning of 5 February the ship struck submerged sandbanks off Rosinish Point on the Isle of Eriskay, grounded and flooded.

The crew were rescued by people from Eriskay, but soon they and others from across the Outer Hebrides had

started recovering the whisky, on which no duty had been paid. Living under WW2 rationing controls, they claimed to have salvage rights to the ship's cargo. A number of them were later caught and imprisoned, and the *Politician* was scuttled.

The story was immortalised in Compton Mackenzie's book *Whisky Galore!* after the war. The classic 1949 film was remade in 2016.

Most of the submerged cargo was officially salvaged at the time but in 1987 North Sea hardhat diver Currie and colleagues embarked on a search

for the wreck after completing a subsea cable repair between South Uist and Eriskay.

They found it and recovered eight bottles. The now-auctioned bottle had remained in Currie's possession along with two bricks from the *Politician*, included in the auction lot.

"We are thrilled to add this bottle of whisky that has become so embedded in Scottish island folklore to the collection," the museum's senior curator Abigail McIntyre told the Press Association. "There are so many fascinating topics we can

explore with our visitors through it, from island life during the war period and underwater archaeology and recovery through to challenging our understanding and portrayal of smuggling in Scottish waters.

"The wreck of the *ss Politician* had a profound effect on the life of the islanders of Eriskay, many of whom felt keenly the injustice of being prosecuted. As well as looking at the impact of the shipwreck generally, we will also explore maritime laws and their implications through this wonderful new artefact."

The whisky is believed to have come from the W&A Gibley distillery, which owned the Glen Spey, Strathmill and Knockando brands before the war. It was purchased with the help of the National Fund for Acquisitions.

The museum's maritime heritage collection is housed in Irvine, Ayrshire, where the bottle was set to go on immediate display, and in Dumbarton.

It will later feature in a planned "Smuggling and Swashbuckling" exhibition. ■



Famed whisky-carrier the *Politician*.

Mary Rose diver to sell rare watch



Mick Burton's army logs are being sold with the watch.

WOOLLEY & WALLIS

A DIVER is hoping that the rare Army-issue watch he wore while working on the *Mary Rose* nearly 40 years ago can now help his children – and fund his dream dive-trip to the Great Barrier Reef.

As a Royal Engineers sergeant-major, Mick Burton was one of the dive-team that placed the cradle used to raise the Tudor shipwreck from the bed of the Solent in 1982.

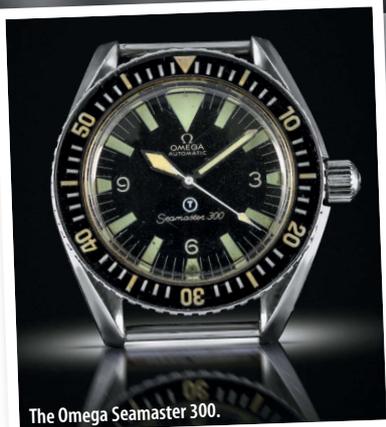
"We were brought in because the sheer physical labour and engineering skills required at that stage were beyond the archaeological diving team and the volunteer-divers who had been helping out," explained Burton.

"I can only describe it as being like underwater mining. The bed of the Solent is hard chalk and the water was pitch-black. We were 60 or 70ft down, at times having to hang onto things because the tide was so strong.

"The work is not only physically demanding but mentally exhausting in those conditions."

Now he is hoping that the steel Omega Seamaster 300 Edition watch he wore on the dives will raise more than £20,000 at auction. Only a small number of the watches were made for military use, between 1967 and 1970.

Sgt-Major Burton was issued with his watch in 1974 and used it to log some 180 hours of dive-time around the world, including several years in Northern Ireland during the Troubles.



The Omega Seamaster 300.

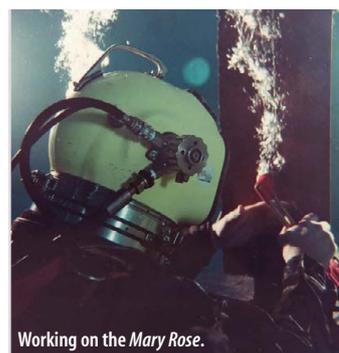
"Your watch is one of your key pieces of equipment when you're diving," said Burton. "You're given a set duration at the start of the dive, for safety as much as anything, and in the bad conditions we experienced in the Solent you're looking at your watch constantly. Any diver would be lost without it."

When the Seamaster stopped working in 1983 the Army intended to destroy it, but agreed to allow Burton to keep it if he could get it repaired. Six years later he found a clockmaker able to do the job, and has worn it only for social occasions since then.

"At the start of the year I happened to see an article about a Rolex diving watch that had sold for a lot of money, so I thought I'd Google mine," explained Burton. "I was stunned when I saw what it could be worth!"

When an auction house valued the Omega Seamaster at £20,000-30,000, Burton decided he could use the money to help his three children and "hopefully go to Australia to dive the Great Barrier Reef, which is something I've never done and would love to do".

The watch was to be sold in the Fine Jewellery auction at Woolley & Wallis in Salisbury on 19 December, along with Burton's army diver's logs, including his time spent on the *Mary Rose*, and a certificate for that work. ■



Working on the *Mary Rose*.

* Dive Watch Guide, page 44.

Freda's Diver Dishes



If it wasn't for lockdown most of us would still be diving in the sea or, if the weather didn't allow, at least in a quarry. I have chosen this dish because December is upon us and gurnard is an extremely sustainable fish to eat at this time of year. Your local fishmonger should have plenty available.

Like pollack, the gurnard has been a much overlooked fish. It is also known as the sea robin, because of its large red pectoral fins, which look like a bird's wings. It's also called chicken of the sea, thanks to its meaty texture. Served with a dulse and red onion mash and a little side-dish of kale and samphire, this makes a beautiful seasonal dish.

Dulse (*Palmaria palmata*) is a wild seaweed that grows on the North Atlantic coast of Britain. For centuries it formed part of a regular diet for coastal-dwelling communities in Scotland and Northern Ireland, because it is rich in vitamins and minerals, and a good source of protein. Dulse also has significant levels of iodine.

Sea Robin: Red Gurnard with Dulse & Red Onion Mash serves 2 divers



Ingredients

2 fillets of tub gurnard, 130g each; 1 green chilli, diced thinly; 1 tsp sea salt; 1 tsp caster sugar; 1 lime zest, grated & freshly squeezed; 2 tbsp rapeseed oil; handful sliced mint; 3 medium potatoes; 1 red onion, peeled & sliced; 5g dried dulse; 1 tbsp rapeseed oil; salt & pepper; 100g kale; 50g samphire; olive oil

Method

In a shallow oven-dish, place the chilli, sea salt, caster sugar, lime juice, zest, rapeseed oil and mint together and mix. Skin the gurnard with a fillet knife and place in the marinade, ensuring that the fillets are covered on both sides. Leave for a couple of hours, or longer if you have time. Bake in a hot oven at 180°C for 20-25min.

Place the dried dulse in a small dish and cover with boiling water for 10min or so, then drain and set aside. Gently fry the red onion in a pan with a little oil until soft and caramelised. Set aside.

Peel, cut and boil the potatoes. Sauté the red onion in a little oil in a pan until caramelised and set aside. Mash the cooked potatoes, add rapeseed oil, red onion and dulse and season to taste.

Steam the kale and very quickly, using a non-stick pan with a little olive oil or butter, fry some samphire, add the cooked kale and serve with the gurnard and red onion dulse mash. Pour the cooked juices over the fish or serve on the side in a small dish.

Top Tip

There are so many great reasons to eat fish, but is our consumption of this delectable food having a negative impact on our planet? We eat fruit and vegetables in season, so why not do the same with fish? For years gurnard were thrown back or used as bait by fishermen, but recently people have realised that they make great eating and their popularity is on the rise.

If you have a dog, bake the fish-skins in the oven in a separate dish until really crispy. Your dog will love you for it and will reduce your waste.

* Freda Wright is a diver and chef on British diving liveaboard *mv Salutay*. Find more of her recipes in the book *40 Dives 40 Dishes*. It costs £16 plus £1.95 postage. £1 from every sale goes to Oceans Plastics Greenpeace, salutay.co.uk





KIERAN DUNCAN

3D photogrammetry image of the wreck.



KIERAN DUNCAN

Diver on the A-turret.

3D insights from Fallen Oak video

ESSENTIAL FREE VIEWING for wreck-divers is *Fallen Oak*, a new 26min documentary marking the 81st anniversary of the sinking of HMS *Royal Oak* in Scapa Flow.

The Revenge-class battleship sank on 14 October, 1939, at the start of WW2, after being torpedoed by the German submarine *U-47* while at

anchor. The rapid sinking caused the deaths of 835 of those aboard, at least 100 of whom were boy-sailors.

Prof Chris Rowland and Kieran Duncan of the University of Dundee have created 3D photogrammetry images of the wreck based on footage and stills of key features captured last year by a team of volunteer divers, led by Emily Turton and Ben Wade of the



Graphic showing the battleship sinking.

Orkney dive-boat *Huskyan*.

Rowland led the original Adus 3D mapping of the wreck from sonar scans in 2006, and the documentary goes behind the scenes to explain the process behind creating the new, more sophisticated, virtual imagery.

The *Royal Oak* saw action during WW1 as part of the Grand Fleet at the Battle of Jutland, and between the wars served in the Atlantic, Home and Mediterranean fleets.

At the start of WW2 the battleship

was designated as obsolete but provided what was regarded as a safe base for more than 1200 sailors.

The protected wreck is normally visited only by Royal Navy Northern Diving Group divers, who replace a White Ensign flag on the stern on each anniversary of the sinking.

This year, because of Covid restrictions, that dive did not take place, although a ceremony was held at the surface.

The *Huskyan* divers were given special permission by the Ministry of Defence to undertake the project.

Fallen Oak, directed by Kieran Duncan, can be seen at vimeo.com/460447596.



Chris Rowland.



this month DIVER likes...

In Transition Many new free video shorts have caught our eye, but for an example of finding fascination in your own backyard, Maxwell Hahn's 8min *Tadpoles: The Big Little Migration*, shot over four years in a British Columbia lake, is a stand-out – find it at vimeo.com/456773907

Seahorse Portal The Seahorse Trust has been trying for years to raise funds to build an online portal for its World Seahorse Survey and now it can, thanks to a grant from the Sealife Centres. Keen spotters of the creatures will soon be able to upload their images to the database.

Legacy of the Rooswijk Yet another vid worth your time is the latest about excavation of this 18th-century Dutch shipwreck on the under-threat (from dredging) Goodwin Sands in Kent. It's on YouTube.

Green Fins OK, a lot of the Reef-World Foundation's 600 or so Green Fins dive-centres are in Malaysia but they clearly work very hard to minimise environmental impact – so congratulations to the Bubbles, Flora Bay and Tioman dive-centres for sharing top honours this year.



The *Royal Oak* in 1937.



3D image showing two of the four torpedo holes.

KIERAN DUNCAN

BODY DOUBLING

Cornwall-based dive-wear maker Fourth Element is known for being innovative, and its latest idea is a simple but appealingly effective one. About two-thirds of the company's design team is female and, as humans



tend to do, they come in a wide variety of shapes and sizes. And because they're always being asked by confused divers: "What size do I need?", especially right now while trying on swimwear, undersuits and wetsuits is impractical, the brainwave was to get the women to model the company's latest ranges themselves. It's not exact, but customers can go for whichever staffer they feel they can most closely identify with. Genius! I suppose it must be saving on modelling fees too, and if it all helps to secure the future of this smiley team, all to the good! The menfolk seem to be off the hook, for now...

have taken to dishing up a steady stream of them in their news pages without necessarily mentioning when these wrecktastic discoveries were made. I guess it doesn't matter to *Express* readers, who don't ask for much more in life than a rollicking good story, but it does give the impression that a whole lot more activity is going on beneath the sea than there actually is at the moment. But really, it is a great way of filling space. We're just off to check out our own deep archives, so beware...

Timeless wrecks

One of the first lessons in journalism school is that news stories should share with the reader as quickly as possible the "five Ws": Who, What, When, Where and Why? It isn't fake news, exactly, if you leave out or delay the "when," but it can be a tad misleading. The *Daily Express* team clearly feel that they've found a magic formula in sensational shipwreck stories because they



It's difficult to imagine this happening in the UK, but in the States at least one pair of scuba buddies are roaming the country as freelance corpse-hunters. Adventures With Purpose, aka Sam

Ginn and Jared Leisek, travel in a campervan and offer their services for bodies to bring closure to the families who have lost them. How do they know where to go? They share their exploits on social media, naturally, claiming no fewer than 18 million views a month, and their YouTube and Facebook followers tip them off. So if a vehicle leaves the road, the occupants aren't located and the dynamic duo are within driving distance, they check it out. The service is free, the pair find lots of other stuff too and claim to form a "super-close relationship" with the families they assist: "We stay in contact well after we've succeeded in the mission," Ginn told *Fox News*. "They love us; we love them."

Be that as it may, we suspect the British police force would take a dim view of such underwater enterprise. It might just imply that they weren't doing their job.

Hard knocks

Does film director James Cameron run the toughest dive-school outside of the Special Boat Service's? *DIVER* recently pointed out that Kate Winslet's role in *Avatar 2* had led to her doing the sort of breath-holds only usually achievable by gulping pure oxygen, and now we believe that's exactly how they're being achieved. In fact all the cast involved in shooting under water seem to have got into the O₂ habit to make life easier for the director. They also have to learn to keep their eyes

and, when required, their mouths open naturally while immersed in the H₂O. We hear that even septuagenarian Sigourney Weaver (yes, she really is 71!), who I'm afraid will always be Ripley to me, has insisted on shooting all her own gruelling underwater scenes too.



"I had some concerns, but that's what the training was for," Weaver told the *New York Times*. "I didn't want anyone to think: 'Oh, she's old, she can't do this... Let me at it!'" Cameron had noted what a hard-case she was years ago while filming *Aliens*: "I remember her just being black-and-blue after a couple of weeks," he said admiringly, his idea of casting perfection. We could have sworn that, as Dr Grace Augustine, Weaver didn't make it to the end of the first *Avatar*, but of course anything can happen in Alpha Centauri. To say that *Avatar 2* is long-awaited is an understatement – the team started shooting around 1956, I believe – but release date might now be as early as 2023! Three more sequels are set to follow.

Tech & tradition

Talking of tough female freedivers, we all know about Japan's *ama*, but I hadn't heard of the similarly intrepid *haenyo* of South Korea. They too are steeped in tradition, though they have conceded to modern ways by using wetsuits and gloves



along with mask, fins and chest-weights, but still fish using a net on a stick. There used to be 23,000 *haenyo* on Jeju island. A typical six-hour day would see them dive repeatedly as deep as 30m. However, the culture is vanishing with an understandable lack of new recruits and too many still dying at work.

Now a local university has invented two safety devices "incorporating advanced IT technology" especially for them, according to *Aju Business Daily*. The first, a "smart flotation device", incorporates underwater cameras and AI and automatically raises the alarm in an emergency. Sounds useful. The smartwatch identifies the *haenyo*'s dive-time, depth and temperatures. My first thought was, why bother to reinvent the dive-computer, but apparently this instrument also indicates their location. Tell us more!

Remember the Divers

Next time you're diving down Torquay way – OK, softies, maybe in spring – you might want to pop into the Divers Arms. Previously Route 16, it was renamed recently in memory of saturation-diver Andy Pybus, who died this summer aged 59 while working in the Gulf of Mexico. Cause of death has yet to be established, with a UK inquest awaited. The pub lies near Babbacombe Beach and is run by Pybus's wife, her sister and four daughters. "I live at the pub and so I am always in the Divers Arms and I feel so

comforted by that," daughter Hannah, who's in charge, told *Devon Live*. "It's a traumatic story but we just wanted to do something positive rather than focus on the negative. It does feel a bit as if we're a little bit crazy doing this at this time, but we've been overwhelmed by the amount of support we've had from everybody." The pub serves Sharp's Doom Bar and



Sea Fury, does home-cooked meals, has a beer garden with views over Lyme Bay, and sounds ideal for a spot of off-gassing.

BE THE CHAMP!



100

That's how many of these articles
ALEX MUSTARD has written now
– a treasury of sound advice!

'I reached out to the British underwater photography community, asking for individuals' essential tips'

BE THE CHAMP! IS 100! I am proud and happy to reach this milestone. I hope you've gleaned lots of useful tips from the columns you've read down the years, and a hearty "well done" to anyone who has read them all.

To mark the century, I wanted to do something special. The underwater world is not an easy place to take photos and this has always brought us together.

I've long believed that underwater photographers are a community, united against the challenge with knowledge pooled and shared for the benefit of all.

Those who've joined my workshops down the years will know that I actively encourage this sharing attitude and I am proud that you learn both from me and each other on my trips.

So, for this anniversary article I reached out to the British underwater photography community, asking for individuals' essential tips.

I gave them free reign, just requesting a pearl that has helped them or that they feel would help others.

As you'd expect, a few cheated by giving me two, but I've happily included

them for all our benefit.

The photographers didn't know what each other would say, so where several make similar points it is a good measure of its importance.

Some went specific, some general, but everything here is a valuable lesson.

A couple of points of order. Apologies, but I don't have space to introduce each photographer with more than their name. Many names you will know, but for those you don't, seek out their images on websites and social media – it is worth it.

Also, please don't read anything into any absent names. I don't have contact details for all the movers and shakers in British underwater photography – and not everyone who got my email remembered to reply before the magazine deadline! Let's get to it.

SUCCESSFUL UNDERWATER photography starts by switching your mindset from being a diver with a camera to a photographer who dives.

The great **Martin Edge** makes us confront this choice by asking: "Are you entering the water to have a fun dive or

Right: Many years repeatedly diving the *Thistlegorm* has taught me how to capture the best shots.

Taken with a Nikon D5 and 8-15mm fisheye. Subal housing. ONEUW strobes. 1/8th @ f/13. ISO 800.

Below: Learning when and where to find compelling subjects is essential.

Taken with a Nikon D5 and Nikonos 13mm fisheye. Subal housing. Seacam strobes. 1/13th @ f/14. ISO 320.

to take the best images you can? Don't get side-tracked – your concentration is everything!"

Martin has told me previously about his watershed moment decades ago. He unloaded his kit from a Cornish dive-boat and instead spent the day shooting a jellyfish trapped in a rockpool.

Something **Henley Spiers** would relate to: "to give yourself the best chance at memorable pictures, it's important that your identity as a photographer supersedes your passion for scuba-diving, meaning that you should be willing to ditch the dive if the image possibilities are stronger on a snorkel, hanging over the side of a boat, or even just wading in shallow water."

However you shoot, **Nick Robertson-Brown** stresses the value of dedication. "Focus on a particular subject you love and then photograph it from all angles, using different equipment and techniques, in different destinations or ecosystems, to build a portfolio of images of your favourite subjects."

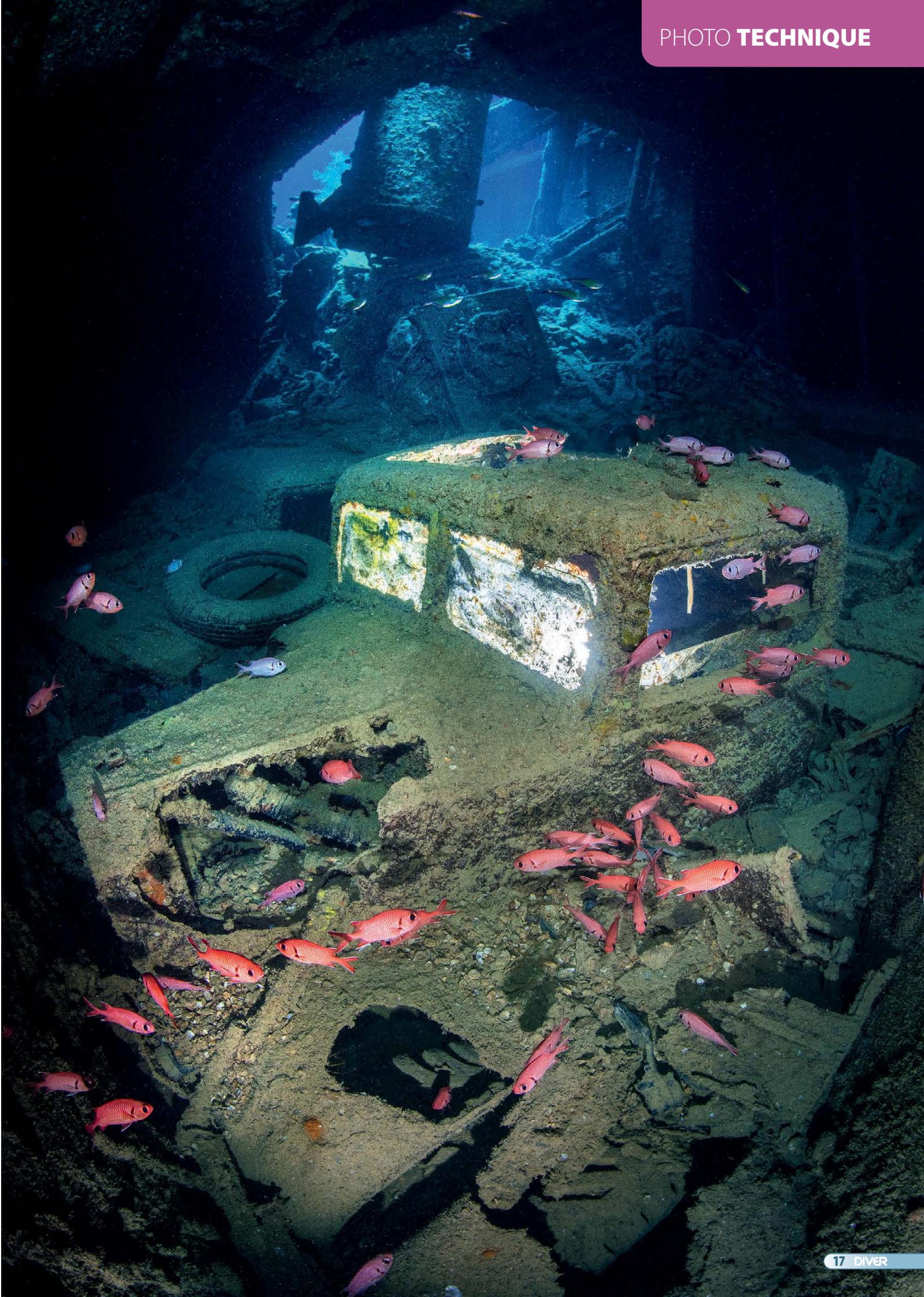
While **Laura Storm** encourages us to keep pushing our own boundaries and not to settle for an average shot, "whatever the environment, I like to look for the story and make it mine – experimenting and adapting until I've created something fresh, rarely seen or unforgettable."

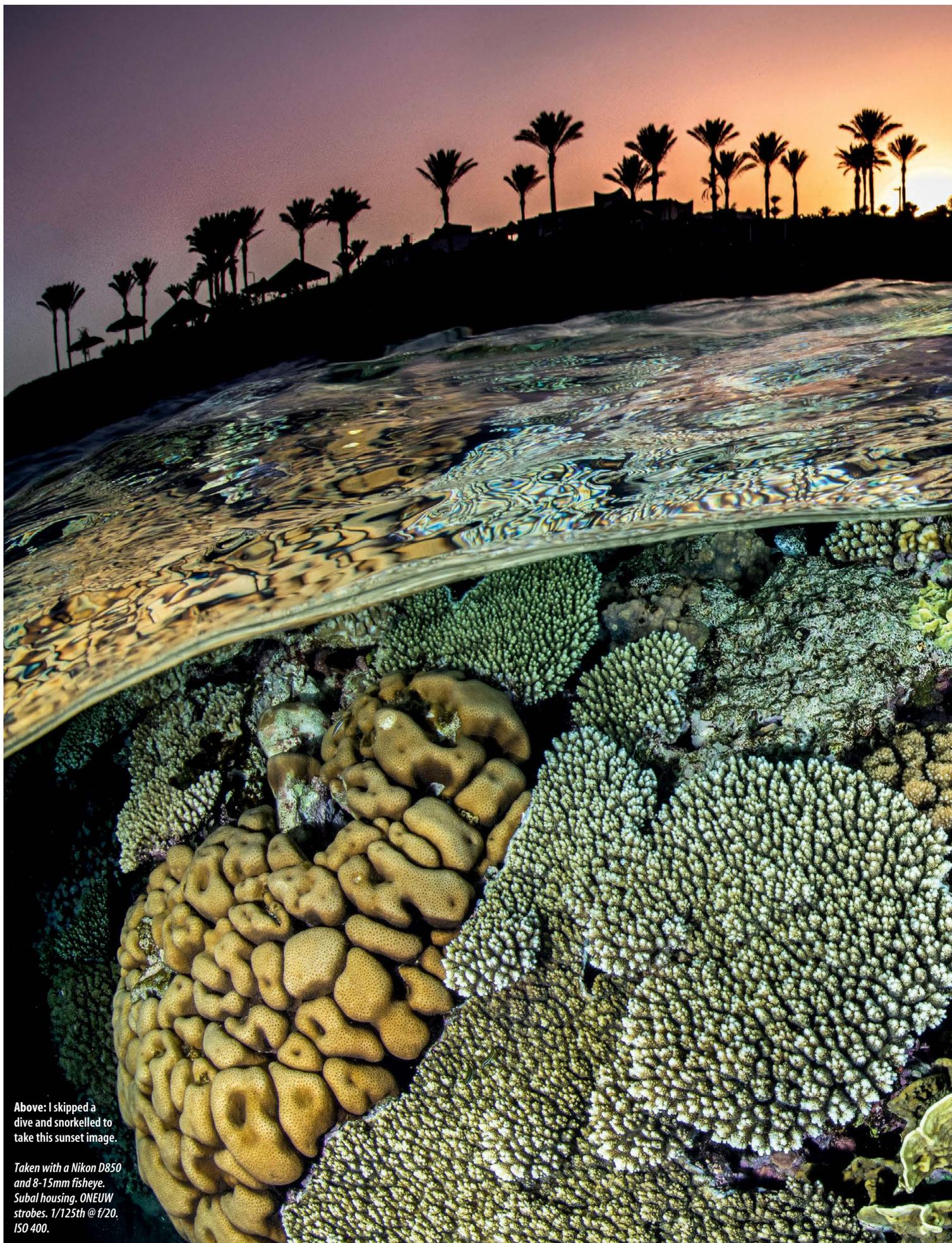
Mark Kirkland encourages artistic expression and not getting too bogged down in tekkie stuff. "Remember that photography is an art-form, so don't get too obsessed with technical perfection. Just experiment and find your own creative impulse."

Horacio Martinez stresses the value of finding your voice. "Learn and master all the techniques and best practices, but as important is to find your own vision, your own ideas and support them against all odds."

Nur Tucker generates her ideas from as wide a range of influences as possible. "I always look at other genres of photography for inspiration and creativity underwater – macro, fashion, flowers and more."

