

DIVER TESTS: WHICH NEW REGULATOR IS MAKING WAVES?

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DON'T KNOW ABOUT YOU, but one of the many things I've missed about dive-trips is that moment at the end of a good day when you hitch yourself onto a stool by the resort bar – or plonk yourself onto a bench outside a pub – and order that drink that, as a good diver, you've virtuously waited for all day.

It doesn't have to be alcoholic, of course – whatever soothes your tonsils – but reliving dive experiences in good company over a cool one is a pleasure I look forward to resuming soon.

But before I get onto travelling and while I'm musing over drinks, I'll mention that a fair few alcoholic stories, happy and sad, are scattered about this issue.

In *News* we hear of the grief of a diver in Argentina. He persuaded brewers to stash 2000 pints of beer 20m down on a popular shipwreck, in an experiment to age it under pressure. Other divers came along and liberated the barrels, causing much angst.

As a pro diver, our hero should have known that for anything you leave lying around at depth there will be someone who can't resist interfering with it.

Next time, rather than a popular wreck, choose a boring, unvisited site. You don't have to name the beer after a ship – just call it "Secret Reef".

At the other end of the bar we have Andy Pilley, one of many divers who have picked up intact bottles of McEwans beer, 1895 vintage, on the *Wallachia* wreck on Scotland's west coast. But as he explains in this month's *Deep Breath*, he didn't just dump his souvenir in the garage – it's now the basis of a promising new brewing business.

It's not all bad news from Argentina, where putting wine under pressure at sea is saving two years in the maturation process. Beside that item is a cautionary tale about drinking at sea: dives are planned to find the mediaeval White Ship, which sank in the Channel after far too much mead had been imbibed in celebrating English victory over the French.

SO HOW ABOUT getting back to our favourite dive destinations and bar-stools, now that we have a roadmap to recovery? There could yet be "many a slip 'twixt the cup and the lip", to maintain the drinking theme, and when it comes to travel prophecy I defer to the experts – in this case our operator Dive Worldwide & Regaldiver's Phil North (and at this point I insist that any link to the taking of strong drink ends).

"Since the government's announcement there's certainly a feeling of positivity surrounding travel, and we very much hope to be able to get UK divers out to some of the world's great diving locations soon," says Phil. "We're already seeing significantly increased demand, along with increased confidence.

"As restrictions begin to lift, we expect to see destinations such as the Maldives and certain Caribbean locations come back first, along with short-haul options. For late 2021 and 2022, there's already great interest in more far-flung diving destinations such as the Galapagos Islands, Indonesia and Palau."

What about "vaccination passports", which I'd see as a handy kick up anti-vaxxer backsides. Phil is circumspect on that one: "There are a number of complexities for governments to work through and co-ordinate if such a concept is to be implemented – but we're confident that the global travel industry will quickly ensure that safe travel can return." Cheers to all that.

FIRST



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Published monthly by Eaton Publications Ltd,
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SUBSCRIPTION: Twelve issues, including p&p, cost £52.80 (UK); £64.80 (Eire/Europe/Worldwide surface); airmail rates available on request. Pay by Visa, MasterCard, Maestro, American Express, sterling cheque or UK Postal Order. Contact the Subscriptions Dept, **DIVER** Magazine, at the above address.

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DIVER is distributed by Seymour Distribution Ltd,
2 East Poultry Avenue, London EC1A 9PT
and printed by Pensord Press Ltd,
Tram Road, Pontllanfraith, Blackwood, NP12 2YA.

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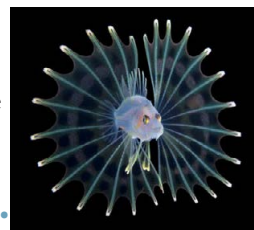
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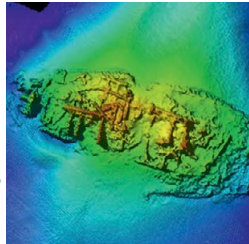
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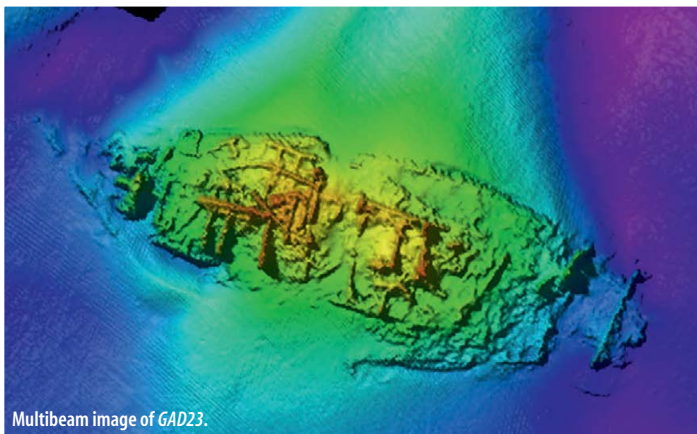
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Multibeam image of GAD23.



Flywheel crank pump on the deck of GAD23.

WESSEX ARCHAEOLOGY

TWO WELL-PRESERVED but unidentified 19th-century merchant shipwrecks have been granted protection on the recommendation of Historic England.

The scheduling of the wrecks by the Department for Digital, Culture, Media & Sport allows recreational scuba-divers to visit them, but their contents are protected by law and must remain *in situ*.

The vessels are referred to as GAD23 and WA08. The first is a rare survival of a once-common type of timber cargo sailing vessel of the mid-to-late 19th century.

It was carrying a large consignment of coal when it sank on the Goodwin Sands off Sandwich in Kent.

GAD23 is also known as the "Bowsprit Wreck", because the spar from which ropes helped to support the foremast has survived.

The near-complete wreck rests on its keel with the hull and iron objects such as the pump intact. The coal it contains could be preserving the remains of the hold and lower hull.

Much of the starboard side is covered by sand but the wreck is at risk of exposure from shifting sands.

More than 5000 wrecks recorded in English waters were involved in the coal trade that reached its height in

Two mystery wrecks win protection in South-east

the 18th and 19th centuries, when England was the leading producer and exporter to Europe, says HE.

Only 26 of these vessels have been identified as sail-powered colliers, and only one other such ship, sunk at Seaton Carew in Co Durham, has been granted protection.

GAD23 has been narrowed down, through research into tonnage, cargo and location, to three Goodwin Sands ship casualties.

They are the *Archimedes*, sunk in 1876; the *Zia Catherina*, which went down two years later or, less likely, the much larger *Superior*, an 1868 sinking.

All three sank in collisions, and damage to GAD23's starboard side indicates this as a cause.

WA08 was discovered on the West Barrow sandbank in the Thames Estuary in Essex, and HE describes it as possibly the most intact post-1840 timber cargo ship known to have survived in English waters.



A ship similar to WA08, seen at Southampton docks in 1878.

HISTORIC ENGLAND ARCHIVE

The 38m vessel was discovered in 2016 during a routine Port of London Authority survey.

Probably a three-master, it had a large cargo of Cornish roofing slates aboard when it is thought to have run aground. Part of the hull and deck

are missing but WA08 is reported to be in "remarkable" condition, with parts of the masts, the rudder, the bowsprit and other features surviving.

Again few examples of this type of ship, once common in England, survive.

The closest known casualty in time, date,

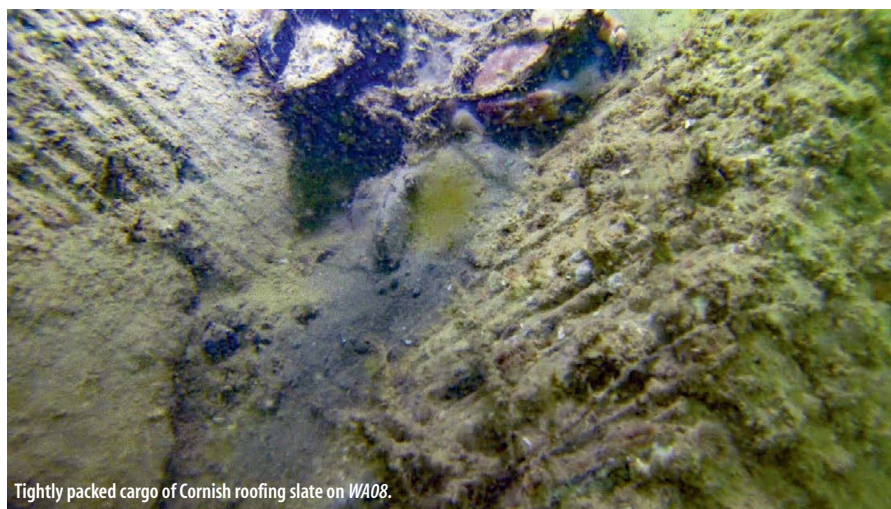
cargo and location is the three-masted Welsh schooner *Myvanwy*, which ran aground nearby in 1904 while carrying slate.

WA08 is also at risk of decay from shifting sands, but HE believes that more detailed analysis could enhance understanding of the Cornish slate trade in north-west Europe during a period when it was dominated by north Welsh slate.

"These two unnamed sailing ships help tell the fascinating story of England's industrial history," said HE chief executive Duncan Wilson. "They are a rare survival of merchant trading that took place around Britain's coast in the mid-to-late 1800s.

"This is a period when Britain rapidly expanded in its industrial and commercial activities. They are special and deserve protection as well-preserved examples of a common type of vessel of the time, with their cargoes of coal and Cornish slate clearly recognisable." ■

WESSEX ARCHAEOLOGY



Tightly packed cargo of Cornish roofing slate on WA08.

BSAC Egypt takes first steps



Red Sea instructors Hedy Amin, Hedra Awad, and Ashraf El Asfoury are put through their paces by BSAC National Instructor Adrian Collier.

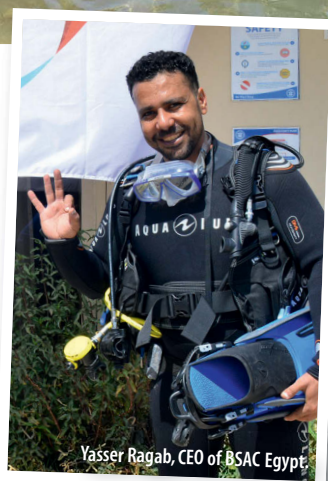
THE BRITISH SUB-AQUA CLUB has signed a new licensing agreement in Egypt, and says it will pave the way for more BSAC diver-training centres to be set up in the Red Sea region.

The club has had long-standing licensing agreements in the Far East in the past, with BSAC Japan, BSAC Korea and BSAC Thailand, so BSAC Egypt is an addition at what has long been British divers' preferred overseas destination.

"It will set the standard for BSAC diving and training in this key diving destination," says the club.

The contract was signed between BSAC and Blue Pearl Ltd of Hurghada, which will now trade as BSAC Egypt. Its CEO is Yasser Ragab, who has worked in Red Sea diving for 17 years.

The licensee says it will work with both BSAC and Egypt's Chamber of Diving & Water Sports (CDWS) to welcome non-divers as well as all agency-qualified divers to dive and train with newly accredited BSAC



Yasser Ragab, CEO of BSAC Egypt.

centres in Hurghada, Sharm el Sheikh, Dahab, Marsa Alam and Safaga.

BSAC currently has 47 overseas centres listed for the Red Sea.

Sixteen Red Sea diving and two snorkelling instructors have so far been trained to gain BSAC accreditation, with work continuing for more operations to gain BSAC Centre status.

The long-term objective is to have 30% of all Red Sea centres accredited.

The club says that it will be providing all necessary instructor and centre support through BSAC Egypt's first few years.

The licensee will translate core training materials into German, French, Polish and Russian.

BSAC's business development officer Adrian Collier said that the club would be "working closely with BSAC Egypt to get more people into diving, potentially leading to new club-members back in the UK.

"Blue Pearl was set up 18 months ago," he told **DIVER**. "Yasser and the other partners have worked in the Red Sea region all their lives and their aim is to bring standards and quality back into the training there.

"They will take two or three weeks to do a crossover and do it properly."

One important aspect would be snorkelling training, "which no one else can do as well," added Collier. ■

Blaze boat captain pleads not guilty

JERRY BOYLAN, the captain of the *Conception*, the Californian diving liveaboard on which 34 people died in a fire in September 2019, pleaded not guilty to charges of "seaman's manslaughter" in a brief court appearance on 16 February.

The 67-year-old entered his plea before a federal magistrate judge in Los Angeles, with relatives of the divers who died watching over video links, said the *LA Times*.

Boylan had been charged with 34 counts of manslaughter in late November, each count carrying a maximum 10-year prison sentence.

He has remained free on bail pending the trial.

All 33 passengers and one crew-member had been asleep in one bunk-room with limited means of escape, while Boylan and four of the crew slept above decks. There had been no roving nightwatch and the captain was said to have been responsible for failing to arrange fire training or evacuation drills.

The prosecution has stated that the captain "was responsible for the safety and security of the vessel, its crew, and its passengers" and had been charged on account of his "misconduct, negligence and inattention to his duties".

Seaman's manslaughter is a 19th-century law applicable to captains and crew held responsible for maritime disasters. Relatives of all but one of the *Conception* victims have also filed legal claims against operator Truth Aquatics and its owners Glen & Dana Fritzier. ■

Freediver hits record distance under ice with no thermal protection



David Vencl: 'I really enjoyed it.'

CZECH FREEDIVER David Vencl has claimed a new Guinness World Record for distance-swimming under ice without thermal protection.

Wearing only trunks and without fins or weights, Vencl took 95 seconds to cover the 81m between two ice-holes in a frozen-over Czech quarry on 23 February. The lake was in Lahost, about 60 miles from the capital Prague. The ice was 30cm thick, now a condition for the record, and the water temperature was 3°C.

The record has been held by Danish freediver Stig Severinsen since October 2013. He covered 76m under

ice in Greenland, and retains the title until Vencl's record bid has been verified, which could take as long as three months.

"80.9m under the ice to catch a breath, and I must say that I really enjoyed it," 38-year-old Vencl said after his exploit. "Not just the euphoria that came after emerging, but the calm under the ice. I swam very well and I was surprised how fast I was. It was a great experience for me."

Vencl had originally planned the attempt for a glacial lake in Austria but changed his plans because of Covid travelling restrictions. He said

he covered a distance of 75m three times under ice in build-up training.

Vencl's competitive freediving bests as recorded by governing body AIDA are 7.05min (static apnea); 154m (dynamic apnea with fins); 117m (dynamic apnea no-fins); 77m (constant weight with fins); and 78m (constant weight with bi-fins).

Severinsen retains the under-ice distance record of 152m with wetsuit and fins, swum in 2min, 11sec. Russian freediver Alexey Molchanov claimed a GWR under-ice distance record using a monofin in February 2020, with a 180m swim. ■

Divers steal beer from shipwreck

SCUBA-DIVERS ARE accused of having stolen or vandalised seven 100-litre barrels of beer – that had been left on a 20m-deep shipwreck in Argentina.

For three months a group made up of three craft breweries and a dive-centre from the resort city of Mar del Plata had been conducting an experiment to mature dark ale with an 11-12% alcohol content beneath the Atlantic.

The barrels had been contained in two metal frames secured to the bow of an offshore Russian shipwreck called the *Kronomether*, which sank in 2014.

But on 23 February, the day before the beer was due to be brought back to the surface, diver Carlos Brelles of the *Thalassa* Diving School discovered that the barrels had been removed from the cages.

He and the group have now called for a criminal investigation to be carried out.

Brelles had come up with the idea of ageing beer at greater underwater pressure than had been attempted before in 2018, and the challenge had been taken up by local breweries Heller, Baum and La Paloma.

They had planned to blend the contents of the sea-matured barrels with another ale to produce 2000 bottles of a special *Kronomether* beer, donating the proceeds to a local natural science museum.

The *Kronomether* is a wreck-site said to be popular with recreational divers, and it had taken a year for the

group to secure the permits necessary to carry out their experiment there.

By that time the coronavirus pandemic had intervened, but the team had finally been able to sink the seven barrels, fewer than originally intended, on 22 November, supervised by the Argentine Naval Prefecture.

They were last seen by Brelles on an inspection dive on 19 January.

If the light-fingered divers had hoped to drink the ale at this stage of the brew they would have been disappointed, because the “gas-less liquor” required blending and would have been “very difficult to drink”.

The brewing team suspects that either the thieves didn’t know that or that the barrels were cut away from the wreck in an act of vandalism.

However, they intend to resume their *Kronomether* Project as soon as possible – presumably with additional security precautions. ■



Loading the barrels for sinking last November.

KRONOMETHER PROJECT

...but undersea wine fares well

FURTHER SOUTH in Argentina, and underlining the potential value of maturing alcoholic beverages under pressure, a winery has carried out a head-to-head evaluation of bottles of Malbec aged beneath the Atlantic and in the cellar – describing the contrast between them as “stunning”.

Rio Negro-based winery Wapisa, part of Bodega Tapiz, submerged 1500 magnums of its 2017 blend for nine months at depths from 6-15m off Las Grutas in northern

Patagonia. It wanted to find out if pressure and consistent low temperature would result in “young wines with the benefit of maturity”.

The result was described as “rounder, more elegant and with fresher fruit”.

With three years of ageing in a cellar reckoned to be equivalent to one year under water, it’s thought that the practice could go mainstream – perhaps also offering future job opportunities for scuba divers. ■



Diving to tend the Wapisa underwater wine racks.



Wapisa Malbec certainly looks aged after nine months submerged.

FINCAS PATAGONICAS



EARL SPENCER RESUMES CHANNEL QUEST TO

PLANNED DIVES to find remains of the 12th-century “White Ship” off France’s Channel coast were foiled by seasonal weather in mid-December – but now historian and scuba-diver Charles Spencer has announced that his high-profile quest will resume.

The 9th Earl Spencer, younger brother of the late Princess Diana, has called the sinking of the mediaeval ship and its aftermath “a mixture between *Titanic* and *Game of Thrones*” that changed the course of English and European history.

The White Ship, a clinker-built Viking-style boat propelled by 50 oarsmen, sank on 25 November, 1120 on its way to Southampton.

It was only about a mile out from Barfleur harbour in France when it hit the submerged Quilleboeuf Rock.

The ship was carrying many members of the Anglo-Norman nobility, celebrating victory after four years of war against the French.

Among them was King Henry I’s only male heir, 17-year-old William Aetheling, William’s sister Matilda la

Perche and one of many illegitimate children, Richard of Lincoln.

William was able to get away on a longboat when the ship foundered, but made the fatal decision to order his guards to row back in a bid to rescue Matilda. The boat capsized as other victims tried to climb aboard, and the brother and sister died.

Only one man, a French butcher, survived the sinking and was able to relate what had happened.

Last year Spencer published a well-received book about the White

New whale identified in Gulf of Mexico

A **BALEEN WHALE** that stranded off Florida's Everglades National Park two years ago has turned out to be a species previously unrecognised by science.

Dubbed Rice's whale, the new species has already been classified as Critically Endangered.

The underweight 11.5m adult male washed up in Sandy Key in 2019, and a necropsy showed that it had swallowed plastics.

Originally assumed to be a subspecies of what had been thought to be Bryde's whales in the Gulf of Mexico, subsequent examination indicates that it is a separate breed.

The whale's remains were buried, but then disinterred a few months later by a team from the Smithsonian National Museum of Natural History, which transported the skeleton to Washington DC.

There National Oceanic & Atmospheric Administration (NOAA) Fisheries scientist Dr Patty Rosel, lead author of a study now published in



A new species: Rice's whale

Marine Mammal Science, worked with NOAA scientists and co-authors Lynsey Wilcox and Dr Keith Mullin to study the remains.

From analysis of the skull they were able to identify distinctive characteristics, while separate analysis of the whale's genetic data provided a second line of evidence.

There are reckoned to be fewer than 100 Rice's whales on the planet, and the species has protected status.

It was named *Balaenoptera ricei* in honour of US biologist Dale Rice, the first researcher to recognise what was then thought of as a Bryde's whale. Rice's whales weigh up to 27 tonnes and grow up to 13m long – Bryde's whales are lighter at up to 25m but have a maximum length of 15m.

Little is known about their life expectancy, though closely related species reach sexual maturity at nine and live about 60 years.

The main threats are ship-strikes, ocean noise, energy exploration and production, oil spills, fishing-gear entanglement and ocean debris.

★ *Meanwhile, off South America's Pacific coast an extensive satellite-tracking survey has revealed that the biggest species of baleen whales are constantly forced to zig-zag to avoid up to 1000 ships that pass through their*



Patty Rosel photographs whale bones.

feeding grounds in Chile's northern Patagonia region daily.

Blue whales (Balaenoptera musculus) surface to feed on krill, making them vulnerable to ship-strikes.

"In most countries unreported cases, limited monitoring and insufficiently documented incidents have precluded any accurate assessment of the true collision prevalence," write the researchers from Chile, Argentina and the USA, whose study has just been published in Science Reports.

Chile's coastal waters are the main summer foraging and nursing ground for the eastern South Pacific blue whale population, which numbers only a few hundred.

They also feature one of the world's largest salmon-farming industries, the source of up to 83% of the traffic.

The team tagged and tracked 15 blue whales in the study, and are now calling for legislation to re-route the intensive shipping traffic seasonally or introduce speed limits, which could reduce the dangers of both ship-strikes and noise exposure to the whales. ■



Patty Rosel was lead author of the study.

LOCATE WHITE SHIP RELICS

Ship. He describes the chances of finding its remains as "optimistic" but says that after detailed research his dive-team will be looking for "surviving metalwork – nails, rivets, etc" that held the timber planking together.

Spencer says he hopes "learning more about the construction of the White Ship will provide some helpful insights into medieval boat-building practices generally".

Working closely with him on the summer diving expedition will be

Roger Michel, Director of the Institute for Digital Archaeology.

"The area has never been subject to any professional archaeological examination, and so may yield interesting new clues about the structure, composition and cargo of the doomed ship," he stated recently.

King Henry 1 was the son of William the Conqueror, and the loss of his heir had far-reaching consequences.

After his death civil war broke out between his appointed successor,



EDWARD X

Set to dive: Charles Spencer.

another daughter also named Matilda, and his nephew Stephen of Blois. Known as the Anarchy, the conflict continued for 20 years, with Matilda's son eventually taking the English throne as Henry II. ■



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GREEK ARCHAEOLOGICAL scuba-divers have recovered a variety of artefacts during the most recent excavation of British diplomat Lord Elgin's ship the *Mentor*, which sank in the Aegean Sea in 1802.

Passenger belongings and parts of the rigging system were found during the excavation, which was carried out under the supervision of Dimitris Kourkoumelis of Greece's Ephorate of Marine Antiquities from 4-21 September last year.

The Ministry of Culture & Sport, of which the Ephorate is part, recently announced what was achieved by the team of 18, which it said included archaeologists, marine biologists, diving instructors, surveyors/ engineers, antiquities conservationists and seabed technicians.

Elgin's two-masted sailing brig had left Greece for Britain loaded with crates of marble sculptures taken from the Parthenon, Acropolis and other Athenian monuments.

It hit rocks during a storm and sank at a depth of 23m in the bay of Agios Nikolaos, south-east of the Ionian island of Kythira.

Everyone aboard survived and Elgin mounted a salvage operation using sponge-divers who succeeded in recovering what became known as the "Elgin Marbles". These are still controversially displayed at the British Museum, now rebranded as the "Parthenon Sculptures".

The latest underwater excavation continued from where that of 2019 left off, on the western side of the hull.

Many timbers remain but scattered

Divers come up with more relics from Mentor wreck



A diver working on the wreck of the *Mentor*.

over the seabed, evidence of the level of destruction that occurred as the *Mentor* hit the bottom, say the archaeologists.

They add that the number of remains found trapped under rocks also indicate the powerful wave action which, assisted by south winds, continues to affect the wreck.

A number of timber and iron objects were found to be parts of the

rigging around the rear mast. They included rollers, bolts and pulleys, some of which retained fragments of mooring rope.

To date 35 complete and partial pulleys have been found.

Also discovered were parts of leather shoes, with in one case a complete sole; shoe and belt buckles; coins, including a small one probably meant for use in card

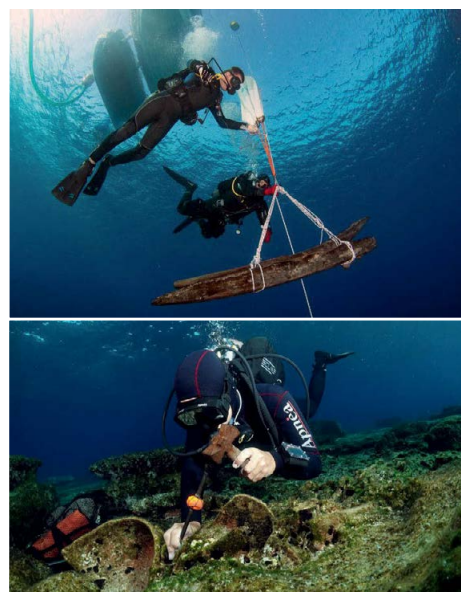
games; two chess-pieces, adding to the six previously found, probably from the same set; and fragments of cooking and other utensils.

Dive-teams have been excavating the *Mentor* since 2011. In that time artefacts found have included navigational instruments, gold watches, gold rings and earrings, cooking pots, chains, coins, bottles and buttons. ■



Artefacts, clockwise from top left: Views of wooden rigging cylinders; pulley with part of its tying rope; both sides of a metal coin, perhaps for use in card games; sole of a leather shoe.

Right, from top: Divers lift a piece of timber; concretion under the hammer.



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MASKED IN THE UNDERWATER MUSEUM



THE LATEST installation by Jason de Caires Taylor is the British sculptor's first in the Mediterranean Sea – the Underwater Museum opened off the coast of Cannes in France on 1 February.

Commissioned by the city's mayor David Lisnard and funded by the Mairie de Cannes, the project took more than four years to develop.

It features a series of six monumental 3D portraits, each more than 2m high and weighing 9 tonnes, located in the protected southern part of the island of Sainte-Marguerite.

For maximum accessibility to snorkellers as well as scuba-divers, the sculptures lie close to shore and shallow at 2-3m deep, resting on areas of white sand between *Posidonia* seagrass meadows and cordoned off from boat traffic.

The location was previously an area of disused marine infrastructure, so the project involved removing marine debris to create space for the Underwater Museum.

As with all Taylor's installations around the world, Ph-neutral materials have been used to attract marine fauna and flora.

The portraits are based on members of the community, from a nine-year-old primary school pupil to an 80-year-old fisherman. Each face is sculpted in two parts, with the outer section resembling a mask.

Sainte-Marguerite was the island where famed 17th-century prisoner the Man in the Iron Mask was incarcerated.

The split mask is a metaphor for the ocean, explains Taylor, with one side depicting strength and resilience, the other fragility and decay.

"From land, we see the surface, calm and serene, or powerful and majestic," he says. "This is the view of the mask of the sea."

"However, below the surface is a fragile, finely balanced ecosystem – one which has been continuously degraded and polluted over the years by human activity." ■



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Dive from home to help save GBR

DIVERS ALL OVER the world are being encouraged to participate in a citizen-science project designed to boost the long-term health of Australia's Great Barrier Reef. All that's required is access to the Internet "and a few minutes to spare".

Training agency PADI says it has teamed up with Australian conservation network Citizens of the Great Barrier Reef for what it describes as a first-of-its-kind initiative, the Great Reef Census. Divers contribute to the effort by carrying out online reef-image analysis.

Between October and December 2020 divers, dive-boats, marine-tourism operators and others in the GBR community created a makeshift research flotilla that captured large-scale reconnaissance data and images from across the reef, says PADI.

Dive-crew, scientists, tourists and conservation groups volunteered hundreds of hours and surveyed more than 160 reefs from the tip of Cape York to the remote southern Swains, capturing more than 13,000 images. These were uploaded to the Great Reef Census platform for analysis.

"The Great Reef Census is a ground-breaking idea for ocean conservation that is inclusive of anyone with access to the Internet," says Michelle Barry, a GBR-based Master Scuba Diver Trainer.

"This allows people all around the world to visit the reef virtually and to be part of an important project to protect it."

If the idea proves successful the model can be rolled out across the world, says PADI, providing "real-time status updates for the planet's treasured reefs".



BRAD FISHER / KATRENE PHOTOGRAPHY

It's far from dead yet – census survey at Agincourt Reef.

"As the impacts of climate change and other threats accelerate around the world, there is an urgent need to scale up conservation efforts globally, which requires everyone to take part,"

says Andy Ridley, CEO of Citizens of the GBR. "The global dive community is in a unique position to support these efforts."

The GBR has experienced three

mass coral-bleaching events in the past five years, stretching traditional management and monitoring resources.

Much of the world believes that the GBR has already gone, according to Ridley. "But the reef is massive, the same size as Germany, so the reality is that it's a patchwork system of incredibly healthy, degraded and recovering reefs."

Only 5-10% of the GBR is regularly surveyed, he says.

"The Great Reef Census is designed to help fill critical gaps in our knowledge of how individual reefs are coping with stresses, and has already returned valuable data."

Divers can get involved in the survey at greatreefcensus.org and also learn about the training agency's own conservationist community of "PADI Torchbearers" at padi.com ■



TURTLE CREATIVE



DERZNO

The Karst Group Mühlbach's base camp.

EXPERIENCED DIVER LOSES LIFE

A 57-YEAR-OLD cave-diver has died while trying to fin through a short underwater section of a system in southern Germany.

The incident occurred on 6 February, about 700m in from the entrance to the extensive Mühlbachquell karst spring system. The caves are near the town of Dietfurt in Bavaria.

The unnamed man, from the Nuremberg area about an hour away, was part of an experienced

dive-team of four from the Karst Group Mühlbach (KGM).

Its cavers are authorised to explore the otherwise closed-off system.

Much of the network of passages is dry but the incident occurred as the man dived through a narrow 6m-long flooded section called the "Mole Siphon".

Although described by the group as being short enough to negotiate by breath-holding, the divers were

SARAH TALLON



North & South teams to form Ghost Diving UK

THE LATEST international chapter of Netherlands-based ghostnet removal group Ghost Diving is to be in the UK, the volunteer organisation has announced.