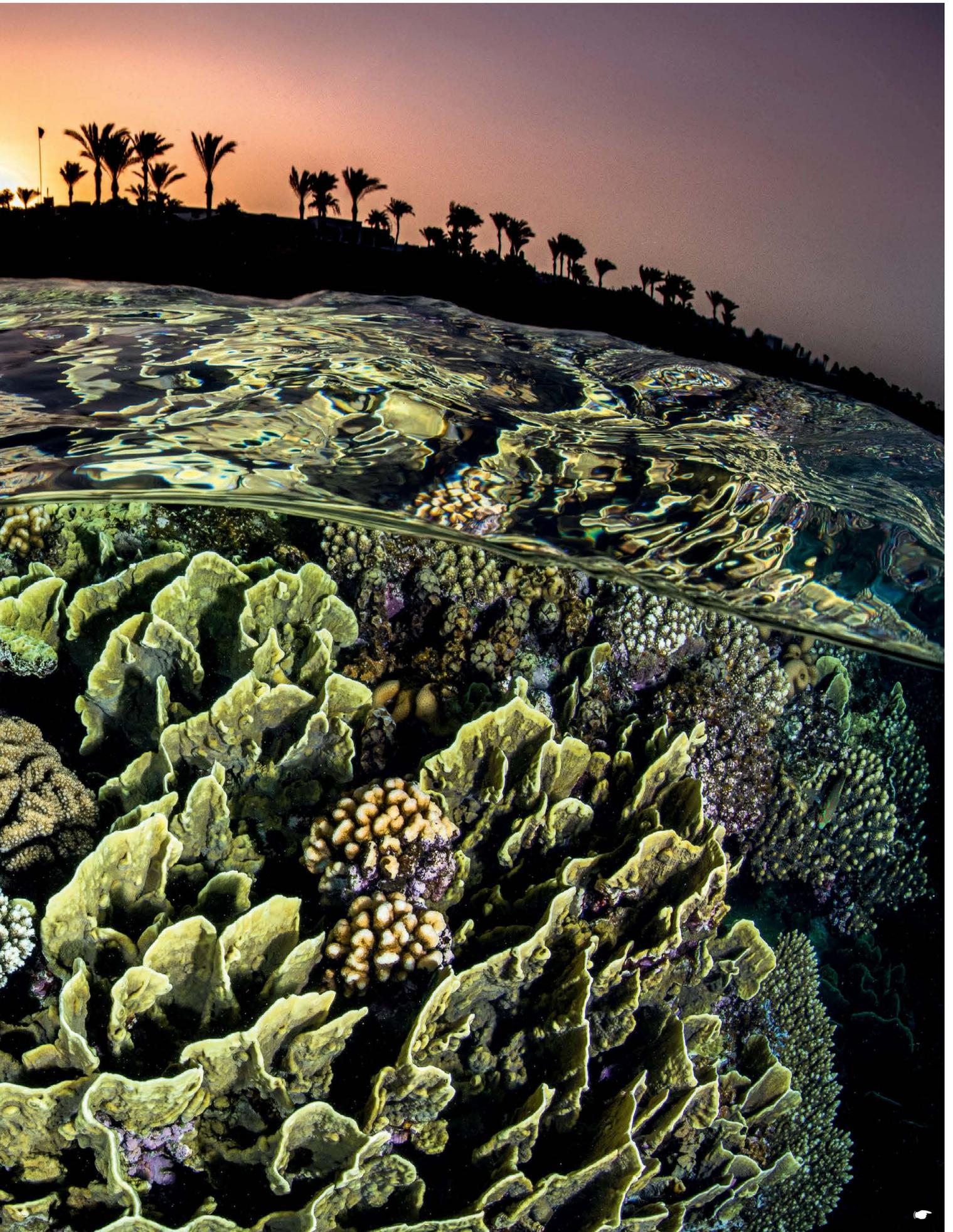


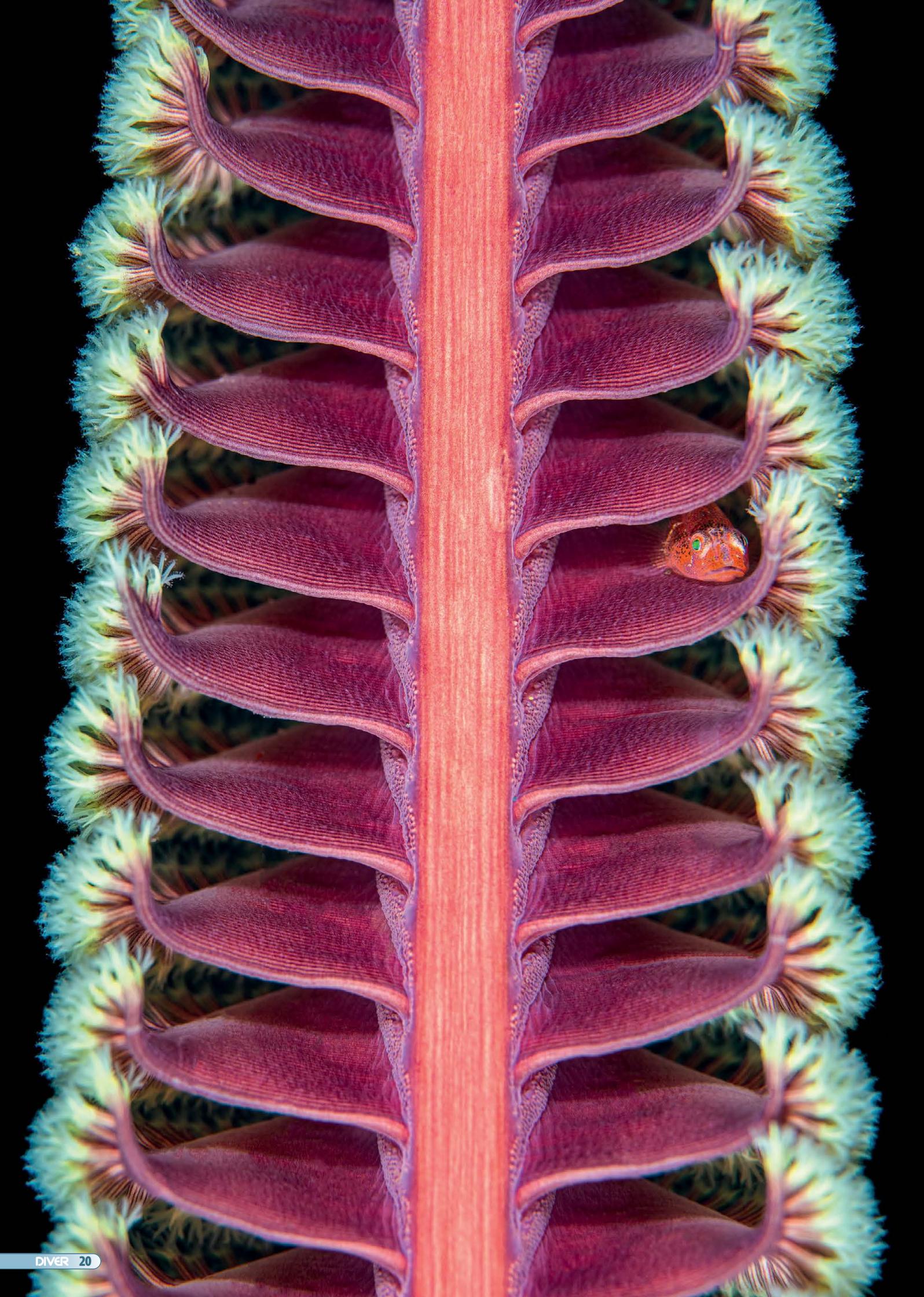




Above: I skipped a dive and snorkelled to take this sunset image.

Taken with a Nikon D850 and 8-15mm fisheye. Subal housing, ONEUW strobes. 1/125th @ f/20. ISO 400.





The most original images will usually garner the most attention. **Paul Colley** encourages us to have no fear of innovation: “The greatest surprises and breakthroughs often come to those who are willing to experiment without worrying about the failures that inevitably pave the road to success.”

Although the best underwater photographers usually think of themselves as photographers first, most are keen to emphasise the value of tip-top diving skills.

Adam Hanlon says: “Develop your diving skills with the same intensity as you do your photography ones.”

And **Simon Rogerson** adds: “Before you take a camera in the water you must have a high level of buoyancy control and spatial awareness. Poor buoyancy skills result in bad photographs and damage to the habitat.”

Saeed Rashid reminds us that it isn't certification cards, but in-water skills that really count. “The best thing to learn is that buoyancy is king and we are never too old or too proud to learn more about how to control it.”

Award-winning teenage photographer **Jasmin Pegge** continues on a similar theme: “Learn about different finning techniques to control and maintain your position in the water and to keep you steady for your photographs.”

PROPER REVERENCE and respect for marine life is essential for successful pictures.

Taking time to understand our subjects makes us both more careful not to disturb them and better prepared to take that winning image. This is an area of weakness that too many underwater photographers overlook.

Caroline Robertson-Brown advises photographers to “get to know your subject, whether it is coral spawning, what food a nudibranch particularly likes, or the feeding patterns of a basking shark.

“The more you know about your subject, the more likely you will be in the right spot at the right time.”

Jenny Stock continues: “Be patient and wait with a shy animal – it's surprising how often it will relax and resume its usual behaviour.”

“Often finding your chosen subject is half the battle,” continues **Jane Morgan**, “especially with the little ones, so research where they live and what they eat to make your job easier. Then all you have to do is take the perfect picture.”

Unsurprisingly, marine biologist **Dr Richard Smith** backs this up. “Take your time to observe, appreciate and learn about your subject. This will help achieve the best insight for capturing



natural behaviours.” It is a simple, but underused formula: the more we learn about our subjects, the better our images will be.

Related to a focus on our subjects is putting thought and planning into where and how we choose to dive.

“Dive one site 50 times, not 50 sites once,” suggests **Rob Cuss**. “The best photos come when you know your subject inside out.”

Dan Bolt encourages us to stay local. “Get to know your nearest dive-site intimately. Knowing which species will be present as the seasons change will help you plan your photography better and you'll be able to spot unusual species when they turn up, which they most assuredly will!”

Shannon Moran certainly agrees. “I'd say the most important thing is to be familiar with your local sites and know what you're looking at.

“I do most of my diving on the same site, yet every dive is different, but you slowly begin to learn the behaviour, territories and personalities of the critters down there.”

Trevor Rees explains: “My photography is all about doing the best I can with common British subjects.

“I realised many years ago that chasing exotic creatures by jetting all over the world had little if anything to do with creating appealing pictures.”

Peter Rowlands concludes: “If there is one positive thing to come out of this Covid year, it must be the renewed appreciation of our British marine life and it's imaging possibilities.

“I hope this will not be a ‘one-off’, but rather the beginning of a new image era from our amazing shores.”

Above: Make your work your own by being different. Give things a twist, like shooting a macro subject with a wide-angle lens.

Taken with a Nikon D2X and 10.5mm fisheye with teleconverter. Subal housing. Inon strobes. 1/8th @ f/9. ISO 100.

TIME UNDER WATER is always limited and the more wisely we use it, the better our images will be. Every moment of preparation or photographic thinking done pre-dive is time saved under water; time that is better invested in pushing our images to greater heights.

“Operating your camera should be second nature to make the best of any given opportunity,” says **Spencer Burrows**. “Practise on land as much as possible.” And Adam Hanlon continues: “Invest time and effort in preparing to capture images before you get in the water.”

Nick More explains: “Have a clear plan when starting your dive or trip. Focus on which subjects you expect to shoot and which techniques you will use to capture them. This will lead to much more consistent and high-quality results, allowing your pictures to stand out.”

David Alpert expands: “Plan what you want to achieve before you enter the water. Have a good idea of the subjects you want to shoot and the lighting techniques you want to use.

“If possible, practise these at home first. But remember, no good battle-plan survives contact with the enemy. Be agile and ready to adapt should your intended plans not work out.”

Properly preparing and optimising our photographic equipment is another essential step for success – even if it is just to avoid the silly errors, we all make.

“Remember to charge the battery – that was the mistake I made last night!” Shannon Moran admits.

Massimo Franzese is another advocate of practice making perfect. “Try any new significant piece of equipment you buy in the pool before taking it on a trip. 🐡

Left: When you see a great subject, make a plan and return for a better shot.

Taken with a Nikon D850 and 105mm. Subal housing. Retra strobes. 1/250th @ f/14. ISO 125.



Use it with subjects similar to those you want to shoot even if this means a friend has to be ‘fish of the day’ or you need to borrow your childrens’ Lego blocks.”

Stuart Gibson encourages a structured preparation to avoid mistakes. “Have a methodical system for setting up your camera in an organised space. Practise and refine that system so that it becomes second nature and you instinctively know it’s all done.

“Removing the worry and uncertainty from this part of the process allows you more energy and concentration on actually taking pictures. And it’s something that can be practised and refined out of the water. So no excuses.”

Paul ‘Duxy’ Duxfield continues: “Keep your dive-prepped camera and housing in your dive-crate under the benches of the wet deck on a liveboard, so it’s fully protected, out of the sun, it can’t fall or

have anything fall on it, and it’s done and ready for action.”

Underwater photography is a technical discipline and the right gear often makes the difference between getting the shot or not. **Rick Ayrton** suggests that we embrace the astonishing capabilities of the latest tech.

“Modern cameras can shoot very high (6400+) ISO successfully and this can be ground-breaking for wide-angle photography in dark conditions, such as shipwrecks. When shooting like this, try to use off-camera lighting and turn off your strobes.

“Even on low power, strobes can be too much in high ISO shots, especially if the visibility is less than perfect.”

Cathy Lewis reminds us of the value of accessories. “Invest in a good viewfinder – they’re not cheap and they’re bulky, but they give you a clear, expansive view

Above: Timing is everything. Not only do we need to be in the right place at the right time, but we need to press the shutter at the peak of the action.

Taken with a Nikon D850 and 28-70mm with Nauticam WACP. Subal housing. Seacam strobes. 1/160th @ f/14. ISO 400.

that really helps with composition. They can take a bit of getting used to, but once you’ve tried one, you’ll never go back.”

“While it’s great fun to delve into the variety of equipment available on the market, it can often feel a little intimidating if you’re on a tight budget,” says **Georgie Bull**. “Think carefully about how you can make the most of the equipment you have. A budget camera can do an amazing job of capturing the ‘feel’ of a dive-site, even if it can’t capture a shrimp’s eye in great detail.”

Rob Cuss is more general in his advice: “All photographic equipment has limitations – learn them and then stick within them!”

Rob Bailey reminds us not to get too gear-obsessed: “It’s the photographer who makes the photograph, not the camera.” **Martyn Guess** reaffirms that solid basics are more important than gear: “If you think you are close to your subject – get closer!”

THE REWARD OF writing this column each month is knowing it goes out to the underwater photographic community.

2020 has been a strange year. I’ve still managed plenty of dives and really enjoyed shooting in the UK this summer. What I missed most was people, both in the resorts and liveboards I frequent around the world, and the motley crew of buddies with whom I’ve shared these experiences.

Arguably, the highlight of getting out diving in the UK has been spending some socially distanced days with diving friends, although a few surface intervals chatting aren’t the same as travelling and sharing adventures together.

Diving and shooting together is one of the pleasures of being an underwater photographer. **Kirsty Andrews** says we should “dive with other photographers – you can learn from and bounce ideas off each other and they won’t complain about having a photographer for a buddy.”

Jenny Stock suggests that you “show people your photos and talk about what you’re trying to achieve. Listen to what they say. People love to share their knowledge with you.”

“My advice would be to talk to as many other photographers as you can,” continues **Cathy Holmes**. “Ask questions, however simple they might seem to be, because generally someone else has had the same problem and can enrich you with a little gem. Integrate, share and reap the benefits.”

We’re lucky to have such a community of underwater photographers. Join in and make the most of the rich vein of knowledge that’s embedded in one of the best aspects of our sport. 



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OUR EUROPEAN TOUR

Pt 2

IT WAS TIME FOR US to leave Sweden, and the plan was to go straight to the UK through Germany and the Netherlands. However, Covid-19 and the restrictions that ensued had other plans for us.

Lockdown was just starting to be lifted in the UK, and a 14-day quarantine was established for everyone entering the country.

As we were allowed to transit only through Germany we stayed in the Netherlands, and when the borders to Belgium and France opened up continued down to Normandy to dive some of its WW2 wrecks.

A diver from Bayeux dive-club offered to show us the diving in the area, and took us out to dive on the ss *Empire Broadsword* and *Norfolk*.

Unfortunately, although hot this wasn't the best time of year for diving in the area and, combined with rainfall the day before, the visibility had been reduced to around 1m.

Despite this, we had two nice dives on these historically interesting wrecks, and can only imagine how enjoyable the experience would have been with decent visibility.

AS WE WERE ABOUT to leave Bayeux our van started making worrying noises. Smoke billowed from the engine. Of course, it had to be the hottest day of our journey so far – 30°C.

Coincidentally, we were just outside a workshop. After being sent on to two other places we found one that had the required spare parts and were able to fix the vehicle without waiting days. That was the upside of having a French van breaking down in France.

While it was being repaired we and the two dogs set up camp in the shade outside, to the amusement of passers-by, and a couple of hours later we were on the road again.

On 10 July quarantine for people travelling from France to Britain was lifted, and we were finally able to cross the Channel and head for our first dive-stop there – Portland.

We dived from Chesil Beach, that

popular spot for shore-diving, and also the submarine *M2*, which required a boat-ride out.

Chesil Cove is an easy dive that suits beginners as well as more experienced divers because there is a lot to see.

However it can be a challenge to get into the water, especially if there is a big swell, because you have to negotiate the pebble slope that gets very steep as you enter the water. And after the dive it's just a matter of making your way back up the pebbles – probably easier with single tanks than with our twin-sets.

In theory sand-eels, lobsters, dogfish, crabs, cuttlefish and octopus can all be found at Chesil. We did two dives and unfortunately saw none of the above, apart from a cuttlefish that swam away as we started our descent!

The *M2* went down in Lyme Bay in 1932 along with all the crew and is designated as a war grave. It sits upright at 31-35m and is almost completely intact.

Despite what might be the first thought of many divers imagining a visit to a submarine there was a lot to see on deck, and besides being an interesting wreck much marine life too. Large conger eels peeked out of the many openings, and schools of fish swam around the wreck.

Diving with dive-centres and going out on dive-boats with other guests was when we really started to see the impact that Covid-19 was making on society.

Other than having to rearrange our travel plans and wear face-coverings at supermarkets it had not affected us that much in our day-to-day life until then. We had been largely keeping to ourselves and camping in fairly deserted places.

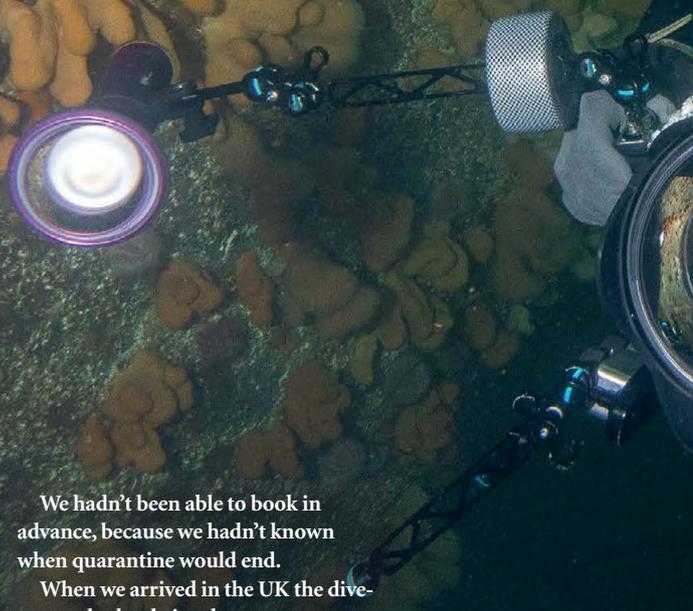
But greeting new people with the elbow and wearing a face-covering on the way out to a dive-site is not how things are usually done, although it soon started to feel normal.

Some places we had wanted to dive had been fully booked by people whose trips abroad had been cancelled and who had turned to home-waters sites instead.



For anyone who missed the first part of their journey, Swedish

film-makers **LINN VENNBERG** and **MATTIAS GRANBERG** set off to tour Europe in their campervan in May, initially diving on Sweden's own west coast. Then it was time to head south-west and start crossing borders



We hadn't been able to book in advance, because we hadn't known when quarantine would end.

When we arrived in the UK the dive-centres had only just begun to reopen, and shore-diving had been allowed for a couple of weeks.

The divers we met were all very happy to be back in the water.

Because of our delayed arrival we knew we would have to cut short our stay in the UK by a couple of weeks, so initially decided to skip Wales.

But after talking to a number of divers who said we shouldn't miss diving in Pembrokeshire, we managed





Pictured: Mattias in Loch Carron.

Above, from left: On the wreck of the submarine *M2*; formidable crab army at Martin's Haven in Wales.

Bottom left: Linn sets up on Chesil Beach.



to fit in a couple of days' shore-diving in Martin's Haven – a decision we definitely didn't regret.

This spot is an easy dive for all levels, although it can be a little trickier getting in at low tide if the swell is big.

Once in the water you just follow the wall and its forest of kelp at the top in either direction around the bay, or explore the sandy bottom in the middle.

During summer spider-crabs migrate to the coast from deeper waters to shed their shells and mate, and Martin's Haven is one of the sites at which you can observe this phenomenon.

Watching several hundred crabs

march over the seabed like an army was an impressive sight. Other than that we saw flatfish, dogfish, lobsters and bobtail squid during our night-dives.

ON OUR WAY to the Isle of Coll, one of our most exciting destinations, we drove through the amazing scenery of Snowdonia national park and up the west coast of England and Scotland to catch the ferry from Oban.

The next day we loaded our snorkel and camera equipment onto a boat and headed out around the Inner Hebrides to look for the filter-feeding giants that visit every summer – basking sharks.

The sea was a bit rough on the way out and, starting to feel a little seasick, I [Linn] decided to get some rest.

After a while a scream woke me: "Over there, a fin!" We had found the world's second-largest fish.

We observed them for a while to see whether they were on the move or sticking around to feed, then started getting ready. Wetsuits were pulled on, cameras prepared and those who had not snorkelled before were told how to do it and what would happen.

There was even time for a quick jumping-in and swimming practice.

Once everyone felt comfortable we slowly approached the basking sharks to manoeuvre into the best position to jump in without rushing them.

Anticipation was high. The skipper gave us his "Go!" and we dropped into the water. I looked up to see a fin moving towards us, and quickly ducked to wait. A shadow appeared ahead, and the next second a massive shark slowly cruised past, paying us no apparent attention.

BACK IN THE BOAT we were all full of adrenaline from the good start to the day, and ready for another drop.

The sharks hung around to feed all day and we spent several hours like this, being dropped to watch them cruise past with their huge mouths agape as they filtered water through their gills, retaining the zooplankton.

Sometimes they would turn and swim past us several times or circle us before swimming away. We returned to harbour very happy.

We stayed on the Isle of Coll for a week, devoted another day to the basking sharks and were lucky enough to get a lot of good encounters, at least at the start of the day.

After a couple of hours they seemed to be moving away, and after searching for a while we were about to give up when we saw a fin in shallow water by a beach.

We approached slowly, slipped into the water and waited for the shark to come to us. Moments later a shadow swept over the white-sand bottom and passed right beneath me in the clear water, almost





slapping me with its tail as it moved away.

With this rare and beautiful encounter we decided to call it a day and head back. On the way we heard reports of dolphins nearby and after heading in that direction suddenly found ourselves surrounded by hundreds of common dolphin jumping and playing around the boat. What a way to end two amazing days at sea!

A DIVE-TRIP TO Scotland would not be complete without diving some lochs. We wanted to see the Isle of Skye so chose nearby lochs: Duich and Carron.

In Loch Duich the bottom is mostly mud and rock and the objective is mainly macro. We dived two sites over a couple of days, and the night dives especially provided interesting sightings.

We encountered bobtail and common squid, a thornback ray, various crabs, lots of long-clawed squat lobsters, sea pens, dogfish and gurnards.

At one site the bottom was covered in thousands of different-coloured brittlestars crawling over each other, a spectacular sight.

Loch Carron, beside being a good place to find interesting sea creatures, provided some beautiful scenery. At a site by the castle in North Strome the wall was covered in deadman's fingers, and closer



to the surface the kelp stood tall and flowed in the stream. We really enjoyed this beautiful gentle drift-dive.

Even more interesting, however, was what we found at the bottom. It wasn't exhilarating at first glance, but looking more closely at what seemed to be a carpet woven of rocks and shells we could see its creators the flame shells peeking out from beneath it.

Loch Carron contains the world's largest known flame shell reef, an important environment used by many different species to reproduce. Again the night-life was especially diverting, from bobtail squid to Yarrell's blennies.

We took some time out driving around the highlands to take in their beauty as

the end of our allotted time in the UK approached, but we did have one last dive destination planned before leaving the country.

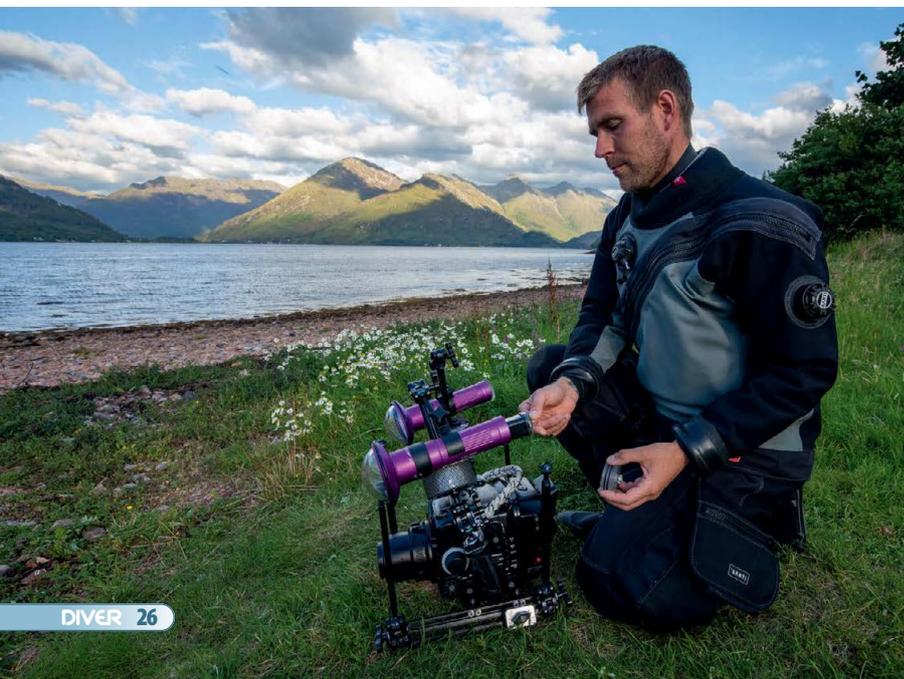
We headed to the Farne Islands in hopes of getting acquainted with its famous inhabitants – the thousands of grey seals that live on its rocky shores.

We took the short boat-ride out to the islands from Seahouses harbour and

Top left: The van parked on the Isle of Coll.

Above & inset: Basking sharks at the Isle of Coll.

Below, clockwise from left: Setting up at Loch Duich; scorpionfish in the loch; long-clawed squat lobster at the same location





almost immediately found seals lying in the sun on the cliffs. We spent a while watching them from the boat.

Now it was all about finding a good spot where the current was right for diving with the seals.

We found a good spot and jumped into the water. We descended along the kelp-covered wall and started swimming along it, heading for the canyon we had spotted from the boat.

After only a minute or so a seal appeared, but after a quick look at us it turned and swam away. Other seals did the same, and after checking us out at a



distance a couple of times started coming closer.

It didn't take long before I felt something pulling at my fin and turned to see a seal inspecting it. They stuck around to play with us for the entire dive and it was unwillingly that we ascended when our dive-time was up.

FOR THE SECOND DIVE we had to find a new spot because the current had changed. The chosen site also had a canyon so we decided to go straight for it, which turned out to be a good decision.

The seals were just as playful on this

dive, and not only our fins but also the cameras were inspected inquisitively.

Several seals came up to nibble my strobes, and even the protection around the domes on both our cameras. We had so much fun playing with them that the dive seemed to be over way too soon.

After that more-than-satisfactory conclusion to this leg of our journey, all that remained was to drive down to Dover to catch the ferry back to France.

The idea was to do some more wreck-diving, we hoped with better visibility than before, before continuing to our next destination – Portugal. 

Below from top: Yarrell's blenny; stout bobtail squid, both at Loch Carron.

Top right: The Old Man of Storr on the Isle of Skye.

Right: Grey seal at the Farne Islands.

Below right: Seals find it hard to resist fins.



DEEP SONIA



Diving to depths approaching 100m is still unusual even for wreck-divers these days, but for specialist marine biologist Dr Sonia J Rowley (who took all the marine-life photos here) it's all in a day's work. **PETRA PRUDEN** learns more



ED ROBERTS

DEEP-SEA GIANTS – the term might conjure thoughts of massive prehistoric sharks, or blue whales the size of school buses. There are, however, other types of giant lurking in the depths.

Dive into the world of Dr Sonia J Rowley, marine biologist and technical diver, on a quest to learn more about some particularly magnificent giants, gorgonian octocorals, and their evolutionary relationship to their environment.

So what exactly are gorgonian octocorals? Octocorals are seafans typically found in shallow tropical reefs, but if you dive further down, anywhere from 30 to beyond 150m, you'll find deep reefs often dominated by the largest of the octocoral forms.

Because of their remarkable size range – some have been documented as growing to more than 5m wide – this type of erect seafan coral is known as a gorgonian, “gorgeous gorgs” as those in the field sometimes call them.

In years past, this deep-reef range of the marine realm in which gorgonians, and countless other forms of marine life can be found was loosely dubbed “the Twilight Zone”, for obvious reasons.

But as far as Rowley is concerned, Twilight Zone is the unofficial term both for Mesophotic Coral Ecosystems (MCEs) and also for the Mesopelagic Zone, the band of open ocean between 200 and 1000m deep. That's why she no longer uses the term – it can be too confusing!

IT'S AT MESOPHOTIC depths that this marine biologist spends most of her time. Her interest in this very specific field arose when she realised that the ocean seemed to be hiding clues to biology and evolutionary phenomena that could be accessed only by diving beyond the limits of conventional scuba.

Her curiosity piqued, she searched for a model group that could be worked on from a comparative standpoint, and one that could be studied across various depths.

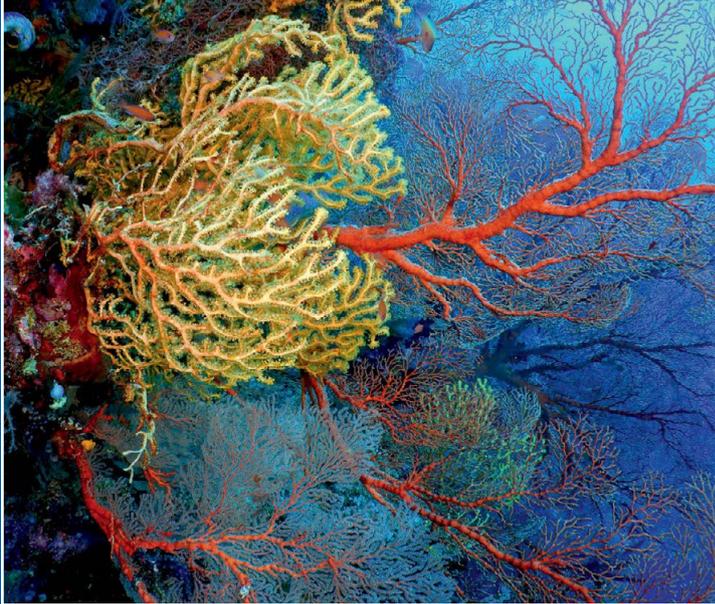
“Gorgonians fit the bill entirely,” she says. “In essence, I think that gorgonian octocorals actually found me!”

Taking them as her starting point, Rowley went on to graduate from the University of Plymouth before moving into the field to study for her PhD on gorgonians in Indonesia.

In 2007, her interest really took off when she was allowed to begin initial studies of giant seafans while on summer contract. Today she works as an assistant researcher for the University of Hawaii at Mānoa's Department of Earth Sciences, at the School of Ocean & Earth Science & Technology (SOEST).

She has accumulated more than 36 years of diving experience, has won several research/dive-related awards, taken part in expeditions in more than 25 countries and is well-versed in closed-circuit rebreather, freediving, and submersible work.

Sonia Rowley's life is unique. While on an expedition, it is encompassed by diving, underwater photography and data collection. Everything she does needs to be well-prepared



beforehand, and well-documented. “Juggling the logistics of technical diving and active field research is fun, I really enjoy it,” she says, while being well aware that her lifestyle “is intensive and may not be for everyone”.

On waking in the morning she likes to

Clockwise from above: Gorgonians photographed during Sonia Rowley's dives, including this one at 140m (right); astrogorgia (below right) at 50m; and this specimen at 90m (bottom).

dive procedure, which includes inspecting the mouthpiece, counterlungs, hoses, re-lubing O-rings and carrying out independent negative and positive loop pressure tests.

“Some people might find this all to be a bit excessive,” she says. “However, I feel that it enables me to check my rebreather in detail and to feel comfortable with the status of its hardware, replacing anything if necessary”. Before actually getting in the boat to head to that day’s dive-site, she completes a number of other calibration tests and pre-dive measures.

Depending on the objective of her dive and the prevailing conditions, Rowley will set up a camera (typically at a depth between 90-100m) to capture the gorgonians’ polyp behaviour.

From there it’s on to gorgonian collection, experimentation, ecological assessment and photogrammetry.

“I will often film sections of the descent, to develop an understanding of the geomorphology and the area as a whole; this helps to develop a gestalt that can, otherwise, seldom be put into words,” she says.

IT MIGHT ALL SOUND like a lot of hard work, but it’s here in these deep reef areas that Rowley feels most at home.

She explains that “nonsense” such as hunger and thirst remain at the surface for the duration of her dive, and that only in this underwater environment does she have a sense of being truly free.

“There’s something very powerful about being in the presence of Nature untouched, just as Nature intended,” she says. “I live every moment for this, and never want it to end.”

But come to an end each day’s diving must, and Rowley still has loads of work to do, both gorgonian- and dive equipment-related.

She does however take the time to capture as much footage as she can of any creatures she encounters on her ascent.

“Sharks, corals, spawning, fighting – it’s all going on and I’ve typically staged a camera so that I can chase these



MARK ANDERSON

take a moment to enjoy the sunrise, then gets to work checking and double-checking all her diving equipment for the day’s research.

“I check all the bail-out cylinders and regulators for content, function and trim,” she says. “I check my camera both before and after it’s been placed in its housing. I also make sure the lights have been inspected and that the unit and cameras are ready to go.”

Rowley runs a CCR Liberty rebreather, and makes certain to re-check valves and gas content. She continues with her pre-

Above: Dr Sonia Rowley, 47, first scuba-dived with her father in Scotland’s Summer Isles when she was 11. “Before that I’d take all the wives, girlfriends, husbands and kids out snorkelling while their respective partners were diving with my parents. It was cold, but so much fun!”

Left: Sonia leaves sharks in her wake as she heads down towards the deep gorgonian zone.



Pictured: Rowley at work on the seabed...
Below left: ...and after the dive back in the lab.
Bottom from left: Deep giant gorgonian at 90m; back on land.
Right, from left: Colourful soft corals from one of the Hawaiian research sites; Sonia Rowley: 'This is the magic.'



activities," she explains with delight, adding: "This is where rebreathers really shine."
 "They give us this freedom, this ability to be at peace with nature and observe interactions previously unseen."
 With all of this new footage, countless coral samples and plenty of new data, it's time to return to the lab to conduct numerous tests.

SONIA ROWLEY IS GLAD to see that her research is making a change. With her professional writing, outreach

programs and data analyses, she has been able to increase awareness of this beautiful marine ecosystem and its inhabitants.
 She has many hopes and ambitions for the future, most of which circle back to the preservation of these deep underwater habitats.
 "Ultimately research, discovery, experimentation, and dissemination of what we find are extremely important elements for protecting the environment, discovering new species, and deepening our understanding of the evolutionary



RICCARDO RODOLFO-METALPA

ANDREW BAIRD



CHRIS KNIGHT

mechanisms that make these species so successful,” she says.

Rowley’s work is highly specialised, and she wouldn’t change it for the world. The research she and other marine biologists accomplish helps us to better comprehend the world around us and brings us closer to the organisms with which we share the oceans.

Being able to don her dive-gear and spend hours in the water is a bonus – for Rowley, diving for giant gorgonian

octocorals is just as much a passion project as it is scientific research.

There can be few other jobs that allow you to dive 100m beneath the sea, photographing both tiny polyps and large sharks all in the same day!

“The entire experience is critical to me for learning and understanding this fascinating world and those that live there,” says Rowley.

“This is the magic – life would hold little meaning without this”.



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IT IS AN HONOUR to guide you on the dive today," says Gennaro as we fist-bump (handshakes are now a thing of the past). I have just arrived at the well-organised Centro Diving Campi Flegrei ready to dive its local playground, the sunken city of Baia.

I have never in my 20-odd years of diving been welcomed in such a grand way. The reason for this warm greeting dates back to 1969, when a small group of local scuba-divers helped a team of archaeologists to recover a pair of marble figures that had been hidden for centuries under the sand and silt of the bay.

My dad was one of those divers, and I have asked him to recount his story many times, always fascinated by what must have been an incredible experience.

"I had to abort the very last dive due to a stomach bug, but I still got paid nearly a million lire for my efforts!" he recalls.

In fact, the Soprintendenza (the heritage supervisory body) awarded each member of the team a monetary prize because of the enormity of the task and the importance of the discovery.

Baia nowadays is a picturesque seaside town, about a half-hour drive north of



It was **FEDERICA SQUADRILLI CARR**'s diver dad Bruno and his team who discovered the long-lost Roman remains submerged off the southern Italian town of Baia. She pays it a nostalgic visit

Above, from left: Bacchus in the Nymphaeum; another statue in the same area.

Right, from left: Federica's father Bruno Squadrilli and a newspaper report of the diving discoveries that caused a sensation in the Naples area.

Naples, where I was born. A jutting headland surmounted by a majestic Aragonese castle and the promontory of Cape Miseno frame the bay, while the landscape right behind the seafront is dotted with small, volcanic crater lakes.

There are plenty of cafes and restaurants on their banks, surrounded by fertile lands lush with orchards and vineyards.

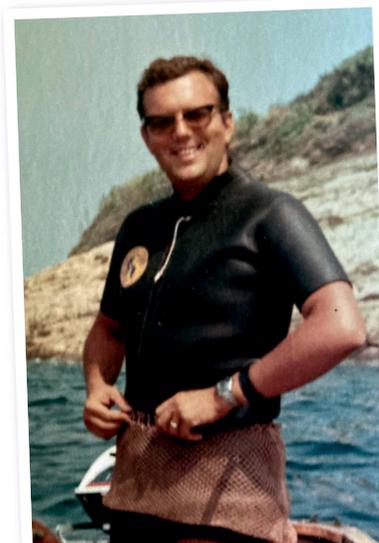
The topography around here reveals a grand and antique past. This area was an exclusive destination for the Romans (Emperor Nero among them) because of its temperate climate, exquisite scenery and thermal baths.

The volcanic nature of the land caused a peculiar phenomenon known as bradyseism – the slow sinking of the shoreline into the sea. It is believed that

from the 4th century AD the town started sliding into the water. Yet Baia's ancient collapse became the reason we have its treasures today. They remained preserved under the sand and created what is a unique underwater museum.

Only a few dive-centres are authorised to guide divers and snorkellers through these waters on unforgettable excursions.

The discovery of Baia's submerged world was relatively slow. In the 1950s pioneering divers and archaeologists had identified the presence of structures and floor mosaics, but it was only in the late





Left and above: Detail and the entire statue of Octavia in the Nymphaeum, seen above with guide Gennaro.

Below: Blenny in the villa wall.

After filling in the necessary forms, having my temperature checked – all done wearing a mask in the beating sun – I assembled my kit and proceeded to the first briefing session.

The dive briefings at Centro Sub Campi Flegrei are detailed and feel more like a history lesson. You're advised to allow time to take in all the information, and why would you want to miss it?

Marcello, one of the partners, spares no details when describing what we're going to see under water and what it was like to live in those marvellous villas or to man a warship in the ancient port.

He is knowledgeable about the area and its heritage and completely trumped me in the history of diving.

"My first open-water dive was with Enzo Majorca," he proudly tells me as we compare background stories, referring to the ground-breaking freediver.

Marcello opened the dive-centre in Baia a number of years ago with two partners and it is now well-established and always busy with visiting divers and regulars. It's easy to spend a week here without getting bored and I now regret that while living in Naples I didn't bother with diving at all. I'm trying to make up for lost time now!

One of the most famous sites we visit is the Julius port, commissioned in 37BC. It is monumental and was intended to

1960s, after a storm and high seas had displaced the silt layer, that a local fisherman stumbled on a piece of marble while navigating what at the time was a very active port.

A team of carabinieri joined forces with the local Underwater Study Group and a number of FIAS divers (the Italian equivalent of BSAC at the time) to survey the findings.

And that's where my dad comes in. His group recovered two male figures, believed to be Odysseus and a companion in the act of getting the Cyclops

Polyphemus drunk. The statues decorated a large room called a Nymphaeum in which the Emperor Claudius would entertain guests, in a play of fountains, other water features and reclining alcoves.

The two statues, along with other items recovered in the following decades, can be seen today in the local museum, which is worth visiting to help better understand the local history. It occupies the castle on the hilltop, overlooking the bay and Punta Epitaffio where the statues were found.

SINCE THEN, THE underwater realm has continued to yield surprises.

Only this summer a new dive-site was opened after one of the best-preserved underwater mosaic floors to date was discovered. Most of the bay is now a marine protected area (and has been since 2002), divided into three sections with different levels of admittance.

While there's plenty of interesting diving to be done in the nearby waters, the main attraction is the archaeological park. It contains many sites, all in shallow waters so suitable for beginners too.

I had dived there before, many years ago, and couldn't wait to get in the water.





house the Miseno flotilla during the Roman civil wars. The port was connected to the nearby lakes by a canal. Between 3 and 5m deep, the remains of the port's walls and sections of floor mosaics can be seen, only lightly covered in sediment.

The notable columns provide an attractive photo opportunity and the many damselfish add a touch of colour to the dive, which is a great introduction to the sunken city's treasures.

But it is the dive beneath the imposing Punta Epitaffio that gets my emotions going. As we follow in the footsteps of my dad, a fascinating underwater path takes us inside the Nymphaeum itself, and the magnificence of its past is made obvious by the positioning of statues – exact fibreglass replicas of the originals – that guide the divers through the room.

How incredible it must have been for the guests of the Emperor to sit in this space, surrounded by representations of the mythical figures of the Odyssey.

Pipes found hidden in the statues suggest a water feature in which floated dishes of local delicacies to delight the guests – basically a precursor of the *sushi* conveyor belt!

AS WE SWIM THROUGH, every now and then Gennaro stops and brushes off the pebbles from the bottom, revealing sections of mosaic or marble flooring.

All around us, colourful perch dance playfully while larger banded sea bream lazily nip at the seaweed. Often I lose sight of the group in the not-so-great visibility, as I find myself mesmerised in this dead but oh-so-alive city.

Finding life and colour among the stones and bricks of the opus reticulatum is like being on a treasure hunt. Under a wall, a solitary anemone has taken up residence and not far away, a bright red seastar provides a burst of colour in the monochrome seascape, to remind divers that this is a thriving ecosystem.

Slightly off the Punta Epitaffio is one of the few villas of the sunken city, showcasing the wealth this area attracted.

The Pisonis were a noble family who organised a coup against Nero. Once found out their villa became the property of the emperor, and it was beautiful.

A large garden is surrounded by a porch and corridors, a thermal complex and fish-rearing ponds, and the structures still convey a feeling of majesty. As we glide peacefully over the stones taking in



Above, clockwise from top left: Divers at the site, with Pozzuoli in the background; mosaic; painted comber; statue in the Nymphaeum; headless Odysseus, also in the Nymphaeum; starfish; diver over the thermal baths structure.



the sight, a solitary yellow blenny peeps from the cracks, claiming its rightful place in this grand location.

This is not the only villa divers can visit but it's perhaps the most interesting for its sheer size and the famous mosaics.

Yet the entire area is an uninterrupted submerged museum, the scale of which could probably be best taken in with the help of a drone. If only we'd had one.

More sturdy, practical structures appear at the dive-site called Fumose (or Smoky), the deepest point in the bay at 16m. Pillars that might have made up the barrier protecting the port encase a rich underwater land in which columns of sulphur gas spring up from the seabed.

Colourful ornate wrasse shy away between the rocks, and shoals of silvery salpes swim past us.

On every dive Gennaro occasionally picks up bits of vase. As we follow him around, he stops at the underwater signage that shows divers where they are located in the park. He is careful in keeping us away from mosaics and marble floors, and meticulous in covering them again after showing them to us.

"Last week we found a private boat, all divers, diving at Punta Epitaffio," he laments back on dry land. "We reported them. I couldn't even identify which language they spoke. It's really hard to protect the site – you need to keep a constant watch."

There are plans to extend the protected status to the entire bay, to include some dive-sites currently outside the zone. One of these is another villa with large fishery tanks and water conduits – many of the local villas had such tanks that kept up the flow of fish delicacies to their tables.

As I come up after my last dive, I look towards the castle to take in the beauty of the bay. Baia's underwater gems have come a long way since 1969.

Above, clockwise from top left: Likely Emperor's House flooring; amphora handle on the Via Herculanea; in the Emperor's Frigidarium; Punta Epitaffio; anemone by the Nymphaeum; wall detail in the Nymphaeum; diver at the Fumose site.



FACTFILE

GETTING THERE ▶ Fly from the UK to Naples with BA, easyJet or Ryanair, then hire a car or take the Cumana train to Lucrino.

DIVING ▶ Centro Sub Campi Flegrei, centrosubcampiflegrei.it/en

ACCOMMODATION ▶ Stay in Lucrino at the Hotel Tripergola beside the dive-centre or stay in nearby Naples.

WHEN TO GO ▶ May to November (other months by request).

MONEY ▶ Euro

PRICES ▶ Flights from £20 return; hotel 84 euros pp per night (with breakfast, dinner & spa). Diving 35 euros pp per dive including marine-park fee.

VISITOR INFORMATION ▶ turismoeservizi.it

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SPOTLIGHT!

FEW THINGS GET A DIVER'S pulse racing more than the thought of treasure – those familiar images of pirate chests overflowing with jewel-encrusted goblets leap to mind.

Richness comes in many forms, however – remember the famous Nanking cargo, still testament to the value of Ming-dynasty porcelain.

Some technical explorers will swear that the real treasure is in the diving experience shared. In any event, the Gulf of Thailand has the potential to deliver such riches. Our understanding of the evolution of trade in this region improves with each new wreck located.

Our team of six, made up of experienced technical divers and marine archaeologists, assembled at Sattahip in Thailand, all willing to pay the costs of exploration despite the possibility of diving nothing but sand.

We met on the pier after making a quick stop at a 7/11 for supplies – no self-respecting mariner would put to sea without Maggi noodles and Kit Kats – and finished loading the fishing vessel that would be our home for the next four days a full two hours early.

OUR CAPTAIN KAI was keen to make an early start – the weather forecast was poor, but travelling at six knots we would cover the 100-or-so miles south-west and arrive at our first mark by 10 the next morning.

Captain Kai, a veteran of the gulf, had obtained GPS co-ordinates from a fisherman friend, and we knew that if the weather were to close in we would be in good hands.

Admittedly the absence of any life-raft never fails to capture my attention, but the heady ideals of health & safety have yet to enrich this part of the world. Should I stay, or should I go? The outcome was never in doubt.

My buddy/friend Andy Moore was our only open-circuit diver, so we got on with blending his mix for the target's depth of 60m, with 18/40 chosen for the bottom and 50 for decompression.

All of the closed-circuit rebreather divers' gases were either pre-mixed or had been left over from previous trips. CCR has changed the cumbersome



TIM LAWRENCE and friends in Thailand live to hunt wrecks, and their recent expedition to a 60m mark revealed what could be a Ming-dynasty collection of pottery. Archaeologists are now working on it. Photos by **SIWAT WORACHANANANT**



logistics once associated with open-circuit expedition-planning.

The south-west monsoon was baring its teeth now. We punched our way into the swell, spreading our legs out over our sleeping mats to stop ourselves slipping off.

After a restless night we rose with the

Above: First sight of the mysterious pottery graveyard.

Inset: Divers on their decompression stop.

sun to make final preparations. The swell had been building overnight, but was expected to drop off in the afternoon.

By 12 it had fallen to 1.2m, and our teams were ready. We avoided diver jams on the line by staggering the dives at 40-minute durations, allowing for good surface support.

Jira Ploymukda and Siwat Worachananant were first up. They were to run a distance-line and leave it in place should they find the target mound, followed by Bruce Koneffe and Oliver Zaiser and finally Andy and myself.

We hoped that the wave-height would continue to drop, because wooden fishing-boats tend to bob like corks, making it tricky to hand off tanks at the end of the dive.

The time passed slowly, but eventually the first team surfaced and we entered. Bruce flashed an OK as we passed him on the line. I tried to read his body language, but without success.

We hit the thermocline at 40m and continued down to 60. Visibility was still a good 5m. Jira's distance line was in place immediately – and that's when we started seeing pottery.

HAVE SEEN WRECK MOUNDS before, but on this one I was taken aback by the density and variety on view. Plates were stacked in one area, large and small pots in another – separated by design?

The visibility allowed us the luxury of seeing the outlines of timber still visible on the outskirts of the mound, and a blue and white pattern marked on some of the pieces. Much of the pottery seemed intact.

I had expected the mound to have been trawled, damaging and mixing up the different designs. Happily surprised, I recovered the distance line and we started our ascent.

At 6m we watched the stern of our vessel crashing into the troughs, and reluctantly surfaced holding onto a thrown line.

Working slowly, we unclipped our tanks and passed them up one by one to the crew, who had positioned themselves off the stern ladder. Moving quickly now, we removed fins and put our weight on the bottom rung, immediately moving up with the boat and the waves. Once safely



Above and below: The pottery is thought to consist of 400-year-old-plus Ming items from China. Highly valued for their smooth white and cobalt blue surfaces and translucent quality, individual vases have been sold for as much as £17 million.

onboard, we compared notes.

There is a long history of trade between China and Thailand, principally pottery from the former exchanged for hardwoods from the latter.

However, Thailand had also exported pottery made in the kilns around Sukhothai, and had lost thousands of ships over the centuries.

SIWAT, A MARITIME archaeologist, commented that the blue-on-white images matched those of Ming pottery found around Bangkok and could be 400 years old. The Ming dynasty ruled from the 14th to 17th century.

Was this pottery part of a passenger's prized possessions or part of a larger cargo? Had this vessel been carrying the products of Sukhothai, or of Nanking in China? It's difficult to date/identify a shipwreck based on one piece of pottery, and finding such wreckage presents us with more questions than answers.

Further investigation will be needed to unlock this ship's secrets. I wondered if the Thai archaeologists would succeed in determining the history of this wreck, given its location in international waters.

The crew recovered the lines, and we moved off to investigate two more marks, although neither would capture my imagination as firmly as this first one.

Our next target mark was the military transport HTMS *Pangan*, which we had dived before, but the last one also looked promising. Conditions had deteriorated, but despite a bone-jarring 3m sea state by noon on the third day that made it hard to move around the boat a team did manage to enter the water and confirm the presence of still more pottery.

By then, however, the conditions had reduced vis to 50cm, making a further search difficult. The sea would hold on to this ship's mysteries a little longer.

Experiencing the vicious high-frequency wave action that had more than likely sunk our targets in the first place, we headed home a day early.

As we entered the headland's shelter, the serenity of the sunset belied the sea's potential to cause disasters. Once ashore, we began to plan our next adventure. ◻

*** Wreck-hunter Tim Lawrence owns technical-diving centre Davy Jones Locker on Koh Tao, davyjoneslocker.asia**



GUNS IN THE GULLY

Pictured: Ben Dunstan with a musket found on the wreck of the *Boyne*. It took four hours' careful work to remove from the concretion.

Below left: The *Boyne's* sister-ship *Palestine*.

We last heard from **BEN DUNSTAN** in May when he shared his diving experiences exploring Cornwall's flooded mines, but that's just what he does when the sea is inhospitable. When conditions allow he looks for shipwrecks, and with the 150-years-lost *Boyne* he struck lucky recently



ONE OF THE MAIN THINGS that initially got me interested in diving was the appeal of shipwrecks. The stretch of coastline off Falmouth in Cornwall has no shortage of wreck-sites, but it wasn't long before my buddies and I had dived all the known sites from the charter-boats and started looking for other sites that had yet to be discovered.

After years of diving the same wrecks and reefs, it seemed a logical choice to get our own boat and spend what spare time we had looking for new sites to dive.

It didn't take long before we were enjoying some success. Mostly this came in the form of well-broken steamships and sailing vessels, but many of them had never been seen since they sank.

The sites were often in shallow water and offered little shelter from the prevailing winds and swells that had reduced them to little more than anchors and piles of scattered steel and iron plate.

It was while researching such wrecks that I and fellow wreck-enthusiast David Gibbins read about a local wreck called the *Boyne*. This 617-ton iron barque (*left*) had been built by Harland & Wolff in its Belfast yard for a ship-owner called WH Tindell to carry sugar back from the colonies in the Far East.

On 2 March 1873 the vessel had been 120 days out of Batavia carrying 900 tons of sugar when, lost in fog off the Lizard, the crew made a navigational error.

Thinking that the ship had already passed Lizard Point, they started to turn north toward the safety of their intended destination, Falmouth.

High cliffs suddenly loomed ahead, and the *Boyne* went headlong into them, at Polurrian Cove near Mullion. In the heavy south-westerly sea it very quickly began to break apart.

Of the crew of 19, only four survived the sinking, with many of the dead washing ashore at Mullion the next day. 🇬🇧



Above: Dave Gibbins exploring the area of kelp-covered gullies.

Below, dockwise from top left: The outer layers of the brass telescope have eroded away; the cleaned-up brass chronometer, still in its box; the instrument as found; the sight of artefacts that originally drew the divers to the gully.

After reading accounts of the incident, David and I considered trying to find the location of the *Boyne's* sinking and see if there was anything left of the vessel.

Back in the 1960s an incomplete brass nameplate had been recovered by a diver in the area, but exactly where it was found had been obscured over time.

The area where the wreck supposedly lay was a very shallow section of reef, right up against some high cliffs. It wasn't

the kind of place you could reach even in a small boat to be able to search with a magnetometer.

According to the *Royal Cornwall Gazette* report at the time "*the spot where the Boyne struck is one of the most terrible in Mount's Bay. The cliffs rise almost perpendicularly from 60 to 80 feet from the sea, and at the base lies one massive bed of clay slate rocks, rising directly from deep water.*"

"The tide was about flood at the time, and no sooner had she struck than she was thrown round broadside to the waves perfectly helpless."

We started diving the coastline on the calmest days from a nearby beach. This earned us some puzzled looks from locals and tourists alike, because access to the beach involved quite a long walk and numerous steps down a cliff path.