There are set to be two teams of technical divers within the new Ghost Diving UK chapter. Team North will operate out of Tynemouth with its own boat, while Team South is based in Cornwall.

Ghost Diving UK will also participate in international missions in collaboration with other chapters, while on a national level it will aim to link up with local scuba diving and conservation groups in the fight against marine pollution.

Initially it has partnered with Healthy Seas, the non-profit environmental organisation that

recycles recovered net and line.

The Ghost Diving Foundation was established by current chairman Pascal van Erp in 2009. Besides the UK it has chapters in the Adriatic, Costa Brava, Egypt, Greece, Hong Kong, Korea, Italy, Lebanon, Malta, New Zealand, Philippines and Poland.

Last March Ghost Diving changed its name from Ghost Fishing “to make it easier for the public to understand what it does”, although the original UK chapter opted to retain the original name and go it alone.

Ghost Fishing UK said it wanted to involve non-diving supporters as well as scuba divers, and described the brand as being already a “household name in the diving industry”.

Find out more about Ghost Diving at ghostdiving.org ■

IN BAVARIAN CAVE SYSTEM

using scuba equipment.

When the man failed to emerge his colleagues were able to pull him out of the section unconscious and were said to have spent hours trying to revive him while bringing him to the surface.

A rescue-team including mountaineers, firefighters and police came to their assistance but were unable to save the diver.

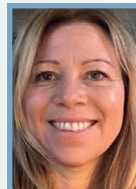
The diver's companions were uninjured but said to be

traumatised by the incident, and an investigation into the cause of the fatality is underway.

The Mühlbachquellhöhle was discovered only 20 years ago, when cavers followed the strongly flowing underground stream it contained.

They found a 300m-long lake, a large waterfall and a number of chambers in a network of passages that extends over more than 10km. ■

Freda's Diver Dishes



I have chosen this dish because mussels are low in fat, high in protein and a very good source of vitamin B12. Did you know that mussel-farming has virtually no negative environmental impact? Mussels don't have to be fed like livestock or farmed fish; they don't need pesticides and they produce no environmentally damaging waste.

On the contrary, they are filter-feeders so they actually make the sea cleaner. Eating farm-grown mussels might be an even greener option than becoming a vegan!

Healthy wild mussels, *Mytilus edulis*, are much meatier than their farmed cousins. Most people can easily recognise mussels, but not many of us forage for them and eat them from the wild. Try only to eat wild mussels during months with the letter R in them. Summer is their spawning season. Farmed mussels can be eaten all year round.

Baked Mussels with a Crisp Seaweed Crumb feeds 2 divers



Ingredients

24 large fresh mussels; glug of dry white wine; 2 garlic cloves (minced); 2 slices white bread (crusts removed); quarter tsp dried red chilli flakes; half tsp Anori seaweed; half tsp shony (seaweed blend); 2 tbsp freshly chopped parsley; sea salt & pepper; olive oil.

Method

Heat a large deep pan and add mussels and white wine. Cover with a lid and cook for 3-4min, shaking the pan halfway through. All the mussels should have opened by now – discard any that haven't. Tip into a colander and set aside.

Meanwhile heat the olive oil in the same pan and add the minced garlic. Then cook carefully for just a minute or two. Turn off heat.

Using a food-processor, blitz the bread. Add garlic and olive oil with the rest of your ingredients and blitz again. Set aside and turn your oven on to 200°C.

Discard the empty half-shell from each mussel and de-beard any that need it. Arrange on a shallow baking tray and cover each one with the breadcrumb mixture. Bake in the oven for just 10min or until you hear them sizzling. Serve with bread and salad. This dish makes a great hot *canapé* for a party (we're all dreaming of having parties again soon!)

Top Tip

Shony is classed as a superfood and can be bought in the supermarket. It's a 100% seaweed blend and can be used as an alternative to salt.

* Freda Wright is a diver and chef on British diving liveboard *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



Film-makers cleared of desecrating ferry wreck

CAN UNDERWATER film-makers desecrate a wreck simply by capturing images of it?

A legal decision on 8 February might have answered that question – but did so on a technicality. A Swedish court acquitted two men charged with violating the sanctity of the *Estonia* ferry, which sank in the Baltic 27 years ago in Europe's worst peacetime disaster at sea.

The vessel went down in less than an hour on a routine sailing from Tallinn in Estonia to Stockholm on 28 September, 1994. Only 137 of nearly 1000 passengers and crew survived.

In September 2019 Swedish photo-journalist and film-maker Henrik Evertsson and deep-sea analyst Linus Andersson sent an ROV down to capture images of the 80m-deep wreck. Shot for a five-part Discovery Channel documentary series, *Estonia – A Find That Changes Everything*, the dramatic underwater footage revealed a 4 x 1.2m hole in the



The Estonia, showing the bow door.

starboard side of the ship's hull.

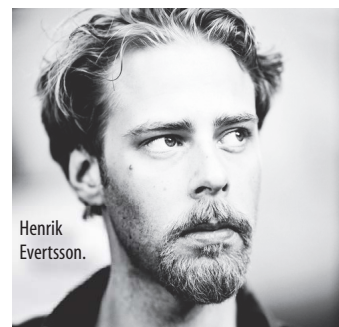
Experts concluded that the hole was probably caused by impact from an object weighing 1000-5000 tonnes travelling at 2-4 knots. This cast doubt on the official verdict that the bow door's locking system had been defective, causing the car-deck to flood and the ferry to roll over.

Campaigners had long argued that this would not have caused such

a rapid sinking, and that a loud noise heard earlier in the night could have indicated an explosion or collision with a warship or submarine.

The documentary reignited calls for re-examination of the wreck.

Sweden, Estonia and Finland had agreed in 1995 not to salvage the wreck, and declared it illegal under their "Estonia Act" to disturb what they had designated a grave-site.



Henrik Evertsson.

The film-makers had faced a fine or jail sentence of up to two years, but argued that their actions were protected under Sweden's freedom of speech and information legislation.

Gothenburg district court denied that such protection provided "carte blanche" to commit criminal actions.

The pair had contravened the Estonia Act, said the court, but it judged that they could not be held accountable because they had been aboard a German-flagged ship in international waters. Germany had not signed up to the Estonia Act, so applying it in this case would violate international maritime law.

Sweden and Finland recently lifted their bans on diving the wreck, and the Estonian government has agreed to allocate 3 million euros to a new underwater investigation by its Safety Investigation Bureau. ■



Unforgettable Photojournalism This book repels even as it fascinates – based on the finest conservation shots from the NHM Wildlife Photographer of the Year competition, you'll marvel at the art but hate much of the inhumane content. *Shark Surfer* by Thomas Peschak (above) is one of the shots that's easy on eye and stomach too.

XTrillion Little Pieces Top tip from Steve Warren, who has reason to believe that this forthcoming documentary about 14 women on a mission to explore the Great Pacific Garbage Patch and highlight plastics pollution will be a must-see – see a trailer at xtrillionfilm.com

Amos Outlook Big-animal photographer Amos Nachoum featured here recently for *Picture Of His Life*, the film about his quest to snap polar bears under water. It's at pictureofhislife.vhx.tv, but if Amos was a tad taciturn in the doc, he chats away enthusiastically in a new 44min World Service Outlook interview – it's on the BBC Sounds app.

Mares Dual Adj 62X Another shout-out from Warren, who reckons this regulator is nothing if not superb – see DIVER Tests.

Young sharks feel the heat

CLIMATE CHANGE is pushing marine animals towards the poles and setting threatened species on unpredictable collision courses – a point illustrated by a new report on great white sharks from the Monterey Bay Aquarium in California.

Increasing numbers of juvenile white sharks have been arriving in the bay, and researchers have analysed data collected through tagging in the past 20 years to find out how climate change has altered their behaviour.

Last August water temperatures in the area reached as high as 21°C, as against an average of 13°.

Such extremes have become familiar since a heatwave lasting from 2014 to 2016. This coincided with unprecedented numbers of juvenile white shark sightings, says the report, and a related fall in populations of shark prey such as salmon and sea otters, the latter a threatened species.

Young sharks at first eat fish, then practise hunting skills on otters before graduating to seals and sea-lions.

The team analysed 22 million electronic data records from 14 sharks tagged in southern California and

Mexico and compared them to 38 years of ocean temperatures to chart how young great whites were being drawn to warmer waters some 370 miles north of their previous range.

Adult great whites can tolerate cold waters but juveniles have yet to build their body mass. "In the north-east Pacific, newborn and small juvenile white sharks were historically confined to southern California and Baja, a 'Goldilocks' zone that was neither too hot nor too cold," said researcher Dr Salvador Jorgensen of the University of California.

"Our study shows that recent ocean-warming has drastically shifted this zone north."

From 1982-2013 juveniles ventured no further north than Santa Barbara (34°N), but the heatwave brought them as far north as Bodega Bay (38.5°N). Monterey lies at 36°N.

"The movement of these young sharks into more northern latitudes is just another example of how marine animals are being displaced by climate change," said Dr Kisei Tanaka, lead author of the study, which is published in *Scientific Reports*. ■

Pirate bones found on Cape Cod shipwreck

THE BONES OF AT LEAST six pirates have been discovered at the site of the early 18th-century shipwreck *Whydah Gally*, off the Cape Cod peninsula on the USA's Atlantic coast.

The vessel, commanded by English pirate Samuel "Black Sam" Bellamy, sank in 1717, and the discovery of the skeletal remains was announced by the Whydah Pirate Museum at West Yarmouth, Massachusetts in February.

The bones were identified by an investigative team from the museum examining several large concretions.

Earlier in the month, conservators had reported working on a recently recovered concretion said to contain small gold bars, silver coins and a pistol, believed to be from the bag of one of the pirates aboard.



Concretion recently recovered from the *Whydah* wreck.

Three years ago investigators obtained DNA from a descendant of Bellamy living in Devon, so will be able to check whether any of the bones is that of the pirate captain.

A previously recovered bone proved to be that of a male with links to the eastern Mediterranean.

"We hope that modern, cutting-edge technology will help us identify these pirates and reunite them with any descendants who could be out there," said Barry Clifford, the Cape Cod diver who discovered the wreck

in 1984. "This shipwreck is very sacred ground. We know a third of the crew was of African origin and the fact that they had robbed the *Whydah*, which was a slave ship, presents them in a whole new light," he said.

"Their benevolent captain Samuel "Black Sam" Bellamy and crew were experimenting in democracy long before the so-called civilised societies had considered such a thing."

Built in London in 1715, the *Whydah Gally* had been trading slaves from West Africa for precious metals

in the Caribbean before it was captured by Bellamy near Cuba.

He already had two vessels but armed the *Whydah Gally* as his new flagship, keeping some of the original crew with him.

Attacking other ships off the USA's Atlantic coast with his fleet, Bellamy is said to have plundered the equivalent of some £88 million worth of treasure in just over a year, but the *Whydah* survived for only two months.

On 26 April, 1717, the ship capsized and sank in a storm, taking with it the 28-year-old Bellamy, "the Prince of Pirates", alongside all but two of the crew.

Using a contemporary map, Clifford found the wreck buried in sand at depths between 5 and 9m, spread over a wide distance.

His dive-team initially recovered some 200 artefacts, including the ship's bell, inscribed "the *Whydah Gally* 1716", cannon, weapons and silver and gold coins.

The museum claims its exhibits to be the largest collection of pirate-related artefacts ever found on one shipwreck, and the only authenticated pirate treasure on display. ■

From the heart

A UK DIVING instructor is trying to raise funds to fix the hole in his heart that threatens his livelihood.

Jack Franklin, 28, from Moreton-in-Marsh learnt in January that he needs an operation to close the PFO (*patent foramen ovale*) and cut his chances of suffering a stroke by 80%.

Such precautionary operations are not available on the NHS, and done privately would cost £19,300.

Made redundant last year during the pandemic, the instructor says he could not afford to fund such an procedure. The condition came to light only after he had suffered a skin bend following a 40m dive.

"The worst case is a bubble finding its way to the brain... so I was incredibly lucky to only suffer a minor bend," he said. "This defect has now put a stop to my life passion and career as a scuba-diver and instructor, as well as my ability to physically work hard due to the high risk of stroke."

Some £7400 had been raised by 140 donors by early March, uk.gofundme.com ■



DIVERS FEATURE IN CORNWALL'S CLIMATE STORIES

A NEW SERIES of documentaries examines how climate change will affect Cornwall – with the first film, *Under the Surface*, focusing on how species that depend on the sea for their survival are already being affected.

Cornwall's Climate Stories also explores projects happening around the county to tackle the problem.

The 30-minute films, made by charity Cornwall Climate Care, are being made available for free online viewing as well as for community and school screenings.

One of the positive stories focuses on ARC Marine, set up by scuba-divers James Doddrell and Tom Birbeck to repair damage to marine habitats caused by trawling and underwater construction.

The company makes carbon-neutral reef cubes to help restore reefs – a green alternative to using concrete blocks. The film-makers say that such initiatives could be "hugely important" as the UK aims for massive expansion of its offshore wind-farms, and to better protect coastlines from increasing storm damage. Seagrass restoration projects also feature.

Under the Surface is narrated by Claire Wallerstein, who for eight years ran Cornish beach-cleaning group



A cuttlefish in Cornwall.

Rame Peninsula Beach Care. She interviews marine experts studying creatures ranging from plankton to grey seals and basking sharks.

"There's so much awareness nowadays about the need to tackle plastic pollution – and rightly so," says Wallerstein.

"It is a huge problem and causes such obvious harm. But it's only one part of the bigger and more complex issue of climate change, which doesn't seem to get so much attention.

"People may not think of climate change being much of a problem in Cornish seas, but what I found while making this film was that dramatic and surprising changes are happening right under our noses

here too."

"Cornwall will be first in line to experience many of the impacts of climate change – from more severe Atlantic storms to sea-level rise and eroding coasts," adds director Bryony Stokes.

"But what people may not know is that it is also blazing a trail for the rest of the country in the fight against climate change.

"There's a huge range of exciting and pioneering work happening here... we hope these stories will give people a feeling of pride and hope – and motivate them to help tackle the climate crisis too."

You can watch *Under the Surface* at cornwallclimate.org ■

Covid-hero doctor is first Emperor dive-trip winner

DIVING DOCTOR Deborah Braham has been named as the first of Emperor Divers' eight Covid Diver Heroes.

Each of the winners being chosen fortnightly until mid-June can look forward to a free liveboard trip once they're able to travel.

Emperor Divers launched the initiative in mid-February, with the aim of recognising divers who had stepped up during the pandemic.

Dr Braham was nominated by a friend, Dave Walker. He had met her on a dive trip to Tobago, and explained how during the coronavirus pandemic she had succeeded in creating "The Visor Army".

"Deborah is an NHS anaesthetist and early on, when PPE was in short supply, she just went on WhatsApp and organised visors and more directly for her hospital," Walker said in his nomination. "Deborah just made it happen."

He said that Dr Braham had married another diver not long after they had met. "With her in the UK and us in Switzerland, we haven't managed to meet up since she had children.

"Whatever, in Yorkshire speak, she's a 'lovely lass' who definitely deserves a good holiday."

Dr Braham's visor initiative was covered in a BBC news report at the time. "A doctor who urged volunteers to make visors for NHS staff due to a

shortage at her hospital says she is 'overwhelmed' by the response," it stated. "Without [visors], doctors and nurses are at high risk of being contaminated by aerosolised particles containing the virus during procedures such as intubation, or when they are caring for patients on ventilators."

"Initially it was just people I knew who came on board, then it was people I didn't know," Dr Braham had told the BBC. "Within a short time this whole thing had grown so big, with so



Covid hero: Dr Deborah Braham.

many people wanting to help."

In a few weeks more than 75,000 face shields had been produced in response to her appeal.

Emperor Divers is rewarding eight nominated Covid Diver Heroes with free seven-night liveboard trips split between the Red Sea or Maldives.

"This initiative is our way of saying thank you to all those hundreds of people who have taken a selfless interest in looking after the vulnerable in their community," says the operator's Red Sea manager Luke

Atkinson of the initiative.

"Examples could include health-workers, carers or those who have come out of retirement to volunteer locally, but really we know there are many other ways people have been heroic."

Contact Emperor if you know of a candidate (not yourself) who would appreciate a free liveboard trip once things have settled down.

Provide their name, a photo and explain in 100-200 words why they deserve a free holiday, and which dive destination they would prefer.

A multi-national panel of Emperor's "most loyal and compassionate staff" are picking the winners, and the operator says it is "in awe" of the quality of the 50-plus nominations it had already received by the start of March.

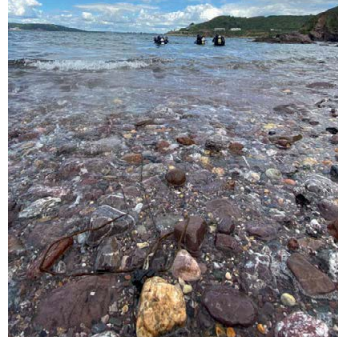
"Dr Braham was judged to be the deserving winner of a Red Sea liveboard trip and we have been in

contact with her to arrange that," it said.

Further winners will be announced on the 14th (Maldives) and 28th (Red Sea) of each month, ending on 14 June. Final entries for the Red Sea must be in by 20 May; for the Maldives by 5 June.

Trips include airport transfers but not flights, and can be taken until the end of 2023. Divers should email entries, comments or questions to heroes@emperordivers.com. Enter the hero's name as the subject line. ■

Sound offer: free marine eco-training



SOUND DIVING in Plymouth is offering free SSI Marine Ecology courses, to boost interest in local marine-conservation initiatives.

The online course, which usually costs £150, is available to divers and non-divers of any age, with a version dedicated to children.

After studying the course materials candidates attend a Zoom lecture and take a final exam to receive the qualification.

Established in 1985, Sound Diving describes itself as a family-run and family-friendly dive centre that has worked around the world.

"Over the past twelve months, it's become clear just how much we need to be doing to look after our planet," says owner Debbie Metcalfe. "We're fortunate to be able to support people of all ages and backgrounds to learn about such an important and interesting topic, and hopefully to build a community of marine conservationists who can make a difference by working together."

Find more at sounddivingplymouth.co.uk or go to @SoundDivingPlymouth on Facebook. ■

MIRANDA BECOMES AN AMBASSADIVER

PADI HAS ANNOUNCED its team of "AmbassaDivers" for 2021, inviting personalities it feels are in a position to influence audiences worldwide.

Best-known in the UK is TV & radio presenter Miranda Krestovnikoff, who made her mark on diving early with the *Wreck Detectives* series and then become one of the best-known faces in wildlife broadcasting with regular segments in BBC shows such as *The One Show* and *Coast*.

"Through her work on and off

screen, she hopes to connect people with nature and the need for conservation," says PADI. She talks to **DIVER** about her role next month.

PADI launched its AmbassaDivers programme in 2015, seeking participants who "are sharing their love for diving, acting to safeguard ocean health and exciting others to pursue their own passions".

The other eight new recruits include Dubai-based Brit Paris Norriss, host of an adventure travel



show said to have audiences of 15m.

Shark photographer Taylor Walston is based in Hawaii, while Chinese film-maker Doudou became China's first female National

Geographic Explorer and claims 1 million-plus social media followers.

Two female AmbassaDivers hail from Japan: Yukie Higashineta and Kaoruko Inou. Argentinian *Big Brother* winner Francisco Delgado, based in Cozumel, is dedicated to introducing younger generations in Latin America to the underwater world.

The team is completed by filmmaker and photographer Tom Park in Australia and Maldives-based Polish dive-instructor Martyna Skura. ■

UNDERWEAR OPTION

Spare a thought for Brandi Mueller. Our wide-ranging correspondent from the USA has resumed her diving in stages out of lockdown, sharing with us all her experiences diving a meg-tooth river, then on liveboards in the Bahamas and Socorro (*this issue*).

Her next assignment on **DIVER**'s behalf was to... Galapagos. I know, the golden ticket!

Before entering Ecuador for the last stage of her journey a negative Covid test was required, with another to follow before heading out to the magical islands. Forty-eight hours before the flight departed, she took that test from a laboratory warmly recommended by expats in Ecuador.

Imagine her shock when she rolled



up at the airport to be told that the test had been a fake! The proverbial hit the fan, but Brandi has learnt to keep her cool in these situations.

Her fallback is crying; then there are various stages

before she resorts to her nuclear option, which involves unpacking at the check-in counter and hurling her underwear around the concourse.

Apparently this usually works. I'm not sure it would for me.

With 90 minutes until take-off (next flight three days' later), officials helpfully suggested that Brandi take a taxi to another lab in town to get a new test. Impractical time-wise.

As I write, I still don't know whether by some miracle she caught that liveboard. Fingers crossed for her.

Absence of dodder

"Scuba Grandad" in a headline does make an action man sound like a right whisky codger, but Randy Thomas recently proved that dodder he is not. You'll know we're talking about America from his first name – he hails from the big-chill state of Texas.

Randy took a frantic call from granddaughter Caitlyn. She'd spotted an 11-year-old boy up to his neck in water in the middle of a large frozen pond, too cold to move or even to call out.

Knowing that Grandad was trained as a Rescue Diver and lived only a block away, he was her first thought. In T-shirt and jeans he plunged in through the ice, made his way to the boy and managed to haul



him out helped by a line tied to his pick-up.

The lad was back home thawing out before the first responders had even reached the scene. When in trouble, who you gonna call? (Actually, the emergency services – but after that, always a diver!)

Bleedin' obvious

Marine-biological research is often fascinating, but occasionally it can leave you thinking – really?

Dolphins have some personality traits similar to those of humans, a new study informs us.

That sounds interesting, I thought, what could those traits be? Sincerity, patience, boastfulness, intolerance, pessimism... sarcasm?

No, after studying 134 captive bottlenoses, the boffins concluded that dolphins tend to be both sociable and curious, just like some of us.

Whaddya know? Any diver who's been lucky enough to enjoy an extended interaction with playful dolphins will know that to be true.

Dolphins have big brains with capacity to spare, and intelligent species are often very inquisitive.

The scientists think it's remarkable that species that followed such

divergent evolutionary roads should end up being so similar. Their insight will help them to understand how certain human personality traits developed, they say. The dolphins? They're just having a laugh.



CHRISTEL S. ON PINKNO

Another reason for falling camera sales might be that people who lose them keep finding them again.

Kellee Bouchard from Moore in Oklahoma flew 1200 miles south to Mexico on a diving holiday, and was finning around 14m down off Cozumel when she saw

a GoPro and retrieved it.

It still amazes me that people leave footage from multiple trips on memory cards instead of backing up, but that's what the action-cam owner had done.

Mind you, that perilous practice did prove helpful, because less than a day after Kellee had started posting footage on social media it came to the notice of another diver, Penny Spurlin.

Turns out that Penny had lost her precious camera in Cozumel not long before, and had given up on finding it again. But she didn't have far to go to collect her property. Her hometown of Tuttle also happens to be in Oklahoma – a half-hour drive from Kellee's place.

Camera boom

The idea that people might want to put their cameras into cases and take them under water always seems to have puzzled the big camera manufacturers, who have regarded the diving corner of the market with some suspicion. Put it this way, they have never fallen over themselves to advertise their wares to divers.

Is this about to change? According to *Digital Camera World*, a "massive boom" could be set to boost this niche market.

Topside camera sales are plummeting as

Fish on Prozac

Although fishes' schooling behaviour might suggest otherwise, every one of them has its own personality, according to some marine biologists (not the dolphin-personality ones above).

Yes, they're all little characters in their own right (fish, not biologists) – until they get dosed up with Prozac, that is.

Apparently when we humans take prescription drugs, not all the chemicals are absorbed into the body. The rest is expelled down the pan, and much of that ends up sloshing about in the ocean.

Prozac is one of the world's most popular drugs for people with depression, OCD or eating disorders.

In the UK alone we get through at least 6 million prescriptions a year.

The scientists fear that all these psychoactive pollutants are now affecting the socialising, feeding, migration and



TOM MARCO

mating habits of fish and other marine life. Administering Prozac to generations of guppies for two years, they found that the fish lost their sparks of individuality. Yes, they all started acting the same!

Who cares? They're fish.

Well, it does matter, because it's the successful individuals of any species that drive its evolutionary development.

Survival of the fittest? How does that work out for zombies? And what does this finding say about human Prozac-users?

Quest for leaders

The Editor is getting worrying ideas. Ever since he heard that *Rolling Stone* had put out a call for "thought leaders" willing to pay the US entertainment magazine \$2000 a pop for the honour of writing in it, he's been wondering if the idea might have "traction" in the UK diving world.

Rolling Stone is forming a "community for innovators, influencers and taste-makers" – thinkers (with deep pockets) in the "worlds of music, entertainment, food, beverage and cannabis". All contributions will be "clearly labelled", so the readers know what they're getting.

I have my doubts, but if any reader wishes to pay **DIVER** breathtaking amounts of cash to express their leading thoughts in the magazine, I'm authorised to say that all offers will be seriously considered. █






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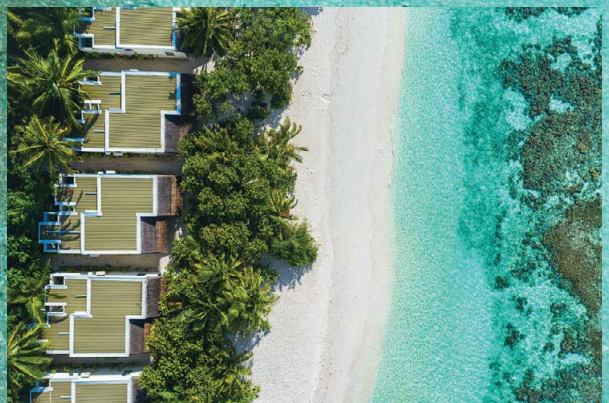
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TO DIVE OR NOT TO DIVE?



If **BRANDI MUELLER** ever doubted that diving boosts our mental health, such doubts were swept away by a recent escape from isolation to the Revillagigedo islands off Mexico. But it was very much a team effort...

I GOT SICK ON THE FIRST NIGHT.

The boat had left the dock and literally moments after my room-mate said: “Oh well, you’re a boat captain, you must never get sick”, I was hugging the small toilet in our cabin, being reminded of the tacos I’d eaten in Cabo before boarding.

The thing is, I don’t get seasick. Perhaps the tacos had been bad, but

I think it might have been that and something else.

This global pandemic has sent my mental health in a downward spiral of anxiety, stress and, worst of all, withdrawal from diving (and I know I’m not the only one).

But I had not considered that the anxiety of diving during a pandemic could also affect my well-being.

About a week before this, I had received an email with an amazing last-minute opportunity to go to Socorro, and I must have stared at it for an hour.

I went back and forth in my head: I want to go, I shouldn’t go, but I’m so miserable here, diving would make me happy... but we aren’t supposed to travel.

I Googled Covid in Mexico for hours, fully researched Nautilus Liveboards’ website to find out about all the measures the operator was taking, and then I stared at the email some more. And then I said to myself: “I’m going.”

How could I not? Socorro has been a bucket-list destination for me for ages. I had absolutely nothing else going on, and I missed diving so much it practically hurt.

Like so many, I had hardly left the house for months, so it would have been unlikely that I had the virus.

But it still concerned me that I could have it, or that I would get it on the plane and spread it to others.

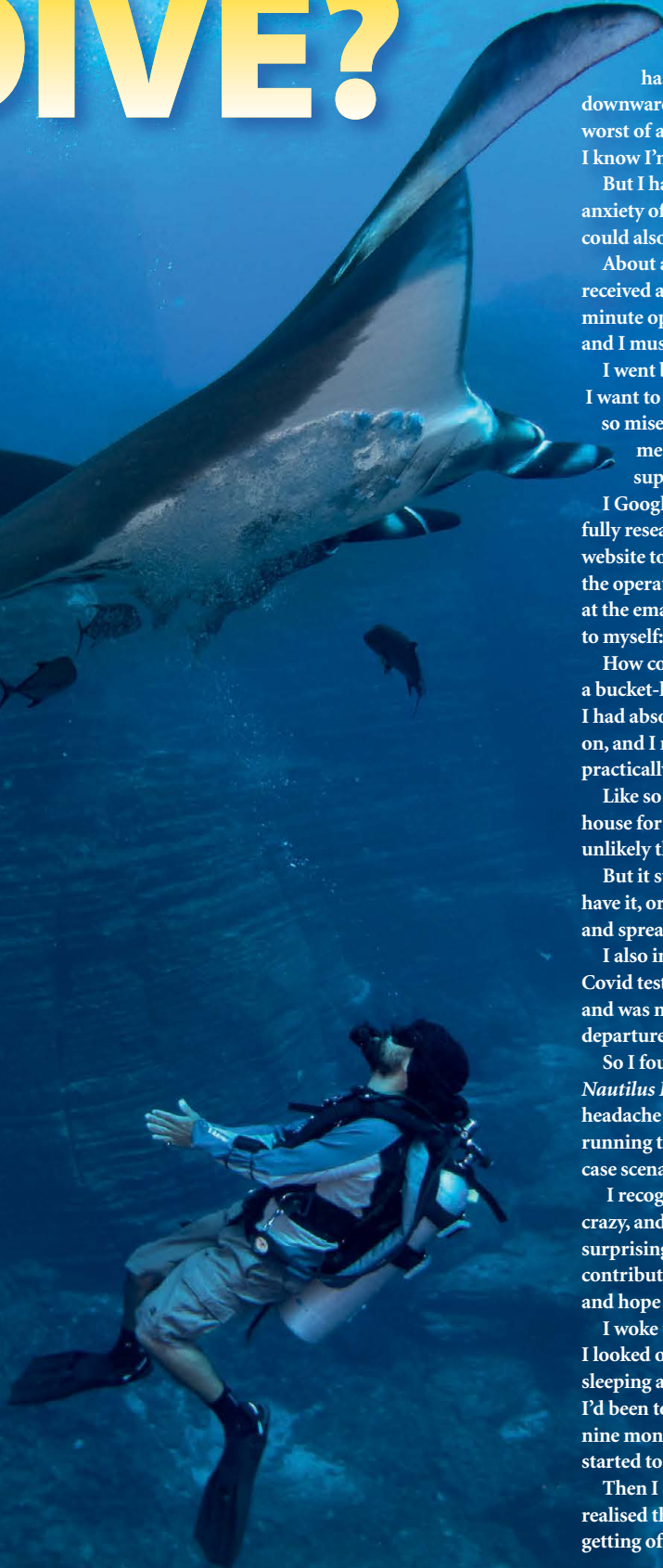
I also immediately went and got a Covid test, as required by the liveboard, and was negative as of five days before departure.