But we had soon discovered the wreck site, a short distance offshore among the heavily kelp-covered gullies.

THE BROKEN REMAINS included a few small steel and iron sections of plating jammed in the rocks, but most interesting the first time we dived the site was the discovery of a gully that seemed to hold a variety of small brass artefacts caught in the concretion of rusting iron objects.

We instantly recognised the remains of a brass telescope protruding from this concretion.

The inner layers of smaller brass tubes had been exposed as the instrument had been worn away in the rough conditions.

We left the items where they were initially, but then decided to try to recover what was left of them before the next set of winter storms had a chance to damage them even further.



At this point we couldn't be certain that this was the wreck of the *Boyne*, because many other vessels had been lost during the same time period along the coast.

As we set to work, to our amazement some incredibly well-preserved items started to emerge. Beneath the telescope was a layer of wooden pieces and small brass items in a very eroded state.

Then came three intact muskets, navigation equipment, a silver knife and fork and an intact wooden box containing the ship's brass chronometer.

The state of preservation of these artefacts was unlike any we had ever seen on a wreck along this coast before. It seemed that by good fortune the items had come to rest in the base of that deep, steep-sided gully, and this had protected most of them from the abrasive action of the sea during the winter storms.

The silver knife and fork bore the letter T, representing Tindell. This, along with a single coin of the right date and the chronometer, provided a very good likelihood of the wreck being the *Boyne*.

Further research in the archives would uncover a document that referred to the ship's crew having been armed for their journey to the Far East, including the loading on board the ship of several muskets – just like the ones we had



recovered. We hadn't realised it but the gully seemed to contain the only real selection of preserved items from the wreck of the *Boyne*.

There are other gullies around it, but they were more exposed to the south-west swell that smashes into this reef for nine months of the year.

So all that was left among the more mobile boulders and stones were tiny fragments of destroyed brass and china.

WE RETURNED whenever the weather allowed, and eventually were able to fully excavate the gully down to bedrock.

Jammed right in the base was a final fourth musket, perfectly preserved with an intact stock and all its brass furniture remaining in situ. This gun alone took four painstaking hours' work to remove.

All the recovered items have been reported to the Maritime & Coastguard Agency's Receiver of Wreck as per UK salvage law.

They are currently undergoing preservation and we hope they will go on display somewhere locally so that the public can be reminded of such long-lost wrecks and the fate of the crews who travelled in those dangerous times. █

Above, from top: A full-face mask helps when working for long periods under water; the first three muskets to emerge.

Left and inset: The silver fish knife and fork found on the wreck, with the letter T for Tindell on the handles.

You can see a video of Ben Dunstan with his *Boyne* finds at https://www.youtube.com/watch?v=zvOH_6u3-bE&t=12s

TIMEPIECES



Divers might no longer need to own a dive-watch but they remain very popular – for all sorts of reasons. STEVE WARREN rounds up 25 of the latest models



Left: Where it all began – the Rolex Oyster dive-watch of 1926.

DAVE ALLEN, THE IRREVERENT Irish comedian, used to do a wonderful skit on teaching his young son to tell the time using an analogue watch. As the lesson progresses, Allen digs himself further and further into a hole. “And the third hand is the second hand,” he explains, instantly realising the absurdity of his statement. Frustrated, he concludes: “Now, you learn to tell the time and I’ll buy you a digital watch.”

For modern scuba-divers, the dive-watch is an anachronism. As an instructor, a bit like Allen, I’d finish with: “Now, you learn to use the tables to pass the exam, then go and buy a computer”.

So, why do a special on dive-watches? Because it’s a Covid Christmas and the watch evokes so many images of audacious dive adventurers of a bygone era, recalling more positive times and challenges sought, met and overcome.

A traditional dive-watch is, unapologetically, pure indulgence. It’s the perfect comfort buy for yourself or a cherished gift for a loved one with which to see out 2020.

My Swiss dive-watch was presented to me by my father. Down on his luck at the time, though I didn’t appreciate it at 23, he’d have had to go without a lot to afford it.

It celebrated my achieving PADI Divemaster status (I know, but this was less-cynical 1986).

A dive-watch was still a must-have then. Electronic dive-computers were rare, distrusted and cost more than a Rolex.

Before scuba-diving developed, helmet-divers were timed by surface tenders. But WW2 free-swimming frogman-saboteurs using oxygen rebreathers had to gauge gas and absorbent levels. After the deeper-diving Aqualung was invented, it became paramount to measure dive-

times, decompression stops and surface intervals precisely to safely use dive-tables.

SMALL OBJECTS OF DESIRE

There are far more manufacturers of dive-watches than there are makers of scuba kit. It’s a huge market, which tells you something about the charisma of diving timepieces among the general public, as well as watch-collectors.

Watches play to the emotions, making them less price-sensitive. Some cost more than a set of dive kit including compressor. Limited editions play up exclusivity and status. Many superlative dive-watches are owned by non-divers.

The right watch can be an investment. A 1975 model with which I was entrusted by a famed underwater photographer cost, in today’s terms, around £1400. Second-hand, it would fetch more than £6000 now.

A dive-computer won’t do that – it’s purely functional. Nor can it match the gravitas of a watch presented to a son for his 21st or bequeathed to him by his father.

All the watches featured here are classic analogue designs, which in a way makes them timeless. Some dive-watch brands that were in at the start have reimaged their earlier models, while newer entrants have sought out the vintage look for their 21st-century designs.

Here’s the basic rundown on features and benefits to be found among this selection to help you make your choice. In some cases, only starting prices are shown. Many models offer options on type of glass, dial livery or strap.

Most suppliers chose to send details of men’s or unisex watches – but dedicated women’s versions, usually a little smaller, are often offered.

ACCURACY

The accuracy of a watch is initially determined by its movement or calibre. For a diver’s needs, it is unimportant. The most any watch featured here will lose or gain in a month is a few seconds.

It becomes important only if your watch might also be used to time sporting activities, or you can’t stand knowing your watch isn’t perfect. Chronometer movements indicate certification to an exceptional degree of precision.

Movements can be quartz, which is battery-driven, or mechanical. Battery-driven watches might have a low-power warning, sometimes indicated by the second hand skipping a beat.

All the mechanical watches here are self-winding, maintaining power from movement of your wrist, and store this for times when you take your watch off. This is the “power reserve”.

Jewels refer to bearings used in engineering of the movement and are likely to be synthetic rubies. Some companies make their movements in house; others use calibres produced by specialists such as Seiko of Japan or ETA of Switzerland.

Magnetic fields, possibly from camera strobes or scooters, and impacts can impair accuracy, so some watches have Faraday cages or anti-shock protected movements. To maintain accuracy, many watches will need regular servicing.

DEPTH RATING

Confusion has long surrounded the true depth rating of water-resistant watches. This was because the rating was based on pressure applied to the watch without moving it.

So, ran the urban myth, the actual depth to which you could safely submerge your timepiece

was considerably shallower than the stated depth. The depth-limits in this guide are those at which the watch will still function perfectly.

Some limits are so outrageous, however, that your watch will need to be strapped not to your wrist but to that of a submersible's articulated arm – and you'd better be tucked safely inside it.

THE CASING

The casing needs to be pressure-proof, hard-wearing, waterproof and corrosion-resistant.

The most common choice of material is 316L stainless steel or, for premium models, much lighter titanium. Bronze is chosen because it encourages the casing to "age" by developing a patina individual to that owner's watch.

In saturation diving, heliox is used. Helium molecules are much smaller than air or water and can leak past seals into a watch under pressure and over time. To prevent damage during deco, an automatic non-return valve, or helium escape valve, can be fitted.

THE LENS

The lens might be made from crystal or from harder-to-scratch sapphire glass. To minimise distracting reflections, the lens might be dome-shaped and also treated with anti-reflective coatings. A magnifier can be built in to make it easier to read the date.

DIAL & HANDS

Easy legibility is an essential quality. You need to be able to assimilate information quickly, sometimes in low light and when narked. The size of the dial and hands and also how they interact is important.

Hands will often have shapes that distinguish them from the indices on the watch-face. High-contrast read-outs also help, achieved with white figures on a black dial, black figures on a white face or other colour combinations. It's a personal choice, because eyesight and colour vision varies.

The bezel markings also need to work in conjunction with these read-outs.

Hands and indices will be treated with a chemical to make them glow in the dark, and among our selection tritium is one choice.

It doesn't require re-energising with a light source to remain illuminated.

Super-LumiNova is another popular choice and comes in various grades. It needs occasional exposure to light to maintain its luminosity.

High luminosity is useful because, in low light, we will normally be using torches, which ruins our night vision, while we usually crook our arm to check gauges, so they're behind the light source and not lit. Besides, high-power lights often create so much glare, wrist instruments become hard to read.

When reading your watch, pause to check that the second hand is moving. If it isn't, your watch has stopped.

THE CROWN

The crown is used to set hours and minutes, date if so equipped, and for winding self-winding watches if needed. It must be pushed or screwed home before diving, or the watch might leak.

Some watches have additional seals to prevent this, though the depth-rating might be reduced. Making sure the crown is fully home also allows it to sit better within its protective shoulder lugs.

An exposed crown is easily damaged and would pose a flooding risk.

THE BEZEL

The bezel is a ring with an indicator that you set against the minute hand as you begin your descent. As the minute hand advances, you can check elapsed time against it.

The bezel can track only for an hour, then you have to mentally adjust. Most can be turned only anti-clockwise. If you knock it while reaching into wreckage it would indicate that your dive had been longer rather than shorter than it really had – a sensible safety feature lest you should ascend thinking you're still within your no-stop time when you've actually crossed into deco.

However, if you're timing safety- or deco-stops, knocking the bezel will indicate that you have completed your stop before you have. To prevent this, some watches have a bezel lock.

The bezel has non-slip edges to make it easy to turn with gloves or, if it's internal, an external adjustment crown. Scratch-resistant ceramics are used on some bezels for durability.

GMT FUNCTION

GMT watches have an additional scale to show the 24-hour clock. Developed for pilots, it allows you to see the time in a second time zone. Travelling divers can fast-check the time at home, to avoid phoning your beloved at 3am to tell them what a wonderful day you're having.

THE STRAP

A bracelet will need to be adjusted to fit your wrist. Bracelets for diving have a fold-out section, also adjustable for length, to fit over a dive-suit, but because neoprene compresses with depth they might still hang loose.

Some plasticised straps have concertina sections that contract and expand to prevent this, while others have spring-loaded buckles that achieve the same result.

A danger with most dive-watches is that failure of one of the retaining pins will cause the loss of your watch and your timing information.

A NATO-style strap passes through both retaining pins, so losing one pin won't put your watch at risk. Some divers prefer a neoprene sleeve that slips over the watch.

Traditional dive watches can be functional, esoteric or both. Unlike most dive-gear they can last a lifetime – or, as heirlooms, longer. Take your time in choosing.

from £99

Momentum Torpedo Blast

Momentum makes the bold claim that more of its watches are sold worldwide through dive-stores than any other brand.

Originally a distributor for several high-end watchmakers, it now makes its own and has designed time pieces for Land Rover, the US Marine Corps and British Columbia Coast Pilots. It provides a two-year warranty with its watches.

The 44mm Torpedo Blast is equipped with a Seiko quartz VX32G single-jewel movement. Battery life is expected to be five years and there is a low-power indicator. The 316L stainless-steel case is certified to 200m.

You can specify lenses made from mineral or the tougher sapphire glass. The Torpedo has a uni-directional bezel and comes in a choice of dial colours.

There's no escaping that the Blast's huge numbers are going to split the vote. But they are easy to read and the bezel is usefully inscribed with a full 60min scale.



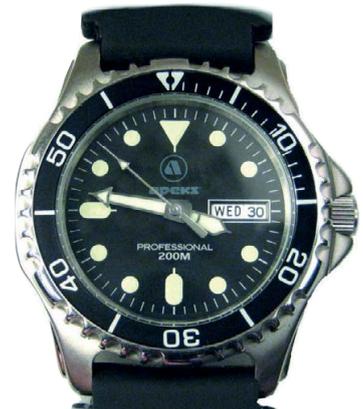
£115

Apeks Professional

With a stellar worldwide reputation as a dive-gear manufacturer, this British-founded company has now passed into overseas ownership as part of the Aqua Lung group. Its watches carry a 12-month warranty.

The Professional dive-watch is available in men's and women's styles. The Seiko-made VX42 jewel-less quartz movement is encased in a 200m-rated stainless-steel casing with mineral-glass lens. Expect a three-year battery life.

The Professional gives out the vibes that a dive-watch should. It has the hallmark of a heavy-duty-looking case, large bezel and, of course, a strap made to fit over a dive-suit.

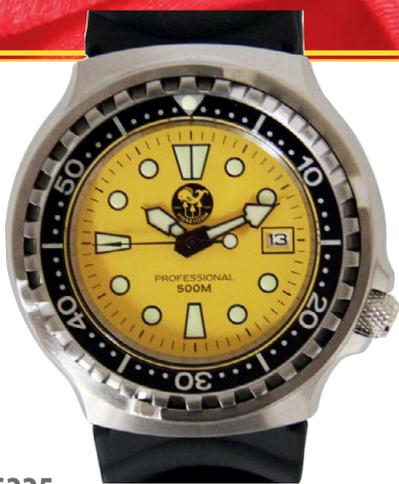
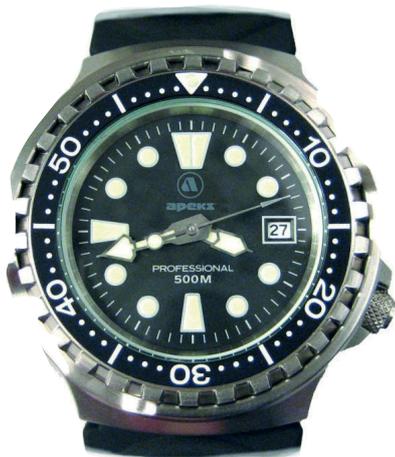


£126

Apeks 500m

The Apeks 500m dive-watch contains a Seiko-made, VX42 jewel-less quartz movement, with an estimated battery life of three years. The stainless-steel case measures 46mm in diameter and the lens is crystal glass. The dial has luminous markings and there is a one-way bezel.

No question about it, this is a diver's watch. The bold bezel and depth-compensating strap make that statement. It has a nice uncomplicated face and hands with the bezel marked off in individual minutes throughout its scale.



£225

Poseidon 500m Professional

Poseidon, founded in 1958, is one of diving's oldest brands and originally made equipment principally for the commercial-diving sector. It is well-known for its side-exhaust regulators and drysuits – the Swedish manufacturer saw one of its Unisuits used by Prince Charles during his dive under Arctic ice in 1975.

The company offers an entry-level and a limited-edition collectible dive-watch, with a warranty period of two years.

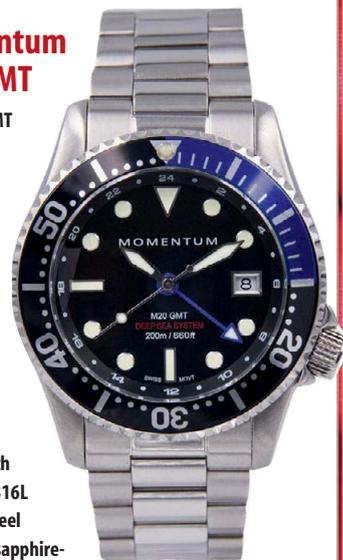
The 500m Professional is useable to a depth of half a kilometre, as the name implies. This 46mm-diameter watch has an unspecified quartz movement, stainless-steel case, luminous dial markings and a one-way bezel.

I like the choice of dial colours, and the 60min marked bezel looks easy to turn with its heavy-duty knurling.

£295

Momentum M20 GMT

The M20 GMT allows the travelling diver to keep track of two time zones at once, as well as manage dives. The 42mm watch features a 316L stainless-steel case and a sapphire-crystal lens.



A Swiss Ronda single-jewel movement drives the watch, and battery life is about four years.

Rated to 200 metres, the M20 GMT is available with a choice of dial colours with Super-LumiNova markings and a one-way bezel.

The important read-out on the M20 looks very easy to assimilate under water – the GMT scale is discreet enough not to interfere with the oversized main hands and indices and outer bezel markings.

from £400
NITE
Alpha



NITE is a UK company. The brand was formed after its founder, Roger Green, saw the qualities of tritium, a luminous material that doesn't need to be re-energised by a light source to keep glowing.

Realising its applications for marking watch faces, hands and indices, he says he was inspired to form NITE, which now offers a selection of special-purpose timepieces, but currently only one dive-watch, the Alpha. It's guaranteed for two years.

The 31mm-diameter dial has a PVD-finished steel case with sapphire crystal that is 300m-rated. Its five-jewel Swiss Ronda 715Li quartz movement uses a lithium battery with an estimated 10-year battery life. A ceramic insert is used to protect the bezel from scratching.

This is a classic, unmistakable, no-nonsense diver's watch that should hold its own at any dive gathering.

£415

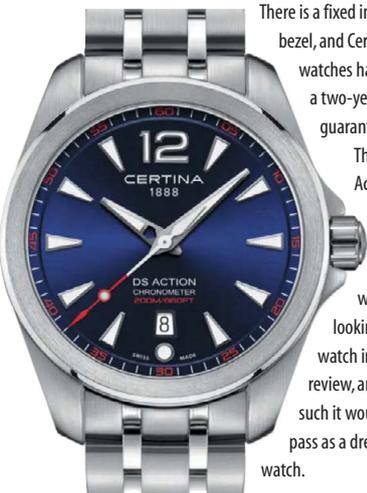
Certina DS Action

Certina is a Swiss watch-maker, formed in 1888. Its diving watch range bears the insignia of a turtle, chosen for the reptile's longevity, toughness and watertight shell.

Certina actively supports the Sea Turtle Conservancy, including donating profits from a limited-edition Certina dive-watch celebrating the NGO's work.

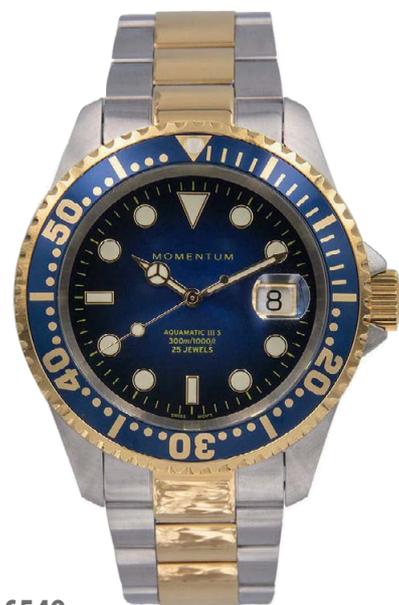
The DS Action is good to 200m. The 41mm, 316L stainless-steel case uses Certina's Double Security system to prevent leakage should you accidentally submerge it with the crown in the "out" position. It's topped off with a sapphire-crystal lens.

The three-jewel ETA Precidrive TM quartz chronometer movement has an "end of life" low-battery indicator. Battery life is around three years.



There is a fixed internal bezel, and Certina watches have a two-year guarantee.

The DS Action is by far the least dive-watch-looking dive watch in this review, and as such it would easily pass as a dress watch.



£549

Momentum Aquamatic 111

The Aquamatic 111 is 300m-rated and is based around a 25-jewel automatic EVA2824 movement with a 41hr power reserve. Both the front glass and see-through backplate are made from sapphire crystal.

The casing is machined from 316L stainless steel. The 42mm dial features Super-LumiNova hands and indices and a choice of dial colours and case finishings is offered.

Classic styling makes it clear that you are a diver.

from £577

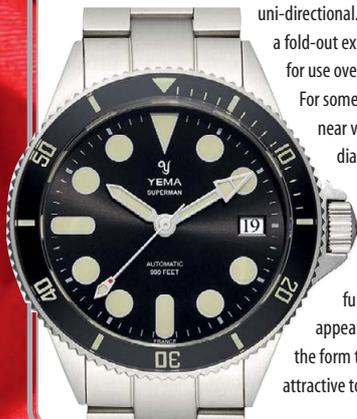
YEMA Superman 11 Maxi Dial

YEMA was formed in France in 1948. Its first diving watch appeared in the 1960s and included a lock to ensure that the countdown bezel couldn't move accidentally and mistime bottom-time or deco-stops. This feature is still incorporated into some of its current line of dive watches. YEMA provides a two-year guarantee.

Based around a 40mm dial size, the Superman 11 Maxi Dial is rated as safe to 300m. The stainless-steel case is topped with a domed scratch-resistant sapphire lens.

It's an automatic, using the French MPB1000 calibre with 31 rubies and 45hr power reserve. Super-LumiNova is the choice for illuminating hands and indices.

The sapphire-crystal protected bezel is non-locking and uni-directional. The strap has a fold-out extension piece for use over a dive-suit. For someone with poor near vision, the larger dial size and very large, distinct markings make this watch functionally appealing, though the form that follows is attractive too!



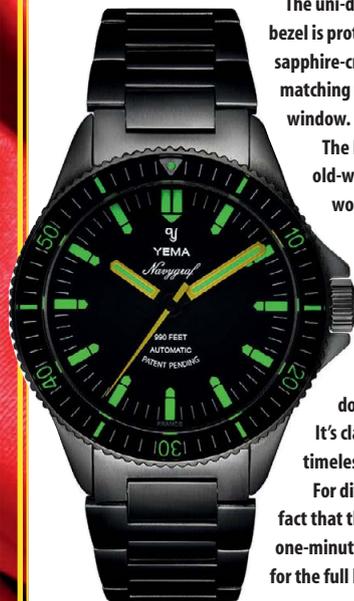
from £577

YEMA Navygraf

The Navygraf uses YEMA's own self-winding YEMA 2000 movement with 29 jewels and a 42hr power reserve.

The 316L brushed stainless-steel case is rated to 300m.

The 39mm dial has been designed for maximum readability with Super-LumiNova markings. Hands are yellow to improve contrast.



The uni-directional bezel is protected by a sapphire-crystal overlay, matching the watch window.

The Navygraf looks old-worldly to me. I would expect to see it flash up on the silver screen as a World War Two convoy commander dodges U-boats. It's classy and timeless.

For diving, I like the fact that the bezel has one-minute increments for the full hour.



from £589

Aevig Huldra

Aevig is a Dutch brand founded by vintage watch-collector and film-maker Chip Yuen in 2013. It currently offers one dive watch among a selection of sports and dress models, and its models carry a two-year guarantee.

The Huldra is powered by a Japanese Miyota 9015 2-jewel automatic movement and has a 40hr power reserve. You can choose from a date or no-date version. This 42mm stainless-steel watch has a sapphire-crystal lens and a choice of bezel designs, one in enamel, one in stainless steel, both set in 30sec increments.

This timepiece has a very clean look to it, partly because of the bezel. It is marked with 15, 30, 45 numerals and an index mark and 5min indices, rather than with individual minutes. These can be read from an inner dial scale.

£760

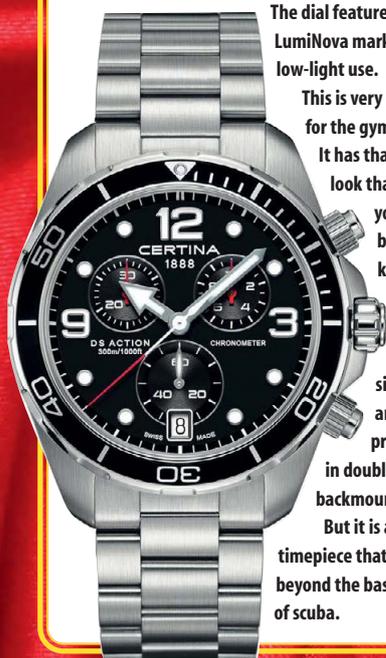
Certina DS Action Chronograph

The 43mm Certina Chronograph is encased in a titanium hull with a sapphire lens and is 300m-rated. It uses a four-jewel ETA G10.212 quartz movement with a three-year battery life and offers a low-power warning.

The aluminium bezel can be used to manage dive times in the usual way, while the chronograph lap functions let you time sports and exercise activities.

The dial features Super-LumiNova marking for low-light use.

This is very much one for the gym and pitch. It has that sporty look that lets your dive-buddies know that you like to hike in sidemounts and do press-ups in double-18 backmounts. But it is a versatile timepiece that goes beyond the basic needs of scuba.



from £795

Christopher Ward C60 Sapphire

Christopher Ward is named for one of its three partners, who include the founders of the Early Learning Centre.

The British-based company has been around since 2004 and uses premium Swiss movements found in much more costly brands.

It says it eschews expensive celebrity endorsements and sells direct through its website to keep retail prices low. Watches come with a five-year guarantee.

One of the less costly models, the Sapphire refers to the crystal used for the dial and case back, providing transparency through which you can view the Sellita SW200-1 movement at work. A self-winding, 26-jewel automatic, the C60 has a 38hr power reserve.

The 40mm stainless-steel case is rated to 600m and has a one-way bezel. Super-LumiNova Grade X1 illuminates the hands and indices.

This watch has quite a classy, understated signature. The bezel is really subtle, making it look more like a dress than a diver's watch.



£795

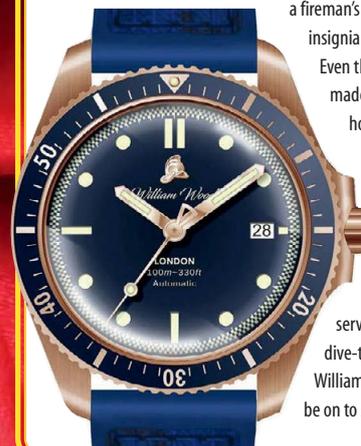
William Wood Bronze Special Edition Valiant

Jonny Garret named William Wood for his grandfather, a Tyne & Wear fireman, and the company donates to the Fire Fighters Charity UK. This is the only dive-watch in its line-up, limited to 200 units and with a three-year warranty.

Over time the bronze case will acquire its own unique patina. The 100m-rated watch has a Seiko 24-jewel NH35 automatic movement with 41hr power reserve and uses a double-domed, anti-reflective-coated sapphire-crystal lens. The bezel is unidirectional and Super-LumiNova ensures easy reading at night.

The Valiant is steeped in firefighting, with a checkered marking *a la* fire-engine livery encircling the dial, a second hand marked with a chime inspired by a fire-engine bell and a fireman's helmet insignia on the face.

Even the strap is made from a fire-hose. Many UK fire-crew dive for leisure, while overseas many fire services include dive-teams so William Wood could be on to something.

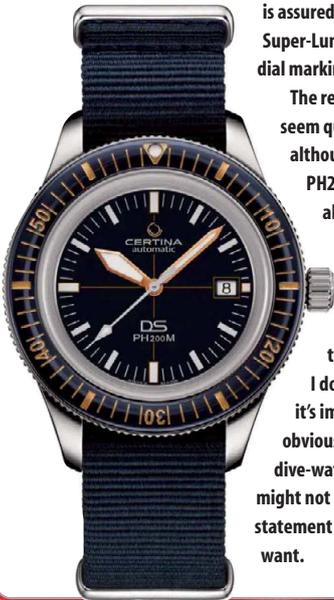


£835

Certina DS PH200M Sapphire

The Certina DS PH200M with sapphire-crystal and ceramic bezel is equipped with a Swiss ETA 25 jewel Powermatic 80.611 automatic movement with an 80hr reserve.