So I found myself onboard the lovely *Nautilus Explorer*, with a splitting headache and my over-active imagination running through every possible worst-case scenario.

I recognised that I was being a bit crazy, and the long day of travel (through surprisingly busy airports) had probably contributed, so I decided to go to sleep and hope I’d feel better in the morning.

I woke up the next morning and as I looked over at my room-mate, who was sleeping at a distance closer to me than I’d been to any stranger in more than nine months, my negative thoughts started to accelerate again.

Then I stopped for a second and realised that I was there, and there was no getting off at that point, so I’d better stop





worrying about it. I gathered myself and went upstairs to get a coffee before continuing up one more level to the sun-deck.

We were somewhere in the middle of the 240-mile journey from the Baja Peninsula of Mexico to the Revillagigedo Archipelago (most commonly referred to as Socorro). I sat for a while alone on the sun-deck with my coffee, taking in an incredible sunrise over unseasonably calm blue water.

The ocean calmed me, as it has done all my life, and I was so happy I had come. I was there – I might as well enjoy it.

DURING OUR DAY at sea we did the briefings, set up our kits and started to get to know the other passengers.

Nautilus Liveboards had really implemented every precaution imaginable to keep guests and crew as safe as possible. It was one of the first companies to reopen after the pandemic started and, when it did, it didn't just "open as normal."

I remember reading about all its efforts and procedures months before and being impressed by how well thought-out its new measures seemed to be. In real life, onboard, they were just as good.

Prior to boarding, the boat is sanitised with hotel-grade chemicals. Guests have

to submit a twice-daily temperature log from a week prior and the negative Covid test. We had daily temperature checks, and if someone had fever or showed symptoms there was an isolation procedure including quarantine of the person and their room-mate to prevent spread (luckily no one had to do that during our trip).

Masks were required in all public spaces. My room-mate and I discussed how we were sleeping so close together that we would likely infect one another either way, so pretty much the only time I didn't wear a mask was in my cabin, just before I started to put my scuba-gear on, and while actually eating.

Hand-sanitiser was everywhere, and people used it. One automatic dispenser was located outside the saloon/dining room to be used before entering, as well as others throughout the boat, usually right in front of anything that more than one person would touch.

Meals were divided into two sittings (which was really the only major difference on the boat).

This allowed people to spread out while eating and sometimes it did feel a little rushed so that everyone could get in to eat between dives, but that seemed a very inconsequential issue given that we were diving during a global pandemic.

Food was served by the hostesses (no touching the serving utensils) and snacks were individually wrapped.

The majority of the inconveniences of the new measures fell on the crew. They had to work even harder than normal, but they seemed not to mind.

The poor head hostess (who made perfect *cappuccinos*) had to keep us all in line, often reminding us to put our masks

Left: Manta ray with diver at the Boiler.

Above: *Nautilus Explorer* at San Benedicto.



Above: Silky shark seen on a night snorkel.

Below: Helping divers out of the water at San Benedicto.

back on (but the *cappuccino* was so good, I just wanted to keep drinking it).

It felt a little like being back in primary school when the teacher has to come out and tell you the rules. She was right, however, and we immediately complied.

Even with all these measures there was still a chance that someone could become infected, but Nautilus did a fantastic job 🍷



of trying to reduce it. As our day at sea continued I calmed down.

By the next morning, when I jumped in for that first ocean dive in more than nine months, it all felt worth the risk.

Socorro is known for the world's most friendly mantas, sharks, dolphins and other big-animal encounters. I agree with all the hype – Socorro is amazing.

Our first dive at San Benedicto had Galapagos sharks, schools of trevally, mantas and even a glimpse of a hammerhead. You probably could have thrown me in a quarry and I'd have been happy just to get in the water, but diving with these animals was everything I'd been waiting and hoping for.

I most definitely had a new appreciation for diving, something I used to be able to do so much.

WE DIVED THE whole day at San Benedicto, which was not only beautiful under water. The island itself was gorgeous, with jagged edges leading up to a volcanic crater.

Between dives I sat on the sun-deck, just taking in the ambience. On the dives we continued to see more mantas, sharks and schools of fish.

The next day we moved to the island of Socorro and spent more time with more mantas (I love them).

Nightfall brought a unique snorkel opportunity with silky sharks. It was one of those times when you wonder if the crew are joking when they say that you can jump off the back of the boat in complete darkness to swim with sharks.

I did it, obviously – you couldn't say no to that!

We spent two days at Roca Partida, which feels like being in the middle of nowhere (we kind of were). The remote rock turned out to be a highway of sharks, huge schools of fish and mantas.



Above: Dolphins at the Boiler.

Above right: Whitetip reef shark.

Below: Inquisitive booby bird.

I loved the way the whitetip reef sharks would pile onto the few ledges on the otherwise sheer rock. It was like a tiny shark apartment with limited space.

They would have their pec fins around one another, as if they were holding each other back from falling off the ledge.

Our last dive-day was back at San Benedicto to dive the Boiler. This site has a reputation for great manta encounters and it didn't disappoint.

Basically, you jump in the water and the mantas come to you. It even felt as if

the rays were taking turns with us, coming up to us individually and then, once they'd visited everyone else, starting all over again. These majestic spaceship-like animals are among my favourites and I could happily have spent days there.

Something else I don't think I fully appreciated before the pandemic is how much I enjoy being around other divers.

We are a unique bunch, willing to fly around the world, spend all our money and cart kilos of gear with us (sometimes during a global pandemic) just so that we can breathe under water.

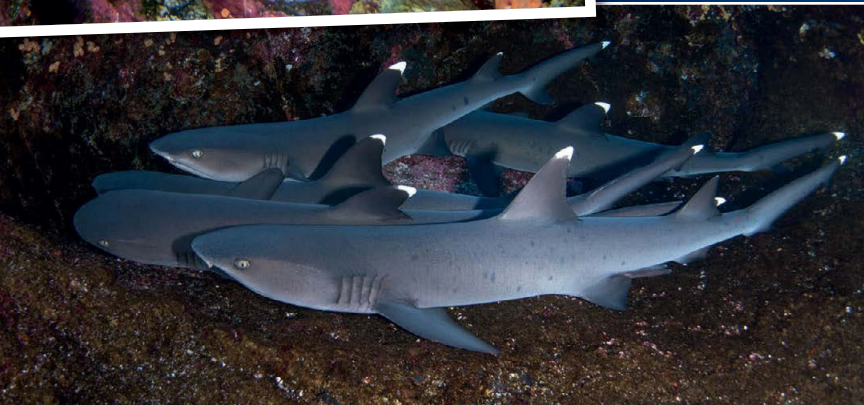
Other divers feel like kindred spirits, and it really is the people with whom we dive that can make a trip even better. Not to mention the shared joy of experiencing incredible dives, and we had a lot of those.

STAYED UP later than normal most nights with a glass of wine (mask on, but off for a second to take a sip, then back on). There were moments when I almost forgot about the pandemic, even as we separated ourselves on each couch-edge and talked loudly to be heard over the intervening distance and through material covering our mouths.

I couldn't help feeling how much I had missed this and how great it was to be experiencing it again.

With news of vaccination successes, I hope this sort of procedure will soon be a thing of the past, and that the stories we





Above left: Whitetip sharks at Roca Partida.

Above: Manta ray with diver at the Boiler.

Left: Piled-up whitetips at Roca Partida.

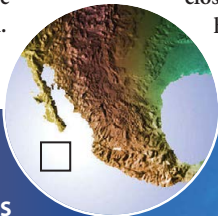
Travel is a personal choice right now, and not without risk. While I think our group managed to dodge the virus (and as you can imagine, every time I sneezed for weeks after the trip I was irrationally convinced I had it), I isolated once I got back so as not to take a chance of infecting anyone else.

Nothing is perfect, but I'm grateful to Nautilus for running trips in such a responsible manner, and for the incredible hard-working crew who agree to make them possible.

They might think they just took us diving, but it was so much more than that. My mental state improved drastically, and I was ready to go back to isolation and sit through a few more months of it until we can all start to put this behind us. █

tell on future liveboards will be about the time we survived months without diving. Perhaps some of these new safety measures will carry on into the future and keep us healthier in the long run. I have seen cases of one person

bringing a cold onto a liveboard and, by the end of the trip, everyone having it. It's difficult not to spread germs in the close quarters of a boat, and hygiene a few notches higher might help us all.



FACTFILE

GETTING THERE ▶ Flights to San Jose del Cabo arrive from major US hubs and Canada. Airport to boat-dock transfers can be arranged with the liveboard and take 45min.

DIVING & ACCOMMODATION ▶ *Nautilus Explorer*, nautilusliveboards.com, liquiddivingadventures.com

WHEN TO GO ▶ November through July. Water temperatures get down to 23°C around February and up to 26°C in June/July/November.

HEALTH ▶ A negative Covid test is not required for entry to Mexico but is required no earlier than seven days from arrival for *Nautilus*.

MONEY ▶ Mexican pesos but US dollars and credit cards accepted.

PRICES ▶ Return flights from the UK to San Jose del Cabo from £550. Nine-day charters start at £2345 including shared cabins, up to 26 dives and all meals. A US \$75 park fee applies on each dive day.

VISITOR INFORMATION ▶ visitmexico.com





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LAURIE CRISP

THE

HAZARDOUS CREW

AFTER ALMOST 40 YEARS, I still get excited about what we might find on the next dive and, once ashore, what we'll find from researching recovered artefacts." So says Iain Grant, who took over as Her Majesty's Ship *Hazardous* wreck licensee in 1995, when he had already been diving it for 13 years. "My first experience of diving the wreck in 1982 was a somewhat fraught

affair," recalls Iain. "Kitted out with borrowed gear from various divers on the boat, I went over the side to look at a concretion that was being recovered for identification purposes.

"It was hanging under three 40-gallon drums – early lifting-bags!

"My performance must have been a little suspect, because on returning to the boat I was asked if I could swim!

"Swimming lessons and dive-training with our branch, SAA 308, started soon after that."

For several years, Iain couldn't see the totality of the wreck. "It was never visible from the surface and, even when working on the seafloor, often visibility was confined to about 1m in all directions.

"Then one day, from the surface in about 8m of water, there it was, in full



For almost 40 years West Sussex divers have been keepers of the flame of an English shipwreck from the early 1700s, describing it as a site that just keeps giving.

BRIAN SHEPHERD, keeper of the group's website, shares the *Hazardous* story

Above: A painting of the *Hazardous* commissioned by diver Dave Johnston.

Left: Another dive on the wreck of the *Hazardous* over.

view. In 40 years, that's happened only a handful of times.

"For a number of years, I spent an awful lot of time fanning sand from inside 1m-square frames. Inevitably, hand-fanning didn't do a lot for visibility. It required good eyesight and an even better sense of touch.

"Initially, there were often surface artefacts to be found: buttons, musket-balls, buckles, the odd coin and, for some unknown reason, a number of divers!

"Occasionally, something more exotic peered out from the sand, refreshing





enthusiasm. Later we used metal-detectors, making it all much more productive.”

Identification is that much more interesting when artefacts appear to have no logical connection with the ship.



Above & right: On some days conditions are ideal for diving.

Left: Licensee Iain Grant.

Below: Photogrammetry of the main *Hazardous* site.

“In the early years, we came across an item later found to be an elephant tusk, and several more have come to light since then.

“Another interesting item was a whale-oil hanging lamp in several pieces, definitely not used on board.

“It wasn’t unusual for the officers in particular to make maximum use of spare hold space for a little additional income on returning to England!

“In time we began searching outside the hull and found cannon and other artefacts, which led to expansion of the protected area.

“Gradually we’re searching those areas, making new and interesting finds.”

I T ALL STARTED in 1977, when two local divers looking for lobsters in Bracklesham Bay came across a cannon protruding from the sand. Over the next few years, several members of Sub-Aqua Association Branch 308 became involved in efforts to name the ship.

From recovered artefacts and historical records it was eventually identified as *Hazardous*, a 54-gun Fourth

Rate warship that had been run ashore on a stormy winter morning in 1706 in an attempt to save both vessel and crew.

The previous evening, *Hazardous* had sought shelter from “hard gales and much rain” in St Helen’s Roads, north-east of the Isle of Wight, but had failed to secure anchorage. In darkness, churning seas and blinding rain, she was blown relentlessly across Bracklesham Bay towards the shore.

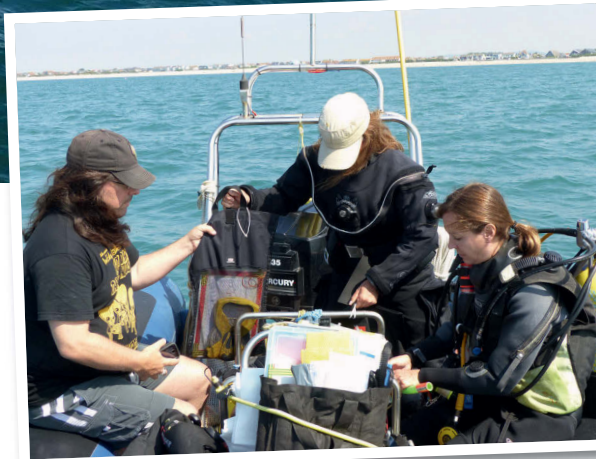
Main and mizzen masts were cut away to reduce windage, but eventually there were no options left bar grounding.

Hazardous had been captured by the Royal Navy three years earlier. Originally named *le Hazardoux*, she was built in Lorient and commissioned into the French Navy in early 1701 as a 50-gun Third Rate warship.

Because of financial constraints the French Navy would contract out some fully prepared warships to private investors for a share of any prizes – in the case of *le Hazardoux* this was to Jean Beaubriand-Lévesque, an experienced privateer from St Malo.

In November 1703, returning from escort duties to Newfoundland, *le Hazardoux* was spotted west of Ushant by three English warships. After a chase, a six-hour exchange and “very much

shattered in her masts & sails”, she struck



colours and was towed back to Falmouth.

Handed over to Her Majesty’s Agent for Prizes, she was valued at £1000 – a huge windfall for her captors.

The following year the Admiralty refitted the ship and commissioned her as Her Majesty’s Ship *Hazardous*.

I N APRIL 1706, *Hazardous* sailed for Virginia to escort home a convoy of some 200 merchantmen.

With three other escort ships and after much delay the convoy eventually left in September, and was battered by bad weather for most of the Atlantic crossing.

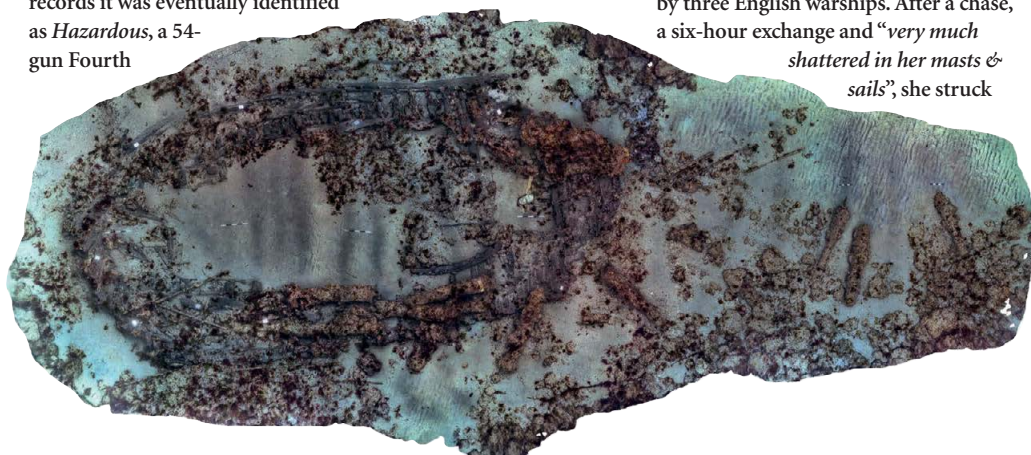
Approaching the Channel, *Hazardous* split from the main convoy to escort 40 merchantmen to the Downs. Three days later on 12 November her captain died “in his bunk strangled in his own blood”. The First Lieutenant assumed command.

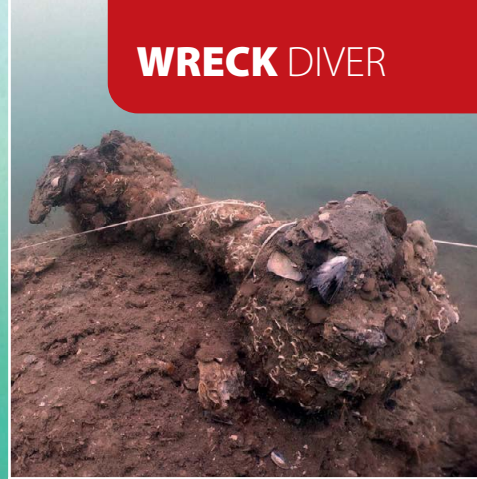
The following day the small fleet was found by *Advice*, another of the escort warships, which had delivered her charges to Plymouth and continued east.

Hazardous’s captain was buried off Start Point, and Captain Lowen of *Advice* took command of the convoy.

The weather gradually deteriorated until late on 18 November when, with winds veering wildly, Lowen ordered the convoy to seek shelter. Unaware that *Hazardous* had failed to anchor, the next morning he watched as she was driven ashore “under her fore sails and spar set sails with colours flying”.

The Commissioner of Portsmouth Dockyard took over responsibility for





what was quickly realised to be the irrecoverable ship. Over the next few months sails, equipment, stores and some cannon were recovered.

At the start of October 1707, with the wreck starting to break up, the remains were sold. They fetched £33 (about £8000 today) at auction.

INITIALLY, ONLY a few enthusiasts in SAA 308 branch dived the wreck-site. Later they formed what eventually became the Hazardous Project Group.

In 1986 *Hazardous* was officially designated a protected wreck-site, and the group was granted a licence to dive it.

Today the group consists of just a few

volunteer divers assisted by archaeological advisor Dan Pascoe.

It manages around 10 visits per year, largely dictated by sea and weather conditions, the state of the tide and divers' availability.

For group-members, the project is no turn-up-and-dive Saturday-afternoon jolly. Significant personal costs are attached to it.

"On that fateful night in 1706, it was the strong, prevailing south-westerly winds that blew *Hazardous* into the shallows on a lee shore," explains logistics officer Dave Johnston. "Those same winds



Above: Finds are photographed under water, like this powder case...

Right, from top: Bar shot; barrel; two cooking pans, with roll of leather in the top one; gun-carriage wheel; buckle; iron-smelting pot.

Left: Logistics officer Dave Johnston.

Below from left: Gun cascabel and timbers; parrel bead (threaded onto ships' lines) lying inside a barrel.





determine site-access and conditions today, regularly stirring up the sea state and seabed to make operations uncomfortable, unsafe or unproductive for us. The joys of British diving!”

The log for Dave’s first *Hazardous* dive in 1m visibility in 2002 recorded that he “...couldn’t really get any impression at all of the site (or even that it was a wreck-site)”!

As for many of today’s dive-team, *Hazardous* represents the vast majority of his diving: “If conditions allow, I’m out on site. You never know what to expect, see or find, especially early in the season after winter storms have done their damage, and the site is always yielding new surprises on all scales.

“On the first dive of 2007, we found and recovered a pristine small glazed drinking jug.

“It had lain buried for 301 years and would probably have been lost forever if we hadn’t managed to dive that day.

“Similarly, in 2014 and 2019 we chanced across two separate large clusters of cannon, well away from the main site, opening up two more areas for research and discovery.

“On a recent visit to one of those areas, protruding from the sand were a pair of copper cooking pots in really nice condition, one with leather rolled up inside it. The wreck just keeps on giving.”

THE PROTECTED SITE lies about 800m offshore and measures 300m in diameter, with remnants of the hull at the centre and cannon and other artefacts around it.

It’s an area with a longshore drift that



moves sediment along the shoreline. The effect, apart from deciding water clarity, is that the site sometimes gets buried and at other times scoured.

So each visit is different. With perhaps several weeks having passed, much will have changed as the effects of tides and weather play out, sometimes dispiritingly so but at other times with new areas and the possibility of new artefacts uncovered.

Reduction in protective sand cover is also the principal threat to the surviving ship’s structure. It is gradually being destroyed, so routine dive activity consists primarily of observing and recording the site’s ever-changing state, and taking any action required to preserve its archaeological integrity.

“There aren’t many places in Britain where you have the opportunity to see a longitudinal section of an old wooden warship under water, but that is exactly what you can see with *Hazardous*,” says Dan Pascoe.



Above: Group-members get together at the start of another day.

Left: Archaeological advisor Dan Pascoe.

Below from left: Marine life at the *Hazardous* site including a jellyfish; tompot blenny; anemones.

“Main gun-deck guns can be seen piercing through the hull or, at the bow end, lying across their gun-ports in the same position as they were lashed for the catastrophic storm of 1706.

“Immediately below them, the deck is visible, supported by a row of deck-beams protruding up from the sediment. It’s amazing to think that after 315 years under water, these wooden beams are still supporting the weight of the guns.

“Moving down through the ship and into the belly of the hold are rows of barrels, some lying on their sides, others upright. Scatters of butchered animal bones all around tell us that they were once filled with meat to feed the crew.”

Other loose artefacts are continually being found as the sediment within the hull gets washed away, says Pascoe.

“Wooden artefacts including spare rigging and gunnery equipment, which are emerging from the bosun’s and gunners’ stores, have to be recovered before they are either washed away or ravaged by marine borers.





long process, taking up much more time than it took to recover the items.”

Some artefacts are naturally preserved, but others can be fragile and friable. “Organic material, such as wood, leather and textiles can deteriorate and crumble within hours if allowed to dry without appropriate treatment,” says Iain.

“Other materials, such as bone, glass and pottery, if not conserved, will slowly de-vitrify and in extreme cases degenerate into a pile of slivers.

“Initially, large quantities of fresh water are required. The water is changed frequently and many times until conductivity readings indicate that the salt has been flushed out. Then the next stage of conservation can be started.

“Preservation for most artefacts is a specialist activity, often time-consuming and expensive – an important consideration when recovering artefacts from the wreck.”

The group relies on the Mary Rose Trust or Historic England conservation department at Fort Cumberland to carry out this final part of the conservation.

“Costs vary according to the requirements of each artefact, but

of its spread and points of interest but photogrammetry can map the site to a level of detail that enables precise measurements to be taken from images.

The latest cameras can cut through poor visibility and improve photographic records.

Technology is available to record and cross-reference activity and the location of artefacts in a 3D context.

“Diving the *Hazardous* site has changed a lot over the years,” says Iain. “Equipment improvements have made working on it much easier, and years of experience have honed our techniques.

“When I started in 1986, creating the site-plan was done by measuring distance and bearing between two divers, sometimes in near-zero visibility. It was painfully slow! We then progressed to trilateration, with three measurements from known points on the site.

“Now, using modern high-resolution underwater cameras and photogrammetry, creating a plan of the wreck in fine detail is amazingly easier.

“It’s possible for one diver to scan a site in less than two hours, though rendering several thousand overlapping photos does require considerable computer muscle and many more hours.

“However, as ever, even the best technology remains subject to the whims of that longshore drift!

“I’m proud that comparison with the earlier site-plan does show the high degree of accuracy we achieved with just ‘pen and paper’ – and a lot of dive-time.”

The *Hazardous* Project Group has always welcomed visiting divers. There is a “Diver Trail”, currently closed but eventually to be resurrected. Divers can contact the licensee to arrange a visit.

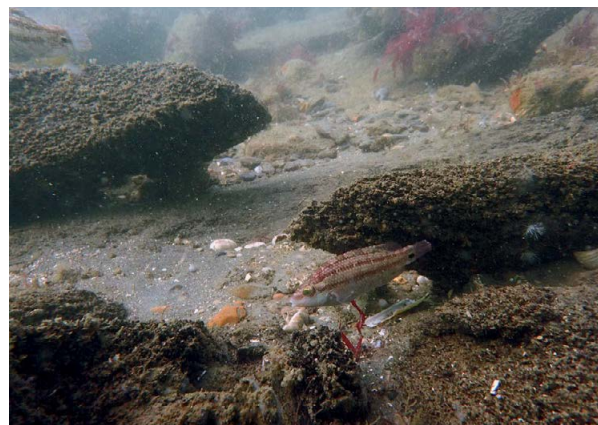
Her Majesty’s Ship *Hazardous* didn’t participate in any major battles, nor expeditions to exotic places.

She wasn’t famous and barely gets a mention in naval records. She was a mid-range warship, one of many similar vessels that made up the core of European navies at that time.

Nevertheless, she provides an insight to a period when nations fought to dominate the seas, to expand and protect their own lucrative colonial trade and disrupt that of others.

In ships like this, thousands of men and boys, volunteers and pressed, lived and died pursuing these objectives. █

Above, clockwise from far left: Finds brought up for conservation including bar & round shot; dividers; cooking pot & smelting pot; shipwright’s axe-head; wooden axle for pulley block; grape shot; cooking-pot rivet detail; rammer head, sponge cylinder & parrel bead; sounding lead.



thankfully HE helps with some funding. Once the process is complete we can see about displaying them for public viewing.

“We hope it won’t be too long before we can get all our finds back on display.”

IN THE EARLY YEARS, divers would use lines, poles, compasses and tape-measures to map out the site, later transferring the details to paper.

In recent years, improved imaging and technology have provided a much clearer understanding of the site.

Side-scan sonar gave a good indication

Above: The wreck site.

Below: Blown out again!



“I feel extremely lucky that I get to enjoy this amazing wreck, but sadly it can’t last forever. As each year passes, another layer is lost to the physical and biological environment.”

The group is legally obliged to abide by best archaeological practices in recording and preserving this piece of maritime history. Its limited excavation licence requires specific permission and stringent conditions are attached.

Planned excavation is an intensive operation requiring additional divers, equipment, boats and funding.

It has been attempted over the years, but inconsistencies of tide and weather would often mean cancellation, or work left incomplete.

The site might be close to shore, but visits are seldom easy. The group RIB would launch from Bracklesham Bay’s public slipway until accumulated shingle and lack of maintenance put a stop to that. So the divers now have to launch from Itchenor, significantly increasing the time it takes to get to and from the site.

And with diving best at the low point on neap tides, time on site is critical.

DIVING INTO 300 years of history might be the romantic notion of the *Hazardous* Project Group’s activities, but much additional work is needed to fulfil regulatory obligations.

Artefacts were previously conserved, stored and displayed at a visitor centre in Earnley until its recent closure, and new arrangements are still being negotiated.

“Recovering artefacts is all very well, but they need to be stabilised before they turn into dust or something soggy and unrecognisable,” says Iain Grant.

“Once exposed to air and light they degrade rapidly, which highlights the importance of timely conservation.

“All recoveries are held in water from the moment they’re brought aboard, and transferring them to more controlled storage with fresh water is a priority.

“That can be just the start of a very



SIMON PRIDMORE describes some useful techniques for improving

your buoyancy control, with photography by **ANDREY BIZYUKIN**. This technique feature first appeared in November 2016

5 WAYS TO PERFECT BUOYANCY

PERFECT BUOYANCY is a holy grail for many divers. It represents a quest for a nirvana where they will eventually attain the gift of remaining completely motionless in the ocean in any position.

They will become passive observers of the marine world, relaxed and effortlessly neutral. No longer will they be constantly inflating, deflating, rocking and rolling. No longer will they be harbingers of doom for the sea-life around them.

Here are five tips to help you on your own journey to neutral nirvana.

1: LOSE WEIGHT

THE NUMBER ONE reason why many people find it difficult to control their buoyancy is that they dive over-weighted, and have to compensate for this by adding unnecessary air to their BC in order to stay neutrally buoyant.

Not only does this excess air expand or contract inside your BC's air-cell with every change in depth, but it also moves around as you change position in the water, making it very hard for you to keep your balance and stay still.

If you reduce the amount of weight you wear, you also reduce the amount of air shuttling about in your BC.

How do you know if you're carrying too much weight? At the end of a dive,

when you have 50 bar or so in your cylinder, position yourself at safety-stop depth, 3-5m, remove all the air from your BC and try to remain neutrally buoyant.

If you find yourself sinking, you're wearing too much weight.

If you find yourself tending to float to the surface, then you don't have enough weight. Easy!

As a general rule of thumb, if you're still using the same amount of weight you used when you first learned to dive, then there is a good chance that you are diving over-weighted now.

This is partly because as you become more experienced your anxiety levels drop, you relax more, your breathing rate slows and you are able to exhale more fully when you descend.

Another reason is that dive-instructors tend to overweight new student divers to make them easier to control!

2: DESCEND VERTICAL, SWIM HORIZONTAL

"BUT," YOU MIGHT SAY, "I can't take off any weight. I need every bit I carry to get me down at the start of a dive!"

This is probably not true. It is more likely that you're not getting yourself in the right position and frame of mind before you make your descent.

Point your legs straight down, keep

your head up and lift your left arm up holding your inflator hose, index finger poised over the deflate button.

Relax. Take your time. Get your breathing right: long, slow breaths in and long, slow breaths out.

Then, after a full inhalation, exhale slowly and completely while pressing the deflate button. And down you go.

Just as in every sport, the way you start is very important, and sets the tone for the rest of the endeavour. Think of sprinters settling into their blocks or swimmers and (high) divers positioning themselves on their platforms.

Once you are at depth and swimming, add just enough air to your BC to compensate for the compression and reduced buoyancy of your wetsuit and to keep you at the required depth.

Your position in the water should be horizontal. Your fins should be behind you rather than below you, propelling you forward and laterally, creating as little water resistance or drag as possible.

A horizontal posture also facilitates the maintenance of perfect buoyancy.

If you are wearing too much weight, it will be impossible to remain horizontal, as the weight around your waist carries your legs downwards while the excess air in your BC settles around your shoulders and lifts your head up.

This may happen even if you're

Above: Modelling under water calls for perfect buoyancy.

correctly weighted, as a belt that fits perfectly around your waist at the surface will slip down onto your hips during your descent when your wetsuit becomes compressed.

Make it a habit to hitch up your belt and re-tighten it around your waist once you're at depth. And, of course, loosen it a little when it gets too tight on the way back up.

If you are naturally floaty or dive in cooler water and wear lots of neoprene, you might have a lot of weight attached to your weightbelt.

This not only affects your ability to swim horizontally and efficiently but is also a safety hazard, because you could be at risk of an uncontrollable runaway ascent if it ever slipped off.

A BC with integral weight-pouches on the harness might be the solution, but see that these are fixed securely and don't flop away from the body when you are swimming, as this could destabilise you.

Also, think about spreading the weight around a little. Put a couple of kilos in pouches on your cylinder camband.

This should help to bring your feet up and head down.

Remember not to put too much weight in places where it can't easily be dumped in an emergency. A BC can get punctured, torn or worn, and if that happens it won't hold air, and you'll need to be able to drop weight to stay afloat on the surface.

3: FIN DELIBERATELY OR NOT AT ALL

WHILE YOU'RE under water, move your fins only when you need to go somewhere. If you're not going anywhere, keep them still.

You might think that you do this already, but the chances are you don't.



Above: A photographer needs to be able to stay motionless to get the shot.

Below: Cave-diver in perfect balance.

Many divers are unaware that they flap continuously and often pointlessly, particularly when they are stressed or distracted. This unconscious activity interferes with your efforts to attain perfect buoyancy.

Keeping your legs and fins from flapping takes a little work. In a pool or a shallow patch of ocean, practise remaining completely motionless in mid-water. If you find yourself slowly being turned in unplanned ways, roll with it.

See where the water takes you. Then turn your body gradually until you're back on equilibrium by dipping a shoulder, or using breath control to make yourself more or less buoyant.

Breathe in a little more fully to increase your positive buoyancy. Breathe out for a little longer to make yourself more negative. Use your fins only to balance.

You might feel an almost uncontrollable urge to kick. Resist it!

Keep your arms tucked in and your hands still too. They are of no help in controlling buoyancy under water. Quite the opposite: they are destabilising devices. The best way to throw yourself completely off kilter on a dive is to wave your arms around.

The closer your arms are to your body, the easier it is to maintain perfect balance and buoyancy, so many experienced

Read more from Simon Pridmore in:

Scuba Confidential – An Insider's Guide to Becoming a Better Diver

Scuba Professional – Insights into Sport Diver Training & Operations

Scuba Fundamental – Start Diving the Right Way

Scuba Physiological – Think You Know All About Scuba Medicine? Think Again!

Scuba Exceptional – Become the Best Diver You Can Be

All are available on Amazon in a variety of formats.

divers swim with their arms crossed across the chest or hands clasped together.

4: BUY THE RIGHT BC

MOST PEOPLE wear BCs that are too big for them, mainly because they try them on in a shop while they're standing up.

The fit of the harness around your arms and shoulders should be comfortable and allow plenty of movement, but see that it isn't too loose.

Put it on; do up all the buckles and Velcro; then get someone to lift up the shoulder-straps. If their hands hover around your ears when they do that, then that is where the BC will go when you inflate it at the surface after your dive.

A BC is something you should definitely try out in the water before you buy, and the smart dive-shops know this.

Pick the size you think fits you best, and take the next size smaller too. Dive with both of them. The smaller one is probably the one you'll keep.

Avoid anything bulky and padded. If you're wearing a wetsuit, padding is unnecessary. Padding also floats.

The greater a BC's integral buoyancy – that is, the more positive buoyancy it has even when completely deflated – the more extra weight you will have to carry to get it under the water with you.

Your quest for perfect buoyancy requires you to wear less weight, rather than more. So minimal integral buoyancy is a largely ignored but very important feature to look for in a BC.

5: KNOW YOUR BC

ONCE WEIGHTED correctly, you will need to make only minor adjustments to your BC from time to time during a dive to stay neutral, primarily to compensate for the effect of changing depth and pressure on your wetsuit.

To do this, you need to know how your BC works. Spend time studying it. Know where the controls are.

Hold it up in front of you, turn it around and imagine where the air will sit in the BC when you're under water. Be aware that it will always go to whichever part of the air-cell is closest to the surface.

Work out how you would need to turn your body in various positions so that the air is close to one of the pull-dumps and you can release it. For instance, roll your right shoulder down so that your left shoulder is uppermost, and you can raise the inflator-hose and release air.

Or dip your head, raise your butt towards the surface and use the "tail dump". Practise using your BC in a variety of situations until operating it becomes instinctive.

Perfect buoyancy is within your grasp! **█**



UPY: THE CREAM

SHARKS' SKYLIGHT, an image showing blacktip reef sharks cruising beneath seagulls at sunset in French Polynesia, saw Renee Capozzola from California named overall Underwater Photographer of the Year 2021.

Her entry triumphed over 4500 images entered by underwater

photographers from 68 countries, and makes her the first female photographer to be named overall winner of the prestigious UK-based annual competition.

British photographer Phil Smith was the first Underwater Photographer of the Year in 1965. Today's UPY competition has 13

categories, testing photographers with themes such as Macro, Wide Angle, Behaviour and Wreck photography, as well as four categories for photos taken specifically in British waters.

"Judging this year's competition was a pleasure, a much-needed escape into the underwater world," said chair

of the judging panel Alex Mustard (AM). "I hope everyone enjoys immersing themselves in these fabulous images."

The other judges were Peter Rowlands (PR) and Martin Edge (ME) whose comments on each image are quoted below as we look at the top three in each category...



© RENEE CAPOZZOLA / UPY2021

1 Wide Angle

WINNER & UNDERWATER PHOTOGRAPHER OF THE YEAR

Sharks' Skylight

by Renee Capozzola (USA)

"In French Polynesia there is strong legal protection for sharks, allowing them to thrive and balance the marine ecosystem. In August 2020 I visited the island of Moorea, which was not only open to visitors but also happens to be my favourite place to photograph sharks.

"I spent several evenings in the shallows at sunset, hoping to capture something unique. Instead of focusing on the split-level images that I am known for, I decided to try something different. I aimed to capture the sharks underwater with the sunset seen through Snell's window.

"It took many attempts, but on this particular evening the water was calm, the sharks came into

a nice composition, and I got lucky with the birds as well.

"Since many shark species are threatened with extinction, it is my hope that images of these beautiful animals will help promote their conservation."

Taken with: Canon 5D Mark III with 11-24mm f/4 lens, Nauticam housing, Sea & Sea YS-D2 strobes. 1/200th, f/20, ISO 400

Judge's comments: "A sunset ballet of reef sharks and seabirds in a tranquil corner of the Pacific Ocean is a richly deserved winner of the Underwater Photographer of the Year 2021.

"This is an image of hope, a glimpse of how the ocean can be when we give it a chance, thriving with spectacular life both below and above the surface." AM

"There was little doubt with the judges that this image was, by some distance, the deserved winner. Absolutely everything in this image is right; composition, light, colour and contrast.

Pretty much perfect." PR

"The first time I set eyes on this image I was nothing short of mesmerised. It's the palette of colours that first attracted me. The stark bellies of the sharks create a kind of union with each other just above their reflections.

"The birds above are particularly dominant in the sunset night sky and it looks like they're queuing to take their turn to feast. Mind-blowing underwater imagery at its very best." ME

RUNNER-UP

Gothic Chamber by Martin Broen (USA)

"The Riviera Maya in Mexico hosts the world's largest underground river systems, filled with clear water, never-ending tunnels and amazing halls with decoration that can compete with the best Gothic cathedrals of the world.

"The challenge of capturing this beautiful hall

in Cenote Monkey Dust was not only the huge dimensions but the fact that it is pitch-black.

"This photo is a x6 shot horizontal panorama stitching captured at 1/15th sec handheld at the usable limit of the camera ISO and diaphragm wide open to create an 86MP panorama.

"My aim was to capture the scale, the tri-dimensionality of it, the richness of the formations and their incredible textures."

Taken with: Sony A7RIII with Canon 8-15mm at 15mm lens, Nauticam NA-A7III housing, Big Blue 15000 lumen. 1/15th, f/4.5, ISO 6400

Judge's comment: "The very best cenote images often catch the judges' eyes in UPY. But Martin's picture raises the bar significantly both in terms of jaw-dropping beauty and for its technical achievement.

"This is a place few humans are capable of even reaching, so to get there and then produce such a demanding piece of photography while in the darkness, deep underground and under water is a stunning achievement." AM

THIRD

Jellyfish Galore
by Oleg Gaponyuk
(Russian Federation)

"In March 2020, I flew to Palau for two weeks of diving. While I was there the borders closed because of Covid-19, so I was able to fly back only after three months.

"It was a good time. Dive-sites where you could previously meet 50 people, I visited alone.

"I went to Jellyfish Lake four times. Usually a snorkelling session lasts 45 minutes because of the large number of tourists but because I was alone I could swim for 3-4 hours.

"Before the first dive, the guide told me: swim to the centre of the lake – there you will see jellyfish. I found only a dozen, and was upset.

"The second time I took a drone with me and quickly flew it around the entire lake. The 2 million jellyfish I had read about on Wikipedia were gathered in a small group near the shore at the far end, about 500m away. I took the camera and swam. It took 20 minutes but I ended up in real jellyfish soup. That's where I shot this panorama."

Taken with: Canon EOS 5D Mk 1V with EF 8-15mm, Nauticam housing, 8-shot panorama. 1/125th, f/16, ISO 800

Judge's comment: "A positive story to come out of the pandemic has produced a very well-composed split-level panorama." **PR**



© MARTIN BROEN / UPPY2021



© OLEG GAPONYUK / UPPY2021

2 Macro
WINNER

Pontohi Pygmy Seahorse
by Galice Hoarau (Norway)



© GALICE HOARAU / UPPY2021

"*Hippocampus pontohi* is one of the smallest and most recently discovered seahorses. They usually live on reef walls and can be hard to find.

"We had found two on the morning dive [at Siladen in Indonesia] so I decided to dedicate the afternoon to getting a backlit photo.

"We were lucky to find this individual hanging out from the wall, allowing the use of a snoot to backlight it with the help of Rando, my dive-guide.

"After setting up the camera and strobe we had to wait for it to get used to us and finally turn toward the camera for a brief moment."

Taken with: Olympus E-M1 II with 60mm macro lens, Nauticam housing, Backscatter mini flash & snoot. 1/160th, f/22, ISO 200

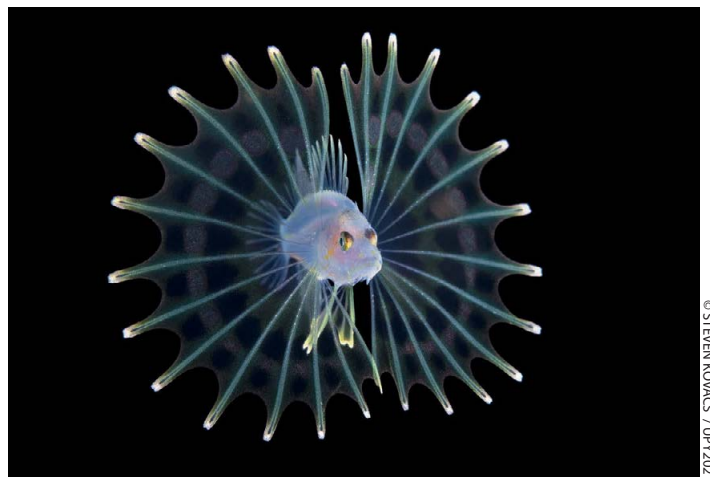
Judge's comment: "This backlit image of a very small pygmy seahorse is superb. The composition is so strong; just a hint of the branch and nothing more. Snooting this particular image is ideal.

"It's bright within the pygmy itself but low-key and subtle. The stark black background makes this image sing so loudly. Deserved winner of the macro category." **ME**

RUNNER-UP

Larval Lionfish
by Steven Kovacs (USA)

"Drifting near the surface at night in over 700ft of water, I came across this 1in larval lionfish off the coast of Florida [at Palm Beach] during



© STEVEN KOVACS / UPPY2021

a blackwater dive. In the Atlantic lionfish are an invasive species and, unfortunately, finding the pelagic larvae is an all-too-common occurrence during these dives.

"This individual was exhibiting more beautiful coloration than usual, so I tried to capture its fins in full display. It's challenging, not only because they shun bright lights and usually try to flee, but also because they fully flare their fins in a defensive posture very sporadically, and then only for brief moments of time.

"I was very fortunate to be able to capture this particular individual in all its glory."

Taken with: Nikon D500 with 60mm macro lens, Ikelite housing, Ikelite DS160 strobes. 1/350th, f/25, ISO 250.

Judge's comment: "They might be an invasive species in the Atlantic but they do make for arresting images and very strong contenders in competitions." **PR**

THIRD

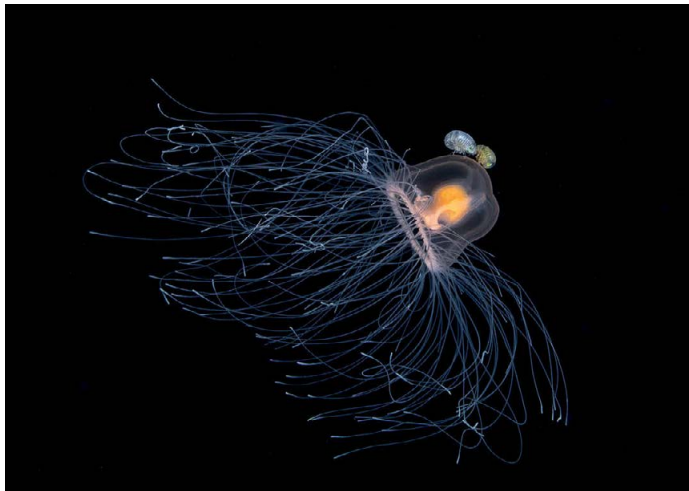
Dream Ship by Chien-Ting Hou

"When I dived at night [at Anilao in the Philippines] and saw this jellyfish it looked very cute, like an alien creature. All the tentacles can sometimes look very messy, but I wanted to take a vertical picture of its tentacles so I waited for a while before finally taking the picture.

"Replaying it, I found two bugs on its body, as if taking a spaceship to go travelling in space."

Taken with: Canon 5D Mark IV with Sigma Macro 50mm lens, Nauticam NA 5DIV housing, INON Z-240 strobes. 1/200th, f/25, ISO 400

Judge's comment: "Blackwater images abound and for all the right reasons but in competitions we are always looking for that something extra. This image, with its two 'hitch-hikers', fitted the bill perfectly." **PR**



© CHIEN-TING HOU / UPPY2021

come so that we could enter the water and begin to explore the huge array of military hardware purposely sunk for divers to enjoy.

"We decided to use a combination of powerful off-camera lights to 'spotlight' the M42 Duster tank and backlight a diver, which helped eliminate any distracting elements in the background.

"Creating this image was a team effort, and a huge thank you to the entire Diverse Divers team."

Taken with: Canon 5D Mk IV with 8-15mm fisheye lens, Ikelite housing, combination of video lights. 1/30sec, f/8, ISO 2000

Judge's comment: "This is one of my favourite photographs of the competition. As soon as I saw it I was mesmerised by the complexity of the lighting, the staging and just about everything else. To be able to set this up late in the day is nothing short of amazing." **ME**



© TOBIAS FRIEDRICH / UPPY2021

3 Wrecks

WINNER

Bowlander by Tobias Friedrich (Germany)

"Due to bad weather at Tiger Beach and in Bimini we had to look for shelter near Nassau in the Bahamas and do some regular dives.

"This wreck was new to me and a big surprise when we descended, because the bow is hanging almost completely over a sandy overhang."

Taken with: Canon EOS 1DX Mk II with 8-15mm fisheye lens, Seacam Silver housing, Seacam Seaflash 150D strobes. 1/160th, f/7.1, ISO 200

Judge's comment: "Images leap out for several reasons: David and Goliath scale, magnitude and unambiguity to name three, and this image has all of those and more.

"If you want to know the secret formula for a classic wreck shot, look no further." **PR**



© GRANT THOMAS / UPPY2021

RUNNER-UP

Reclaimed by the Ocean by Grant Thomas (UK)

"It was late in the day and the sun was setting over the arid landscape of Jordan's southernmost city, Aqaba. We were waiting eagerly for night to

THIRD

Golden Hour at the Georgios by Renee Capozzola (USA)

"This split shot of the Georgios shipwreck was taken in Neom, Saudi Arabia along the Gulf of



© RENEE CAPOZZOLA / UPPY2021

Aqaba in the Red Sea. In 1978, this large cargo ship originally from England became stranded on a shallow coral reef at night and then suffered from a big fire.

"Now serving as an artificial reef for many marine organisms, it sits halfway out of the water on the bow side and in roughly 80ft on the stern side. Locals refer to this site as the 'Saudi Titanic'."

"I used a very small aperture, an extremely wide rectilinear lens at 12mm, a lower ISO, and strobes to light the coral under water."

Taken with: Canon 5D Mk III with 11-24mm lens, Nauticam housing, Sea & Sea YS-D2 strobes. 1/160th, f/20, ISO 200.

Judge's comment: "The angular nature of the semi-silhouetted wreck contrasts brilliantly with the curve of the colourful coral reef that claimed it. A split-level image that is not only technically perfect, but really tells a story through both halves of the frame." **AM**

4 Behaviour

WINNER

Striped Marlin in a High-Speed Hunt in Mexico

by Karim Iliya (USA)

"This is a terrifying scene for the small fish, fleeing for their lives as a striped marlin hunts them. The slightest mistake is the difference between life or death. There are often birds hunting from above and sometimes a dozen other marlin, among the fastest fish in the sea, as well as sea-lions attacking from all sides."

"I went to document these feeding frenzies [off San Carlos, Baja California] but was not expecting such a fast-paced hunt, almost too fast for my brain to process."

"For a moment this scene unfolded before me and I had to rely on all my instincts and practice under water. I used natural light and stayed on the periphery of the baitball to try to minimise disturbance."

Taken with: Canon 1D X Mk II with 16-35mm f2.8L lens, Nauticam housing. 1/800th, f/5, ISO 1250

Judge's comment: Most baitball images are taken from further back but this one, bang in the middle and in your face, is amazing and strikingly different.

"The fish's eyes seem even wider open than normal. No wonder!" **PR**



© KARIM ILIYA / UPPY2021

RUNNER-UP

Face to Face by JingGong Zhang (China)

"This is a picture of blennies in a fight. It is a species of chaenopsid blenny found around Japan and South Korea. Its most distinctive feature is its very cool hairstyle, often referred to as 'Punk Blenny' or 'Mohican Blenny'."

"In fact this kind of blenny fight scene is very rare because they usually just stay in their lairs and don't interact. But during the breeding season, if an area is too densely populated, they will engage in fierce fights for a mate, and these fights are often quickly settled."

"Blennies are among my favourite projects. From getting information to the long waiting and searching process, it took me about three years intermittently to shoot this scene. I would like to thank my Japanese friends who helped me, and am very honoured to share this charming moment." [The location was Minabe, Wakayama.]

Taken with: Nikon D850 with 105mm macro lens, Nauticam NA D850 housing, Retra Flash PRO with Retra LSD. 1/250th, f/22, ISO 320.

Judge's comment: "The dedication you put into this project is commendable. The composition of

the two blennies and the peak of the action are amazing. The black background sets off the drama; it would never have worked if it was any other background colour." **ME**

THIRD

Milk Feeding by Mike Korostelev (Russian Federation)

"On this day in the Indian Ocean a family of 13 sperm whales allowed me to stay with them the whole day. It is a big honour to be with whales in

their ocean habitat. They probably remember whaling years ago but they forgive us.

"At the end of the day one mother started to feed her calf just metres from me. I froze. It was incredible to see such a private moment."

Taken with: Canon 5D Mk IV with 8-15mm 4f1 fisheye lens, Seacam housing. 1/640th, f/4, ISO 1000.

Judge's comment: "An image can take you there visually but it's difficult to convey the emotions the underwater photographer must have felt. All I can say is that I wished I could have been there to experience it too." **PR**



© MIKE KOROSTELEV / UPPY2021



© JINGGONG ZHANG / UPPY2021

5 Portrait

WINNER

Guardian Deity by Ryohei Ito (Japan)

"As the Asian sheepshead wrasse grows older, it changes sex from female to male and at the same time it develops a large lump on its head.

"I thought about the lighting and composition so that the image of the bump and the powerful face could be conveyed, and was challenged many times. It lives in a shrine under water and looks just like a guardian deity." [Taken at Tateyama, Japan.]

Taken with: Canon 5D Mk4 with EF8-15mm F4L fisheye USM lens, Sea & Sea MDX-5D Mk4 housing, Retra Flash Pro strobe. 1/200th, f/22, ISO 200

Judge's comment: "A subject might have natural visual character like a caricature but that is not enough for a competition-winner.

"The lighting and composition lifted this portrait up and up the ranking each time we viewed it. A worthy winner. **PR**

RUNNER-UP

Japanese Manefish by Keigo Kawamura (Japan)

"Japanese manefish can't be found just by looking for them. They can be encountered only by diving when a perfect tide brings them close to shore. I have dived for 20 years and took this picture when we met for the first time.

"Juveniles have mirror-like skin and a glassy, crystal-clear body, so I chose to light it from the back to reveal these characteristics."

Taken with: Canon 5DsR with EF24-70mm F4L IS USM lens, Zillion ZAP-5DsR housing, Sea & Sea YS-D1 strobe. 1/200th, f/22, ISO 400

Judge's comment: "An extraordinary fish, a rarely seen character of the deep, exquisitely photographed for our eyes to feast on. A beautiful picture." **AM**



© RYOHEI ITO / UPI/2021

THIRD

French Angel by Michael Gallagher (UK)

"I took this portrait of a gorgeous French angelfish while scuba-diving at the legendary Salt Pier in Bonaire in the Caribbean. Luckily for me, two key elements combined so that I could snap this



© KEIGO KAWAMURA / UPI/2021



© MICHAEL GALLAGHER / UPI/2021

intimate portrait of one of my favourite fish: firstly, my subject was familiar with divers and not afraid to face the camera and, secondly, I was able to exploit the shadows under the pier to create a dark background that helped to highlight the exceptional beauty of this particular fish."

Taken with: Canon 5D3 with 2.8f/15 100mm macro lens, Hugyfot housing, INON Z240 strobes. 1/200th, f/16, ISO 400

Judge's comment: "Superb facial contact with excellent portrait eyes. Notice the two yellow fins just behind and either side of each other. Perfect placement in every way." **ME**

6 Black & White

WINNER

The Cut by Diana Fernie (Australia)

"This photograph was taken at Leru Cut in the Solomon Islands. I was lucky enough to have won a 10-day trip on the *Solomons PNG Master* liveboard and was very excited to have the opportunity to visit this site again. Having dived these waters twice before, I knew what to expect.

"However, I needed an elegant model and my immediate companions could not be classified in any way as elegant! Fortunately, there was another photographer in my group whose beautiful model wife was the perfect subject.

"Somewhat cheekily I managed to capture a few shots of her as she posed for her husband!"

Taken with: Nikon D850 with Nikkor 8-15mm, Isotta D850 housing, INON Z330 strobes. 1/125th, f/4.5, ISO 1250

Judge's comment: "Great use of all the tones from rich black right through to clean white. The composition is classic and the decision to convert to black and white was a winning choice." **PR**

RUNNER-UP

Time Travel by Martin Broen (USA)

"Imagine yourself in an underwater cave in Mexico, hours away from the exit to surface, diving through a never-ending labyrinth covered with prehistoric formations, seeing charcoal in the ground from the fires of an ancient culture, finding bones of animal species extinct 8000 years ago, and everything around you is preserved as it was back in the time those caves flooded.

"It's a visceral feeling of going back in time to a different age.

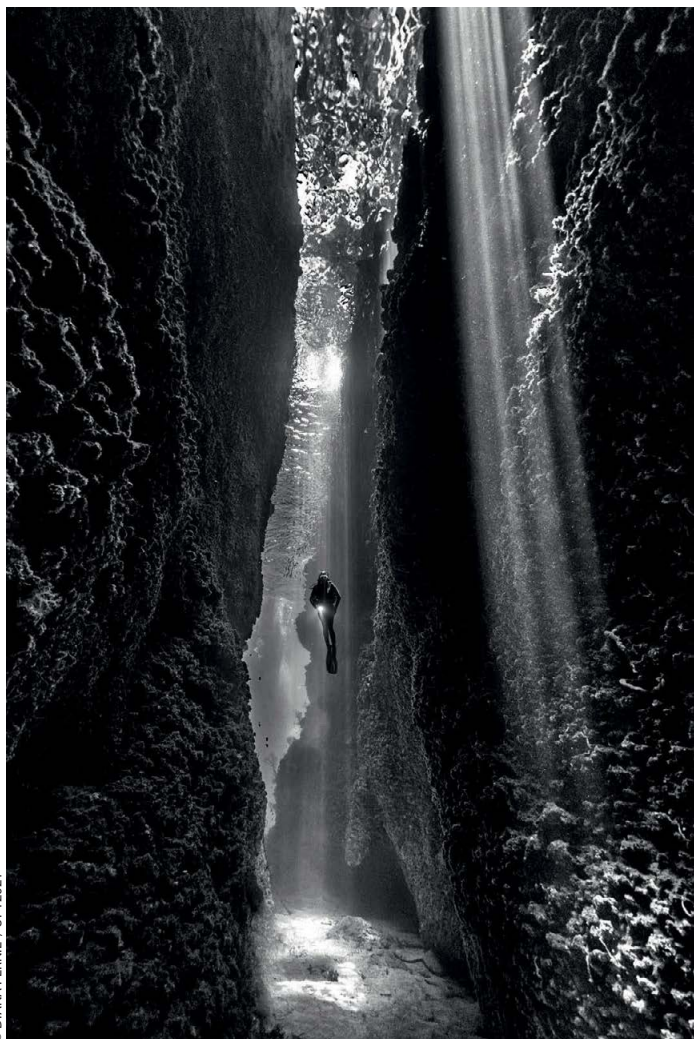
"This image [from Cenote Chan Holis] is trying to capture that: the rugged texture of those prehistoric overhead environments with pristine formations framing the diver in darkness.

"The depth of the never-ending tunnels and the feeling of the travel in time given by the zooming movement into the light and model. And the processing in black and white to simplify the image.

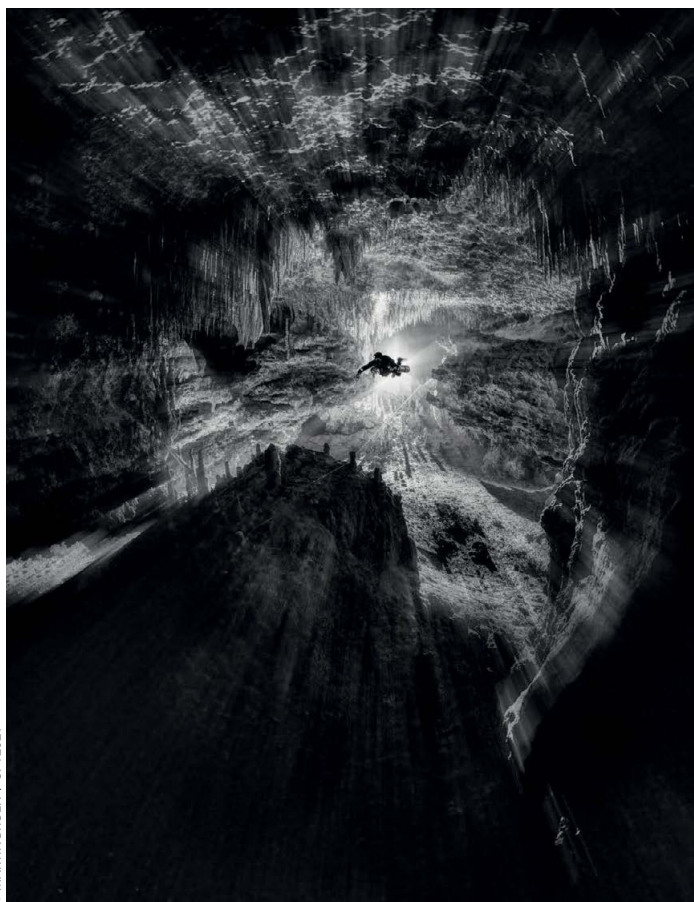
"A claustrophobic feeling for some and of discovery and adventure for others."

Taken with: Sony A7RIII with Canon 8-15mm @ 15 lens, Nauticam NA-A7III housing, Big Blue 33000 lumen. 1/10th, f/5, ISO 5000

Judge's comment: "Wow, the judge is speechless! Such beautiful words – an extremely well deserved runner up in this category." **ME**



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© MARTIN BROEN / UPY2021



© RENATA ROMEO / UPY2021

THIRD
Double Turtle
 by Renata Romeo (Italy)

"During the long months of the pandemic I had to revise, like everyone else, my usual way of life and to replace the usual diving with snorkelling. This activity surprisingly gave me new time and space, interesting perspectives and different points of view. It gave birth to my life in a time of shadows.

"This summer, snorkelling very early in the morning in Marsa Eqla [Red Sea, Egypt], I often met the smaller, friendly hawksbill turtle of the bay. Enchanted by its elegant movements, I watched it for hours eating and breathing.

"I noticed that particular conditions of light and sea made perfect reflections of the turtle on the surface. For days I waited patiently to capture the photo I had imagined – a perfect moment of frozen geometry."