The 42mm body is made from 316L stainless-steel, is 200m-rated and features a second sapphire-crystal back so that you can observe the mechanism. Legibility



is assured from Super-LumiNova dial markings. The read-outs seem quite fussy, although the PH200M has already won awards for its design. Despite the bezel, I don't think it's immediately obvious that it is a dive-watch – so it might not make the statement you would want.

from £895

Christopher Ward Trident C60-Blue

Mike France, CEO and co-founder of Christopher Ward, is a diver and says of the manufacturer's support for ocean conservation: "I have become very familiar with the havoc being wreaked in our oceans by global warming. So when the opportunity arose to support the inspirational work of the Blue Marine Foundation, it was a no-brainer, really." The company has set a target to donate £200,000 to the foundation.

The Trident C-60-Blue has a 40mm brushed stainless-steel case, rated to 200m. A sapphire-crystal lens is surrounded by a uni-directional anti-scratch ceramic bezel.

The Sellita SW200-1 automatic movement has a 38hr power reserve and features 26 jewels. The dial has a wave pattern and indices and hands bear Super LumiNova luminous markings.

This is a watch I wouldn't glance at to check the time. I'd be studying the wave patterns inlaid into the face when I'm sad and missing the ocean. It would be an emotional buy.



from £895

Christopher Ward C-65 Super Compressor



Super Compressor refers to the C-65's classic backplate casing, which compresses onto its seal during descent. According to Christopher Ward, this improves the watch's water-resistance. You can view the mechanism in action through the transparent back.

Equipped with the Sellita SW200-1 automatic movement with 26 jewels and 38hr power reserve, the C-65 Super Compressor has an internal bezel for recording elapsed time, with a dedicated adjustment crown.

Super-LumiNova Grade X1 is used for easy reading in low light. This 41mm-sized timepiece is rated to 150m and would look very much at home on your wrist in a boardroom. It doesn't scream "diver". It's subtle.

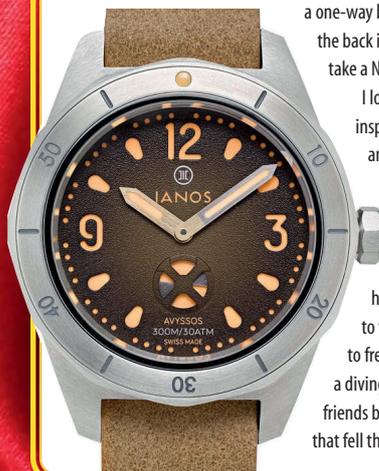
£1265

Ianos Avyssos

Launched by one Jacob Hatzidimitriou using Kickstarter, this Swiss-made watch nods to both the freediving tradition of Greek sponge-divers and Greek invention the Antikythera Mechanism, a geared device from some 2200 years ago used to calculate astronomical movements for navigation. A two-year warranty is provided.

The 44mm case is made of 316L stainless-steel with a dome sapphire-crystal glass front lens and a mineral glass observation port case back. Depth rating is 300m.

The manual wind movement is the Sellita SW216-1S, 24-jewel calibre, with 42hr power reserve. The dial has a sandpapered appearance and the luminous indices resemble traditional Greek diving stones. The second hand has been replaced by a spinning replica of an Antikythera gear. There's



a one-way bezel, and the back is slotted to take a NATO strap. I love the inspiration and boldness of the project. Before Covid I had planned to visit Greece to freedive using a diving stone with friends but, of course, that fell through.

£1399

YEMA Superman Bronze Bordeaux

The Superman Bronze Bordeaux is designed with an understated look to serve as both a dive and dress watch.

The brushed bronze casing ages with use and will take on a vintage look unique to each owner.

Beneath the sapphire-crystal window is your choice of a 39mm or 41mm dial. The hands have a gold accent and Super-LumiNova is used for low-light legibility.

The manufacturer uses its own YEMA 2000 29-jewel automatic movement with 42hr power reserve. The bezel is abrasion-protected by a sapphire-crystal inlay and uses YEMA's unique lock to ensure error-free dive-time management.

I'm very taken with the countdown bezel. I like the reassurance of the lock, and the one-minute increments dotted around it. If I was using the Bordeaux for timing decompression dives, these features would be very appealing.

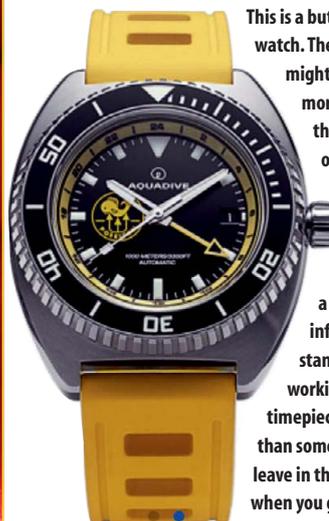


£2400

Aquadive Poseidon

The Aquadive Poseidon is a collaboration between Poseidon and Austrian dive-watch specialist Aquadive, formed in the 1960s. It's a special-edition watch, limited to only 300 units. Rated to 1000m this is a GMT model, equipped with an inner 24hr scale to allow you to track time in a second time zone.

It's an automatic watch, using the Swiss 21-jewel, shock-resistant ETA 2893-2 movement with 42hr power reserve. The 43mm casing is made of 316L stainless-steel. Super-LumiNova is employed to make the indices easy to see in dull light conditions, and the one-way bezel is set in 30sec increments.



This is a butch-looking watch. The display might be a bit more crowded than some others, but then it does set out to present a lot of information. It stands out as a working diver's timepiece rather than something to leave in the hotel safe when you go diving.

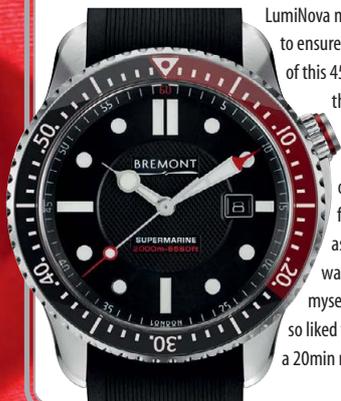
£4195

Bremont Supermarine S-2000

Vintage aircraft pilots Nick and Giles English founded Bremont in 2002. They offer a range of pilot, sports and dress watches with three-year guarantees hand-built in the UK. The French name? The brothers made a forced (and illegal) landing on a farmer's field in France. The farmer, a former WW2 pilot, also happened to restore watches. He put the brothers up and hid and helped to fix the aircraft. The brand is named for him.

The Supermarine (after the Spitfire maker) S-2000 is rated to 2000m. Precise time-keeping is promised from Bremont's BE-36AE automatic chronometer movement, which features 25 jewels. It's protected from magnetic interference by an internal Faraday cage and has a 38hr power reserve.

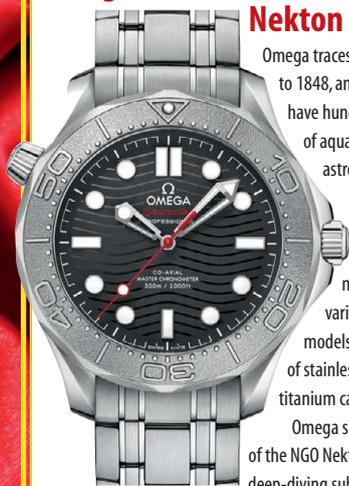
The stainless-steel case is finished with a DLC coating and the lens is of sapphire-crystal. Highest grade X1 Super



LumiNova markings are said to ensure easy reading of this 45mm watch in the dark.

The big dial and clear read-outs make this a functional as well as a good-looking watch. I tend to limit myself to 20min deco so liked that the bezel has a 20min red zone.

from £4700

Omega Seamaster Diver 300m Nektun Edition

Omega traces its history back to 1848, and its watches have hung from the wrists of aquanauts and astronauts.

Its wide range of dive-watches include numerous variations for most models, such as choices of stainless-steel or titanium casings.

Omega supports the work of the NGO Nektun, which has a deep-diving submarine currently researching Indian Ocean seamounts.

The Nektun Edition uses Omega's 35-jewel Master Chronometer 8806 automatic movement and has a 55hr reserve. The case is stainless-steel and the bezel titanium with a laser ablated scale. The ceramic dial and hands are treated with Super-LumiNova for low-light reading. Sapphire-crystal is used for the lens and the case back carries a Nektun sub engraving.

There is a helium escape valve – and also a waiting list. The Nektun has a unique livery within the Omega range and in some ways it's a fun look that should stimulate a few conversations.

£5500

Carl F Bucherer Patravi Scuba Tec Black Manta Special Edition

Carl F Bucherer is a Swiss family business dating back to 1888. It has backed UK charity the Manta Trust for the past eight years, sponsoring satellite tags to track ray movements, and says its ScubaTec line is dedicated to protecting the oceans. The company provides a two-year guarantee.

This watch is crafted around a 500m-rated 44.6mm titanium case, treated with an anti-reflective DLC finish. For saturation-divers a helium escape valve is provided.

The lens is sapphire-crystal. Inside is a 25-jewel CFB1950.1 certified chronometer movement, automatic and with a 38hr power reserve. The uni-directional bezel is ceramic and Super-LumiNova is used.

The maker considers sustainability important, and the textile insert of the black rubber strap is made of 100% recycled plastic bottles recovered from the ocean.



Owning such a watch would constantly remind me of precious past manta encounters. The Black Manta line is limited to 188 units.

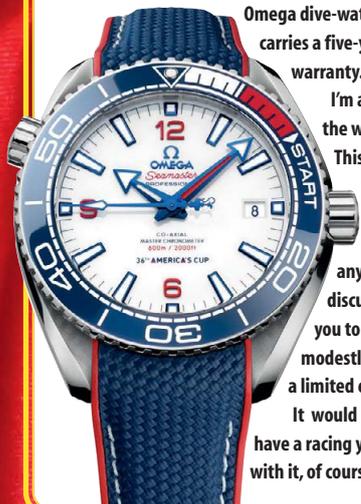
£6020

Omega Seamaster Planet Ocean 600m 36th America's Cup Edition

This Omega sports the livery of the famous race's competition logo. The 600m-certified 43.5mm case is made of anti-magnetic steel, while the domed lens is of sapphire-crystal. A helium escape valve is built in.

Inside is a 39-jewel Omega automatic 8900 chronometer movement with a 60hr power reserve, observable through the clear back.

This limited-edition watch features a uni-directional bezel with not only a dive-timing scale but also a start and 5min pre-start warning for yacht-racing. Like all Omega dive-watches, it carries a five-year warranty.



I'm a sucker for the white dial.

This is a watch that stands out and, of course, any ensuing discussion allows you to reveal modestly that it's a limited edition.

It would be nice to have a racing yacht to go with it, of course...

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The new version has been updated with a 1200m-rated titanium case, helium escape valve and automatic 38-jewel, 60hr power-reserve Master Chronometer calibre 8912 movement. The push-button bezel safety lock remains, ensuring that dive, decompression and surface-interval times are accurately recorded.

This is the one watch that you really feel you have to live up to. It belongs on the wrist of a top underwater cameraman dodging megalodons, or an explorer discovering Atlantis beneath the Antarctic ice-cap.

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TREASURE MEN OF BERMUDA



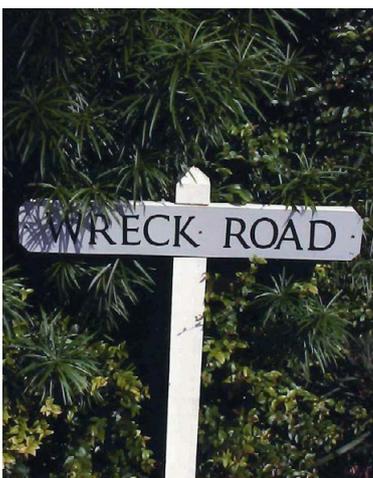
The background: Bermudian treasure-diver Teddy Tucker found an

emerald-studded gold cross on a Spanish galleon back in 1955. It came to be seen as the most valuable single object ever found on a shipwreck, but as the Queen of England was about to visit Bermuda Museum to view it, it was found to have been stolen and replaced by a replica. JOHN CHRISTOPHER FINE remembers diving around the island and meeting its treasure-hunters in 1995

TWO VERY DIFFERENT MEN, both tracing their family origins to early settlement on the Atlantic island of Bermuda, searched its waters for sunken treasure. Both men are dead now. We became friends, discussed many subjects; however, neither man talked about the other.

Perhaps they were rivals, proud of their accomplishments in life and in the lucky finds they made under water. Both were probably protective about the sunken treasure they thought had yet to be found.

I first met Harry Cox in a speciality



BERMUDA TOURISM AUTHORITY



food store called Miles Market in Hamilton, the island's capital. Pointed out to me by a clerk, he was wearing a dark blue blazer, shirt and tie, Bermuda shorts, socks and black shoes. He was restocking the shelves of a freezer with sausages.

Harry greeted me warmly, and in the following moments set up plans to take me diving at a shipwreck site at the weekend. The owner of Miles Market, he and his wife lived in a magnificent home atop a cliff outside town.

As I came to know him, I found him to be a Renaissance man. His knowledge of history in particular was encyclopaedic.

Waiting for me on the dock that weekend was Harry, his son Ricky and a couple of friends he'd promised to take out on *Shearwater*.

A grand yacht, it seemed far too elegant to be a dive vessel. Treasure-hunting is a messy pursuit – nothing stays clean, and the rough handling required for heavy equipment will scuff up a deck pretty fast. Harry and guests welcomed me aboard.

I had been diving with 'Seal' Limes and Billy McCallan on Bermuda. We had

Top: The fabled original gold and emerald cross found by Teddy Tucker, seen under glass in the museum. But where is it now?

Above: This was the real thing, photographed to show its scale.

Left: Bermuda is all about sunken ships, as the name of this byway indicates.

found the remains of a Spanish colonial shipwreck. I had been towed behind a ball on a long line.

Billy was a natural. This was before GPS made it easy to return to an exact mark in the ocean. Billy had nothing more than a compass aboard his dive-boat and that seemed unnecessary to him.

I was "shark-bait". That's what they called the person being dragged behind the boat, holding fast to a line, feet on one of those big red float-balls.

Visibility is unlimited in the waters around Bermuda. It was easy enough for me to look down 9m. Billy's plan was for me to let go of the line and drop off the float-ball if I spotted wreckage below.

That I did. Several times. Billy's only interest was in Spanish colonial

shipwrecks. The other stuff, clearly from the 19th century, didn't interest him.

I finally found what Billy deemed to be an important Spanish shipwreck site and we began to work it below.

We discovered many artefacts on that wreck I had discovered. That thrill of adventure was keen in my memory – and soon I would be lured by what Harry Cox told me about another wreck he'd found that dated to the Spanish colonial period.

SHEARWATER HANDLED well as we left Hamilton harbour. The ocean was rough. Waves broke over the bow. A woman aboard was the first to get seasick.

Harry seemed to enjoy his sea-legs and prowess at the helm. He was at one with the sea. Not the image of a seafaring man, he looked the part he played in life: proprietor of a successful store.

It took us a while to get out into the open ocean, but Harry had no difficulty finding where he wanted to drop anchor.

He was cautious about any other boats that might be following. He checked to be sure that none were in sight before he closed in on the wreck-site.

No other vessels were out in this choppy weather. It looked as if the ocean was building, although the sky was clear and the sun hot.

"Be very careful. Take this wire. You may be able to hook a bottle out of the coral. Try not to break it," Harry



Above and right: Harry Cox working the Spanish shipwreck site. With him above is his son Ricky.

Below: Working to free an object from the coral.

cautioned. He gave me a piece of wire with a small hook bent into the end.

That was it so far as instructions went. Harry fiddled with his gear as I went over the side with my tank. The sea was warm.

Once below I took my mask off to savour the soothing salt water in my eyes. I do that on every dive. In the mornings I type away, and after a spell at the computer my eyes get bleary. I welcome the soothing ocean in them.

By the time I had donned my mask again, Harry was down the anchor-line. He was wearing ratty clothes, looking every bit the pirate. The only detraction from his "look" was that just a brush with sea air seemed to redden his face.

I smiled at him through my mask. He simply motioned me toward a coral head and began his work. He had a large hammer, chisel and pry bar weighing him down to the bottom.

As I swam away, now on my own, I wasn't convinced that Harry Cox would earn a doctorate in marine archaeology with his salvage technique.

I FOUND SOMETHING right away. It was impossible to get to. Somehow the thin glass bottle had lodged inside a coral head. I could look down through the top and see it. The coral had grown around it.

There was no way I could get it out except by following Harry's instructions, using the wire to somehow hook it from the top to pull it gently out, straight up through the hole in the coral.

I was as careful as I could be. I hovered over the coral head to avoid damaging it in any way. I studied the bottle, recognising it as thin glass. Its sides were mottled in beautiful colours.

Sunlight penetration 9m down was extraordinary. Colours remained vivid. I tried to fathom this dilemma. How



could I get the bottle up and out of the coral without damaging coral or bottle?

Harry's pry bar and sledge came to mind. No, I'd rather leave this artefact where it had been for 300 years than risk destroying it or trampling a stand of natural beauty.

I'd tell Harry that I'd found a bottle but couldn't retrieve it. I wouldn't give him an exact location. I wanted it left alone.

When I turned, no one was even in sight. I swam away, and noticed Harry working a ledge near the anchor-line.

I found many Spanish olive-jar pottery shards. I recovered another bottle that was easy to remove from the coral, and lots of pieces of broken glass. This was an exciting underwater site.

When I had my bag full of artefacts I swam back to *Shearwater*, pulled myself up the anchor-line and handed my bag up to one of Harry's friends. Harry was already aboard preparing lunch.

The ocean had kicked up. Waves were breaking against the bow. Harry's son Ricky had to let out more scope on the anchor-line. Harry wanted to drift further from the site we were working anyway.

The woman remained in seasickness misery, and another of Harry's friends was lying over the rail.

There is nothing worse than being sick



at sea. My Breton clan heritage steels me against this awful predicament. As a dive instructor I knew there was little anyone could do to treat it once it took hold.

The victim would just have to ride it out – and Harry was unwilling to abandon this opportunity to do another dive on his wreck-site.

The table inside the pilot-house was set, and there I came to recognise the diabolical side of Harry Cox's nature.

With the already seasick woman sitting beside him, her head in her hands, he purposefully, and with considerable showmanship, dipped canned oysters into a jar of peanut butter and wolfed them down.

The only way to describe Harry's prolific appetite is with a "yuk". On land his culinary habits would make a person sick. He delighted as his victim watched in horror before running out of the cabin to join the man leaning over the rail.

Harry looked at me with a gleam in his eye. He tried to offer me a peanut butter-dipped oyster. It was disgusting – and I like peanut butter.

WHEN WE DIVED AGAIN it was only Harry, his son Ricky and I that took to the ocean. Once under water there was some surge at 9m but it wasn't bad. I could easily work. I wanted to get a better overview of the wreck-site.

Whatever had happened to this vessel,



it seemed that we were on scattered wreckage. Harry didn't know its identity. From olive jars he had previously recovered and from the shards I'd picked up the wreckage was clearly Spanish from the colonial period.

Above: Harry Cox, son Ricky and Charlie Reed with artefacts found diving on Spanish colonial shipwrecks – a rare brass cannon, a swivel gun, an olive jar and an octant.

Left, clockwise from far left: Priests came to the New World with wooden crucifixes, but often left with gold and emerald ones. hand-blown glass bottles, diver prizes at the Maritime Museum; all that remains of this navy sword is the brass hilt; ships heading to the New World carried trade beads – indigenous people traded gold and silver objects for such trinkets.



That made the dives exciting. There was plenty of scattered debris. I returned to the coral head that held the delicate bottle I had found on the first dive.

I looked again for a means of extracting it without damage, but there was none that I could figure out so I left it to continue my hunt.

Again I filled my bag with pottery. I found pieces of Chinese ware, obviously the result of the ship taking on cargo at Spain's Caribbean port of Veracruz, having received it from a mule train that carried goods overland from the Pacific port of Acapulco.

Spain's Manila galleons traded with China and Japan in the Pacific.

The Chinese porcelain pieces were the most exciting for me. They meant that this was an outward-bound vessel, coming from Mexico on its way back to Spain. Whatever cargo it carried would certainly be the wealth of merchants and royal commissioners in the New World. Treasure.

The ocean was heaving when I pulled myself up the anchor-line and handed my heavy mesh bag to Harry. He took it, huffing and puffing. I thought his red face was even redder than before.

"Go down and bring up my tools, good lad. I couldn't bring them up. Be sure the anchor isn't caught in coral," he instructed me from the stern.

I slipped back down under water. The tools were lying near the anchor-line. I made certain that the flukes were in sand and would pull up easily, then swam to pick up the tools.

There it was. Only a tip showing above the sand, but there was no mistaking the glint of gold. Excitement coursed through me. I dropped Harry's tools, swam to the object and pulled it out of the sand. I laughed until water filled my mask.

"That rascal Harry Cox," I thought to myself. While the gold and jewelled cross was adequate, it was clearly a prank. Harry had planted it in the sand for me to find. He was now sure of my diving and knew I wouldn't miss the opportunity to look around when I returned for his tools.

I placed the jewelled gold cross in a BC pocket, gathered Harry's equipment and pulled myself up to the surface.

HARRY TOOK HIS heavy tools from me. An elfish gleam was in his eyes when I pulled the gold cross out of my pocket, holding onto the swim platform. "Here, Harry. Where did you get this? In the five-and-dime store?"

Harry had a wonderful laugh. He laughed only long enough to take the fake gold cross in his hands and look at it himself. "Yes. When you once touch gold you cannot be fooled," he said.

I pulled myself aboard, helped raise

the anchor and we headed in. Never were people so glad to step onto the dock that evening as were *Shearwater's* passengers.

The ocean was rough, with high waves. A front was coming through. We wouldn't be able to return to Harry's wreck-site that week.

I spent time with Harry at his magnificent home. He had found amazing treasures. Among his favourites were navigational instruments. A brass octant was in excellent condition considering its age, and the fact that it had been shipwrecked in a hurricane.

Harry wanted me to join his quest for the legendary *Sea Venture*, a ship that had been owned by the English Virginia Company. In 1609 she had been caught in a hurricane. The crew put her on a coral reef to prevent her sinking. Survivors came ashore and settled on Bermuda.

"*Sea Venture* carried my ancestors to this island." Harry waxed sentimental. "I'm determined to find her remains." The spread was luxurious. Whatever his propensities for grub aboard ship, his wife prepared a magnificent table at home.

TEDDY TUCKER WAS LEANING

against a gigantic millstone at his dock. He stood in shorts with bare feet, his complexion tanned brown as a nut. His sandy-grey hair was short-cropped. If there was a man who resembled a Hollywood adventurer, it was Teddy. A legend on the island of Bermuda, he had found enormous wealth under water.

It had been to replicate the fabled gold and emerald cross that Teddy had found in 1955 – Tucker's Cross – that Harry Cox had hoped to fool me with the dime-store replica.

I was on Billy McCallan's boat after a day on the ocean diving for treasure. Teddy had welcomed us heartily. Billy wanted to tell his friend about the shipwreck I'd found.

We recovered six-sided ceramic tiles from the wreckage. I found a large lead sounding weight that Billy chopped out of the coral. There were many pottery shards and olive-jar pieces that I had originally spotted when I first dropped off the line.

I was good shark-bait. It made Teddy laugh. He was affable and easy to get

Below left: Legendary Bermuda diver Teddy Tucker with the millstones he found on a shipwreck.

Below: Police Sgt Instone shows John Christopher Fine the fake gold cross.

along with. Of solid build, he might have been the captain of a sailing ship of old.

Teddy told me that the Crown took his original finds from him. This was wonderful mystery, the stuff of which adventure stories are made.

Teddy had great luck diving for treasure around Bermuda. He discovered a clutch of it from the wreckage of a Spanish galleon heading back to Spain. The ship wrecked in a gale and foundered on one of Bermuda's shallow reefs.

Navigators of old headed east in the Atlantic when they reached the vicinity of the Carolinas. Their directions warned of treacherous shallow reefs around Bermuda, and sailing masters kept well off the island as they followed the course of the northward-flowing Gulf Stream that would take them across the ocean homeward-bound.

This ship had never made it home.

TEDDY HAD HIDDEN his finds. By law Bermuda required a salvage diver to declare underwater finds to the Receiver of Wreck. Bermuda has a fair system. It is fair to native Bermudians, and Teddy Tucker was certainly descended from an original clan of Bermuda settlers. Yet Teddy was unsure what to do when he found such immense wealth.

Bermuda is a small island. It's impossible to keep a secret, no matter clandestine intent. Soon the rumour of Teddy Tucker's treasure got out.

As the story grew, it became necessary for him to declare his wreck. He turned the treasure over to the authorities and claimed salvage.

By law, if Bermuda wished to have the treasure, so declared, the government would have to buy it and give just compensation to the salvage diver.

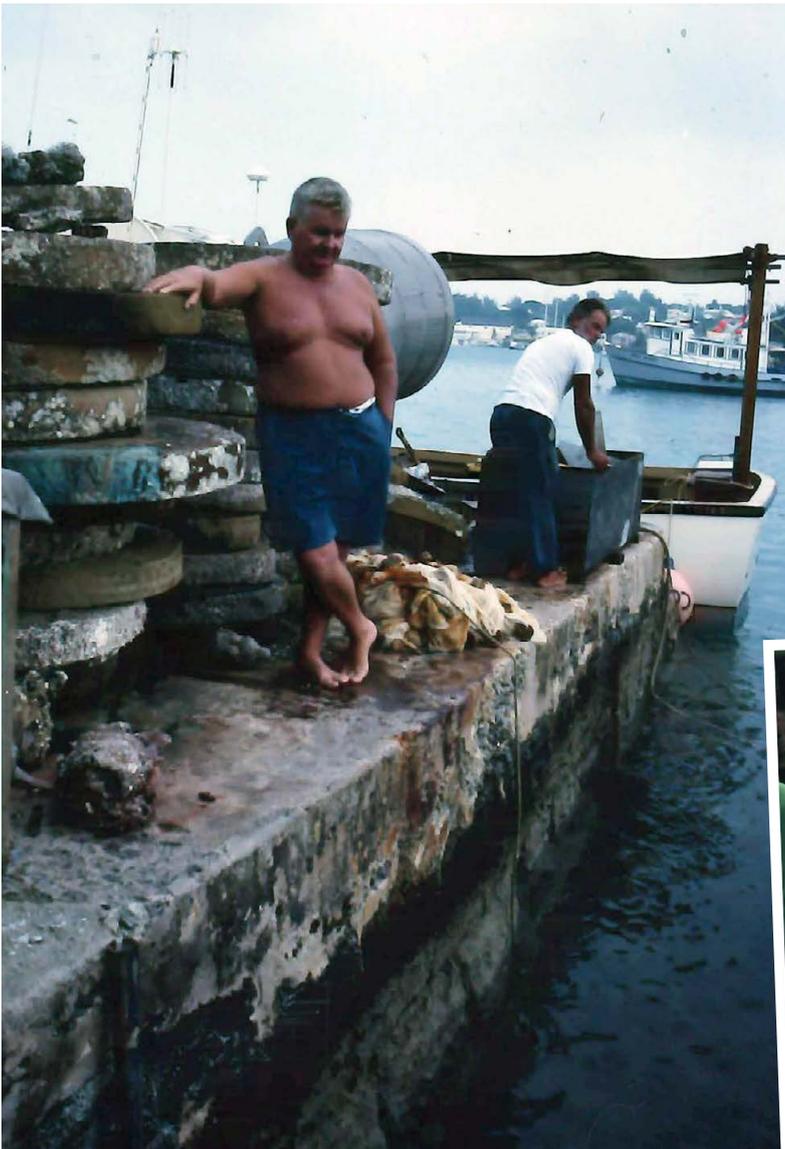
In the case of Teddy Tucker's amazing finds of gold, especially the gold and emerald cross of immense value, historically and monetarily, the government wanted it. The requirement

was that the find would have to be appraised.