Taken with: Canon 90D with Tokina 10-17 lens, Easydive Leo3 housing. 1/250th, f/8, ISO 160

Judge's comment: "Lovely tones and perfect reflections. The imperfection in Snell's window especially highlighted with the turtle, seeming to be looking at it, sealed the deal." **PR**

7 Compact
WINNER
Double Near the Surface
 by Jack Berthomier
 (New Caledonia)



© JACK BERTHOMIER / UPY2021

"I used to go fishing in the Ouenghi river to take some shots a few days after big rains that cause flooding. The current is strong but still practicable for freediving, with dislodged plants, leaves and branches.

"They bring out a lot of colours, which showcase this plain New Caledonian carp (*Kuhlia rupestris*), which is common in our rivers."

Taken with: Sony RX100 with INON UW-H100 wide angle lens, Isotta housing, internal flash. 1/800th, f/5.6, ISO 200

Judge's comment: "A much-deserved winner of this category. The author has made the carp stand out against a colourful background of yellow, greens, reds and blues. The hint of colour in the sky sets this image off to perfection." **ME**

RUNNER-UP
Rainbow Goby
 by ManBd (Malaysia)

"While I was under water with this hairy panda goby [at Lembeh in Indonesia] it was very shy, so it took a long time for it to be comfortable enough to pop its head out.

"While waiting I set up my coloured torches and aligned them to illuminate the coral, but not the goby. Then, to produce a sharp picture of the goby, I had to use another snoot with white light, so that it was recorded correctly and surrounded by all the colour."

Taken with: Olympus TG4 with INON lens, Olympus PT-056 housing, Big Blue torch. 1/200th f/5.6, ISO 200

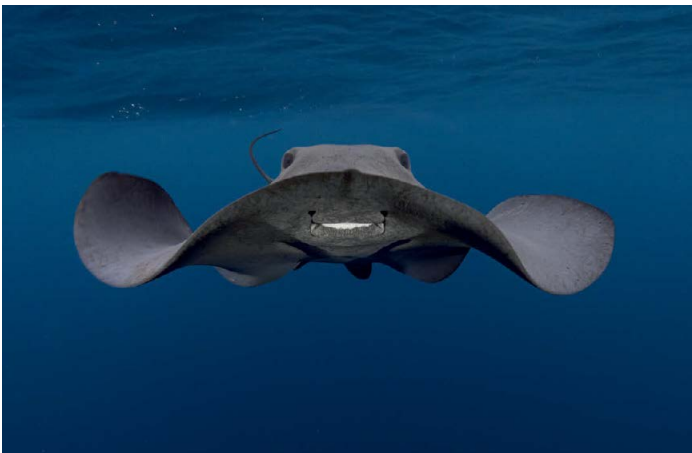


© MANBD / UPY2021

Judge's comment: "A fantastic and challenging subject, expertly photographed with the innovation you'd expect from a former winner of UPY's Up & Coming award." **AM**

THIRD
Pelagic Sting Ray
by Isaías Cruz (Spain)

"This image was taken in summer, offshore from Bermeo [in Spain's Basque Country] while doing a shark dive. While I was surrounded by three blue sharks, this pelagic ray appeared to check the bait. "It was a very rare encounter – this animal (*Pteroplatytrygon violacea*) has not been sighted before in these waters, and I had never seen one before. It was going in and out from the bait, so I tried to get close to it calmly. Then it came right



© ISAIAS CRUZ / UPY2021



© RHOHEITO / UPY2021

up to my dome and I took the photo."

Taken with: *Sony RX 100 V with INON UWL-H100 lens & dome, Nauticam NA-RX100V housing, Glowdive Max lights. 1/160th, f/5, ISO 500*

Judge's comment: "Beautifully timed symmetry with subtle non-distracting surface reflections. A big shot from a small camera." **PR**

changing our plan to accommodate our now fairly depleted gas supplies, we descended again.

"I swam ahead and waited just beyond the beginning of the permanent mainline watching the team swim towards me, followed closely by the lighting assistants creating those beautiful halo effects. Suddenly everything just lined up perfectly, so I pressed the shutter just as Max turned to tie into the mainline."

Taken with: *Sony A7S II with FE 24-70mm f/2.8 GM lens, Nauticam NA-A7II housing, Big Blue 30k, two 15k, two 4k video lights. 1/125th, f/2.8, ISO 2500*

Judge's comments: "We always value fresh vision in this category, and the combination of incredible lighting and shallow depth of field empower this image with originality and truly capture the spirit of adventure that the photographer was striving for." **AM**

"This strong image brought two words to mind – confidence and talent. Confidence to pull off such an ambitious image, and talent to visualise such good composition and control complicated lighting." **PR**

RUNNER-UP
Toward Shining Light
by Ryohei Ito (Japan)

"As we were mooring the safari-boat in Maaya Lagoon [North Ari Atoll, Maldives] at night, manta rays came behind the boat to eat the plankton that gathered in its light, so I put on my snorkel and fins and went into the sea with my camera.

"This manta repeatedly flipped in front of me and went deep into the water. Watching up close, I was absorbed in releasing the shutter.

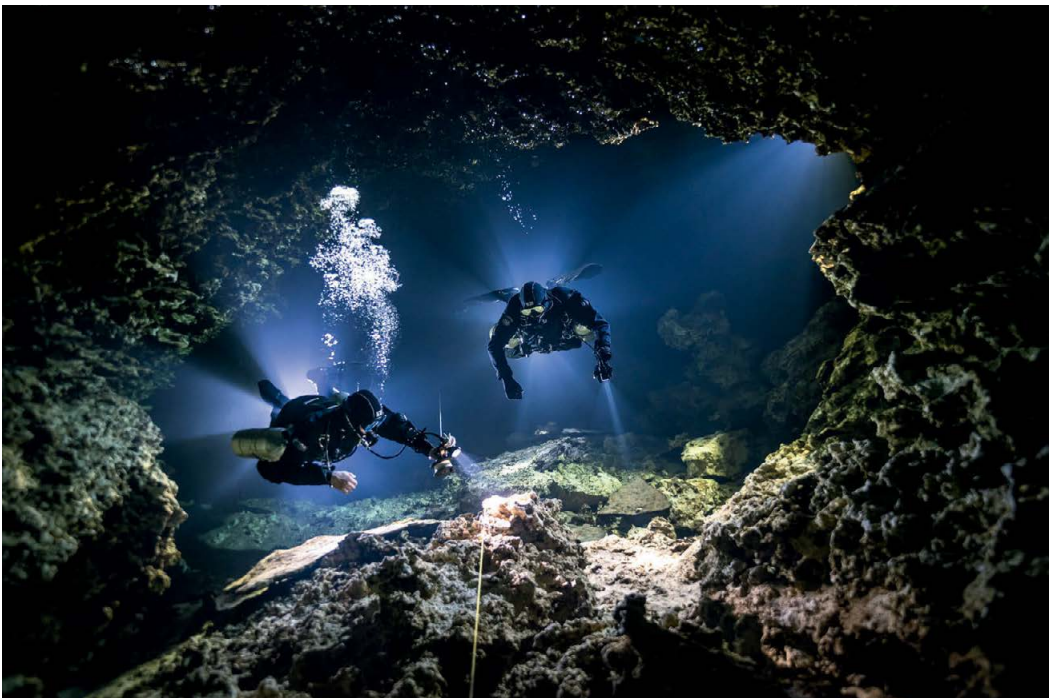
"This photo was taken aiming at the ray rising from the depths toward the light at the surface."

Taken with: *Canon 5D Mk4 with EF8-15mm F4L fisheye USM lens, Sea & Sea MDX-5D Mk 4 housing, Retra Flash Pro strobe. 1/200th, f/16, ISO 400*

Judge's comment: "Impressive enough a composition with just the subject alone contrasted on a dark background but the simple surface light lifted this image above the pack." **PR**

THIRD
Resplendence:
Black-Browed Albatross
by Danny Lee (Australia)

"Whenever I see an albatross I get excited! Their sheer size and beautiful features make them a joy



© ALICE BENNETT / UPY2021

© DANNY LEE / UPY2021



to photograph. I have been working on a series of split-shots of the various species that visit our Tasmanian waters for a few years now.

"Getting good eye-contact as well as good feet symmetry is a challenge because they are generally quite shy birds.

"I use a very simple inexpensive compact camera and do not use a wide-angle dome or wet lens when taking these photos. The small 6cm flat port on my housing might be small but works a treat in calm conditions.

"Getting the exposure settings right is the important part because the albatross's feathers are so brilliantly white, and yet it can be reasonably dark under water." [Taken in the Bay of Fires.]

Taken with: Canon G7x Mk II, Meikon Canon G7x housing. 1/125th, f/8, ISO 160

Judge's comment: "I really liked this image from the outset. A split-image of an albatross is one thing but this author has gone on to include great light, superb eye-contact and a glint of both feet. Superb imagery." **ME**

9 British Waters Wide Angle

WINNER & MY BACKYARD WINNER

While You Sleep by Mark Kirkland (UK)

"Malls Mire, a small woodland in Glasgow between a housing estate, supermarket and factory, is an unlikely haven for wildlife. As winter thaws, for a few nights each year one of its small muddy ponds comes alive with common frogs.

"I first photographed them there in 2018 and since that day I've had this image in my head. It took another two years before I captured the little wonders that stir on cold nights as the city sleeps.

"Using a temperamental remote shutter while combining long exposure, backlighting, close-focus wide-angle and split photography meant that I had to abandon any frustrations and try (and inevitably fail) for the hundredth time to get it right.



© MARK KIRKLAND / UPY2021

"This final shot is a culmination of 25 hours over four nights of lying in darkness, covered in mud, waiting on Nature's unpredictable elements to align. Time well spent? Absolutely."

Taken with: Olympus OMD Em5 Mkii with Panasonic 8mm fisheye lens, Olympus PT-EP13 housing, Sea and Sea YS-110a strobes. 20, f/16, ISO 1000

Judge's comments: "I honestly think that the appearance of this image will go down in the history of underwater photography as a defining moment. Perfect yet flawed, natural in urban. I think it is a masterpiece. Savour it." **PR**

"Technically assured, artistically innovative and revealing an original and valuable view of the life of frogs. Every aspect contributes to the story: spawn shouts what's happening, bare trees show season, the sky demonstrates time of day, tower blocks reveal location, even the droplets on the dome look like stars!

"A most fitting winner of our new My Backyard award, introduced to show that underwater

photography can still thrive when many photographers are forced to stay close to home. Even in the centre of the city of Glasgow, frogs and world-class underwater photography can thrive." **AM**

"You have followed your dream for some time and all your hard work and cold nights have paid off. A night-time city suburb with high-rise flats; add to the mix common frogs. You have illuminated them perfectly, notwithstanding the light, the cold and, most of all, creating a split-image. Simply perfect in every way." **ME**

RUNNER-UP

The Great Migration by Mark Kirkland (UK)

"It's the microscopic plankton that draw the massive basking shark up the west coast of Britain and into the narrow channel between the Isles of Coll and Tiree in the Inner Hebrides.

"While their migration is predictable, to share the water with them still requires that element of luck and to spend a late summer evening with them (in 2020, of all years) was a dream.

"I've photographed basking sharks before and never managed that classic 'head-on' shot, so decided to try for something different.

"With challenging lighting conditions and plankton-rich waters I wasn't sure if it could be done, but after two years of planning, an experimental 19in dome (frame made by my brother – thanks Paul), trial and error with lenses and ND filters, and of course the arrival of the sharks, I finally had the chance to find out."

Taken with: Olympus OMD Em5 Mkii with 9-18mm lens, PT-EP13 housing. 1/200th, f/6.3, ISO 1600

Judge's comment: "This image raises the bar for basking shark shots. There is so much that has to come right to get a shot like this that it might seem impossible but we now have proof. It is possible and it's absolutely awesome!" **PR**

THIRD

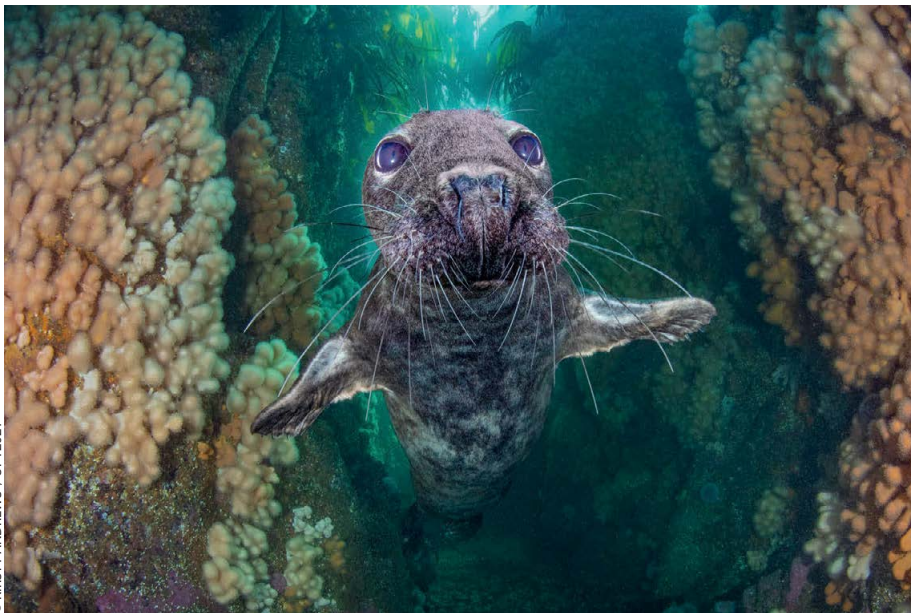
Grey Seal Gully by Kirsty Andrews (UK)

"Grey seals are wonderful to photograph but I particularly like this shot [taken in the Farn Islands] because of the background.

"My buddy showed me this pretty gully full of dead men's fingers and light coming down through kelp. I waited there for a while, hoping

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© KIRSTY ANDREWS / UPI/2021

a seal would turn up. In the end I had only one quick pass from one shy seal, but I was able to take this pleasing portrait."

Taken with: Nikon D500 with Tokina 10-17mm lens, Nauticam NA D500 housing, Retra Pro strobes. 1/160th, f/11, ISO 200

Judge's comment: "Seals are among the UK's most charismatic marine species and I love seeing this individual immersed in its habitat in the colourful underwater world of British seas."

"It is a fresh take on a subject usually photographed near the surface or among seaweeds." **AM**

10 British Waters Macro

WINNER

Portrait of a Variable Blenny by Malcolm Nimmo (UK)

"The variable blenny (*Parablennius pilicornis*) is a relatively new arrival to UK coastal waters, with its origins from more southerly waters (it has been recorded throughout the Mediterranean Sea)."

"This species can appear in a number of colour forms. This one was standing out proud on a reef ledge in Plymouth Sound in July 2020, making it an ideal subject."

"The image was captured using snooted lighting to emphasise only the face of the blenny, with the snooted light being positioned from above the head, enhancing the facial features."

Taken with: Nikon D7200 with 60mm lens, Nauticam housing, INON 240 strobe with Flip Snoot Pro. 1/80th, f/13, ISO 200

Judge's comment: "A beautiful UK fish portrait. Everything about this image is perfect. The composition of the two eyes in relation to the height gives us the stark black background, which is framed along all three sides."

"Both eyes are on the law of thirds and the mouth below has also been framed on the lower law of thirds."

"All these elements provide us with a beautiful all-round framed underwater photograph." **ME**



© MALCOLM NIMMO / UPI/2021



© ALEX TATTERSALL / UPI/2021



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RUNNER-UP

Stalkie on Bootlace Weed by Alex Tattersall (UK)

"On a beautiful summer morning in Kimmeridge Bay in mid-July, we left the beach and swam through beautiful clumps of bootlace weed at high tide."

"Looking closer, we could see snails, shells, anemones and stalked jellyfish making temporary homes among the weeds. Very peaceful moments."

Taken with: Nikon D850 with 105mm lens, Nauticam housing, two Retra Flash Pro with beam restrictors. 1/60th, f/11, ISO 400

Judge's comment: "One of my favourites in the contest, a stunning composition that feels totally original despite the familiar subject matter. Fabulous photography." **AM**

THIRD

Nest Buddies by Dan Bolt (UK)

"The corkwing wrasse you can see in the background was actually busy building a nest under Swanage Pier."

"This means he was very distracted by his duties and would regularly come back to the same spot to add more gathered pieces of seaweed."

"The nudibranch had been making its way along a nearby piece of kelp, and I had to wait only a minute or two before it made its way up a seaweed stump."

"This enabled me to grab a few shots just at the moment when wrasse and nudibranch were both in frame."

Taken with: Olympus OM-D E-M1 with 60mm macro lens, Aquatica AE-M1 housing, Sea & Sea YS-D1 strobes. 1/250th, f/14, ISO 320

Judge's comment: "When I first saw this image, I thought it was lucky to have the wrasse appear in the background but, having read the back-story, I did him a disservice."

"The image was intentional, well-planned, timed and positioned, which makes it even more impressive." **PR**



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11 British Waters Living Together

WINNER

ss Hispania

by Kirsty Andrews (UK)

"The UK, in my view, has some of the finest wreck diving in the world, and the ss *Hispania* in the Sound of Mull is one of my favourites.

"This wreck truly has become an artificial reef: the wreck attracts the wildlife and both wreck and wildlife attract the divers.

"Every inch of metal is covered in anemones, seaweeds or sponges, orange and white.

"My buddy was investigating the superstructure above a row of portholes and I moved back, shooting as wide as I could to try to give a sense of scale within this colourful scene."

Taken with: Nikon D500 with Tokina 10-17mm lens, Nauticam NA D500 housing, Sea & Sea YS-110a strobes. 1/80th, f/11, ISO 800

Judge's comment: "A deserved winner that combines a strong image visually with a very positive message." **PR**

RUNNER-UP

Crab Affairs

by Atanas Petrov (UK)

"During a dive on the ss *Rosalie*, a wreck off the coast of Weybourne in England, I noticed these two brown crabs (*Cancer pagurus*) occupying a groove in one of the supporting elements of the propeller shaft.

"They had probably completed an important part of their life-cycle, the mating, and the male



© ATANAS PETROV / JUP2021

on the top was protecting the female underneath until her exoskeleton hardened.

"I was pleased to witness and capture this special behaviour using my wide-angle lens, which allowed me to include part of the surrounding environment as well."

Taken with: Nikon D300 with Tokina 10-17mm fisheye lens, Subal ND7100 housing, INON Z-240 strobes. 1/25th, f/13, ISO 200.

Judge's comment: "Symmetrical scenes are rare under water and mirrored composition really makes this precisely composed shot stand out, revealing how this seabed structure is helping these Cromer crabs live their lives." **AM**

THIRD

Pontoon Island

by Dan Bolt (UK)

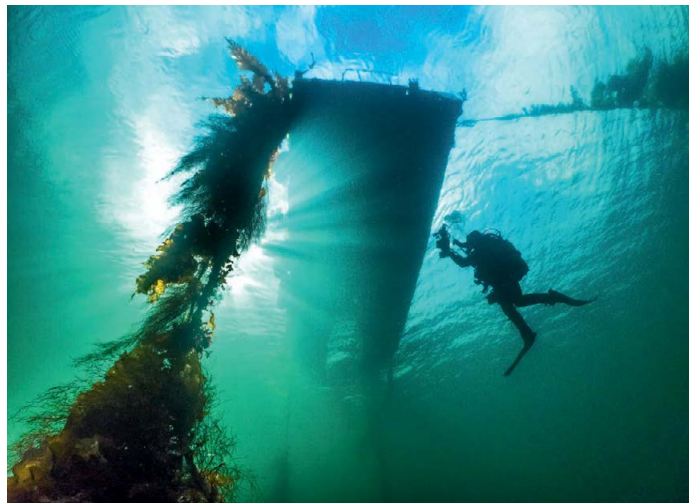
"Anchored in a sheltered inlet on Loch Carron, western Scotland, this floating pontoon is used by local fishermen to stow their gear when not being used. It's been there for some years and is now a floating island of life.

"The anchor-line is a vertical forest of seaweeds, ascidians and fan-worms, while the underside is covered with anemones and sponges.

"This was a very lucky shot, because it was taken during the only 15-minute period when the sun came out on a seven-day trip!"

Taken with: Olympus OM-D E-M1 with 14-42mm lens with Nauticam WWL-1, Aquatica AE-M1 housing, Sea & Sea YS-D1 strobes. 1/320th, f/16, ISO 640

Judge's comment: "You got lucky with the sun breaking through. It's the silhouette of the sunburst illuminating the distant diver that



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really sets this image off. The surface is bright but the anchor-line tones it down somewhat.

"I like the way you have also used the bottom of the pontoon to shade the sunburst. I would have thought that this was a complex arrangement. Very well done." **ME**

12 British Waters Compact

WINNER

Sunrise Mute Swan Feeding Under Water by Ian Wade (UK)

"I had been watching a couple of mute swans at my local lake in St Georges Park, Bristol. They seemed to be following people around, looking for food. I decided to attach a small weight to the back of my GoPro and threw it into the lake a short distance from me.

"The weight would mean that the GoPro always fell onto its back, so I could shoot at an almost vertical angle.

"I had connected the GoPro to my phone so that I could remotely fire off images.

"The GoPro hitting the water attracted the swans' interest and they swam over. I waited until one of them was in the correct position and with its head under water, and shot a high-speed burst of images, enabling me to capture this picture."

Taken with: GoPro HERO3+ Black Edition with f/2.8 lens & housing. 1/433rd, f/2.8, ISO100

Judge's comment: "This was a unanimous choice from the judges. Although the face of the swan is in shade it's all the other elements that were so strong. Snell's window in particular, with the low light and the branches of the trees. Beautiful image." **ME**

RUNNER-UP

Hold Tight by Sandra Stalker (UK)

"Within my underwater photography I am always



© IAN WADE / UPPY2021

excited by the tiny and overlooked, mostly focusing on macro and getting as close as I can to my subject.

"On this day last summer the conditions were perfect at Kimmeridge Bay in Dorset: calm sea, clear vis and fantastic underwater scenery meant that it was like diving through a spectacular underwater meadow.

"There were so many tiny stalked jellyfish clinging to the bootlace weed. The ambient light was stunning, with sunshine beaming through the long strands of bootlace.

"For this shot I went much wider than normal and used the ambient light to almost silhouette the stalked jellyfish, emphasising its tiny shape against the naturally lit background."

Taken with: Canon G7Xii, Ikelite housing, Backscatter miniflash, 1/200th, f/10, ISO 125



© SANDRA STALKER / UPPY2021

Judge's comment: "Sandra's beautiful image is wonderful and unintentional homage of a famous 1960s shot taken at the same location by the great Colin Doeg, BUPY in 1968 and founder of BSoUP. Colin's shot *Rays Of The Spectrum* was celebrated for decades, yet is topped by *Hold Tight* with the inclusion of a stalked jellyfish. **AM**

THIRD

Pinky by Sandra Stalker (UK)

"I absolutely adore these little gobies and their grumpy faces. I often watch them when I dive as they have such an inquisitive nature and often challenge me to a staring contest, which they win.

"They tend to blend in with the background on the sand, so for this shot in Portland harbour, Dorset, I lit the goby with both a coloured filter behind and a snooted strobe in front to bring out the face and draw attention to an overlooked little fish.

"I was excited by the contrast of the vibrant pink to the glumness of the face."

Taken with: Canon G7Xii with CMC1 lens, Ikelite housing, Backscatter miniflash with snoots, 1/125th, f/8, ISO 250



© SANDRA STALKER / UPPY2021



Judge's comment: "A delicate use, and choice, of light and colour made this image stand out for all three judges. It's great to see such images that celebrate UK marine life and the capability of compact cameras." **PR**

13 Marine Conservation

WINNER

Aerial View of a Crowded Island in Guna Yala

by Karim Iliya (USA)

"A tightly inhabited village off the coast of Panama serves as a microcosm reminder of how humans across the planet are consuming land and space at a rapid rate.

"Most of the Guna people live on these densely populated islands, catching fish and farming coconuts on nearby islands. The importance of humans' relationship with Nature and the need to protect it becomes very apparent when you look at our species from a bird's eye perspective and see how much space we take up.

"I had come to this Guna Yala region to photograph the art of making *mola*, the people's traditional clothing. While waiting on a boat I flew my drone over this island to get this perspective and give more impact to the image than I could have shooting at sea level or from under water."

Taken with: *DJI Phantom 4 Pro with 20.7mm lens. 1/500th, f/2.8, ISO 100*

Judge's comment: "A stark visual reminder of how we humans overpopulate and totally develop land, then overfish the surrounding delicate environment. This image captures that unnatural and unsustainable imbalance perfectly." **PR**

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RUNNER-UP

The Yellow Candy

by Pasquale Vassallo (Italy)

"During one of my trips to the sea, at Campi Flegrei, I noticed a strong presence of these yellow nets, closed like candy. I could not understand their purpose. In the following days, with the help of some local fishermen, I discovered that the candy is the heart of a trap. It is filled with dead fish and inserted into another net.

"The smell attracts small *Nassarius mutabilis* molluscs that are unable to get out.

"Once the trap's contents have been recovered the candy is often abandoned in the sea, causing plastic pollution and, as visible in the shot, a trap for other organisms."

Taken with: *Canon 5D SR with 8-15 lens, Seacam 5D housing, one strobe. 1/60th, f/16, ISO 125*

Judge's comment: "A physically small example of ghost-fishing, where discarded plastics that take hundreds of years to break down carry on catching and entrapping marine life." **ME**

THIRD

River of Blood from a Dead Sperm Whale

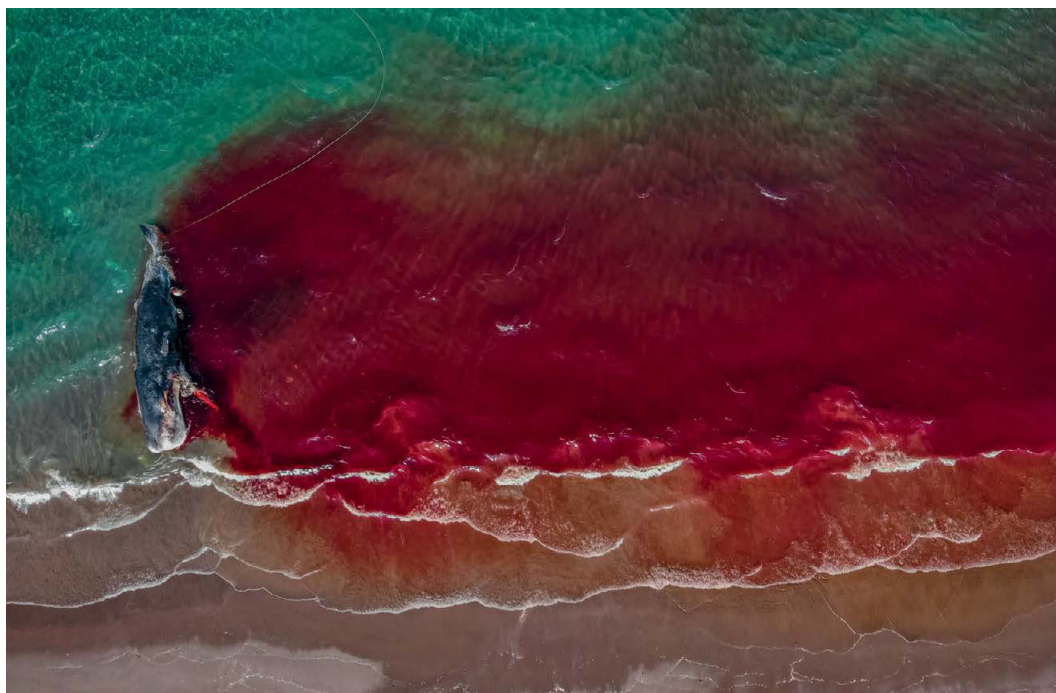
by Rafael Fernandez Caballero (Spain)

"Seeing a dead animal is always sad. But seeing a big mammal dead like this sperm whale is indescribable. From land [in Baja California Sur, Mexico] the image was terrifying, but when I flew the drone the situation was even more shocking and dramatic.

"There was an incredibly large river of blood, maybe longer than a mile, coming out of the sperm whale."

Taken with: *DjiMavic air, 1/230th, f/2.8, ISO 100*

Judge's comment: "A terribly sad scene with the ocean saturated from the death of this great creature. The aerial view tells the story perfectly, revealing the sperm whale's characteristic profile and the flood of blood on the tide." **AM**



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© RAFAEL FERNANDEZ CABALLERO / UPY2021

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The scuba fix

ARE YOU LONGING FOR SOMEONE to look you in the eyes and utter those three precious words? The words that will lift your heart and make you feel glad to be alive?

Oh, it's been such a long time. Too long. Sometimes you just need to hear those three words to feel that everything is right with the world.

We're going diving! As I write those words, a thousand imaginary emojis leap from the page and dance around my head. Diving is joy. And we all need some joy in our lives.

Let's be honest, this pandemic and lockdown experience has been a bit of an eye-opener.

No "real-life" socialising, no travel, and obliged to spend way more time than usual inside our own homes. The scariest part? It's certainly not Covid. It's that we've been locked up with the person who can hurt and annoy us the most: ourselves.

I've learned a few things during lockdown that have surprised me.

I'd never thought of myself as religious but my fridge has become an Oracle. When my mind is distracted – that'll be several times a day – I find myself performing a ritual.

Standing in front of the fridge, bathed in light from the open door, I stare inside as if this will reveal some deeper spiritual insight.

It's futile. But at least my shopping list is always bang-on accurate.

Less of a surprise is my continuing addiction to news. Working from home, it's far too easy to form a 24/7 relationship with newspapers, radio and TV news, and social media.

Which leads me to the real revelation from lockdown. The seemingly infinite capacity of people to whinge about their hard-done-by-ness is seriously annoying me.

So, I breathe... and I think instead about diving.

AND WHEN I WENT through my memories of different dives in different places with different groups and individuals, I realised that people just don't complain about stuff when they're diving. It's actually quite miraculous.

Before the dive, there's the anticipation. It's an adventure!

Everyone is busy checking that they have everything, assembling kit, sometimes needing a bit of help. Perfect strangers will donate an O-ring or help to fix a fin-strap.