One appraiser was hired by the salvage diver, one by the Bermudan authorities and another was independent. Once the value was settled Teddy Tucker was paid handsomely for his treasure and it became government property.

The centrepiece of his find, the emerald and gold cross, was placed under bullet-proof glass and displayed in the museum in Hamilton, where it remained for many years.

In preparation for a





Left: Billy McCallan with olive jars recovered from a Spanish colonial shipwreck lost off Bermuda.

Above: Ceramic vessels used for smelting gold recovered from a wreck.

Right: Billy McCallan with more artefacts from Spanish shipwrecks – ballast stones, scale weights and ceramic gold-smelters.

Below: A Spanish ship's anchor in clear water.

Bermuda police. Sergeant Instone informed me that the case was still open. The Queen of England never put her hands on Teddy Tucker's gold and emerald cross, the centrepiece of his treasure discovery, and its disappearance remains an unsolved crime.

This is the stuff of which Hollywood films are made. How did a thief get into the alarmed museum, then remove the original gold and emerald cross from under that heavy bulletproof glass protection and replace it with a fake?

Holding the fake, it was obvious that it was only a replica. Like the dime-store cross with which Harry Cox had tried to fool me, anyone who examined the replica would immediately know it was not real. It wasn't even sufficiently heavy to make it seem authentic.

It seems that distortion though the thick glass of its case kept the heist from being discovered by the museum authorities, probably for years, until the day it was removed for the royal visit.

THE HEAVY MILLSTONES against which Teddy Tucker was leaning had been recovered from another shipwreck he had found. He wasn't sure what he was going to do with the huge pile of this once-heavy cargo.

The millstones remained on his dock, the last I knew. Teddy loaned his salvage ship, the *Miss Eula*, to work on a shipwreck project near shore just south of Florida's Jupiter Inlet. I met him there, and we had great fun discussing his Bermuda diving adventures.

My friends Harry Cox and Teddy Tucker are gone. Both men have passed over the bar. Their adventurous diving exploits are legend. They're part of Bermuda folklore that will live forever in the history of the island.

Bermuda is a land of sunken ships. Of doubloons and silver bars. No one can find it all. Perhaps some lucky diver will come to the surface with another clutch of gold, heralding once again Bermuda's sunken treasure.

royal visit in 1995, Bermuda's authorities planned to remove it from its display to show to the Queen when she visited the museum.

However, when the bulletproof glass was removed it was immediately apparent that the cross that had been on display was a fake. The original had been stolen. How or when the crime had been accomplished was never discovered.

I was shown the fake cross by the



BERMUDA

Bermuda is a series of 181 islands located 665 miles south-south-east of Cape Hatteras, North Carolina. They were discovered by Juan de Bermudez in 1503 but never settled by the Spanish.

It was only in 1609 when *Sea Venture* wrecked on the shores that the British began a permanent colony on the island named for its discoverer.

Bermuda remains a British overseas territory, its governor appointed by the Crown.

With 64 miles of rugged coastline the land surface area of all the islands is only 20.6sq miles and it has a population of 65,000 – and a claimed 300 shipwrecks to explore. Information about these is available at gotobermuda.com



STAYING AFLOAT

One diver's salvation through art and the sea: you might know her better as a regular contributor and DIVER cover girl, but **JADE HOKSBERGEN's** abiding passion is for mixing her love of the ocean with painting



EXPRESSION THROUGH ART has always played a vital role in my life and my wellbeing. I started painting from the age of 14 after being given a diagnosis that would change my life forever.

My affair with painting quickly blossomed when my artistic ambitions were recognised and encouraged by my father. Painting soon became something I engaged in on a daily basis, often several times a day. It was as important to me as breathing and, in strange ways, it has kept me alive and going.

I slowly learnt that by putting paintbrush to canvas, I could feel temporary relief from the internal demons I faced. Painting felt to me like a necessity, rather than a hobby, and I painted so prolifically that it felt as though it defined my very existence for a while.

It has allowed, and still allows me to process emotions I struggle to articulate in words. I guess you could say that I write my biography best with a brush.

MY BODY OF WORK can be broken down into two series: the ANOX (2009-2012) series, and OCEAN series (2013-2020).

The ANOX series is the product of an enormous creative urge that began after the diagnosis made it clear that I was treading on a thin line separating life and death. Each ANOX painting is a composition comprising these lines.

Paintings in this series are not only characterised by the use of clean bold lines but also bold colours and rigid geometrical shapes.

They reflect a past version of myself that was not only chasing an ungraspable sense of control in life but operating in a deadly-narrow comfort zone.

Growing up in the Philippines allowed for weekly visits to the sea, and I was introduced to scuba-diving at the age of 9.

This exposure to the underwater world would start directly influencing my art from 2013 on, as I began a new series of work: OCEAN.

This saw clean, bold lines replaced by messy ones, mirroring an evolving self that was more relaxed, one no longer confined inside a rigid mind-prison.

This series is the product of an evolving self, one more accepting that much of life is beyond our control.

Rather than the use of exclusively bold colours, the OCEAN series uses a more nuanced palette, symbolising life's uncertainty and the idea that, rather than being absolute, many things in life fall under a spectrum.

The OCEAN series reveals an appreciation for lifeforms under water, and exhibits the spontaneity and freedom that comes with embracing this uncertainty.

It draws influence from life in the ocean, where I've often felt most free. Diving transports me to the same place painting does, a place of tremendous healing and relief. It's a place where destructive tendencies are hushed.

By processing my emotions through art, abstruse creatures are born, and destructive thoughts are purged. I keep my head above the water by painting what might lurk below.

I've been told that the subjects of my paintings resemble the kind of fish found in the deepest reaches of the oceans, with their jagged teeth, filamented features, elongated spines and light-producing lures.

I'm not sure how that came to be, because I usually photograph life firmly within recreational-diving limits, with the occasional frogfish being the most fearsome-looking creature encountered.

However, in 2018, when I started blackwater diving, I encountered fish that looked just like those in my paintings.

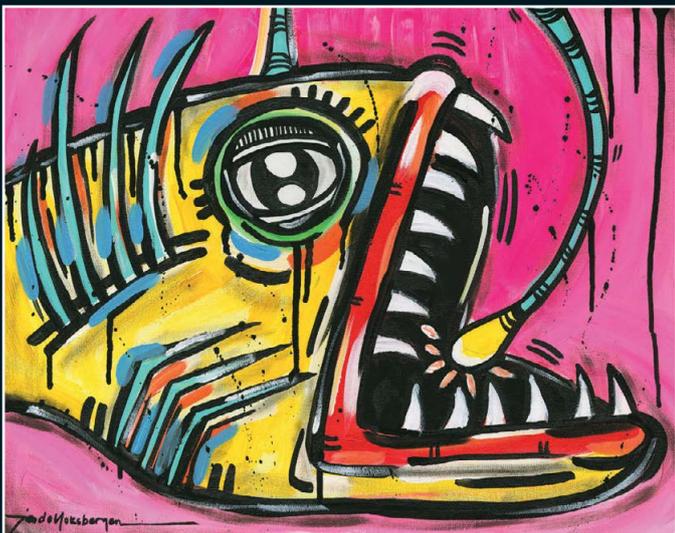
Through encountering these larval, pelagic animals, I realised how much of a parallel there was between my work and that of Mother Nature. In a strange way, I felt as if I was diving in my imagination.

For instance, the larval lionfish I encountered looked like a close cousin to the portraiture I had painted on canvas. I've always known it, but now there was no debate, Mother Nature is truly an artist that can't be outshone.

AS I EMBARKED on the OCEAN series, my ties to the sea were strengthening. On a trip to Malapascua in 2013, a place world-famous for thresher sharks, I met Henley Spiers. He would later become my husband and father to our two children.

Together we pursued a life guided



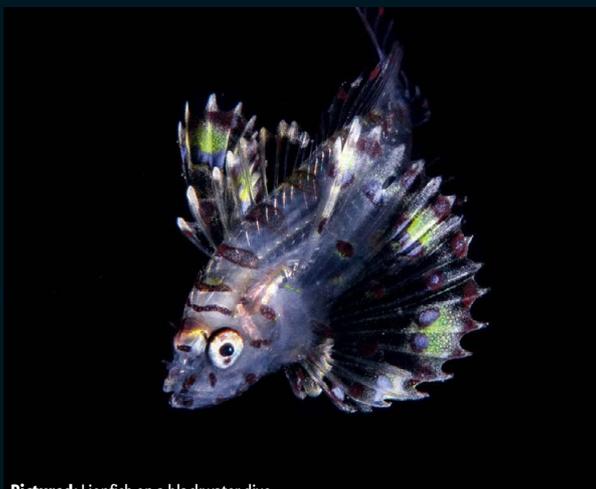


by undersea encounters, working together as dive pros in St Lucia, before transitioning to a new career as underwater photographers. I hope you will have seen some of our features in the pages of **DIVER**.

The camera is a valuable creative outlet, fulfilling my passion for sharing the story of the ocean's smaller, and often overlooked inhabitants.

At heart, however, my creative mother-tongue is painting.

I'm less interested in painting what I can see as what I feel. My art will always be very personal, and for a long time I fought shy of sharing it, for fear of being criticised and judged.



Pictured: Lionfish on a blackwater dive.

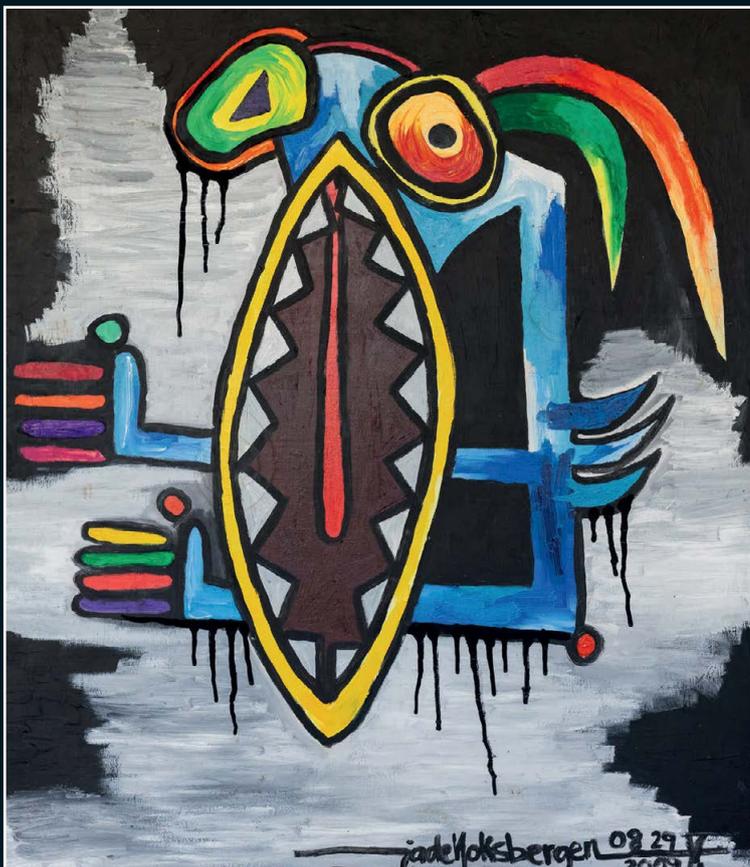
Most of my work includes "symbols" – abstractions of certain objects/ features/ elements that I feel are important in the telling of my story.

Some of these symbols include sharp teeth, drool drops, belching tongues, crosses, and the three ribs (often disguised as fish gills), and they highlight a particular trauma in my past of which I bear the scars today.

In many ways, the "portraits" I paint are extensions of myself, carrying the burden of my emotions so that I don't have to.

Therefore, by the same train of thought, any criticism of them feels like a criticism directed at my own existence.

However, I've since learned that for the viewer they are nothing more than works of art, and there is nothing more



You can see more of Jade's work and keep up with the weekly release of new artworks on her website jadehoksbergen.com, or by following her on Instagram: @myjaded.artstyle or Facebook: @jadehoksbergen



subjective and varied in this world than our taste. So, I have decided, as a personal challenge, to keep creating but also to share and let them go.

To let go of the fear that comes along with exposing these extensions of myself, but also to physically let them go. I truly believe this is the next step I need to take for my personal growth and, truth be told, I only have so many walls!

My paintings document not just my metamorphosis as a painter, but as a survivor – one who has found great solace in the ocean and art. ■



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SATURDAY ON THE NORTHERN SHIP



LUIS MOTA

THE CONDITIONS IN the north of Portugal might be far from good, but we love to dive here. We often have to deal with combinations of chronic poor visibility, green water, low water temperatures and stormy conditions, but we still enjoy our special reef and wreck dive-spots. Two highlights are the WW2 U-boat *U-1277* and the “Navio do Norte” (or Northern Ship), a name given to the wreck by local fishermen.

U-1277's story has been told many times by experienced scuba-diver Luis Mota, who has a deeper knowledge of it than anyone else, formed after several hundred dives on the wreck.

The submarine was scuttled by its crew in 1945, so lacks the tragic back-story of some wrecks but that doesn't detract from the sense of mystery of diving a murderous war machine built by the Third Reich.

We dive the site whenever sea and weather conditions allow, whatever the vis. The relatively well-preserved wreck has exerted its magnetic appeal for divers ever since it was rediscovered in 1972.



It is possible to dive a favourite wreck regularly for years and still find something new. But not often is the find as surprising as that made recently by PEDRO MOCO

The *Navio do Norte* is as intriguing but more mysterious, not only in terms of its identity but of when it sank. Luis believes it could be the British steamboat *Tiber*, which sank on 21 February, 1847.

She was sailing between Gibraltar and Southampton when she sank off the small village of Vila Chã, either because of a storm or dense fog.

The wreckage appears to be from a wooden ship, though the timber is almost gone, and of an age compatible with the *Tiber*, but no one can be sure.

The heap of ship parts and cargo, fused over time by the effects of salt water and marine organisms, rests at about 33m in an open sandy area, but it's still possible to identify cannon, mortars (rare even in the Portuguese navy museum), parts of

the mast, ballast, ammunition, the hull lining and reinforcement, the Admiralty-type anchor and containers for transporting food.

This immense amalgamation of pieces never fails to delight us however often we dive the *Navio do Norte*, because on every dive we seem to see and identify something new.

My friend Delfim Trancoso is a diver who knows more about it than most, and hearing him speaking with emotion about it is always an enriching experience.

That said, I didn't think there could be too much to add to all the knowledge of *Navio do Norte* gained by so many divers over the years, but I was wrong.

On a single dive on 18 June this year I made a surprising and rare discovery.

IT WAS A SUNNY Saturday morning. Diving the wreck calls for good sea conditions, not least to allow the boat-ride out from the port of Leixões, and this doesn't occur that often.

Our group was from the Submania dive-centre family and our vessel was the

Above: Pedro's dive-group prepare for another day on the *Navio do Norte* wreck.



LUIS MOTA



LUIS MOTA



RUI OLIVEIRA



RUI OLIVEIRA

IF, a support-boat for classes and school dives.

The trip was relaxed, as it is always with our group. As we approached the site we prepared our equipment, closed our dry- or semi-dry suits, slung our tanks onto our backs, tested regulators and torches and put on our fins, gloves and hoods.

Above, from left: Two cannon; it was a dogfish that led Pedro to his find.

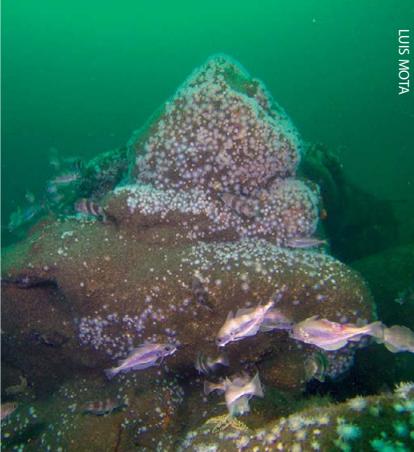
Left, from left: Lobster; conger eel.

Below: Pedro with his find.

The extraordinarily jolly and experienced diver Luis Osorio was my buddy on this dive. We back-rolled off the



LUIS MOTA



LUIS MOITA



ZÉ BETO MIRANDA



ZÉ BETO MIRANDA

tubes, approached the buoy and moved down on the anchor-line. As one of the last pairs in, we had been asked to release the anchor at the end of the dive.

The visibility at the bottom was a pleasant surprise, 8-10 m – rare in northern Portugal. We were able to take in an unusually large proportion of the wreck all at once.

The anchor was fastened on the northern edge of the wreck. We drifted

over the cannon, mortars and their ammunition, containers, twisted pieces of iron and the many unidentifiable items.

Luis was easy to identify under water in his yellow, initialled fins, but in this unaccustomed good visibility there was little risk of losing each other.

It was a pleasant, very peaceful dive in which we could even see the wide expanse of sand around the wreck.

About 15m south of the debris I spotted a shadow on the sand, something that stood up about half a metre from the seabed, slightly inclined.

It looked like a piece of shapeless iron and I didn't think too much about it, but while looking in that direction I noticed a dogfish perched on the sand.

These cartilaginous shark relatives are rarely seen on the wreck, and I used my torch to signal the sighting to my buddy and proceeded, because of the good visibility, towards the dogfish.

Luis followed. I didn't have a camera with me but simply wanted to record the half-metre dogfish with its yellow-speckled back as an observation in my memory. It looked at me calmly with its big eyes and didn't move.

I WAS ABOUT TO SWIM back to the wreck when I looked again at the protruding item that had first drawn my attention – and what I saw left me appalled and confused.

I could clearly see the profile of the butt of a gun – a carbine or a rifle.

My heart started beating hard, which is not the best thing that can happen to a diver, but the discovery seemed too significant to allow me to remain calm.

I touched the weapon, half-buried in the sand, and at first it felt to be stuck fast, but it proved possible to shift by applying a little effort.

Slowly I turned the piece on itself to release it from the sand, and when it came free was amazed by its weight – enough to pull me down towards the bottom.

Lying on the sand while inflating my BC slightly I looked at my find. It seemed to me extremely beautiful, covered with shells, sand and organisms.



Above, dockwise from left: Pout on the wreck; wheel; diver with mortar; the mortar's trailer.

It was clearly a gun – I could see the rounded trigger-guard. It seemed to me a treasure, something that had possibly been held in the hands of one of the ship's crew and abandoned in the course of the shipwreck.

Perhaps he had fired it in the past, taken lives and saved others. That weapon, more than 170 years later, could still tell a story.

I had to take it with me to help unravel the story. Experimentally I started to ascend – even though it was a heavy piece, surely my BC would enable me to carry it?

I still had 120 bar of air, a comfortable amount in a 15-litre bottle, so instead of finishing the dive at that point, penalising my buddy as well as myself, I made another plan.

I carried the gun under and parallel to my body, blew some more air into my BC and finned towards the anchor-line.

I would tie the artefact to the end of the line while we finished the dive and retrieve it when we released the anchor.

Luis followed, trying to understand what I was up to. On the way, we came across husband and wife divers Elsa and Pedro, who just stared wide-eyed.

But I didn't stop, because the piece was heavy and I was on a mission.

I TIED THE BUTT of the gun to the anchor-line with some difficulty. Luis helped me with the knot, pulling on the cable to assist the operation, and we continued the dive. It seemed strange to leave my treasure behind, but we had the rest of the dive to enjoy.

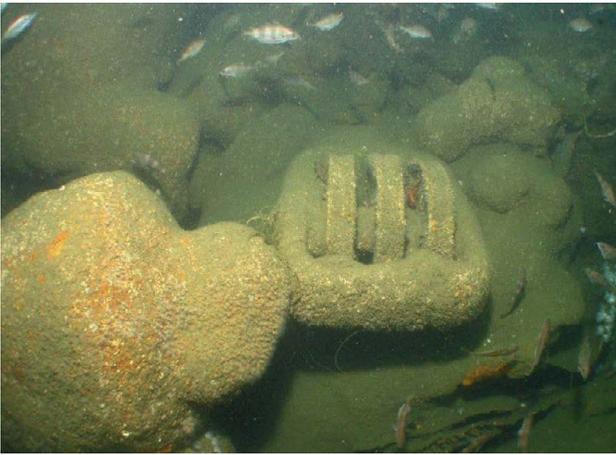
We did another tour of the wreck, enjoying the company of congers eels, pouting, crabs and octopuses until we reaching the 50-bar mark, released the anchor and climbed the loose line.

We made a two-minute decompression stop at 16m, as my computer instructed, 



'MY HEART STARTED BEATING FAST, WHICH IS NOT THE BEST THING THAT CAN HAPPEN TO A DIVER'

ZE BETO MIRANDA



ZE BETO MIRANDA

and the usual safety-stop at 5m.

During this stop, I thought about the artefact I had found and the impact that the discovery would have on my diving friends. It was the longest three-minute stop I had even spent!

At the surface I inflated my BC and signalled to the boat that everything was fine. But I couldn't contain myself and called out to Luís, who was skipping the boat: "Be careful to hoist the anchor, because I left a rifle tied to the rope!"

My companions seemed sceptical, but as I got rid of my weight-belt and BC I talked and talked, and everyone started to wonder.

Another diver, Victor Marafona, was

lifting the anchor and could feel the extra weight. As the gun broke the surface to general astonishment, Luís cried: "Look, it really is a rifle!"

We took photographs of the gun and of me holding it across my chest.

We decided straight away to hand it over to the National Centre for Nautical & Underwater Archaeology, an organisation created by Portugal's Directorate-General for Cultural Heritage.

We sent over some pictures, and the archaeologists' first impression indicated that the gun was a Portuguese or English shotgun from 1830-1840, compatible with the date of the sinking of the *Tiber*.

If it is English, the identification will be

Above, from left: Pulley; diver with cannon.

that much closer. If it's Portuguese, we'll have a new identification problem on our hands.

Only careful cleaning of the piece, including a long period of desalination and various treatments, can pinpoint its origin and the reason for it to be where I found it so long after its loss.

We await the results of the analysis.

I think that every diver dreams of discovering a treasure, even if it has no significant monetary value. It only needs to be a glimpse into history.

This time, it was my good fortune to make a discovery, but I believe that the *Navio do Norte* holds many more surprises. ▣

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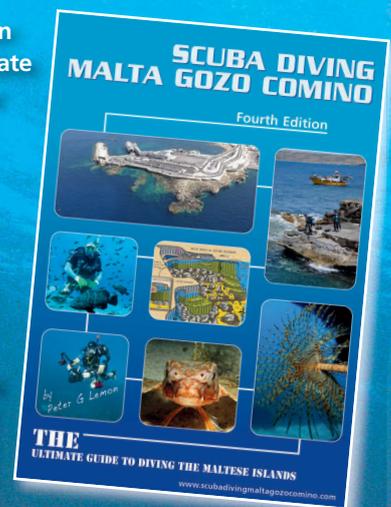
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Diving with purpose

RECENTLY I'VE BEEN TRANSFIXED by diving on TV. The BBC series *Enslaved* is a global story that takes divers all over the world to investigate slavery and connect people and identities through the wrecks of slave ships.

It's absolutely brilliant. If you didn't see it, catch up on iPlayer.

The four episodes are like an exponential version of *Who Do You Think You Are?* It's a revealing delve into the ancestry of entire populations of black people who were displaced and trafficked through slavery – largely by British merchants and through British ports – and how that story resonates into the here and now.

It's a documentary that couldn't be more timely. And it's explored through today's divers; many of whom are seeking a link to their own ancestry and stories by diving and investigating the wrecks of these slave ships. This is powerful and compelling viewing.

This is not a little bit of diving on the side, but lots of diving. This is not easy diving in pretty conditions, but every type of diving – from deep, technical diving in the English channel to freediving in murky shallows off Costa Rica.

The divers call their group Diving with a Purpose. You can actually feel the urgency and the passion as they set about their mission. There's no attempt to select pretty wrecks in perfect conditions – the story is more important than the conditions, and the divers are genuinely working to look for clues.

This is not some neutral endeavour or scientific exercise; this is personal, emotional. Far more gripping than artful, fictional drama.

As a result it's a million miles away from our usual TV diving fare. Which will generally feature a jolly (but somewhat awkward-looking in their kit) TV presenter pointing at a fish, while the camera-crew and support divers endeavour to prevent them from drowning.

BUT LET'S TAKE A BREATH. After all we do have some outstanding TV of our oceans in the *Blue Planet* series among others. This demonstrates the powerful use of diving in an entirely different way.

Because the overwhelming majority of divers are not diving for any purpose other than recreation and pleasure. Let's not knock it. To be honest, diving without a purpose is probably one of the few things that can rescue our sanity in these challenging times.

I now look at *Blue Planet* in the same way that I view a series like *Autumn Watch*. It's a joy for the eyes and a balm for the mind. It connects you to something that's larger than yourself and places your concerns into a kinder perspective.

I have to confess that I'm often guilty of a "mission diving" mentality. I've had to be searching for something, photographing or videoing. Managing complex kit, depth, gases and decompression. Carrying out some kind of task. Busy, busy.

Maybe it's only when you remove the "busy" that you can experience the peacefulness offered by diving. Weightless and relaxed, the rhythm of your breathing, the simple enormity of the expanse of the water around you. Just being in the moment. It's our best therapy for the here and now.

Perhaps the best lesson in diving is that you don't need a purpose to find meaning.

LOUISE TREWAVAS

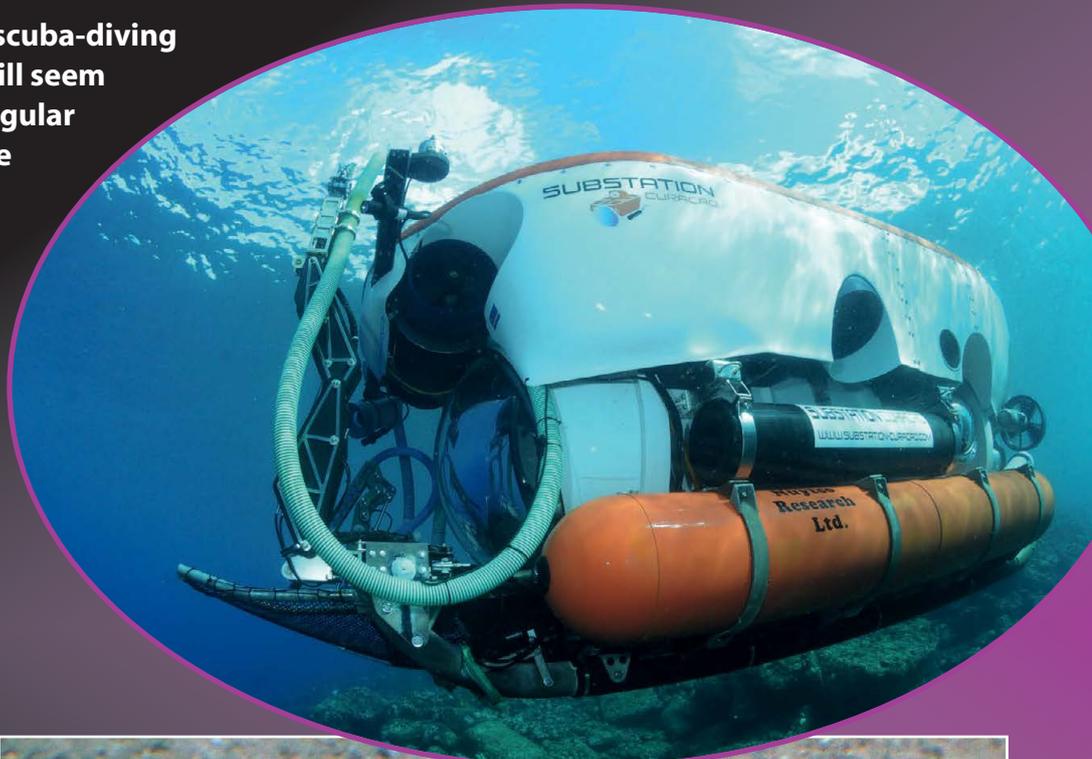


DESCENT TO THE TWILIGHT ZONE



Much of the scuba-diving in Curaçao will seem familiar to regular visitors to the Caribbean

but there is one dive that is completely out of the ordinary. So what lies 300m down, on the outer edge of the Twilight Zone? **MICHAEL SALVAREZZA** and **CHRISTOPHER P WEAVER** had to find out but first, for context, some shallower dives were needed...



THE REEF DROPPED OFF suddenly and tumbled into the depths, creating a sheer wall beginning at 14m and extending beyond recreational diving limits. Hard corals mixed with colourful sponges made for an inviting journey along it.

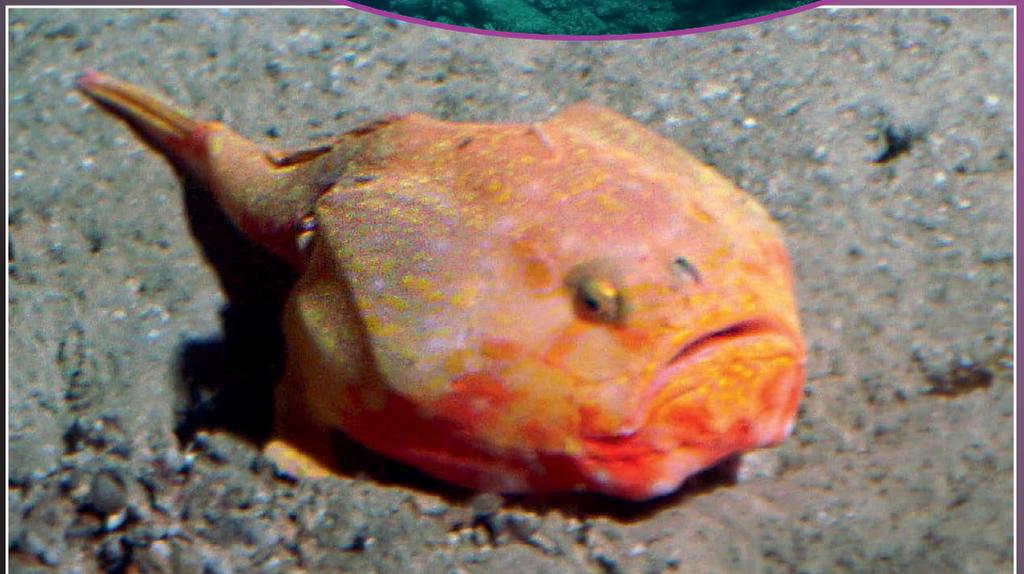
Schools of wrasse and tang darted about, while several wary moray eels poked their heads out of crevices to strike a threatening pose.

This was Blue Bay Wall in Curaçao, on our first dive of the week, and a good start to a trip aimed at exploring the island's deeper reefs and eventually venturing deeper than most scuba-divers ever get to go.

Curaçao is the "C" in the ABC islands of Aruba, Bonaire and Curaçao ("B" is probably the best-known to UK divers). It lies just 35 miles north of Venezuela and is 37 miles long and seven wide.

In sharp contrast to the coral jungle that lies just offshore beneath the waves of the warm Caribbean, Curaçao has a desert-like landscape.

Not much more than 50cm of rain falls per year and this, combined with hot and sultry temperatures, gives rise to cactus and other desert flora and fauna. It also means that there is little run-off from the



Top: The deepwater submarine prepares to dive.

Above: At 2400m, the sub camera photographs unfamiliar-looking fish like this.

land, making for invitingly clear waters.

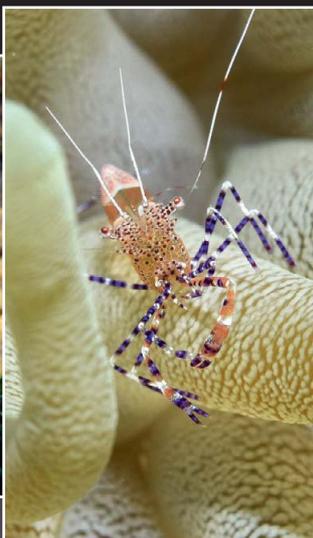
As we traversed Blue Bay Wall, we found ourselves swimming with Nassau grouper, rock hinds and several species of parrotfish. With a water temperature of 29°, we were quite comfortable in our 3mm suits for an extended exploration.

Blue Bay Wall is one of Curaçao's best dives but there are many others to intrigue divers visiting this Dutch

territory. We had soon fallen into a pleasant routine of diving twice in the morning, grabbing a hearty island lunch and spending the afternoon either doing another dive, enjoying time on the beach or getting out and about on the island.

We explored a number of good-quality dive-sites, but describing four will suffice to give a flavour and range of the place.

At Playa Largo Drift we cruised over



a picturesque reef system in a slight current and photographed lizardfish and a peacock flounder along with invertebrates such as feather-duster and Christmas tree worms.

This was a good second dive of the day because it was shallower than the deeper walls, but the “drift” in the name is a bit misleading – far from a strong-current experience, this was merely a gentle flow along the shore.

In Bullen Bay we dropped to 23m and spotted a green moray as well as a giant barracuda patrolling the reef.

This site also features a wall and drop-off, and smart divers keep one eye focused on the deep blue waters away from the reef in case of spotting jack, tuna or the occasional reef shark.

One of Curaçao’s signature dives, Mushroom Garden, is a favourite spot known for its huge coral growths and columns of rock covered in orange cup corals. The “garden” extends over a swathe of ocean bottom and the outcroppings resemble big mushrooms.

We didn’t have the opportunity to do a night dive there but imagine the orange corals would make for striking photographs in the darkness.

CURAÇAO’S DIVE-SITES include some fascinating shipwrecks, and one lies at the mouth of Willemstad Harbour.

The *Superior Producer* was a freighter

that sank in 1978 in 30m. When we visit the Caribbean it’s often difficult to imagine ships sinking in these calm, clear, warm seas but water is water.

Bad judgment and poor seamanship can sink a vessel there just as easily as anywhere else in the world.

The *Superior Producer* had left harbour overlaid against the advice of its captain, whose trepidation became reality almost before the crew had finished waving good-bye to people on shore.

The 73m cargo ship was heading for Venezuela for the Christmas shopping season and her hold was full of clothing and alcohol, but the water was rough.

The combination of large ocean swells and overloading spelt trouble and within minutes the cargo had started shifting. The *Superior Producer* sank quickly on an even keel.

Shortly afterwards blue jeans, cotton T-shirts, sheets and crates of whisky began washing up on shore.

It was a Christmas that kept on giving for the locals, with divers getting in on the act to help recover the goods. Within days many islanders were wearing new clothes and some were reeling from the effects of the alcoholic bonanza.

The wreck continues to be a gift to Curaçao – as a terrific dive. Covered in marine growth, it is home to a wide

Above from left: The head of a lizardfish; shrimp and crabs often make their homes among the stinging tentacles of anemones; a French angelfish, though they are often found in pairs.

variety of fish life. We found purple-tipped anemones near the base and on closer examination found that these hosted several species of colourful shrimp. Minor penetration is possible into the bridge area and down into some of the cargo holds.

THE DEEPER DIVE mentioned earlier would not be technical but achieved through the use of a submarine. Substation Curaçao, located near the Curaçao Aquarium, takes passengers down to 300m, and we had signed up to see what it was like.

It’s a tourist excursion but we did feel like *bona fide* ocean-explorers as we talked to the tour guides about the construction of the vehicle, the safety measures in place and what we should expect to experience on our dive.

The five-person submarine was built by Nuytco Research and is designed for a depth of 600m, tested to 460m and certified for 300m.

It has a metre-wide front-facing viewport and two other 25cm ports, redundant battery, air and oxygen supplies and uses scrubbers to remove carbon dioxide from the main cabin, so passengers could in theory survive on the bottom for four days should the sub become disabled. Far from that, we hoped to be back in time for lunch.

After a briefing, we entered the sub and got comfortable lying flat on our

Below from left: Like other damselfish, three-spots are unafraid of divers; an arrow crab takes shelter beneath a small anemone; a gaudily-coloured stoplight parrotfish.





stomachs near the front viewport. This position would become a little challenging to our backs as the dive progressed, but the excitement of descending beyond the reach of sunlight helped us to forget about the discomfort.

The sub pushed off from a loading dock and traversed over the familiar-looking reef nearby before starting to descend.

A slight swaying at the surface made us aware that we were inside a vehicle, but once below the influence of the waves its motion became indiscernible.

AT FIRST THE DESCENT felt much like any scuba-dive as we watched hard corals, seafans and sponges appear ahead, but because of the curvature of the dome-port everything looked further away and smaller than we were used to. A giant-sized green moray immediately below us looked as if it was 10m away!

Soon, however, things began to feel

Above: A small community of fish photographed by the submarine at 180m and (inset) a lionfish at 120m. The bad news for would-be deepwater photographers is that deploying a DSLR is not practical from the sub.

Below from left: The strange face of a peacock flounder; a turtle finds respite on the reef.

different. As we dropped below 120m, the darkness was beginning to set in.

Surprisingly, we were still seeing the invasive lionfish at these depths – scuba-divers try to eradicate them from the shallow reefs, but if they are thriving at 120m the challenge of ridding the Caribbean of these fish is far more difficult than we had imagined.

At 180m the sunlight was all but gone. Now we felt that the adventure was really underway. Corals vanished and the landscape became alien and rather bland and rocky.

Inside the sub, quiet and darkness began to envelope us. The whirring sounds of the motors and the occasional communication with the surface alone broke the silence, along with the commentary of the captain.

At 240m, a set of large boulders emerged from the darkness. We saw an occasional deepwater eel slithering along the bottom, along with some shy fish that

resembled squirrelfish. Creeping along the seabed were sea urchins, and an occasional crinoid could be seen on the rocks. All of this was brilliantly illuminated by the sub's powerful lights.

Then, at about 290m, a loud terrifying bang startled us. In that brief moment we couldn't help picturing the submarine cracking open!

THE CAPTAIN ASSURED us that this was nothing to be worried about, simply the metal adjusting to the pressure, but it did serve to remind us that we were at the mercy of the integrity of the submarine, and far from the surface should there be a problem.

With hearts beating that bit faster, we turned our attention back to the underwater landscape in front of us.

We "bottomed out" at 308m, having reached an area of ocean that few scuba-divers will ever see, before beginning a slow ascent back to the world of sunlight,



blue waters and reefs teeming with life.

The ocean floor turned out to be a mixture of rocks and muddy substrate, where we discerned both familiar and unfamiliar marine life.

Seeing species such as squirrelfish and lionfish surprised us only because we were seeing them at such depth. But for us marine-life geeks, it was seeing those species found only in the dark waters of the deep that was the real treat.

We found, for example, red sea urchins that the captain said were poisonous, and a fish known as the peppermint basslet, while sitting on the mud was a dour-looking deep-sea toadfish, presumably waiting for its prey to swim close enough to be pounced upon.

With the optics of the dome of the sub, using a DSLR camera would be difficult as the photos here are those taken from the sub's own camera. But the sightings were fascinating, even as the largely barren deepwater environment stood in stark contrast to the lush coral jungles nearer to the surface, and knowing that we were 300m down was a thrill.

We were excited to have this unique experience under our belts.

WHILE WE TRY TO maximise our time spent under water, it's always worth getting out to see what else places have to offer. Curaçao reflects the Netherlands' rich culture in its colourful architecture, and a stroll down the famous waterfront in Willemstad will remind travellers of Amsterdam, while various statues and monuments commemorate the history of the island.

Another striking feature of the harbour is the Queen Emma Pontoon Bridge for pedestrians, which opens every half-hour to allow boat traffic to pass through.

Like clockwork, the alarms go off, the gates close and the bridge's many outboard motors swing the floating bridge open and closed.

It's fun to watch, and even more fun to



be on when the bridge is in motion.

Visitors to Curaçao might enjoy the arid environment, comfortable resorts and sense of rich history and culture but divers know that the real treasure lies where angelfish and butterflyfish meander over healthy reef systems teeming with marine creatures.

They'll find the frenetic spotted drums, defiant damselfish, protective schools of sergeant-majors and all the other denizens of its coral cities.

Divers are fortunate in getting to see what so many others never will, and if you think it's worth the outlay, deepwater submarine divers belong to an even more exclusive club. ■

Above: Staircase on the Superior Producer.

Below right: Glasseye snapper are shy reef-dwellers.

Below: Curaçao is true to its Dutch heritage.



FACTFILE

GETTING THERE ▶ Flights from the UK to Curaçao on KLM and Air France.

DIVING ▶ Blue Bay Dive, kennethdivecenter.net. Substation Curaçao offers several types of submarine experiences down to the 300m deep excursion, substation-curaçao.com

ACCOMMODATION ▶ Mike and Christopher stayed at the Hilton Curaçao, which has since closed, but Willemstad offers options in all price ranges.

WHEN TO GO ▶ Year-round, but with warmer and clearer water in summer. Caribbean hurricane season extends from June through to the start of November but Curaçao is far south and rarely affected.

MONEY ▶ US dollars.

HEALTH ▶ Recompression chamber located at the St Elisabeth Hospital.

PRICES ▶ Return flights from £480pp. Two-tank dives with Blue Bay Dive, \$110pp. Submarine excursion \$650pp.

VISITOR INFORMATION ▶ curacao.com



A BRIGHTER BRITAIN

Wild and Temperate Seas: 50 Favourite UK Dives
by Will Appleyard, with Kirsty Andrews, Dan Bolt, Jason Brown,
Jake Davies, Alex Gibson, Stuart Philpott & Elaine Whiteford

EITHER WILL APPELYARD or his publisher Dived-Up was smart in choosing the format for this book, not least for including a magic number of dives in the title.

You need only look at the top of both Amazon book-lists below to see how effective that “big round number” formula can be.

You’ll also note that *Wild and Temperate Seas: 50 Favourite UK Dives* has wasted no time in coming in at number 2 in the most wished-for diving-book list.

In fact this book is pretty smart all round. With Christmas coming, it could be a well-timed gift for all those divers who have discovered or rediscovered the joys of British diving in 2020 as a result of overseas travel restrictions.

I declare an obvious interest here – Will Appleyard is a highly valued contributor to this magazine, and I like to think that his articles on British diving this summer played their part in convincing warmwater divers that they could do worse than give home waters a chance.

In the past too many books about homeland diving have concentrated on the dour aspects of the experience.

Concentration on maritime history and green, indistinct photos of wreck details glimpsed through the murk can create a feeling of diving as a duty rather than diving for fun.

My over-riding impression of this new book is that it has been produced just like a guide to a warmwater destination. The pages look bright, the high quality of the underwater photography leaves an impression of disarming colour and variety, and the writing is light and bright.

Best of all, the book previews the actual dives and takes us for the ride, instead of making us feel as if we’re revising for an exam. It makes us want to be at the location.

Regular UK divers will be familiar with many of these largely mainstream sites, but will still enjoy finding out how the author and those of his friends who share the writing and photography duties experience them.

Will concentrates on the favourite south-western diving locations dealt with in his previous books – Dorset, Plymouth, Porthkerris and Lundy, assisted by Dan Bolt on Torbay and



Stuart Philpott on Rock wrecks.

Then the book leapfrogs north to Scotland, stopping only to take in the Llyn peninsula and Rathlin Island on route to St Abbs.

This is where the concept does seem to sag a little. What, no Pembrokeshire, nothing on the south-east or east coasts until we reach the Farnes? I hope these gaps might be filled in a future edition.

But once in Scotland the book is on firm ground again, with lashings of loch-diving courtesy of specialist Elaine Whiteford, and Jason Brown covering all eight prime Scapa wrecks, plus Mull and some Atlantic outliers contributed by Kirsty Andrews and Dan Bolt.

Despite the range of writers the bright, direct tone of the text remains consistent throughout, making this an easy, enjoyable read.

In case I’m accused of being partial (especially when you read the next review) yes, there are some literals and a few oddities in the text

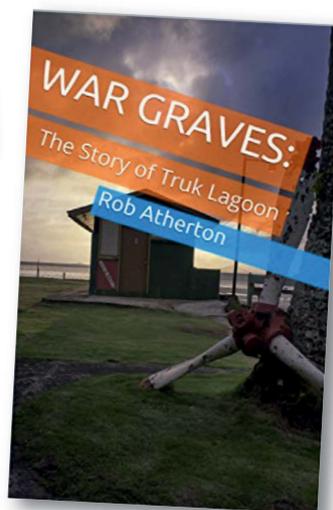
(such as where the author suddenly seems to start referring to himself in the third person), but there’s nothing seriously jarring.

Books like this are just what British diving needs and, perhaps with some judicious extensions next time round, it deserves to do well.

Dived Up
ISBN 9781909455344
Softback, 176pp, 16x23cm, £17.95
(also ePub & PDF versions)

FAILURE OF FOCUS

War Graves: The Story of Truk Lagoon
By Rob Atherton



SPARE A THOUGHT for book editors. Correcting spelling and grammar errors, forestalling legal problems, indexing – that, I guess, is the easy bit.

Book editors must also give authors their honest opinions on what’s right and what isn’t for their paying public. They have to see that the writing delivers on what the title promises.

Toughest of all, they must ensure that the book is consistent in style and detail from beginning to end – however many pages that might mean reading, re-reading and perhaps re-arranging, to the point of cursing

their decision to take career path that had seemed a good idea at the time.

A lot of writers who self-publish nowadays get round all this by taking on the book editor’s work themselves. Unfortunately this tends to show.

I’m not saying that Rob Atherton is the worst culprit in this sense – far from it, even if the very first word in this new book is mis-spelt.

War Graves is a handy reference for divers visiting Truk Lagoon, and I can see that an immense amount of hard work has gone into it, index and all.

All I’m saying is that it could have been so much better.

There are a lot of books about Truk, unsurprisingly because it’s one of the world’s great dive locations, but several fall short of perfection.

Notably, given that the Pacific island group holds the most colourful, photogenic collection of wrecks in the world, some books fail to do them justice in their accompanying photos.

War Graves doesn’t even try to compete on this front. The photos are sparse, small and mono, though this does at least serve to give the book an authentic World War Two flavour.

This is a book of two halves and the first is a history of the war in the Pacific. It takes in Truk but also ranges far and wide beyond it.

The second half, the “appendix”, should be the meat for divers. It’s a list of 40 wrecks and their stories, along with a second appendix of eight aircraft-carriers and battleships that once visited Truk but weren’t actually there at the time of the Operation Hailstone sinkings.

And that’s my main problem with this book. It’s subtitled *The Story of Truk Lagoon* but so much of it isn’t concerned with Truk at all.

I understand the need to put any story into context, but that first section on the entire Pacific war goes off on wild tangents such as the last Japanese soldier to give himself up. He gets a full three pages.

That, or the story of the bombing of Hiroshima and Nagasaki and all the other Pacific-theatre battles, might be fascinating but they’ve all been told many times elsewhere.

When the author does finally get on to how wreck-diving developed in Truk, and the pioneers responsible, that fascinating story is dismissed in a couple of pages. Then, unaccountably, it’s repeated in different words over another couple of pages, as if his notes got mixed up.

Either way, it would have been great if someone had just said to him: “Forget everything that isn’t about Truk,

TOP 10 BEST-SELLING SCUBA-DIVING BOOKS

as listed by [amazon.co.uk](https://www.amazon.co.uk) (14 October, 2020)

- 100 Dives of a Lifetime: World’s Ultimate Underwater Destinations, by Carrie Miller & Brian Skerry
- Underwater Foraging – Freediving for Food, by Ian Donald
- Fifty Places to Dive Before You Die, by Chris Santella
- Pirate Hunters, by Robert Kurson
- Atlas of the Maldives: A Reference for Travellers, Divers and Sailors, by Tim Godfrey
- The Diver’s Tale, by Nick Lyon
- Diving the World, by Beth & Shaun Tierney
- Diving and Snorkelling Bermuda, by Lawson Wood
- Diving and Snorkelling Red Sea, by John Raterree
- Staying Alive: Applying Risk Management to Advanced Scuba Diving, by Steve Lewis

or vital to put it into context – keep all those notes for another book, and just stick to fleshing out the title of this one!”

From a diving point of view, some of those 40 wrecks do have some paragraphs tacked onto the historical accounts about what it’s like to dive them, but many don’t, or are accorded only a passing reference to the underwater experience.

The fact-lists of wreck lengths, depths and other specs at the end of each account are useful. However, the book’s back cover claims *War Graves* as “a book for scuba-divers”, yet the paucity of diving descriptions or underwater photos or development of diving in Truk leaves it as more of a rambling military-history book than a diver’s guide.

If it’s individual wreck histories you want, you’ll be happy enough. If you want a book that conjures up the whole Truk diving experience, you might consider shopping around.

Rob Atherton

ISBN 9798653713644

Softback, 280pp, 15x23cm, £17.81 (also a Kindle version)

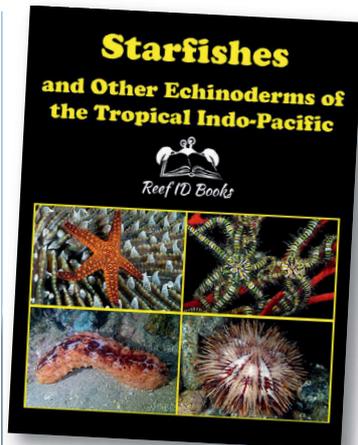
COUNTING THE STARS

Starfishes and Other Echinoderms of the Tropical Pacific
by Andrey Ryanskiy

THE WORD “STARFISH” covers a multitude of sea creatures. Other than marine biologists it’s likely to be underwater photographers who will be keenest to identify particular species.

More often, photographers simply like to have a bright red, purple or gold star strategically placed in the frame to add colour and character to a wide-angle scene.

Last year we reviewed *Nudibranchs of the Coral Triangle*, the previous field guide in this useful series by Andrei Ryanskiy (and Yuri Ivanov in that case),



and concluded that while not a thing of beauty it was functional and effective. Of particular note was that of the 1000 species logically grouped in the small photos, confusing colour- and age-related variations were taken into consideration.

As with that book, so with starfish, which appear to have been a bit neglected until now. Again you get banks of small but sharp reference shots, in this case of 450 species, along with the common and Latin names, family, geographical distribution, size and distinctive features.

A pictorial index at the start is useful in determining where best to start on a search.

“This book is interesting not only for divers and underwater photographers but for snorkellers, tide-poolers and beachcombers as well,” says Ryanskiy.

Other books in his fast-growing Reef ID series cover Coral Triangle fish, Indo-Pacific crustaceans, the Maldives, Indonesia and the Philippines.

The paperback version is not yet available on Amazon in the UK (it costs about \$25 in the USA) – I looked at the e-book, which might be more convenient to carry about these days.

Reef ID Books
reefidbooks.com
eBook, 92pp, \$14.99 (launch discount to \$9.99)

Reviews by Steve Weinman



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as listed by amazon.co.uk (14 October, 2020)

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2. Wild and Temperate Seas: 50 Favourite UK Dives, by Will Appleyard
3. Fifty Places to Dive Before You Die, by Chris Santella
4. Force Z Shipwrecks of the South China Sea: HMS Repulse & HMS Prince of Wales, by Rod Macdonald
5. Sun on the Water: The Brilliant Life & Tragic Death of my Daughter Kirsty MacColl, by Jean McColl
6. Scuba Diving Hand Signals: Pocket Companion for Recreational Scuba Divers, by Lars Behnke
7. Deco for Divers: A Diver’s Guide to Decompression Theory and Physiology, by Mark Powell
8. Under Pressure: Diving Deeper with Human Factors, by Gareth Lock
9. The Last Dive: A Father and Son’s Fatal Descent (audiobook) by Bernie Chowdhury
10. Underwater Foraging – Freediving for Food, by Ian Donald

Want to winter in Malta?



MIKE MCBEE

Malta had been on the UK's no-go list for non-essential travel for some time and now recreational travel to all destinations is forbidden – but what if you find that it's essential for you to get away and work from there for an extended period this winter?

It might be out of season, but you would be able to get plenty of diving in – and Malta is British scuba-divers' favourite Mediterranean escape.

Long-established dive-centre Maltaqua is offering a deal for divers who want to relocate to the islands between now and next March to work

remotely – while joining it for dives in their free time.

A four-week stay costs 1400 euros and eight weeks 1900 euros. Both packages include a one-bedroom apartment with bathroom, kitchen and wi-fi 100m from the St Paul's Bay dive-centre, along with 20 instructor-escorted shore dives with road transport and tank and weight hire.

Additional dives are charged at 25 euros each. Flights are not included.

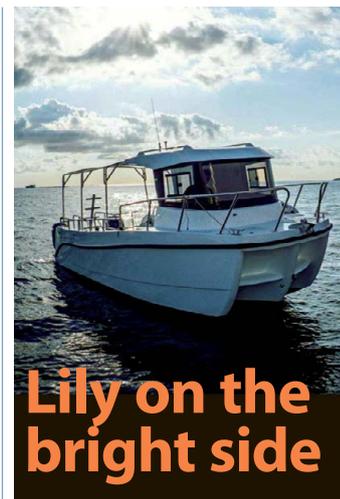
Sea temperatures are likely to drop from 20 to 14°C by the New Year, with air temperatures falling from 22 to

15°C, but there is little rain during the winter. "There are no more than five days a year where the weather is such that we have to cancel all diving," says Maltaqua.

Passengers arriving from the UK must complete a paper copy of both a public-health and a passenger-locator form and submit to temperature checks, but do not have to self-isolate.

Insurance for divers travelling to Malta can be obtained from certain diving specialists, though cover for Covid-19 is unlikely to be included.

▶▶ maltaqua.com



Lily on the bright side

"For the past year my staff have been whispering to me that we needed to part with our faithful RIB... it was time for a new, fresh boat with more options and possibilities." So Jason Fabri of Maltese dive-centre Watercolours in Sliema told us, in an entertaining account of the boat-fabrication process, which for reasons of space we must condense here.

The new boat, *Lily*, is a trimaran and was built in Spain. The dive-team wanted a bow cabin to give ample deck space and were very specific about everything from cleat heights to type of diving ladder, all of which were custom-made.

Lily can carry 12 divers and visit more remote dive-sites thanks to its 440-litre petrol tank. A sun canopy, toilet and shower allow for comfortable day-trips to Comino and Gozo, with a pair of Yamaha 150hp outboards fitted for reliability and manoeuvrability.

Soon after *Lily's* arrival Covid-19 struck, but the new workhorse is "turning out to be exactly what we needed to inject energy into the gloom that's drowning so many people and businesses," says the admirably positive Fabri.

When the time comes for you to sample the dive-boat, a 10-dive Watercolours pack costs 315 euros.

▶▶ maltadiving.com

Diverse confident of Croatia's charms

Croatia, which celebrates 30 years of independence in 2021, is one of the gems of south-eastern Europe, says UK-based Diverse Travel, which has decided to add the Adriatic location to its 2021 programme.

Croatia has 3600 miles of coastline including more than 700 islands, 400 islets and 75 reefs, making it the biggest Adriatic archipelago.