The excitement always builds on the journey to a dive-site. You would be there only if you really wanted to be there. Even when the wind picks up and the chop from the waves smacks you clean in the face, the thought of complaining will never cross your mind.

On the dive you're just there; you're in the moment.

Of course, it would be difficult to whinge with that reg in your mouth, but it just doesn't occur to you.

Even if you don't encounter a dolphin. Even if the vis was less than perfect. Even if you missed the wreck – you're here and it's all good. There's no complaint.

And after the dive, everybody has a satisfied kind of glow. Some are chatty, full of tales of their dive. The mug of hot tea is heaven. If you managed to lose your torch, you shrug. If your drysuit wrist-seal leaked so badly that you're soaked to the armpit, you just laugh.

Scuba is the universal fix that can heal the world and it's woes. Can we have some more – please?

LOUISE
TREWAVAS





FROM SEPTEMBER 2018 to December of the following year, I worked as site manager on a project in northern Mozambique, building a new airport in the north, near the Tanzanian border, for a contractor to a gas and oil company.

The work was very tough, usually with 12-13-hour days, seven days a week.

We lived in a camp, with all the limitations that implies, but I was often required to travel to the city of Pemba, about 250 miles to the south, either to attend meetings, search for places to quarry or, once every couple of months, to have a long weekend break.

Nobody can work 12/13 hours a day, seven days a week, forever!

As a Master Diver, I try to go diving wherever I find myself, and Pemba was no exception. But this was not a straightforward proposition.

Pemba in Mozambique is not to be confused with the Tanzanian island to the north. It is a coastal city, the capital of the province of Cabo Delgado, and unfortunately the security situation in northern Mozambique is bad these days, as security forces struggle to control a wave of insurgent attacks that extend to the burning of entire villages.

When I was there travelling overland was already considered very dangerous, so I usually visited Pemba by air, using helicopters or aircraft made available by our client, the oil company.

But sometimes, and because I needed to dive, I made the trip alone, driving along the 250 miles of dirt roads that passed through small villages with huts built of timber and clay, with straw roofs.

It would take me about five hours driving through the bush without stopping until I reached Pemba.

The city is dominated by a huge bay,



When you're working in a troubled part of the world, time off for scuba can be a blessed relief. **PEDRO MOÇO** was based in northern Mozambique

OFF DUTY



the third largest in the world, and its population lives mainly from fishing and informal trade, though there is also a sub-population of expatriates engaged in activities often related to oil and gas.

Pemba is now a growing city, even though its infrastructure was weakened by the civil war that devastated Mozambique after independence.

There are some good-quality hotels and resorts, the rates for which mean that they are occupied by foreigners or by the few wealthier Mozambicans.

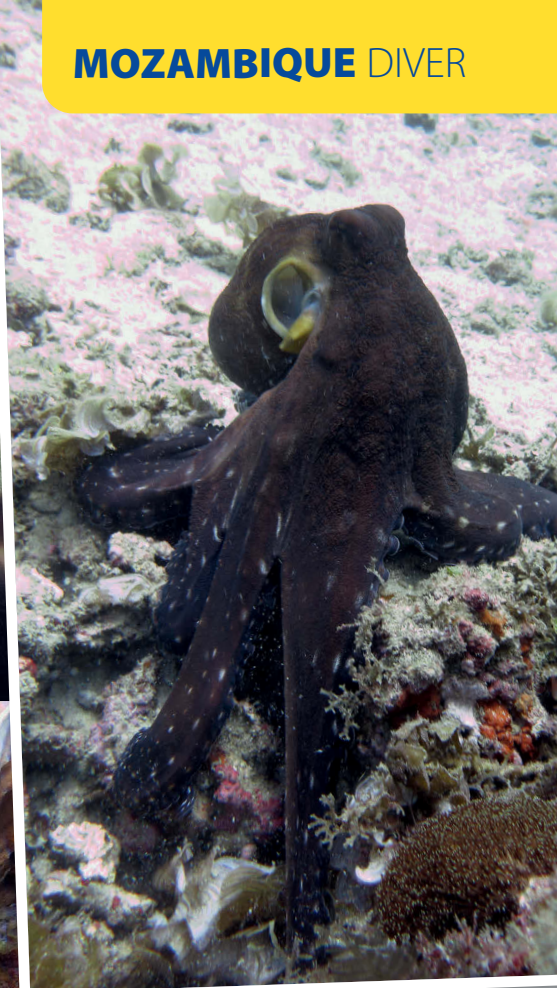
A former colony of my country Portugal, the national language is Portuguese, though tribal languages and English, brought by American and South African workers, are also spoken.

WHEN I ARRIVED for the first time, I brought in my luggage my dive-mask and computer, which are always with me. I contacted Pieter Jacob, a South African who set up in Pemba 25 years ago and who runs a small lodge with scuba-diving facilities – Pieter’s Place and CI Divers.

From that day, and after our first dive together, we formed a natural friendship based on our common passion, diving. Whenever I came to Pemba I would stay at Pieter’s Lodge and whenever I could – almost always – we’d dive.

The lodge is a magical place, dominated by a large baobab tree that is, I believe, at least 2000 years old and seems to watch over everyone’s well-being. The rooms are frugal and basic, in the African style, and have the essentials for resting as long as you’re not particularly demanding.

I usually occupied a windowed room with a straw-covered roof. The privacy afforded only by gauzy curtains was minimal, but then I never felt I had much



to hide. Mosquitoes would often keep me awake for much of the night until eventually I would give up the fight, fall asleep and let them proceed with their meticulous bleeding.

For those first dives, other than my mask and the computer I used the lodge’s rental diving gear. First time out the staff carried the kit and left it under the baobab. I put it together, detecting in the process a scorpion hidden between the BC and the tank-holder.

They just put the BC in the pool and the scorpion floated off, leaving me safe from unwanted bites. Pieter had laughed and told me that he had previously dived with a scorpion in one of his boots.

It had waited until they got under water before stinging him: “I had to go up and abort the dive!” he complained and I laughed too, because in Africa it’s

Far left: Under the ancient baobab tree at Pieter’s Place, Pemba.

Above, from top: Juvenile emperor angelfish; Geometric moray eel.

Left: Regulars from CI Divers – Angel, Pedro, Pieter Jacobs and Nuno.

like that, and the best we can do is to be cautious and not over-dramatise.

Diving off Pemba was to enter an enchanted world, full of life and the bottom carpeted with corals, a wonderland of different shapes and colours. The water was so clear that it made me feel as if I was gliding, suspended in the void. Even the colourful fish resembled birds of different colours.

PIETER MUST BE one of the few divers operators who goes out even if he has only one customer. The vast majority of the dives I took with him were solitary, with just the two of us at the bottom, sometimes covering almost a kilometre over coral and sandy seabeds.

Some of the dive-sites had been discovered by Pieter. A spot he calls the Tunnel but that others call the Gap is perhaps the most emblematic of these.

It’s an immense wall that starts about 12m deep and plunges vertically. The maximum depth I reached there – indeed anywhere – breathing air, was 54m.

As we descended the wall, its appearance and the life it contained would vary and we would move on from being surrounded by numerous small tropical fish to a few larger ones.

We would sometimes see a female grouper weighing more than 100kg, swimming peacefully surrounded by remoras like some water-goddess.

One day we saw her accompanied by what I thought at the time was a great shark, perhaps a tiger shark, but back



on the boat Pieter explained that it was a cobia, a large fish that mimics a shark for its own defence, even though it lacks a shark's teeth and intimidating persona.

On other occasions we dived with turtles, those beautiful marine beings that would look back at us placidly and swim away with a flap of their fins.

We also saw, from time to time, great Napoleon wrasse, those fish with a pronounced hump on the head that never fails to remind me of John Merrick, the Elephant Man.

As we descended the immense wall would lose natural light, colours fading and everything becoming bluer. Just before the 40m mark a natural tunnel formed by dissolving limestone invited brief exploration, ascending slightly but only about 8m long and 2m in diameter.

The whole time spent on the wall we would be surrounded by life, colour and movement. When the no-decompression limit approached we would ascend,



Top: Blue-spotted ray.

Above: Pink skunk clownfish.

Below, clockwise from top left: Moray eel; black-saddled tobies, lizardfish, longfin bannerfish.

continuing to appreciate the wall's charms. We would complete the dive with a 5m safety-stop, still surrounded by corals and marine life, in particular blue-spotted rays and lionfish.

Sometimes, especially at weekends, Pieter and I would have company on our dives. Divers from the Portuguese and South African expat communities would

join us. Together with Nuno, a partner in an electrical-equipment company; Jean, a young Brazilian in the quarries business; and Angel, a food-supply manager, we would carry out many good dives and became good friends.

As well as the Tunnel we dived the Twin Peaks, Londo, Seventy Four and Finger E/W and Finger N/S sites.

At the latter we had a window of only 1-2hr between tides if we were to avoid the strong current. It was still a drift-dive and, if the moment was well chosen, we could cover more than a kilometre of coral reef and fish without effort.

Finger N/S is an extraordinarily dynamic dive if done well and I highly recommend it to anyone who has the opportunity to try it.

It commences from the seabed at 32m, gradually ascending to 5m safety-stop level among solitary coral bommies.

WHILE I WAS in Mozambique a cyclone called Kenneth struck Pemba and some nearby villages. The waves in the bay reached a height of more than 6m and destroyed a small rock jetty.

I dived with Pieter five days after Kenneth had passed through, and that dive was one of the saddest I have ever done. In some spots the corals had been completely destroyed. Even the fish were looking confused and disoriented.

Large shoals had been dismembered and individual clownfish were searching frenetically for their old anemone homes.

After Cyclone Kenneth we changed our dive-sites and started to dive closer to the shore at spots that had been less exposed to the destruction.

Water temperature varied through the year from 27-30°C and visibility was rarely less than 10m – typically more than 30 m.

When I did the 54m dive I can remember how clearly I could see a couple of divers who would have been some 30m higher in the water column.

The marine life in this part of the Indian Ocean is varied and I have the best memories of the dives I did

for more than a year in Pemba's bay.

It's a difficult destination to reach. Travel is expensive, tourism very poorly developed, and these days the insecurity hinders organised leisure travel.

But for anyone who happens to find themselves there, as I did, I can strongly recommend the beaches, warm sea, fresh grilled fish and seafood and, especially, those natural diving experiences. □

*** pietersdiversplace.co.za**



breakthrough biology

AUSTRALIA

DAMSELS HARNESS SHRIMPS

HUMANS HAVE been farming animals for millennia, but scientists reckon they have found the first evidence of an animal domesticating another species. And the farmer happens to be a coral-reef fish.

Scientists from Australian universities Griffith and Deakin found that longfin damselfish (*Stegastes diencaeus*) employ planktonic mysid shrimp (*Mysidium integrum*) to fertilise algae farms for them.

“We found highly territorial longfin damselfish and mysids have a mutualistic relationship that benefits both,” said Dr Rohan Brooker from Deakin’s Centre for Integrative Ecology.

“The damselfish aggressively defend a patch of reef, where they farm algae for food, against all but the mysid shrimps.”

Divers well know how aggressive damselfish can be if they detect an intruder in their territory. “Swarms of the mysid shrimp, which benefit from the protective refuge provided by damselfish, fertilise the algal farms with their waste, improving quality of the farmed algae and, in turn, the condition of the farmer, the damselfish,” said Dr Brooker.

According to Dr William Feeney of the Environmental Futures Research Institute at Griffith the relationship “is the first recorded case of a non-human vertebrate domesticating another species.

“The relationship between damselfish and mysids could tell us much about how we first domesticated familiar species like cats, dog, pigs and chickens,” he said.

“It is generally food-scrap or shelter that are thought to have attracted animals to humans, but this study highlights the important role that protection from predators also plays in domestication, with mysid shrimp quickly consumed by other predators when the damselfish farmer wasn’t present.” The research can be found in *Nature Communications*.



LASZLO LIXES

USA

Ultra-black fish reveal invisibility secrets

THE ULTRA-BLACK skin that renders some deep-sea fish invisible to prey has been the subject of a study by scientists who hope to replicate its light-trapping properties in applications

ranging from solar panels to telescopes.

In the deep ocean there is no natural cover but there is still light, created by bioluminescent organisms that use it to hunt. So at least 16 fish species have evolved skin so black that it absorbs more than 99.5% of light.

This makes them some 20 times darker and less reflective than everyday black objects – and almost impossible to detect. Near-invisible nanocrystalline teeth complete their disappearing act.

A research team from Duke University and the Smithsonian National Museum of Natural History used an ROV and trawl-net to capture 39 ultra-black fish from around a mile down in Monterey Bay and the Gulf of Mexico.

The darkest specimen was a tiny *Oneirodes* anglerfish from which a mere 0.044% of light reached the human eye – a result previously matched in Nature only by bird of paradise feathers.

The fish’s skin-cells comprise microscopic packets of pigment called melanosomes. These were found to be longer and more tightly packed together than those of the sort of black reef fish familiar to scuba-divers.

The researchers used a spectrometer to measure light reflected off the fishes’ skin, and an electron microscope to analyse the melanosomes, which computer-modelling confirmed to have the optimal geometry for swallowing light.

This property caused a problem when trying to photograph the fish. “It didn’t matter how you set up the camera or lighting – they just sucked up all the light,” said zoologist Karen Osborn.

Alexander Davis of Duke was lead author of the study, published in *Current Biology*.

Above right: Fish-farmer – a longfin damselfish.

Below: Fangtooth and other blacker-than-black deep-sea dwellers that prove tricky to photograph.



KAREN OSBORN, SMITHSONIAN MUSEUM OF NATURAL HISTORY



DOUGLAS BASTOS / SMITHSONIAN

BRAZIL

High-shock electric eels hunt in packs

ELECTRIC EELS had always been thought of as solitary night-hunters – until they were observed for the first time recently working together in large groups to kill prey.

Individual eels of the new species being studied in Brazil can emit more electricity than any other known creature.

Volta's electric eels (*Electrophoris voltae*) are not true eels but a type of knifefish that can grow up to 2.5m long.

The hunting group, many of them more than 1.2m long, were found in a small river-fed lake in the Amazon basin by a scientific team led by C David de Santana of the Smithsonian's National Museum of Natural History in the USA.

For most of the day and night the 100 adult eels would lie motionless in the deepest (3.5m) part of the lake, surfacing occasionally to breathe. But at dusk and dawn they would hunt for an hour or so, corralling 2-5cm tetra fish into tightly packed balls in water less than 1m deep.

From time to time groups of up to 10 eels would split from the group, surround the baitball and launch simultaneous electric attacks.

The shocks would catapult the tetras out of the water, to be eaten by the eels when they landed stunned. Each hunt would include 5-7 such attacks.

"This is an extraordinary discovery," said de Santana, senior author of a study published in *Ecology and Evolution*.

"Nothing like this has ever been documented in electric eels. Hunting in groups is pretty common among mammals, but it's actually quite rare in fishes."

de Santana's Amazon expeditions have revealed 85 new species of electric fish over nine years.

In 2020 Volta's and another new electric eel were identified – before then only a single species had been described.

The Volta's 860V shocks are the strongest electric discharge measured in any animal, and 210V higher than any previously recorded. "If 10 of them discharged at the same time, they could be producing up to 8600V of electricity," said de Santana. "That's around the same voltage needed to power 100 light-bulbs." The shock lasts only about 1/2000th sec but could fell a human.

"This is the only location where this behaviour has been observed, but right now we think the eels probably show up every year," said de Santana.

"Our initial hypothesis is that this is a relatively rare event that occurs only in places with lots of prey and enough shelter for large numbers of adult eels."

Normally electric eels feed alone at night by zapping sleeping fish.

The scientists plan another expedition to collect tissue samples, measure voltages and radio-tag eels to determine whether they use low-voltage shocks to communicate with each other as whales or dolphins would use sound.

AUSTRALIA

Partying stars adopt teen lifestyle

CORAL-MUNCHING crown-of-thorns starfish (COTS) can find their own way home – as long as their locale is stocked with their favourite food.

Homing starfish had never been documented before, say Australian scientists after observing hungry COTS emerging from their Great Barrier Reef shelters in the afternoons to feed on coral overnight, and returning home at dawn.

"The crown-of-thorns starfish often partied all night, slept in and only those with a well-stocked larder found their way home – so it's very much a teenager model of behaviour," said lead author Dr Scott Ling from the University of Tasmania's Institute for Marine & Antarctic Studies.

Above, from left: Electric power pack in their shallow hunting area; close-up of one of the eels, which can deliver an 860V shock.

Below, from top: Scott Ling with a crown-of-thorns starfish; COTS feeding on a coral reef.

"Their preferred prey is *Acropora* corals," said co-author Prof Morgan Pratchett from the ARC Centre of Excellence for Coral Reef Studies at James Cook University. "When populations of *Acropora* dropped, the starfish didn't return home. Their behaviour is directly linked to local abundance of *Acropora*."

The study shows that healthy reefs with high *Acropora* cover might be inviting COTS aggregations and the outbreaks that cause extensive and sustained coral loss throughout the Indo-Pacific region.

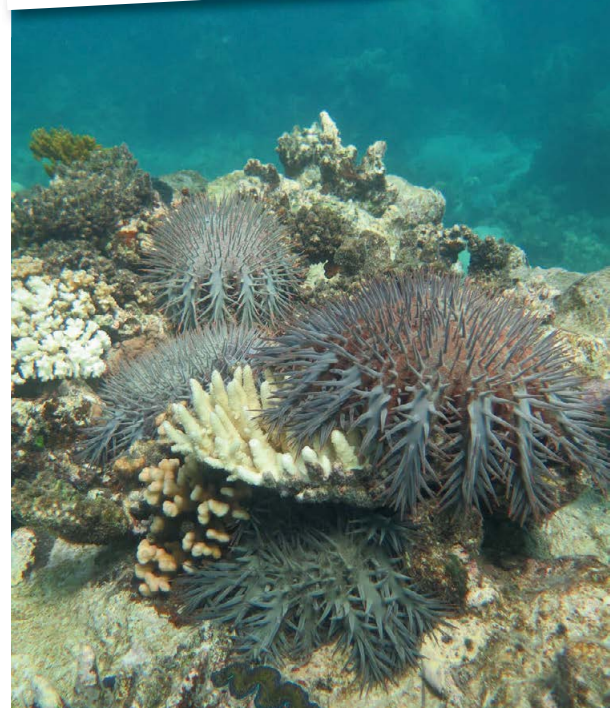
The researchers used in-situ time-lapse photography to track the movements of 58 starfish in the northern and southern GBR during a 2015 outbreak. When the

COTS couldn't find *Acropora* they became homeless, wandering up to 20m a day.

"Unlike sea urchins that can switch diet once they overgraze kelp forests, results of the time-lapse monitoring indicate that the starfish will consume available *Acropora* and ultimately eat



SCOTT LING



ARC COE FOR CORAL REEF STUDIES

themselves out of house and home, before dispersing in search of new feeding grounds,” said Dr Ling.

Previous GBR outbreaks were recorded in 1962, 1979, 1993 and 2009. Bleaching caused by climate-change is now the greatest threat to coral reefs worldwide, but combined with COTS outbreaks it can prove catastrophic.

“By better understanding the behaviour of these starfish we can help prevent and control their outbreaks, which will help alleviate the pressures on coral reefs,” said Prof Pratchett.

The study is published in *Proceedings of the Royal Society B*.

JAPAN

Eye-teeth protect whale sharks



OKINAWA CHURAUMI AQUARIUM

IN HUMANS THE “eye-teeth” are the upper canines, but new research suggests that the world’s biggest fish have eye-teeth in a more literal sense.

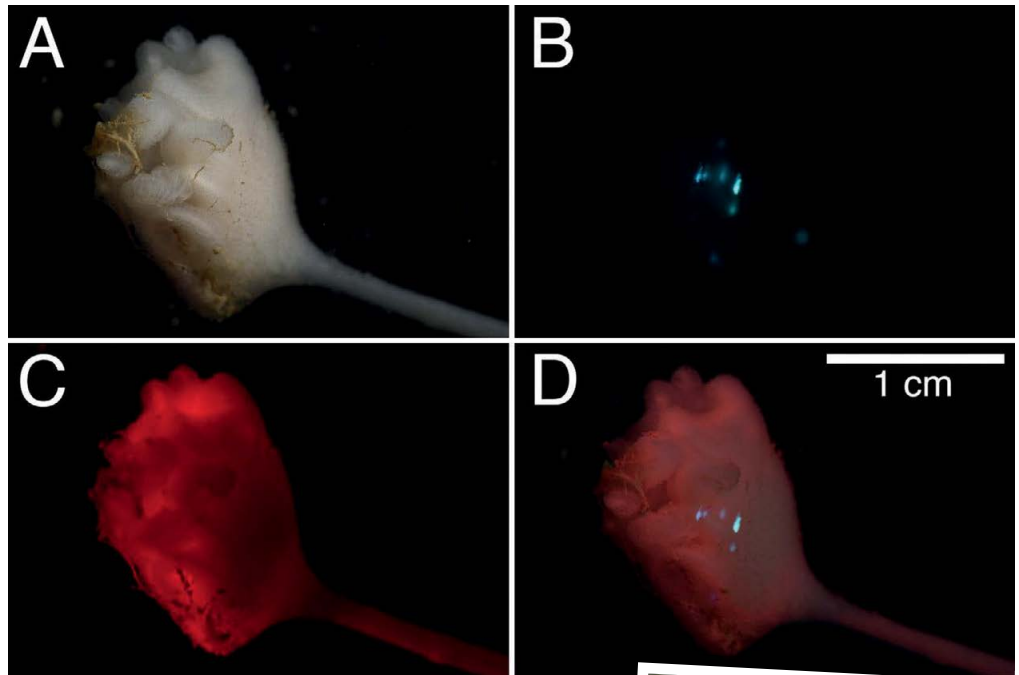
Whale sharks have been found to have tooth-like scales all over their eyeballs, a feature not noted before in any other vertebrate but, in the absence of eyelids, thought to protect the eyes from harm.

Japanese researchers say that whale sharks have evolved an eye covering made from tough “dermal denticles”, similar to those that cover their entire bodies, and those of other sharks and rays.

Similar to teeth, the tiny scales are based on a pulpy core encased in the bony tissue known as dentine, with an enamel-like outer coating.

Designed for abrasion resistance, they protect against damage from “mechanical, chemical and biological hazards”.

Scientists had previously assumed that vision was unimportant for environmental perception in whale sharks, because their eyes are small relative to the



MBARI

Left: The eye of a whale shark is covered in tiny ‘teeth’ or dermal denticles, and can be partially retracted without losing sight of what’s going on.

Above: Internally generated lighting-up sequence, seen in a sponge for the first time.

Right: The sponge as it appeared, rooted on the seabed.

body, and only a small section of the brain is devoted to sight.

But the level of protection for the eyes now seems to suggest the opposite.

The discovery was made by analysing ultra-sound recordings of captive whale sharks at Okinawa Churaumi Aquarium, and CT scans of a preserved eyeball.

The sharks seem to gain further protection by retracting the eyeballs into the sockets, but the scientists believe they maintain a restricted view when doing this. The retraction distance was around half the diameter of the eye, so the pupils were not completely concealed.

Whale sharks normally retract their eyes only for short periods, but one specimen that had been transferred between aquariums in Taiwan and the USA kept its eyes retracted for 10 days on arrival in Atlanta – yet appeared to have no difficulty in navigating in that time.

The study is published in *PLOS One*.

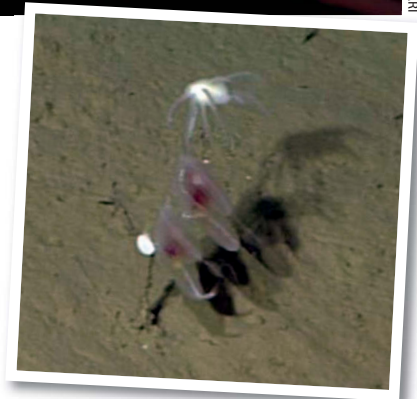
USA

First self-lit sponge found

THE FIRST INSTANCE of a deep-sea sponge able to create its own light has been reported – following a chance “touch” in the laboratory.

Scientists from Monterey Bay Aquarium Research Institute (MBARI) had deployed their Don Ricketts ROV over the 4km-deep seabed 100 miles off California when its camera picked up the sponge anchored in the mud.

Researchers had noted the unnamed species on the seabed for decades, from



the Canadian Arctic to the Gulf of Mexico and around Hawaii, but had never studied it. The specimen was brought up only to study a ctenophore on its surface.

The animal was placed in the darkened laboratory on the research vessel where, to the researchers’ surprise, a gentle touch caused it to emit a blue-green glow.

“I was working on the benthic list of bioluminescent organisms at that time and tested everything I could,” said Séverine Martini of the Mediterranean Institute of Oceanography in Marseille. “When I stimulated it, it was clearly bright and lasting for several seconds.”

Many deep-sea animals glow but sponges had been considered an exception. Some that appeared luminous turned out to contain glowing bacteria, or had eaten or been colonised by bioluminescent animals – which is how so many deep-sea animals are able to shine.

Martini, study co-author Carrin Schultz of the University of California and MBARI marine biologists have shown that the sponge contains coelenterazine, the key chemical needed to create light, as used by other marine organisms from jellyfish to cephalopods.

“This finding is pretty spectacular evolutionarily in that we don’t know

of any other sponge that has been shown to use coelenterazine, let alone clearly shown to be bioluminescent,” said Schultz.

The ROV cameras had been unable to detect light coming from the sponge and five others collected later, but a low-light video camera captured the top, filaments and stalk of each sponge glowing brightly enough when touched to be easily visible to the naked eye for 5-10 seconds.

The discovery was made in 2017, but the study was only recently published in *Frontiers in Marine Science*.

“After Séverine identified that the sponges were bioluminescent, it took us several years and three research expeditions to piece together what was going on biochemically,” said Schultz.

“In the end, all of the evidence pointed toward the sponge not using a bacterial symbiont for bioluminescence but using chemicals and enzymes from its own cells to produce light.”

The researchers now want to establish what benefit the sponges derive from being bioluminescent only on contact – whether it’s a tactic to deter predators or to attract prey – with food scarce in the deep ocean, such sponges have evolved to be carnivorous, catching passing food on tiny hooks on their surface.

powerful, highly directional sounds emitted as the whales forage.

The monitors could detect and identify the clicks from 12.5 miles away, and during a foraging cycle the whales produced foraging-type clicks 60% of the time. The results confirmed the whales to be widespread in the north-western Med, with a possible hotspot in the Gulf of Lion between Spain and France.

Twenty-four-hour monitoring in winter suggested that the whales’ foraging strategies differed between areas. In the Ligurian Sea between Italy and Corsica and in the Sea of Sardinia the clicks showed them foraging around the clock.

But in the Gulf of Lion larger groups sought intense oceanographic features, such as when storms churned up water layers to bring nutrients towards the surface from depth. For these whales, foraging activity declined at dawn.

Squid, their major prey, ascend only at night, so if they descend again at dawn it would explain the decrease in sperm-whale foraging clicks from that time.

This daily pattern suggested that the whales are “adapting their foraging strategy to local prey behaviour”, said Pierre Cauchy, lead author of the study published in *Endangered Species Research*.

“The findings also indicate a



INBAULT, PIXABAY

MEDITERRANEAN

Sperm whale breakfast timetable

SOME MEDITERRANEAN sperm whales are active around the clock, while others start their day in a laid-back way – and researchers from the University of East Anglia think they know why.

The team recorded sperm-whale clicks over a wide sea area for several months, using 1000m-rated AUVs carrying acoustic monitors that focused on the



Above: Sperm whale at the surface.

Left: One of the UEA Seaglider autonomous underwater vehicles used to monitor the whale clicks.

geographical pattern to their daily behaviour in the winter season,” he said.

The scientists reckon there are fewer than 2500 mature Mediterranean sperm whales, threatened by fishing, ghost-nets, ship-strikes, marine debris ingestion and human-generated noise.

“Increasing observation efforts, particularly in winter months, will help us better understand habitat use, and identify key seasonal habitats to allow appropriate management of shipping and fishing activities,” said Cauchy.



ANTARCTIC

‘Star Wars’ Weddell seals go ultrasonic

Above & bottom right: Divers in McMurdo Sound get close to the Weddell seals, but can’t hear all their vocalisations unaided.

Right: Paul Cziko and Lisa Munger prepare to dive under the ice.

WEDDELL SEALS can produce chirps, whistles and trills at frequencies beyond human hearing range, according to new research. The species is highly vocal, but the ability to emit ultrasonic calls had never before been identified in any of the 33 known species of seal, sea-lion or walrus.

Researchers at Antarctica’s McMurdo Oceanographic Observatory discovered nine ultrasonic call types used regularly by the seals. These vocalisations were in the 20-50kHz range – humans are able to hear only those sounds below 20kHz.

Recordings were made using a sensitive broadband digital hydrophone in the two years after the observatory was installed under sea ice in McMurdo Sound in 2017.

The researchers regularly scuba-dive to observe the seals, one of which was recorded producing the high-frequency sounds on an underwater video camera.

Weddell seals (*Leptonychotes weddellii*) range further south than any other mammal. They use their big teeth to create air-holes in the sea-ice before diving as deep as 600m for up to 80 minutes at a time to hunt prey.

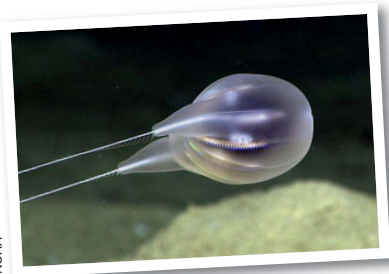
The scientists, led by University of Oregon marine biologists, have yet to confirm why the seals have evolved to make such sounds, but speculate that



UNIVERSITY OF OREGON

PUERTO RICO

Deep jelly ID: no sample required



NOAA

A NEW SPECIES of comb jelly found almost 4km deep has become the first creature to be described and named by US National Oceanic & Atmospheric Administration scientists on the basis of video evidence alone.