Diverse describes the nation's underwater attractions as "hidden caves, coral-adorned walls with overhangs and swim-throughs to explore" with many endemic species.

It describes the sea as "perfectly clean", with grouper, catfish, lobster, moray eels and octopus commonly seen on dives and plenty for macro-lovers too, including nudibranchs and yellow seahorses.

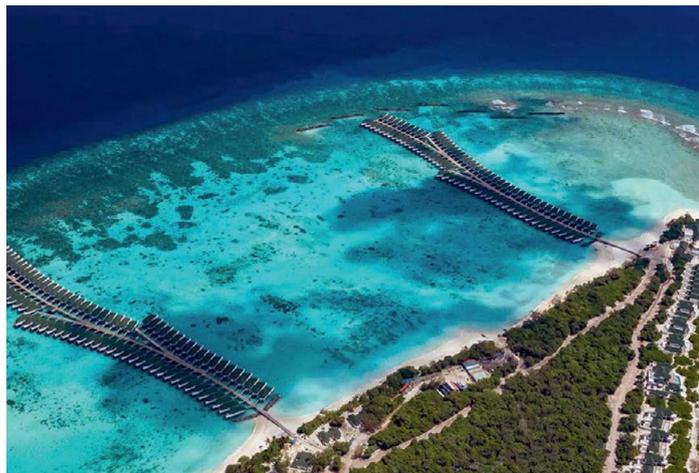
The Dalmatian waterfront town of Trogir is the chosen base, with one-week dive holidays starting from £575pp (based on next May) including easyJet flights from Gatwick or Luton to Split, return transfers, seven nights in a one-bedroom self-catering apartment and 10 boat-dives.

▶▶ diversettravel.co.uk



BOOKING NOW

Diving with your dining?



Sun Siyam Resorts in the Maldives makes bold claims for its Siyam World, described as a “revolutionary new concept resort” on an island in Noonu Atoll “unlike anything the Maldives has ever seen”. It opens this December.

Situated on a 54-acre natural atoll, the resort’s dive-centre offers 33 dive-sites described as suitable for any level of diver and all “easily accessible” – which means between 15 and 45 minutes by boat.

So what’s revolutionary? The unique 24-hour WOW! Inclusive Plan, that’s what, offering guests an “infinite choice of endless dining possibilities”

at the 12 restaurants and bars covering what appears to be just about any cuisine that takes your fancy. There are 12 accommodation categories too, from 72sq m beach villas to 94sq m deluxe water villas complete with pool and slide. So it’s all about choice – so many decisions!

Prices start from US \$603 a night for a beach villa for two on the WOW! Inclusive plan. Dive packages start from \$355pp including equipment.

Airline prices to Male start from £560pp, with 45min seaplane transfers required from there.

▶▶ sunsiyam.com

Just when they thought it was safe...

Though Egypt had remained on the official no-go list, Ultimate Diving reported in October that it had “had success with our first guests departing to the Red Sea since March, and they have returned from warmer climates beyond excited.”

Let’s face it, not everybody was worried about flying, lack of Covid insurance or the prospect of self-isolation on return, and the UK tour operator had said it could guide divers through the process with the latest information, advice and competitive package prices.

When “normal” service resumes it reckons the Hilton Plaza in Hurgada is ideal for divers, giving access to a mixture of fringing reefs, inshore islands and offshore reefs and islands. Book ahead for seven nights from £1085, including flights from Gatwick, airport transfers, seven nights’ B&B (two sharing) and 10 dives per person.

▶▶ ultimatediving.co.uk



LISA COLLINS

PARTYING AT SUNSET

Sunset House in Grand Cayman is looking ahead to the week starting 29 May next year to hold its “Sunset Submersion”, with prices rising from US \$1679 for a courtyard room up to \$2011 for an ocean-view apartment (two sharing).

For that you get seven nights’ B&B; four days of two-tank boat-dives, the *Kittiwake* wreck included; unlimited shore-diving; underwater poker run (not sure!); coral conservation talk; optional guided coral nursery dive; cocktail party; movie & pizza night; distillery & brewery tour; sunset sail and farewell barbecue and games night.

You get the T-shirt too – sounds like one big dive-party to us!

The price includes a donation to the Cayman ECO Divers Coral Conservation Fund.

▶▶ sunsethouse.com

SAVINGS AT FILITHEYO RESORT

Dive Worldwide says a couple can save £1400 between them if they book a holiday in the Maldives by 30 November.

That’s for a stay at Filithayo Island Resort on the island of Faafu. The resort consists of 125 villas with air-con, TV and *en suite* bathrooms, and there is a selection of restaurants and a spa. You’re promised a laid-back atmosphere, the chance of large

pelagic encounters and a range of sites including well-known Route 66.

The price of £2695pp includes return flights from the UK, transfers, seven nights’ half-board (two sharing) and six days’ unlimited shore-diving, with nitrox for qualified divers. You can book now for travel between 1 December and the end of October next year.

▶▶ diveworldwide.com

Master ecology, then head for Fiji when you can

Ocean Ventures Fiji, a PADI dive-centre in Natewa Bay in the south of Vanua Levu, has put together its own South Pacific Coral Reef Ecology online course.

Springing from a field ecology course it has taught for many years, it aims to bring coral-reef ecology and “a love of the marine world to everybody who is unable to travel and experience these amazing

ecosystems for themselves during these difficult times”.

Much of the content is said to be applicable to coral reefs globally, but it is illustrated by photos and videos mostly shot by the team in biodiverse Natewa. The eLearning course can be taken as a standalone programme at US \$50

or with certification in Ocean Ventures’ exclusive PADI South Pacific Coral Reef Ecology speciality course at \$95. The basic \$50 will be deducted from selected courses and dive packages if you dive with Ocean Ventures Fiji in the future.

Examples of current package prices: a two-tank dive trip with kit hire costs Fiji \$220pp (about £80).

▶▶ oceanventuresfiji.com

TRAVEL CORRIDORS



Forget it for now – they’ve been closed until further notice. We’ll let you know where you can go to dive overseas as soon as they are re-established!

NEW BUT UNTESTED

The latest kit to hit the dive shops

Garmin Descent Mk2 & MK2i Computers >>>>

What don't these new Garmin Descent dive-computers do? They are claimed to be far more than mere dive-computers, in fact, in the way they can handle apnea, open-circuit air, nitrox, trimix and mixed-gas rebreather diving. Using an optional sonar transmitter, the 2i can additionally display as many as five different tank pressures simultaneously from as far away as 10m. At the surface, when linked to Garmin's In Reach network, the Descent can send and receive texts and even generate an SOS that provides your GPS location to rescuers. Surface-sports features include ski-mapping, GPS tracking, heart and respiration monitoring, oxygen measuring and more. The Descent 2 costs £1200 and the Descent 2i £1400, with the T1 transmitter £350.

>>> garmin.com



LOMO LED Strobe >>>>

Priced at £10, this new marine LED strobe light is claimed by LOMO to be a bright performer. Beginning with a bank of LEDs putting out 200 lumen flashes and said to be visible from 2km away, the strobe can be dived to 80m and has a non-penetrating magnetic switch. An adjustable armband is included.

>>> lomo.com



Akona Laguna Folding Duffle Bags <<<<

Some smart thinking at Akona seems to have led to the launch of this product. Opened up, the 80-litre holdall measures 73 x 35 x 30cm, but collapsed the length reduces to only 10cm and it stows against the built-in padded regulator end-pocket. This space-saving bag, hailed as perfect for liveaboard trips, costs £65.

>>> midlanddiving.com



Mares Dual Adjustable 62X Regulator >>>>

New from Mares is this regulator with a second stage that is pneumatically balanced for easy inhalation and can be tuned for the diver's personal comfort. The balanced diaphragm first stage incorporates Mares Dynamic Flow Control for enhanced air delivery, and the ports are angled for effective hose-management.

>>> mares.com

Aqua Lung Storm Fins >>>>

£55 will buy you a pair of these lightweight travel-friendly fins. They are formed from a single block of Monoprene, which is said to enable the blade to flex progressively throughout its length for an easy but powerful stroke. The open foot-pocket is said to be comfortable even with bare feet, and five sizes from junior to 2XL adult should ensure a good fit.

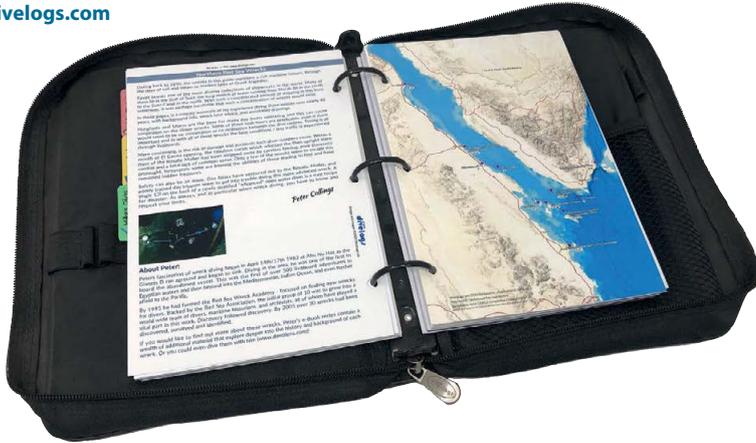
>>> aqualung.com



DiveLogs Northern Red Sea Wreck Diving Wetnotes ▼▼▼▼

When you are next able to get to Egypt these new wetnotes are available to take under water with you to guide you through and around 21 of the Red Sea's best-known wrecks. Created in consultation with wreck-diver Peter Collings, each dive-site is illustrated with an artist's impression, depth profile and accompanied by introductory comments. Among the featured classics are the *Carnatic*, *Dunraven*, *Giannis D* and, of course, the *Thistlegorm*. They cost from £11.

▶▶ divelogs.com



Mares XR-Rec Silver Backmount Single Cylinder Set ▼▼▼▼

This is the latest wing to join Mares' BC line-up. Boasting 16 litres of lift, this weight-integrated doughnut-styled model sports an aluminium backplate, steel quick-release left shoulder- and waist-buckles, and an array of D-rings for accessory-management. The price is £539.

▶▶ mares.com



INON X2 Viewfinder 11 for Nauticam ▼▼▼▼

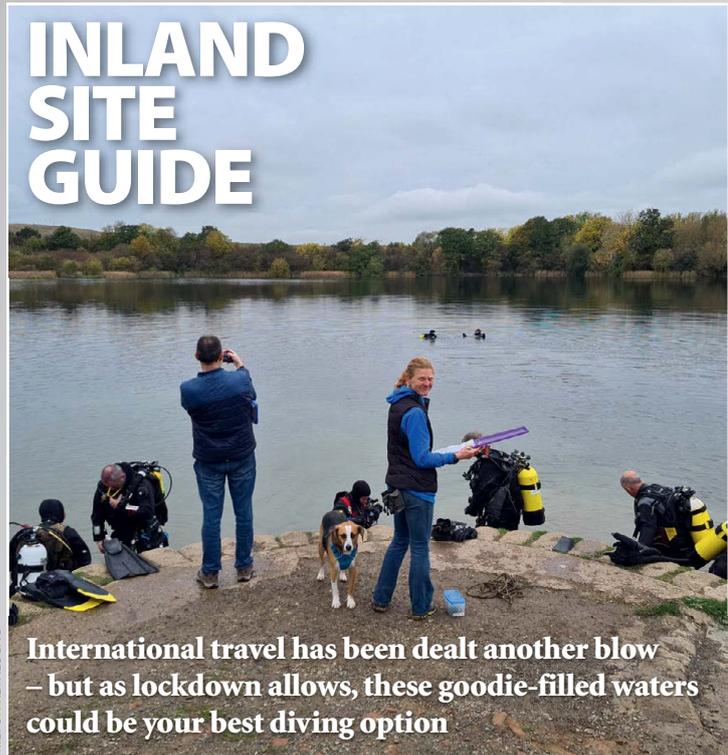
INON has released two new viewfinders for all Nauticam DSLR and many Nauticam mirrorless housings. The Straight Viewfinder Unit 11 provides eye-level orientation and costs £881. The 45° Viewfinder Unit 11 costs £660

and offers a swivelling slanted eyepiece claimed to be ideal for

low-to-the-seabed macro work. Both feature coated optical-glass

lens systems with 1:1 magnification.

▶▶ inonuk.com



International travel has been dealt another blow – but as lockdown allows, these goodie-filled waters could be your best diving option

MILTON KEYNES SAC

NEXT ISSUE

Essential Blackwater

Ultimate guide to this addictive form of night-diving

Sub Modelling

'Measure those rivets!' Diving a U-boat for a purpose

Strange Days in Red Sea

Unusual shark behaviour on a trip to the Brothers

Western Stars

Scottish diver picks out some favourite wreck-sites

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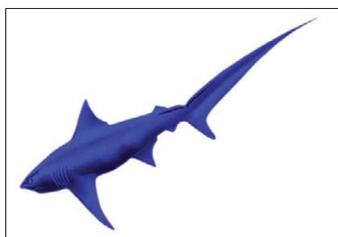


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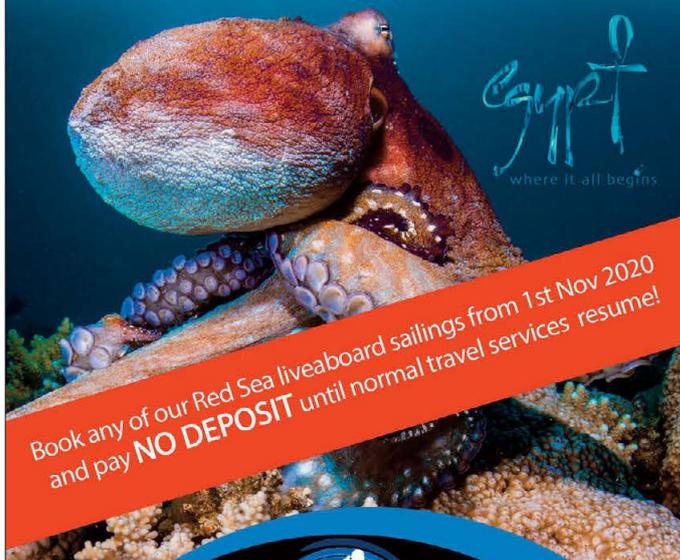
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Venture Dive Charters. For quality diving from Plymouth, visit: www.venturecharters.co.uk or Tel: 07948 525030. (73533)

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DIVING MEDICALS

Diving Medicals - Nottingham. Sport Diving medicals: £55. HSE Commercial Diving medicals: £120. OGUUK Offshore medicals: £110. HGV/PSV medicals £55. Student and Group discounts. Combine any two medicals and pay only £5 extra for the cheaper of the two. Tel: 07802 850084 for appointment. Email: mclamp@doctors.org.uk (70407)

HSE MEDICALS

and phone advice - Poole

Dr Gerry Roberts and Dr Mark Bettley-Smith.

Tel: (01202) 741370

Diving Medicals - Midlands (Rugby) - HSE, Sports Medicals and advice at Midlands Diving Chamber. Tel: 01788 579555 www.midlanddivingchamber.co.uk (72756)

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Active and friendly BSAC club. All year diving in local lake. New and qualified divers of all agencies welcome. Own clubhouse with 7m RIB and compressor. For further information visit www.mksac.co.uk (64403)

Alfreton (Derbys) BSAC 302. Welcomes new members and qualified divers. A small but active club with own RIB, wreck diving a speciality. Contact Angela on 07866 799364. (68370)

Appledore Sub-Aqua Club (SAA 35) Friendly club welcomes experienced divers from all agencies. Regularly dives Lundy island, own hard boat / compressor. Contact Damian 07831 152021.

Banbury SAC. Friendly, active club with weekly meetings and training sessions, own boat, compressor and equipment. Welcome divers/non-divers. www.bansac.org or call 07787 097 289. (69308)

Birmingham Underwater Exploration Club. Friendly, active dive club. Weekly pool sessions. Regular trips. Own RIB based in south Devon. Training and equipment loan available to members. Tim 07775 580033. (65792)

Bracknell Sub Aqua Club welcomes new and experienced divers from all agencies. Meets poolside at Bracknell Sports Centre, Thursdays from 8.30pm. Diving, training and social calendar: www.bracknellscuba.org.uk or tel: 07951 855 725. (65792)

Braintree Riverside Sub Aqua Club based in Braintree, Essex. A friendly club, we welcome divers of all abilities and have an active diving and social programme. Come and join us! email: denise.f.wright2@btinternet.com www.braintreeriversidesac.co.uk (69397)

Bromley/Lewisham Active divers required. Full programme of hardboat diving throughout the year. Check out Nekton SAC www.nekton.org.uk or contact Jackie (01689) 850130. (68537)

Buckingham Dive Centre. A small friendly club welcoming all divers and those wanting to learn. We dive throughout the year and run trips in the UK and abroad. www.stowe-subaqua.co.uk Tel: Roger 07802 765366. (69433)

Chelmsford and District SAC meet at 8pm every Friday at Riverside Pool. New and qualified divers are welcome. See our website for details: www.chelmsforddiveclub.co.uk (68620)

Cockleshell Divers, Portsmouth, Hants. Small, friendly club welcomes new and experienced divers from all agencies. Meets at Cockleshell Community Centre, Fridays at 8pm. Email: cockleshell.divers@aol.co.uk (64762)

Colchester Sub-Aqua Club welcomes experienced divers and beginners. Sub-Aqua Association training. Diving at home and abroad. Meets at Leisure World Friday evenings. Contact Tony (01787) 475803. (68263)

Chingford, London BSAC 365. Friendly and active club welcomes divers from all agencies and trainees. Meet Wednesday 8pm, Larkwood Leisure Centre E4 9EY. Information: www.dive365.co.uk Email: loughtondivers365@gmail.com (69208)

Cotswold BSAC, a friendly club based at Brockworth

Pool, Nr Cheltenham, Fridays 8pm. Regular inland diving and coast trips. Tel: 07711 312078. www.cotswoldbsac332.co.uk (68577)

Darlington Dolphins Sub Aqua Club, small friendly BSAC/PADI, open to new and experienced divers. Meet Friday night in Dolphin Centre at 8.30. Tel: 07773 075631 or email robkilday@hotmail.co.uk (72665)

Darwen SAC, in Lancashire, with an active diving programme. Own RIB. New members welcome regardless of agency/training. We provide BSAC training. Weekly pool sessions. www.darwensac.org.uk (69161)

Dream Divers. Very friendly dive club in Rotherham welcomes divers of any level/club. Meet at the Ring O Bells, Swinton, last Thursday of the month at 19.30. Email: info@dreamdiversltd.co.uk (69699)

Ealing SAC. BSAC 514. Friendly, active club, own RIBs; welcomes new and experienced divers. Meets Highgrove Pool, Eastcote, Tuesday nights 8.30pm. www.esac.org.uk (68413)

East Cheshire Sub Aqua. Macclesfield based BSAC club. Purpose-built clubhouse, bar, two RIBs, minibus, nitrox, compressor. Lower Bank Street, Macclesfield, SK11 7HL. Tel: 01625 502367. www.scubadivingmacclesfield.com (65609)

East Durham Divers SAA welcome new/experienced divers of any agency. Comprehensive facilities with own premises half a mile from the sea. Contact: John: 07857 174125. (68663)

East Lancs Diving Club based in Blackburn. Friendly, active club welcomes new members at all levels of diving from all organisations. Tel: 07784 828961 or email: ELDC@hotmail.co.uk www.eastlancsdivers.co.uk (69411)

Eastbourne BSAC; RIB, Banked air (free) to 300bar, Nitrox, Trimix. Enjoy some of the best diving on the South Coast, all qualifications welcome. www.sovereigndivers.co.uk (65695)

Eastern Sub Aqua Club SAA 1073. We are a small friendly dive club and welcome new and experienced divers alike. We are situated north of Norwich for training. For more information please see our website: www.esacdivers.co.uk (65879)

Elton Sub Aqua Club, Aberdeenshire, welcomes newcomers and experienced divers. We dive year round and meet on Thursday evenings. Contact www.ellonsubaquaclub.co.uk (65523)

Fife Scuba Divers Tel: 07575 372575 www.fifescubadivers.com SAA Club No203. Meetings: Thu 19.30, 81 East Way, Hillend, KY11 9JF. Training Club, Crossovers welcome. (72380)

Flintshire Sub Aqua Club based in Holywell, Flintshire, welcomes new and experienced divers from all agencies. Full dive programme. Meet Wednesdays. See us at www.flintscac.co.uk or call 01352 731425. (64293)

Guildford BSAC 53. Welcomes new and qualified divers. Friendly, active club with 2 RIBs, compressor, Nitrox, meets Tuesday at clubhouse with bar. www.guildfordbsac.com or call 07787 141857.

Hartford Scuba BSAC 0522, based in Northwich, Cheshire. A friendly, active diving club. Compressor for air and Nitrox fills. RIB stored in Anglesey. www.hartfordscuba.co.uk (67287)

Hereford Sub Aqua Club, is looking for new members. Regular diving off the Pembrokeshire coast on own RIBs. Training and social nights. Contact: rusaqua@googlemail.com (69146)

HGSAC, South Manchester based friendly, non-political club welcomes newcomers and qualified divers. Lots of diving and social events. Family. Three RIBs and compressor. www.hgsac.com (68501)

High Wycombe SAC. Come and dive with us - all welcome. Active club with RIB on South coast. Contact Len: 07867 544 738. www.wycombesubaqua.com (69131)

HUGSAC - BSAC 380. Experienced club, based around Hertfordshire, with RIB on the South coast. Members dive with passion for all underwater exploration. All agencies welcome. www.hugsac.co.uk (63275)

Ifield Divers. Crawley-based club. Twin engine dive boat with stern lift in Brighton Marina. Training for novices, diving for the experienced - all qualifications welcome. www.iffeld-divers.org.uk Email: info@iffeld-divers.org.uk or tel: 01883 731532. (64514)

Ilkeston & Kimberley SAA 945, between Nottingham and Derby, welcomes beginners and experienced divers. We meet every Friday night at Kimberley Leisure Centre at 8.30pm. Contact through www.iksac.co.uk (68559)

K2 Divers, covering West Sussex/Surrey. A friendly BSAC club, but all qualifications welcome. Training in Crawley, boat at Littlehampton. Email: k2divers@yahoo.co.uk or tel: (01293) 612989. (68335)

Kingston BSAC, Surrey. Two RIBs, clubhouse and bar, active dive programme, two compressors, Nitrox, Trimix, full training offered at all levels. All very welcome. www.kingstonsac.org or tel: 07842 622193. (69176)

Lincoln - Imp Divers. Small, friendly, non-political diving club with our own RIB are looking to welcome new and experienced divers. Contact Richard: 07931 170205. (69383)

Lincoln and District BSAC. Active club with own RIB, compressor and other facilities. Regular trips and training. www.lincolndivingclub.co.uk (69336)

Lincs Divers BSAC 1940. Friendly, active dive club offering dive trips and training for new/experienced divers. Lincoln based. www.lincsdivers.co.uk

Llantrisant SAC, two RIBs, towing vehicle, welcomes new and experienced divers. Meet at Llantrisant Leisure Centre 8pm Mondays. Contact Phil: (01443) 227667. www.llantrisantdivers.com (68519)

Lutterworth Dive Club, active, social, friendly. Own RIB, regular trips. Welcomes qualified divers, any agency. Training at all levels. Most Tuesdays, Lutterworth Sports Centre, www.lsaac.co.uk (70043)

Leeds based Rothwell & Stanley SAC welcomes new and experienced divers, full SAA training given. Purpose built clubhouse with bar, RIB, compressor. Meet Tuesday evenings: 07738 060567 kevin.odd@talktalk.net

Mansfield and District Scuba Diving Club. www.scubamad.co.uk Sub Aqua Association - club 942, 8 Beech Avenue, Mansfield, Notts. NG18 1EY. (71643)

Manta Divers, Norfolk wreck & reef diving. Small, friendly, experienced club. All agencies welcome. SAA training. www.mantadivers.org (64088)

Mercian Divers (BSAC 2463) Active & Friendly club. New, experienced & junior divers welcome. Own RIB. Based in Bromsgrove, West Midlands. Tel: 01905 773406 www.mercian-divers.org.uk (65391)

Merseydivers (BSAC 5) Friendly & active club with 2 RIBs & Compressor/Nitrox/Trimix. Meeting every Thursday 7pm till late. All divers welcome. www.merseydivers.com or call Steve on 07570 015685.

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It's not our usual *Deep Breath* fare but we found it hard to resist these images by MALCOLM NOBBS of a male Sydney cardinalfish, surely the most selfless of fish, guarding his golden treasure. JAMIE WATTS (above left) tells the story

Honey, I ate the kids

IT'S ONE OF THE MORE BALANCED parenthood stories in nature. The female funnels her oil reserves from her food to produce, even by fish standards, a magnificent clump of large, nutrient-rich eggs. Then the male takes over, starving himself to offer one of the more impressive examples of dedicated protection of their offspring – in a unique way that starts a month before they are even “born”

The Sydney cardinalfish is endemic to Australia and is mainly found from southern Queensland to southern New South Wales, and is particularly numerous around Sydney, hence its name. It's a mouthbrooder.

From around November until March the female releases an egg mass close to a selected male, and a few seconds after he fertilises the eggs, he will slurp up the egg mass, and carry them in his mouth until they hatch. It's not hard to spot these males. The bottom of the chin and throat



bulge with the mass of a few dozen eggs.

After spawning, his appetite is strongly suppressed for the month or more during which he will carry the eggs, and then the young fry, in his mouth.

It makes sense, of course, having a

suppressed urge to eat your children, and it's made easier by the relatively sedentary nature of cardinalfishes, particularly when mouth-brooding. They don't need a lot of calories to keep them going. During a three-to-five-year life-span, cardinals can have dozens of broods. The system works.

MALCOLM TOOK THESE photographs at Fly Point in Nelson Bay, north of Sydney. “As I took these shots I could see that the male cardinalfish would regularly open its mouth to rotate the egg mass, keeping them clean and aerated.

“Occasionally it would partially expel the eggs before sucking them back in.”

Some mouthbrooder species seem to be able to dispose of eggs that are no longer viable, and they seem to eat a few – possibly the damaged or unfertilised ones.

The colour of the eggs will slowly change as the young fish absorb the orange-red yolk and build their silvery bodies. It seems that in some cardinalfish species around half of the eggs in a given egg-mass will survive to hatch.

On hatching, the youngsters of many cardinalfish species stay clustered together in dad's mouth for a few days.

We're not sure with the Sydney cardinal just how long this might be – one of those things that seems not to have been well-studied for this species. But for an animal this small to take a month or longer without food has to be a physiological stretch, and cardinalfish fry are not so very different in form or composition from copepods, the small crustaceans that make up the bulk of the cardinalfish diet.

So at some point it makes sense for the youngsters to swim away from the safety and danger of their father's mouth. Before he gets his appetite back. █



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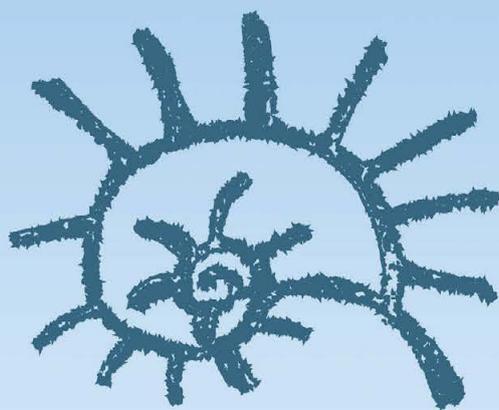


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