A team from NOAA's Office of Ocean Exploration & Research discovered the ctenophore, now named *Duobrachium sparksae*, off Puerto Rico in 2015, but only after years of analysis has it now been described in *Plankton & Benthos Research*.

Spotted on ROV footage, the jelly was recognised as new to science by NOAA scientists Mike Ford and Allen Collins.

"It's unique because we were able to describe a new species based entirely on high-definition video," said Collins. "The cameras on the *Deep Discoverer* robot are able to get high-resolution images and measure structures less than a millimetre.

"We don't have the same microscopes as we would in a lab, but the video can give us enough information to understand the morphology in detail, such as the location of their reproductive parts and other aspects."

The jelly measured about 6cm, with 30cm tentacles. "It moved like a hot-air balloon attached to the seafloor on two lines, maintaining a specific altitude above the seafloor," said Ford. "Whether it's attached to the seabed, we're not sure."

MMO IWDG



Above right: The newly described comb jelly – a video replaced the need for a specimen.

Right: 'For our next impression, a killer whale!' – long-finned pilot whales.

NOAA notes that comb jellies and jellyfish are not closely related, though both are 95% composed of water.

Comb jellies usually have eight rows of cilia that beat rhythmically, refracting light into colours as they move, preying on arthropods and larvae. Between 100-150 species have been identified.

AUSTRALIA

Orca copycats

SOUTHERN AUSTRALIAN long-finned pilot whales have developed the ability to mimic killer whale calls – and the team that made the discovery believe they use the trick to outsmart their natural predator and food-rival.

The Curtin University research was based on analysis of whale calls recorded in the Great Australian Bight between 2013 and 2017. All previous research had been carried out with Northern Hemisphere populations of the species.

Three previously unreported unique vocalisations were noted, and along with mimicry evidence was found of "duetting" between the whales. Such co-ordinated and patterned singing by two animals is common in birds and primates but rare among aquatic mammals.

Related to social bonding, it suggests that pilot whales' acoustic comms system is more sophisticated than previously suspected, say the researchers.

Lead author Rachael Courts said that mimicry could be a clever strategy by the whales "to disguise themselves from predators, including killer whales. It may also allow them to scavenge food remnants from killer whales, undetected."

She also noted that some of the calls were "remarkably similar" to those of long-finned pilot whales in the Northern Hemisphere – "which is surprising as non-Equatorial aquatic mammals such as these are not expected to cross the Equator for large-scale migrations".

The populations were thought to have been out of contact for 10,000 years-plus.

"Our findings therefore raise the question of how far these two populations' home ranges really extend," said Courts. "Now that we have some of their call repertoire documented, we can monitor home ranges with remote underwater sound recorders." The study is published in *Scientific Reports*. 

UNIVERSITY OF OREGON



they might use them as a basic form of echo-location technique, as employed by toothed whales, including dolphins.

This could help the seals to navigate beneath the Antarctic ice, where almost-total darkness prevails in winter. It could also be a means of communicating with other seals when there is excessive chatter in the lower-frequency range.

Prof Paul Cziko, lead author of a study in the *Journal of the Acoustical Society of America*, said that the calls "create an almost unbelievable, otherworldly soundscape under the ice – it really sounds like you're in the middle of a space battle in *Star Wars*, laser beams and all!"

The research team hope to find out whether ultrasonic calls are more widely used by males, females or juveniles, and how they are used while hunting.



UNDERSTANDING SHARKS



The images on the following pages were taken by shark-dedicated photographer **MARTIN STRMISKA**. How can one's career be shaped by such a maligned animal? He talks to **NIKOLA VALTOŠOVÁ** about his job

DEPENDING ON THE subject matter, wildlife photography comes with a list of challenges. Some adventurers travel great distances to reach remote, misty mountaintops and snap a photo of a gorilla in its natural habitat, or to icy glaciers to witness polar bears in the wild.

But what about chasing around the world to photograph one of history's most demonised creatures, the shark? What does it take to capture these wonders of the deep?

There are numerous shark hotspots around the globe. They range from the rugged shores off South Africa's Eastern Cape through the abandoned coastline of southern Australia all the way to the populated beaches of southern California.

With an estimated billion (or more) sharks still around in the ocean today, certain species stick out more in the public mind than others.

We all know bull and tiger sharks and, of course, great whites, and to the public they retain their generally nasty reputations, but divers know better. Many

choose to dive to photograph them, often in hopes of changing the narrative and protecting these magnificent creatures.

One such diver is Slovak Martin Strmiska who, from an early age, loved the ocean and was fascinated by marine life and the idea of scuba-diving. That love quickly grew into a career.

Today, Strmiska is a certified cave, rebreather and advanced trimix diver and a professional underwater photographer and journalist. "I've always admired sharks," he says.

"For me, they are beautiful creatures that embody the power, but also the richness, of the oceans." He has now been photographing sharks for nearly two decades, and knows his subject intimately.

In the early days before gaining experience, however, he needed to know not only how to photograph sharks but how to do it safely.

"My first close encounter was with an oceanic whitetip in the Red Sea," he tells me. "As I had more chances to observe them up close, I quickly grew accustomed to being in their presence."

My parents often say that they couldn't get me out of the water. For my 15th birthday, my father made my dream come true and we both got certified as scuba-divers and never looked back.

One day, after years of being an avid diver, I took my father's underwater camera for a spin. It started as a way to kill time at decompression stops, but in the end it changed my life. In 2005, I became a professional underwater photographer and journalist...





“I would watch their behaviour in different situations, and learnt how to read much of their body language.”

Finding out how to feel comfortable in the water with sharks was, however, only the first step. Strmiska realised that he had a long list of hurdles to overcome to maximise the quality of his photography.

“Sharks are actually very shy animals, something I don’t think many people truly understand,” he reflects.

“When I’m taking photos of them, it’s my job to convince them that I’m not

a threat, nor am I dangerous in any way.”

Once this initial foundation is laid, Strmiska is able to creep closer to capture amazing moments.

He does give one warning, however, advising divers never to look the sharks directly in the eye, because this could be perceived as a threat.

On various occasions the photographer has found himself going the extra step to get that one-in-a-million shot.

Although he has grown to feel more than safe while in the water, he does have

Above: Great hammerhead at Bimini in the Bahamas.

Below from left: Bull sharks at Bimini; oceanic whitetip at the Brothers in the Egyptian Red Sea.

one story that involves the two words that have given his quarry its fearsome reputation: “shark bite”.

“The events of this story took place on a baited dive on the Aliwal Shoal reef in South Africa,” he says. “There were dozens of good-sized blacktip sharks circling the bait-crate all day.

“In an effort to get the best shot possible, a blacktip snapping for a fish with its jaws open, I had been taking out sardines and dropping them right in front of my camera lens. This was





Above: Lemon sharks in the Bahamas.

Left: Blacktip reef sharks at Kauehi Tuamotu in French Polynesia.

Below: Silky sharks at Suakin in Sudan



actually working pretty well – that is, until it started working maybe a bit too well.

“My tactics began gaining special attention from one particular hungry female, who was going to get her share of sardines no matter what.

“When I ran out of fish, she circled back and snapped onto my forearm.

“Despite the shock of what had just happened, her bite was actually quite gentle. Her sharp teeth did, however, cut through my suit and into my skin, leaving a few gashes, large enough for one single stitch.

“When I went back to the boat to explain to the dive-guide what had just happened, he actually waved his hand at me and told me I could go back into the water if I wanted!

“Today I’m grateful for that experience, because it grew my respect for sharks and taught me how best to interact with them.

“Plus, my story completely discredits the idea that sharks are attracted to human blood in the water.

“None of these so-called ultimate killing machines went into a frenzy, nor did any other sharks try to approach me that day.”

STRMISKA HASN'T had a similar run-in with a shark since, and, if anything, his relationship with them has improved.

“There are a lot of things you can do to keep yourself safe when diving with sharks, while still taking some wonderful shots,” he says. What he has found improves his chances of getting in close is diving with a closed-circuit rebreather.

“With how skittish sharks can be, I’ve discovered that the less noise I make under water – the biggest cause of noise usually being me exhaling bubbles – the



Clockwise from left: Galapagos shark at Wolf; also in the Galapagos, a whale shark at Darwin; tiger shark at Tiger Beach in the Bahamas.

Below: Caribbean reef shark at Tiger Beach.

He believes that anyone can have positive experiences with sharks, and while a career as a shark photographer might not be for everyone, it's clear that he has found his calling.

"I am so grateful for the opportunity to photograph sharks in their natural habitat," he says. "After all the time I've spent with them under the waves, I can truly attest to how marvellous they are.

"My only hope is that my work later translates into a greater understanding of sharks and their preservation." ▣

closer I can get to them. Therefore, I dive with a Liberty rebreather, because the lack of exhaled bubbles, together with my attempts to make as few quick movements as possible, have resulted in exceptional photo opportunities on a completely different level."

Apart from – or rather thanks to – his photography, Strmiska has all but dedicated his life to the preservation of sharks. One way in which he strives to raise awareness and change people's opinions is through his campaign Silence of the Sharks.

This crowdfunded organisation aims to provide sharks with a voice and also help to end the hunting of them.

"Because of my unique photography, I was approached by several people in the shark world," he tells me.

"We decided to work together to improve people's understanding and opinions of sharks, with the ultimate goal being their preservation."

With the success of his photography and campaign efforts, he has now started another company called Ocean's

Rockstars, where he sells shark-related apparel and donates a portion of the sales to the protection of sharks.

Much of Martin Strmiska's life revolves around his love for sharks and because of that, he has managed to raise awareness of them as beautiful and misunderstood.



silenceofthesharks.org
oceansrockstars.com



IT'S A FYNE

Continuing his popular tour of the many diving attractions of western Scotland, **ROSS MCLAREN** lands up on the shores of Loch Fyne – and picks two sites that can be relied on to offer a good day out for divers



LOCH FYNE ON SCOTLAND'S west coast is probably best-known for the incredible seafood that is sold across the UK and Europe. At 44 miles in length it's Scotland's longest sea-loch and it has a maximum depth of around 200m, which adds up to plenty of opportunities for diving.

Although perhaps pipped to the title of "most-dived loch in Scotland" by Loch Long just to the east, Loch Fyne is an ever-popular destination for divers throughout the country and also from elsewhere in the UK.

It might be slightly further from the central belt and Glasgow than Loch Long, but the journey is more than worth it.

To reach the loch from Glasgow, you have to drive around the head of Loch Long and down its western bank under the impressive Arrochar Alps and the very popular mountain the Cobbler. From there you follow the A83 into the unbelievable Glen Croe.

The views from the Rest and Be Thankful at the top of the glen looking back along the road you've taken are worth the extra driving.

WITH 22 dive-sites along the loch (according to *Finstrokes*) there should be more than enough to satisfy the appetite of most divers.

Aside from Finnart (or A-Frames) on Loch Long, I don't think there's another site in

Scotland as popular as St Cats, also sometimes listed as Seal Reef or St Catherines. The name might be up for discussion but its popularity is definitely not, and once you've taken a wee dook under water it's easy to see why.

With plenty of parking and a pretty easy entry and exit point, St Cats can be really busy during the summer months – and not only with divers.

The good old Scottish midge also appears to appreciate the site, and enjoys a buffet courtesy of divers.

You have been warned, keep covered up – but the site is well worth braving our wee pests.

There are two ways to dive St Cats. The "main" dive is pretty straightforward – drop

DAY



Above: Dogfish in Loch Fyne.



beneath the surface and head directly out from the shore to reach a drop-off. It's not a cliff as such, but still an obvious drop.

From this point you head down to 8-10m and simply turn right, keeping the slope on your right-hand side. This isn't the main part of the dive but don't rush it – keep an eye out for the odd dogfish hanging around the slope.

Keep finning at about 10m and eventually you pick up the rock reef.

From there on, the depth is up to you. Follow the edge of the reef down until a steel wire crosses your path, probably at 16-20m.

This is where I would suggest starting to zig-zag across the boulder field, taking your time to

check for life in every nook and cranny. If you're looking for depth, however, swim over the top of the wire and continue to follow the reef down to your chosen level.

I've only ever been to around 40m, and though there isn't much in the way of life I have seen the odd fireworks anemone down there.

REGARDLESS OF THE depth you choose, the dive is the same. Simply zig-zag your way back up the reef, taking your time.

The rocks teem with life, and you'll often find the odd lobster hiding away.

Once you're done exploring, head back to the edge of the reef, now keeping the slope on your

left at about 10m, and fin back for about the time it took you to reach the boulders and you'll be back at the entry-point. It's as easy as that!

If you're looking for something a wee bit different there is actually the wreck of a speedboat to be found in the opposite direction to the reef.

Many people will offer bearings to reach it, but I've found that the easiest way to find it is to simply swim straight out and down from the entry-point and head to 18-22m.

From there turn left, keeping the slope on your left-hand side. Have your buddy swim at around 17m and you at about 21m (if visibility allows for that) and simply fin until you come



across the wreck. Depending on your fin-strokes, you should hit it after four to seven minutes.

The detour from the “main” dive to visit the speedboat is well worth it.

It remains pretty much intact, although the seats seem to have miraculously detached themselves, and is now home to scores of squat lobsters, anemones and, I am reliably informed, a rather large “ling” as well.

All I can confirm is that it’s something big. At the time of writing all I’ve seen is its bum, and I’ve seen that countless times but never its other end!

My suggestion for taking in the speedboat is to do it first, because once you’ve finished exploring the wreck you can head up the slope to a shallower depth and then back along keeping it on your right.

This will take you back to the entrance, but if gas/dive plans allow you can then continue to the “main” reef and do a slightly shallower zig-zag, checking out the boulders once again.

IT SEEMS TO BE a fairly common name for dive-sites in Scotland, but Anchor Point in Loch Fyne must be one of the “finest”. Sorry about that.

A good 20-30 minutes further down the loch from St Cats/Seal Reef, the added drive is more than worth it for this dive.

Again, parking is fairly good at the side of the road, with a really easy entry and exit to the site.

This dive isn’t quite as straightforward as the one at St Cats (I might have got slightly lost last time I was there, but thankfully my buddy didn’t).

Above from left: Hermit crab; sealoch anemones and sea-squirts; a passing jellyfish.

Below, from left: Colourful lobster; divers’ entry point at Anchor Point.

Other Loch Fyne shore-dives:

Thirteen Mile Reef; Triple Reef; Gortain Point; Gortain Croft; Seilich; Feather Star Reef; Furnace Tea Rooms; Dogfish Reef; Furnace Quarry; Stallion Rock; MoD Reef; Midletters; Kenmore Point; The Creggans; Strone Point; St Catherines Pier; Drishaig Reef; Cairndow View

Gas fills: Aquatron (Glasgow); K-Dive (Coatbridge); Puffin (Oban); West Coast Diving (Knockentiber)

Post-dive refreshments:

Quarry View Garden Centre & Loch Fyne Oysters (Furnace); Cairndow Stagecoach Inn; Green Kettle Inn B&B (Garelochhead); Ben Arthur Both & The Pit Stop (Arrochar)



From the big rock on the right-hand side of the beach that makes a good perch for kit, head into the water and then roughly north-west down to about 16m, where you should reach the top of the wall.

Follow the wall down to about 30m and then zig-zag back up the cliff-face.

The rock is alive with squat lobsters, the odd lobster and there’s even a rumour that a conger eel hides in the cracks.

It’s a very different dive to the one back up the road at St Cats. The “cliff” adds

some interesting underwater topography, and the wall is an impressive sight to behold.

Loch Fyne, like Loch Long, is very much over-shadowed as a tourist attraction by the more popular Loch Lomond nearby.

For divers, however, both lochs offer not only natural topside beauty that in my opinion rivals that of their more famous neighbour, but also an abundance of adventure below the waterline. ◀



MORE DOWNTIME

Lost diver re-enactment in *I Shouldn't Be Alive*.

THE UK OFTEN SEES A SPIKE in diving accidents at certain times, such as the Easter weekend, when a lot of divers return to the water after a winter lay-off, although last year was rather different, as divers returned cautiously to the water in the height of summer.

One legacy of the coronavirus pandemic has been to open our eyes further to the possibilities of diving in the virtual world, and for those concerned with safety the Internet's educational sites repay a browse. Some excellent safety resources for all divers exist outside those provided by the training agencies.

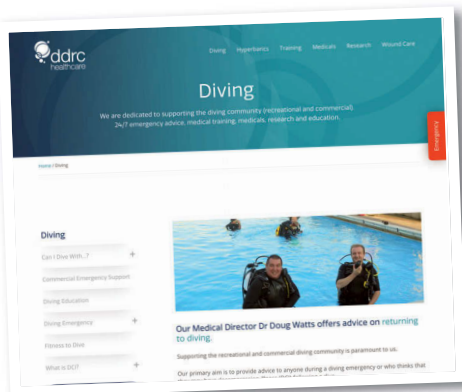
The mission statement of the **Diving Diseases Research Centre (DDRC)** reads "to promote the benefits of safer diving practices and of the wider applications of hyperbaric oxygen in general medicine through service delivery, awareness-raising, training and research."

Its website is packed with useful information, such as straightforward explanations of DCI causes, signs, symptoms and treatments.

Information and flow-charts help you to understand and manage the procedures to be followed should you be involved in a diving accident, either as victim or witness.

I was fazed by some of the things I learned, having fallen into the complacency trap of assuming that nothing much had changed in the protocols since I was an active instructor a quarter of a century ago. Duh.

DDRC also posts a number of accident scenarios as discussion points. The whole lead-in to what went wrong through to the outcome is broken down as a case study from which to learn.



Last time **STEVE WARREN** surveyed the online world of diving last July he concentrated on entertainment, much of it from the early days of scuba. Now he turns his attention to some of the freely available and invaluable lessons in safety

There are also many interesting studies into aspects of recreational diving we might not normally consider, from flying to mental health, alcohol and drugs. ddrc.org/research/divingresearch

Divers Alert Network (DAN) has published some extremely informative and thought-provoking filmed lectures online. Perhaps one of the most important, because the dangers are little understood and often glossed-over, is addressed by Dr David Charash.

His discussion of **Children in Diving** should, in my steamroller view, be required viewing before signing up any child to a scuba class. **YouTube Search: David Charash Children and Diving**

Another doctor, Michael Strauss, takes up the



complementary topic of **Aging and Diving**, one that's becoming increasingly relevant to boomers like myself. Luckily, it's mostly positive. **YT Search: Michael Strauss Aging and Diving**

Diver Fatalities: How Good Divers Get into Bad Trouble is presented by Dan Orr, something of a legend in US diving. He first dived in 1958 and is an ex-CEO and president of DAN.

He has also worked extensively in improving cave-diving safety. His overview of why divers get into trouble – and Orr emphasises that none of us, regardless of certification level and experience, is immune – provides the solutions that can keep us far safer.

It certainly reminded me of some of my own



attitudes and skills that needed sharpening up.

YT Search Dan Orr Diver Fatalities

Back in the UK, Gareth Lock has been doing sterling work promoting diver safety in recent years, and he offers a one-hour online fundamentals course based on his pioneering human factors research.

You do have to pay for these courses, but a free and important contribution to diver safety comes in the form of Gareth's recent documentary *If Only...*, deriving invaluable lessons from the tragic death of a rebreather diver. thehumandiver.com/ifonly



Bryan Bugge and his widow Ashley in *If Only...*



Controversial in some quarters for the restrictions it imposes on professional divers, the **Health & Safety Executive's** role is to prevent accidents at work. As part of its remit, the HSE has commissioned a number of important dive-safety studies.

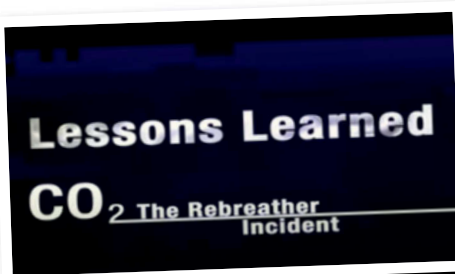
Investigating the Relationship between Simulated Depth, Cognitive Function and Metacognitive Awareness was co-authored by my old friend Sam Harding and Dr Phil Bryson at the DDRC. This study into the effects of narcosis resonated with me because, in my 40-odd years of diving, the only time I've ever felt that I might die under water was the result of a narcosis hit.

Soberingly, Sam tells me that she has detected nitrogen diver-impairment at depths as shallow as 6m. [hse.gov.uk/research/rpdf/rr256.pdf](https://www.hse.gov.uk/research/rpdf/rr256.pdf)

Another highly enlightening study was carried out by HSE staff including Nick Bailey, previously an engineer for Scubapro.

Although **Performance of Diving Equipment** was published in 2006, when I visited Nick at his HSE test centre in 2017 it was clear that the problems the report identified were still relevant.

For example, checks found that nearly half of divers' used regulators tested no longer met EN250



Rob Hewitt: *I Shouldn't Be Alive.*

breathing standards, the legal minimum for them to be sold new in the UK. Reasons for this included lack of proper after-dive care by owners and inadequate servicing. But another insidious issue was divers adding incompatible accessories.

On my visit Nick showed me a top-of-the-line regulator that could not meet EN250 beyond 18m simply because a cheap hose from the Far East had been installed in place of the CE-verified original. [hse.gov.uk/research/rpdf/rr424.pdf](https://www.hse.gov.uk/research/rpdf/rr424.pdf)

If Only... is not the only CCR case-study out there. Kevin Capon is ex-military, and fastidious in his pre-dive preparation. He pursued a post-forces career as a professional news photographer and cameraman, and **CO₂ The Rebreather Incident** is an HSE film that breaks down how he nearly died while filming under water for Sky News.

Among the experts interviewed is Simon Pridmore, diving techniques columnist for **DIVER**. What is particularly striking is that Kevin did everything precisely as his closed-circuit rebreather instructor had taught him. It was unfortunate that he had been taught to do the wrong thing.

I encourage all diving students to read training manuals thoroughly and, especially, to check they really have completed all the pool and open-water work exactly as laid down in the book. Instructors, me included, do make mistakes and I've seen many cut corners. Kevin nearly died because of instructor error. **YT Search: Kevin Capon Rebreather Incident**

The Royal Society for the Prevention of Accidents (ROSPA) has also produced a short video on rebreather safety that, inevitably, also touches on the issue of poor instructors.

The film includes interviews with training-agency representatives and the highly respected



technical diver Rich Stevenson. **CCR Aware – Safety, Advice and Information for New and Prospective CCR Divers** is an excellent rebreather primer. [rospa.com/Leisure-Safety/Water/Advice/Rebreathers](https://www.rospa.com/Leisure-Safety/Water/Advice/Rebreathers)



Time and again, divers get lost at sea. In the February 2020 issue of **DIVER** I called the Nautilus Lifeline personal locator beacon "one of the most important safety aids ever made for divers".

I Shouldn't Be Alive, Dive of Terror, re-enacts the ordeal of Navy-trained diver Rob Hewitt, who endured four days drifting off New Zealand's North Island after a current separated him from his boat. Consider it a 40-minute plea for owning a PLB. **YT Search: This Man Survived 4 Days Lost At Sea**

Getting lost can happen while under water too, of course, especially on unguided dives. The National Association of Scuba Educators (NASE) provides a great video tutorial on **Compass Navigation** – all of which can be done on land.

YT Search: NASEWorldwide Compass Navigation



Kevin Capon in *CO₂ the Rebreather Incident*.

The diving industry sometimes shies away from discussing safety openly but ignoring the risks and tolerating poor training and diving practices invites incidents and fatalities – and that's what really gets diving the bad press. ☐

McCREADY BEYOND THE OUTER LIMITS

Deep Hostage
by Mike Seares

THE THIRD IN Mike Seares' John McCready thriller series is outrageous. By any standards.

Last month I reviewed the entire set of AJ Bailey thrillers by Nicholas Harvey, the other dive-fiction writer to have captured my imagination recently. Those indie books are easily relatable for divers, and they do thrill, but compared with the work of fellow-diver Mike Seares they're almost as low-key as real life.

In the hefty *Deep Hostage*, Seares really goes for broke. It's all high-gloss action, its plot soaring cheerfully over the top and, like the previous two McCready volumes, it's a scream-out to Hollywood to come and turn it into a blockbuster movie.

And if after the Covid pandemic Hollywood still has the appetite and budget for all the flash hardware, simulated floods, crashes, explosions, underwater and aerial action sequences the screenplay would require, I'm sure it would be tempted.

McCready is every square-jawed British action hero rolled into one. Naturally he is an accomplished scuba-diver and his main business seems to be developing underwater vehicles, but there are few limits to his accomplishments (though deep thinker might not be high on the list).

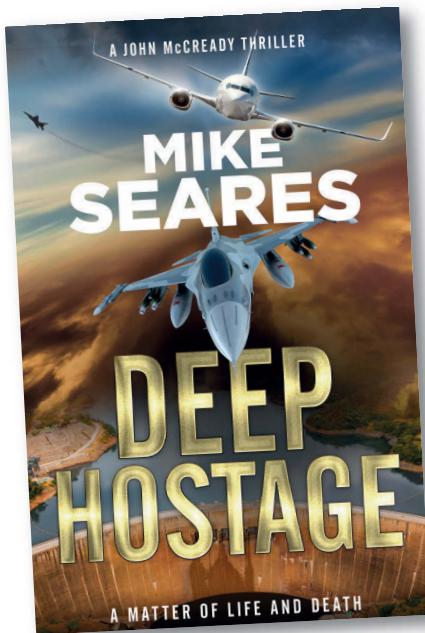
This time he finds time for romance with the world's most famous film star but seems happier when the going gets tough, a capital city needs saving and he can slug it out with world leaders and brutal terrorists in a flooded conference centre.

Scuba is an element but far from the major one in this plot. Although there is plenty of underwater action, much of it is vehicle-based.

In fact the book left me reeling from its relentless parade of transport technology, which I imagine reflects a fascination on the part of the author that might well surpass his interest in people.

So we have lovingly described action involving characters in submersibles of various sizes, DPVs, cars, helicopters, aircraft, cruise-liners and even the International Space Station, for crying out loud.

The cutting-edge technology also extends to "hemofilters" that appear



to stave off the threat of the bends in divers very effectively, even if having to plug them directly into your veins sounds uncomfortable.

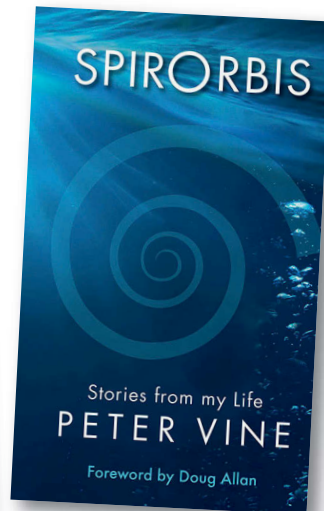
There's a high body count and plenty of collateral damage along the way, though mercifully we don't have to worry about clearing up behind these heroes and villains.

As ever in the McCready universe I happily suspended all disbelief (you have little choice), plunged into *Deep Hostage* and enjoyed the ride.

The last page contains a little teaser for the next book, and I'm sure I'll do the same with that one.

A digital box-set containing *Deep Steal*, *Deep Impact* and *Deep Hostage* is now available at £9.99.

mikesearesbooks.com
ISBN: 9780995733985
Softback, 480pp, 13x20cm, £11.99
Digital (Amazon, Apple, Kobo) £4.99



HEART OF THE MATTER

Spirorbis: Stories From My Life
by Peter Vine

SSOME READERS might remember that Peter Vine wrote a *Deep Breath* column for this magazine a few years ago – a good-natured look at the difficulties he has encountered diving with Parkinson's disease.

He has reached that stage of life when people look back to assess their achievements – in his case motivated by discovery of a box full of yellowing letters, photos and press-cuttings.

The great wildlife cameraman Doug Allan points out in his insightful foreword that his old dive-buddy has chosen to recall his life through stories from its very diverse stages, as opposed to a joined-up flow.

This approach works OK, though I think it has limitations. For instance, rather than an overview of his upbringing, what we get is a series of long diary entries covering boating exploits Vine shared with his family, full of unfamiliar names and places.

This does establish that the sea was in his blood, but it isn't a welcoming

way into an autobiography.

As Allan observes, Vine has never been afraid to reinvent himself, and later sections of the book cover parts of his life in which he worked first in aquaculture and then as a producer of books and World Expo displays, mainly for Middle Eastern countries.

He is clearly proud of his success in publicising Gulf states that could do with some positive PR today, but these sections turn into a catalogue of achievements that might well be of limited interest to divers.

That said, the meat in this unusual sandwich of a book is very tasty. The *spirorbis* of the title is an insignificant creature, a type of tubeworm, and we never learn that much about it. Vine makes no bones about the fact that it made a handy specialism when he started as a marine biologist, and was his meal ticket to visit – and dive in – many exotic parts of the world.

He always seems to be diving in to pick up *spirorbis* specimens that lurk everywhere under water, blessing them as his passport to adventure.

At a time in the 1960s and '70s when most UK scuba-divers would be dipping into home waters or, at best, parts of the Med, Vine was ranging all over the world, especially the Pacific, Indian Ocean and Red Sea.

This was also a time when people would dive to 60m and beyond on air without giving it much thought, and some of his exploits, particularly with Doug Allan, are truly mind-boggling in health & safety terms.

The heart of this book has plenty for divers to enjoy, if they're happy to take in the non-diving stuff along the way. It's moving, funny and packed with amazing stories: gems like his solo wreck dive in the Solomons, or the *Lady Jenny V's* encounter with the Sudanese Navy in the Red Sea, worth the price of admission alone.

Though I'm bound to seek out the diving content I found the bulk of *Spirorbis* fun to read, because Vine is such a good writer. You should find yourself carried along quite happily, looking out for all the gold nuggets.

Artisan House Publishing
ISBN: 9781912465088
Hardback, 374pp, 16x24cm, £20
Kindle £7.65

Reviews by Steve Weinman



TOP 10 BEST-SELLING SCUBA-DIVING BOOKS

as listed by amazon.co.uk (23 February, 2021)

- 100 Dives of a Lifetime: World's Ultimate Underwater Destinations, by Carrie Miller & Brian Skerry
- The Third Dive: An Investigation Into the Death of Rob Stewart, by Robert Osborne
- Deco for Divers: A Diver's Guide to Decompression Theory and Physiology, by Mark Powell
- Fifty Places to Dive Before You Die, by Chris Santella
- Diving Bermuda, by Jesse Cancelmo
- Reef Life: An Underwater Memoir, by Callum Roberts
- Diving the Thistlegorm, by Simon Brown, Jon Henderson, Alex Mustard & Mike Postons
- Underwater Foraging – Freediving for Food, by Ian Donald
- The Last Dive: A Father and Son's Fatal Descent (audiobook) by Bernie Chowdhury
- Fishes of the Maldives, Indian Ocean, by Rudie H Kuiter & Tim Godfrey

WELL AND TRULY TESTED



The ideal for divers is heavyweight performance from lightweight, compact and flexible equipment, reckons STEVE WARREN. Would a mid-priced reg meet that brief?

REGULATOR

MARES DUAL ADJUSTABLE 62X



MARES OFFER AROUND A DOZEN regulators, including speciality models such as under-arm and sidemount designs.

The Italian brand takes a mix-and-match approach to first and second stages, so you can choose a combination that you especially like if it's not offered as a standard package.

The Dual Adj 62X is in Mares' middle-price range. Over the past three years I've tested a number of Mares regulators across the price spectrum and found each one an excellent breathe. Most of them incorporate patented features to improve performance and this one is no exception.

The First Stage

The 62X in the partnership is compact and nicely finished, with a satin look. It's a balanced-diaphragm type, in which breathing effort isn't really influenced by falling tank pressure. Air delivery remains almost constant

pressure. Air delivery remains almost constant



until your tank is nearly empty.

Within the first stage, medium pressure has to drop before the air begins flowing to the second stage.

A spring tries to open the first-stage valve and allow air through to the mouthpiece, opposed by another spring in the second stage of equal strength to keep the valve closed.

If these forces weren't balanced, the regulator would freeflow constantly.

Inhaling lowers or unbalances air pressure in the second stage, part of which helps to keep the second-stage valve shut, and now the higher-pressure air in the first stage can flow along the hose and into your mouth.

However, all along its path the air is in contact with the internal surfaces of the regulator and hose. This impairs performance by creating drag that drops pressure progressively.

The effect is exacerbated by depth, because the gas you're demanding becomes much denser, and by sharp breaths that cause eddies to disrupt flow.

Air-flow is also rendered less efficient by corners around which the air must pass inside the regulator body, as well as longer hoses.

All regulators and the divers breathing from them are subject to these simple laws of physics.

To reduce these effects, Mares employs DFC (Dynamic Flow Control) in its first stages. It's basically a venturi system, similar in principle to how the venturi effect works in a second stage.

It routes air through the first stage so that it creates a vacuum, which Nature famously abhors. Air behind is pulled along by the air moving ahead to fill the space.

This is claimed to help maintain the air's momentum and reduce pressure loss.

In the 62X, like some other less-expensive Mares first stages, not all the mp ports are fed by DFC. Only the designated port for the primary second stage offers it.

It's common sense to want the easiest breathing possible from your primary and octopus, and to have no restrictions on the ports into which you can plug your whips.

For example, if you use a combined safe second and direct feed, it needs to run from the left, while many octopus-users prefer to lead from the right.

Many regulators have port arrays where one outlet will outperform the others. What really counts is how much air the reg can pass, and how easily a diver can obtain it in a sharing emergency. Can the Dual Adj 62X cut it if things go wrong? Keep reading.

There are four mp ports, all slightly angled to help hoses curve naturally, and an hp port on each side for a transmitter and/or SPG.

Mares Auto Sealing Technology keeps water out of the 62X if you forget to fit the dust-cap before washing it.

The 62X meets and, presumably, exceeds the highest of the standards required of regulators sold in the EU and UK, EN250A.

These machine tests use a high rate of 25 breaths per minute and a volume of 2.5 litres.

Left: The compact and lightweight first stage makes packing and travelling easier.



The first-stage inlet is protected by Auto Sealing Technology, so won't leak if dropped in a dip tank without cap.

A maximum inhalation and exhalation effort is defined in joules. This surface-air volume figure, adjusted for depth, means that the reg must pass a mass of air of 375 litres per minute for one diver at 50m, or 500 litres for two divers sharing a safe second at 30m. EN describes this as a moderate breathing rate.

The 62X is also coldwater-certified for water as cold as 4°C, again achieving the EN standard of 5min at the single-diver breathing rate at 50m without freeflowing.

However, the first-stage spring that flexes to open the valve is exposed to the water, and in that respect the 62X is not environmentally sealed. Ice and silt could congeal around the spring under extreme diving conditions.

Mares offers additional environmental kit to entirely seal off the spring chamber from the water. Adding this should reduce maintenance costs for those diving in heavy silt, and prolong the regulator's anti-freezing qualities in very cold water.

The Second Stage

Lightweight with a technopolymer casing, the second stage uses Mares' Vortex Assisted Design venturi system, which dates back to the 1970s. Venturis create a depression in the air-flow path that causes a vacuum. Air in front sucks air behind after it.

In a second stage, you breathe in against a slight vacuum throughout



Second stage bi-material purge button and adjustable breathing comfort knob.

your breath, which takes effort.

The first part of your inhalation is called cracking effort – it opens the valve to get the air flowing. After that effort reduces but is not eliminated, so you must still suck to keep the air flowing. A venturi is essential in reducing this effort to the bare minimum.

In the VAD model, air is spun creating a vortex, which Mares claims improves the ease of

breathing by enhancing the venturi effect.

It also makes the inevitable cooling that occurs during inhalation take place further away from the second-stage valve than other designs. This helps to keep the valve ice-free on coldwater dives.

Cracking effort is kept low by balancing the second-stage spring with air. Pneumatically balanced second stages were once the preserve of high-end regulators but are becoming common on lower-priced models.

They overcome the problem of the spring that keeps the second-stage valve closed being of fixed strength.

To prevent freeflows on deeper dives, the spring needs to be stronger than is needed in the shallows. This increases inhalation effort.

By surrounding the spring with air the pressure of which can be varied automatically with changes in depth, a lighter spring can be used, minimising cracking effort throughout your dive.

You can adjust the cracking effort using a dial, hence Adjustable or Adj. Making your regulator harder to breathe from is not something that should ever be done without a very good reason.

There is no pre-dive/dive switch. Bravo, Mares – I hate those things!

In Use

The compact first stage means that you might have to remove the primary second-stage hose to install another mp hose beside it, as I did to fit the safe second.

The DIN connector is nicely ribbed and very easy to do up and remove with wet hands.

My first dive with the Dual Adj 62X was to around 30m, at a steady finning pace. I was struck by how comfortable the second stage is – I was barely aware of it.

I think this is a

combination of the unit being almost neutrally weighted under water and a nice mouthpiece, plus use of a flexi-hose.

However much I twisted my head, there was never any strain on my jaw from the hose binding.

You can sip air, with no real feeling of inhalation-resistance. The exhaust T is very good indeed at leaving your field of view clear of bubbles. The purge is easily activated with or without gloves.

Accidentally insert the second stage upside down, as can happen in the confusion of a sharing situation, and it clears completely with a normal exhalation.

Air for Two

To earn the suffix A on the EN250 certification, a regulator must not only support one diver breathing moderately hard at 50m, but two divers breathing from the primary and octopus or auxiliary second stage at 30m. This important modification to EN certification arrived in 2014.

Most recreational divers pack a safe second, so the A certification carries some weight.

The Dual Adj 62X is breathing-machine-approved for octopus use, but our reviews include a manned test.

The idea is to balance the objective computer read-out from the lab with the subjective views of humans literally breathing under pressure. We try to "beat the lung", or demand more air than the regulator can actually supply.

My buddy was Dennis Santos, a dive veteran of 50 years with considerable recreational, military and salvage-diving experience.

At 30m we hugged a shipwreck and fanned like crazy to force up our breathing rates.

Gibraltar was under lockdown, restricting the size of our dive-team, so it wasn't possible to perfectly monitor our gas use. Previous tests suggest that we do briefly hit the 500 litres per minute standard EN250A requires, though we can't measure work of breathing.

What we can do is describe how easy a breathe the



The ports are angled to guide hoses neatly and reduce binding.

regulator provided.

Breathing from the DFC-fed primary, I was

aware of the physiological effects of the CO₂ build-up this test always creates, but I felt that the Dual Adj 62X was giving me all the air I could ask of it without restriction.

Dennis, using a matched Mares Dual Adj octo led from a standard outlet, was forthright when we surfaced. "That regulator is fantastic," he enthused, "it just threw all the air at me I wanted." So yes, it does cut it in an emergency.

Conclusion

The Mares 62X Dual Adj is a superb regulator. The compact first stage and lightweight second stage belie a heavyweight performer.

I highly recommend it. ■

SPECS

PRICE ►► £377, octopus £161

FIRST STAGE ►► Balanced diaphragm

PORTS ►► 2hp, 4mp

SECOND STAGE ►► Pneumatically balanced, downstream, adjustable

WEIGHT ►► Yoke 953g, DIN 779g

CONTACT ►► mares.com

COMPUTER OCEANIC F10 FREEDIVING WATCH



OCEANIC HAS BEEN A DRIVING FORCE in scuba computer design since the mid-1980s. For decades it provided other dive brands with computers to sell under their own labels.

Among its line are computer-watches, a little smaller and less conspicuous than traditional dive-computers so suitable for everyday wear.

With the continuing expansion of breath-hold diving, it was an easy segue into providing a dedicated watch-styled freediving computer, the F10.

I used the word “dedicated”. Who needs such a computer? After all, many scuba computers have a Freedive mode.

The answer is twofold: not every freediver cares for scuba-diving, and the F10 has features and benefits beyond those usually included in scuba computer freediving capabilities.

The Design

The F10 passes easily as a generic digital wristwatch and has a useful choice of time-keeping functions. It's operated by four buttons.

Menu selection is made as with other Oceanic dive-computers: a combination of pressing buttons to select modes, enter sub-menus, choose a setting and save it.

Getting it right requires you to press and hold buttons for shorter or longer times, a bit like Morse code using a dot and a dash. It doesn't take long to master and Oceanic provides a small waterproof prompt slate to help if you get stuck.

An extension-strap is included for those using thick suits and gauntlet-style gloves.

There is also a tool to enable users to change their own battery. An optional cable allows you to change functions using an app and download your dive-logs.

In Use

I took the F10 on a snorkelling week to Lanzarote. I've been a snorkeller since I was six, over a half-century ago now, and I still love it!

The F10 has a lot of features, and as I went through the 30-odd-page PDF, having the slate alongside helped me to keep track of which button to press when, and for how long.

It took a little longer to get comfortable with the F10 because I was dealing with both watch

Additional log showing time of day of dive and water temperature.

and computer menus. I had a couple of false starts setting menus, entirely normal for me. I'm just crap with crowded diagrams – I never got to add the doors on some flatpack furniture because the “join A to B avoiding X using C” child's sketch did my head in. Ordinary people will find the manual easy to follow.

I have poor near vision too, and the F10, despite being slimmed-down for use as a watch, has big high-contrast digits and cleanly laid-out displays.

I never needed to reach for my reading glasses, except to see the mode legends printed next to the buttons. I had to memorise these.

Only three buttons are used to access and set menus, and the last just turns on the backlight. The buttons, even with 5mm gloves on, are easy to press.

As for watch features, you can choose the usual time and date displays, such as 12 or 24hr clock and English or American day/date layout.

For travelling you can set a second time zone and make it more or less prominent on the face as you prefer. There is also an alarm clock function and, to keep fit, a stopwatch, countdown timer and five-lap recorder.

The F10 automatically switches into Freediving mode and begins monitoring and recording your dive once you descend below a depth you set. This can be 0.6, 1.2 or 1.6m.

The shallower depths might be useful if you're training in the shallow end of a pool, for example, but 0.6 could activate the computer if you were reaching into a deep dip-tank to rinse a camera, or resting at the surface with your arm dropped.

You can preset alarms to inform you when you cross as many as three intermediate depths during descent. The third alarm can be considered a warning that you've passed the maximum pre-planned depth. I don't think these work in reverse, alerting you as you ascend.

There's also an option to add another depth alarm that sings out if you descend by a certain amount – say every 5m. You can also set an alarm for when you reach a maximum preset dive-time.

These alarms, if you pay attention, can stop you becoming dangerously distracted by taking pictures or stalking fish.

Under Water

In Lanzarote the water was rough all week, so I concentrated my dives in a relatively small area. The deepest I dived was 13m.

The F10's screen is supremely clear, simply indicating current depth and elapsed time. If you set your alarms to audible, they beep and also activate an LED on the outside of the casing.

The LED is easy to see, even in bright light, but

I struggled to hear the audible alarms, a problem I had with another freediving computer I tested on the same trip. I wasn't even wearing a hood, though there was a lot of background noise from breaking waves.

In calmer water I sometimes, but not always, heard the F10 beep. If you're watching the screen, visual warnings flash up.

Years ago, I spent a day pool-training with freediving champions Aharon and MT Solomons. Timing breath-holds and, especially, surface intervals, was key to progressively prolonging dives. Today's freedivers have tables they follow to adapt their physiology for apnea.

I've marvelled at my friend Jamie Watts making multi-minute descents with grace and ease.

Jamie depends on breathing-up exercises between dives. I'm not a natural and discovered something interesting about myself using the F10. The computer can measure your surface interval between dives and lets you know when the time you've programmed in is up.

Termed Surface Recovery Time, this helps you to maintain your own breathing-up regime.

I set 2min, though again and again I wanted to dive before the time was up.

The F10 helped me to pace myself. I can see that this feature has value as a training aid and, in



Basic diving display, showing current depth and elapsed dive time.



Display on surfacing, showing maximum depth, elapsed dive time, time on surface and dive number.

the field, as a reminder to slow down.

I didn't freedive at night. With no lights on Charco Del Palo's natural lava pier, and the waves likely to run you aground if you miss the ladders, discretion seemed the better part of valour, and I was keen to avoid a mauling.

In an unlit swimming pool the backlight worked extremely well. As with other Oceanic computers, you can set how long this remains on after you press the button. I chose 10sec to give me plenty of time to assimilate the read-outs.

On the surface, along with counting down your surface interval and alerting you if you've selected the Surface Recovery Time alarm, you'll see a record of your maximum depth, elapsed dive time and dive number.

Go further into the F10's log and you'll get additional information such as surface interval between descents, date and time of day and temperature. You can also see how your depths changed during the duration of each dive.

The F10's built-in memory can record 99 dives. After that it deletes the oldest one in favour of the newest. It also records your longest-ever dive, deepest dive and average depth in History mode.

To save your log to a computer, you need to invest in Oceanic's download cable and install its software.

Conclusion

This comprehensively specified computer will suit serious freedivers keen to improve their performance. The menu is quick to master and the displays cleanly and boldly presented. I like that the battery is owner-changeable. Highly recommended. ■



Entry to Freediving mode menu.

SPECS

- PRICE ►► £356
- DIVING DEPTH ►► 100m
- BACKLIGHT ►► Yes
- BATTERY ►► User-changeable
- CONTACT ►► oceanicworldwide.com

BOOT SCUBAPRO DELTA 5

HEAVY DIVE KIT AND SLIPPERY SLOPES can make you uneasy on your feet. In Gibraltar, where I conduct most kit-testing, such a slope leads down to Rosia Bay, the harbour into which Admiral Nelson's body was delivered after his posthumous victory at Trafalgar.

That slope has already rolled one diver, resulting in a broken arm, and I treat it with respect. It's not somewhere I want to lose my footing.

On my last trip, I replaced the chlorine-stained, delaminating and holed wetsuit boots I'd worn for the past 10 years with a pair of Scubapro Delta 5s from Dive Charters, Gib's only dive-centre, which has often supported **DIVER** tests. And, yes, I paid full retail for them!

The Design

The Delta 5 is a hard-soled boot with double-lined neoprene 5mm uppers. It features wraparound plasticised panelling over the toes and around the heel. This helps to prevent wear from your fins' foot-pockets and heel-straps.

For a better kick, the stippled finish also provides a non-slip grip that stops your fin from yawing on your foot. The heel features a chunky retainer tab to stop your fin-strap slipping off.

The boots are zipped, making them easier to don and doff. An expansion gusset behind the zip prevents water flowing into the boot through the teeth, which would cause heat loss.

A nice touch is a Velcro tab that stops the zip opening by accident. All seams are dry-stitched, further reducing flushing.

But in use, what really surprised me was how much better the Delta 5s proved to be on that

treacherous slope when wet than my old boots.

The tread on the Delta 5 sole is a very different pattern to that on those boots,

which had traditional edge-to-edge ribbing. The Scubapro sole combines grooves with a series of forward- and backward-facing V-shaped ridges. I felt that traction was noticeably superior.

Conclusion

I did a lot of heavily laden walking on that trip and the Delta 5s proved to be warm, comfortable and non-slip. Highly recommended. ■



Right: The non-slip sole pattern proved highly effective on wet slopes.

Left: The zip opens wide for easy donning and doffing and has a security tab to prevent it coming undone. Expanding gusset prevents flushing.

SPECS

- PRICE ►► £38
- SIZES ►► 3XS-4XL, or 34/35-48
- CONTACT ►► scubapro.com

NEW BUT UNTESTED

The latest kit to hit the dive shops



Scubapro Everflex Seal 5/3 Hood <<<<

Its full name is the Everflex Seal 5/3 Hood without Bib and with Face Seal, and Scubapro reckons it to be a real head-warmer. Thick neoprene is used to reduce heat-loss from your skull, while thinner, more supple neoprene provides comfort around your throat and jawline. Silverskin creates the face-seal and a baffle automatically exhausts trapped air without allowing cold water in. It costs £41.

>> scubapro.com



Cressi Aviator BC >>>>

Weighing in at around 2.5kg, the £404 Cressi Aviator is a classic-styled jacket BC aimed at the dive-traveller. The backpack folds, keeping the Aviator compact for packing. Technical features include integrated weights, three dump-valves, cargo-pockets and metal D-rings. A padded spine and swivelling shoulder-buckles are designed for comfort.

>> cressi.com



O'Three Octopus Hoodie >>>>

O'Three has added this hoodie to its signature leisure-clothing line, intended for casual wear at and away from the dive-site. The company is keen to emphasise that its manufacturing is climate-neutral. The garment costs £40.

>> othree.co.uk

Isotta A7s Mk111 housing <<<<

Sony's professional A7s Mk111 full-frame mirrorless camera boasts a 12mp sensor and 4K video capture, and divers can take those capabilities under water in Isotta's new housing. It features aluminium and stainless-steel construction for durability and double O-ring seals for security. An extensive line of locking ports accommodates a choice of lenses, and optional accessories include strobe connectors, viewfinders, monitor housings and vacuum testers. Prices start at £2360.

>> mikesdivecameras.com



Mares Metal Buckle SS316 <<<<

Built to be strong, corrosion-proof and functional, this £35 buckle has two small winglets that need to be pressed simultaneously for it to separate. The catches are shaped to be snag-free, to eliminate tangling on hazards such as fishing- or guide-lines.

>> mares.com



D Luxe Evo Tank Strap

These new tank-bands from Nautilus are made for carrying stage cylinders and rigging sidemounts. You can choose from different lengths to fit popular cylinder diameters, as well as some Suex scooters, and 4 or 6cm widths. A choice of colours allows for identification or just looking cool – even camo is available. The bands cost £18 each.

►► nautilus.uk



Fourth Element RF1 Freediving Suit ►►►

This suit, in men's and women's fits, is a departure from standard freediving suit designs, with its back-entry zip and internal nylon lining rather than open-cell neoprene. These features are claimed to make the RF1 easier to don and more rugged. A combination of neoprene materials, including Glideskin, are said to ensure that the RF1 conforms to the body shape, minimising flushing and maximising freedom of movement. This 3/2mm suit costs £350.

►► fourthelement.com



William Wood Red Watch ►►►

Fire and water do go together: William Wood's Red Watch is a 100m-rated timepiece for divers who want to sport a very different look. Recalling the history of the Fire Service, you'll find the dial trimmed out with station-officer rank insignia and the chequered trim seen on fire-engines, while the second hand carries a fire-bell chime indice. Even the strap is made from fire hose. The 316 stainless-steel case can be ordered with a Japanese or Swiss automatic movement, there's a one-way bezel for recording dive-times and Super-LumiNova markings make it easy to read in the dark. The Red Watch costs £695.

►► williamwoodwatches.com



NEXT ISSUE

Seamounts of the Azores

Your guide to these amazing Atlantic diving hotspots

Breath-Hold Cave

Marcus Greatwood's freedive team haven't been idle

Maldives Escape

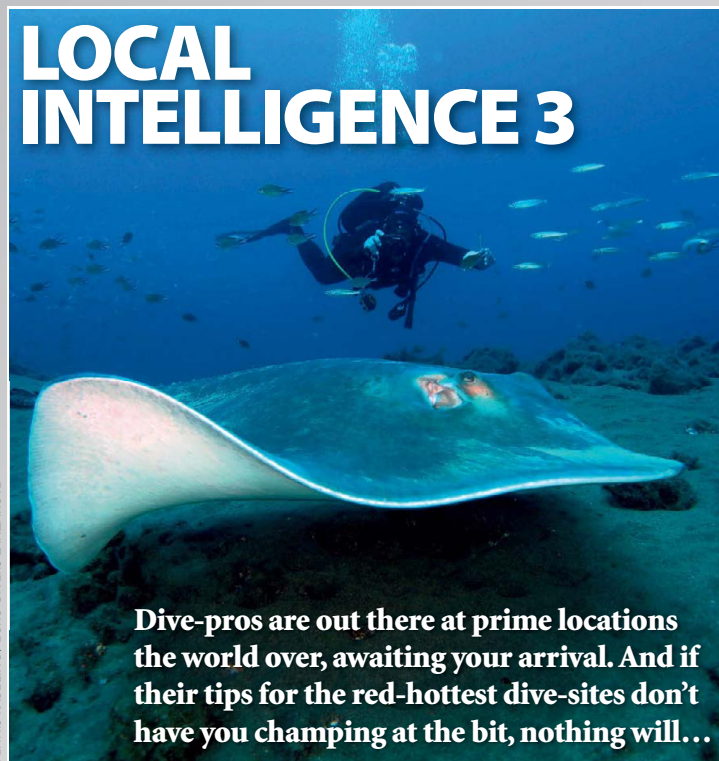
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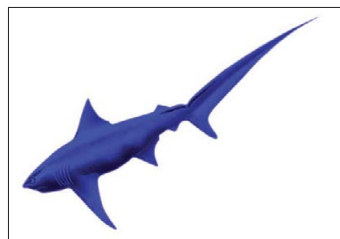


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Venture Dive Charters. For quality diving from Plymouth, visit: www.venturecharters.co.uk or Tel: 07948 525030. (73533)

DIVING MEDICALS

Diving Medicals - Nottingham. Sport Diving medicals: £55. HSE Commercial Diving medicals: £120. OGU 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.midlandsdivingchamber.co.uk (72756)

CLUB NOTICES

FREE OF CHARGE. (Max 25 words).
Non-commercial clubs, no sales.

Arnewood Divers, Christchurch - where diving is safe and fun from our own hard boat. Training from beginner to Instructor. Find us on Facebook or <https://sites.google.com/view/adsac/home> (64403)

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)

Alfretton (Derby) 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. (69308)

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. (68523)

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)

Ellon 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.flintsac.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.ifield-divers.org.uk Email: info@ifield-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)

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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.lscac.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.

Merseyside training club, new and active divers from all agencies, weekly pool session. Own RIB towing vehicle Contact www.wapsac.org.uk or wapsacsa@gmail.com

Millennium Divers. Active, friendly club for all levels and certifications of diver, based in Portland, Dorset. UK diving and holidays. Club social nights www.millenniumdivers.org (68351)

Mole Valley Sub Aqua Club. Surrey based SDI club, own RIB, active diving UK & Abroad, training and social events. Trainees/crossovers welcome. Contact: 07410 949268 or email: info@mvsac.org.uk (68691)

Monastery Dive Club (Dunkerton Branch). New divers welcome to join our club. Trips to Plymouth and NDAC. GSOH is a must. South Wales area (Crosskeys, Risca). Text: Flinty 07971 432803 or email: welshtflinty@hotmail.com (65305)

Nekton SAC. Based in Bromley, we are a friendly and active SAA Club that welcomes experienced and new divers alike. Info@nekton.org.uk or call Steve: 020 8467 4599. (68387)

Nemo Diving Club. Small friendly dive club offering dive trips and training for non/experienced divers in Retford and surrounding areas. Contact: www.nemodivertraining.co.uk (69640)

North Wales Sub Aqua Club. Llandudno based and open to new and experienced divers. Fun, friendly and active SAA affiliated club. Training every weekend. www.nwsac.wales (70688)

North Glos BSAC 80. Friendly, active club welcomes new and experienced divers. Own boat and equipment with weekly pool sessions, Thursdays, 8.30pm at GL1 Gloucester, (Gloucester Leisure Centre). www.nglos.co.uk (68483)

Nuneaton, Marlin BSAC welcomes experienced divers to Pingles pool every Thursday. Active training, diving, social programme in a flourishing club with no politics allowed. www.marlinsac.com (69322)

Orkney SAC. Small, friendly active dive club, based in Kirkwall, welcomes divers of any level or club. Own RIB and compressor. Contact Craig: 07888 690 986 or email: craighbarclay31@hotmail.com (69735)

Plymouth Sound Dive Club welcomes qualified and experienced guest divers. See www.plymouthdivers.org.uk for more information/weekly club notices. Contact relevant dive manager or diving officer@plymouthdivers.org.uk to join a dive. 72219)

Preston Divers SAA 30. The friendliest dive club. Come and meet us at Fulwood Leisure Centre, Preston on Monday nights between 8.00pm - 9.00pm. www.prestondivers.co.uk (64198)

Reading Diving Club. Experience the best of UK diving with a friendly and active club. All welcome. Tel: 01183 216310 or email: info@thedivingclub.co.uk www.thedivingclub.co.uk (69447)

Reading Sub-Aqua Club (BSAC 28). Active, friendly, based Palmer Park. Clubhouse, licenced bar, compressor, 2 RIBs. Club night Thurs, all grades/agencies. Training to Adv Diver +. rbsacinfo@gmail.com www.rbsac.org.uk Tel: Colin 07939 066524. (72402)

Richmond Sub-Aqua Club (Surrey) welcomes new and experienced divers. Very active diving, training and social calendar for about 100 members. Contact: contact.rsac@gmail.com, www.richmondsubaqua.club, 07843 959 775.

Robin Hood Dive Club. Yorkshire based and one of the most active in the country with a full 2019 calendar of trips. All agencies and grades welcome. No training or pool, just a growing bunch of regular divers. www.robinhooddiveclub.com or find us on Facebook (59245)

Rochdale Sub-Aqua Club. Beginners and experienced divers welcome. Full training provided. Pool session every Wednesday. Club has two boats. More info at www.RochdaleDivers.co.uk or call Mick 07951 834 903. (65103)

Ruislip & Northwood BSAC. Friendly, active club, RIB, welcomes new and qualified divers. Meets Highgrove Pool Thursdays nights 8.30pm. www.rnbsac.co.uk Tel: 07843 738 646 for details. (69469)

Scotland Plug Divers. Small, friendly dive club welcomes newly qualified and experienced divers to join us. Regular hardboat diving around Bass Rock/Firth of Forth/Eyemouth and trips abroad. Tel George: 07793 018 540. Email: plugdivers@btinternet.com (64638)

Selby Aquanauts SAA 1117. Family friendly club, welcomes new and qualified divers. Regular trips UK & abroad. Meet every Thursday, Albion Vaults, Selby at 9pm. Contact Mark: 07831 295 655. (69261)

Sutton Coldfield SAC, friendly BSAC club, welcomes all divers from trainee to advanced. All agencies. Own RIBs and compressor. Meet every Wednesday, 8.15pm at Wyndley (3.4m pool). For free try dive call Alan: 07970 573638 or Mark: 07787 106191. (64974)

Sheffield BSAC36. Friendly, social and active dive club welcomes newcomers or qualified divers. Trips, socials, weekly pool and club/pub meetings, club RIB. See www.bsac36.org.uk (69191)

SloUGH 491 BSAC, small friendly club welcomes divers at all levels. Meet at Beechwood School Fridays 19.30. Diving holidays and South Coast. Email: malcolm@uv.net or tel: Tony (01344) 884 596. (69722)

SOS Divers (SAA 263), Stourport, Worcestershire. Founded 1979. Friendly family club welcomes qualified and trainee divers. Own RIB. Contact Althea by email: arannel23@outlook.com (57542)

South Coast Divers (SAA 1150) Portsmouth. A friendly and active club welcomes new and experienced divers from all agencies. Email: southcoastdivers@hotmail.co.uk or call Darren: 07449 794 804. (69224)

Totnes SAC (Devon). We are an active multi-agency club and welcome new members and qualified divers from all organisations. Two RIBs and own compressor/nitrox, plus club 4WD. Diving all round South Devon and Cornwall. Visit www.totnes-bsac.co.uk for details. (68319)

South Queensferry SAC, near Edinburgh. Two RIBs, gear for hire. Pool training during the Winter; trips & expeditions in the Summer. Pub meeting at Hawes Inn. Call Warren: 07980 981 380. www.sqsac.co.uk (64861)

Steining Scuba Club, West Sussex. All divers welcome. Steining Pool, Monday evenings at 8.30pm. Contact Andy Willett on 07786 243 763. www.seaurchindivers@hotmail.co.uk (63956)

The Bath Bubble Club SAA777 seeks new members. New and qualified divers of all agencies welcome. Weekly pool training, every Wednesday at 9pm, Culverhay Sport Centre, Rush Hill, Bath. Regular diving programme from club RIB. www.bathbubbleclub.co.uk (68434)

Wells Dive Group. Friendly, active club in Somerset welcomes new or experienced divers. Meeting/training at The Little Theatre or the pool on Thursdays, try dives available. Regular RIB diving, trips around the UK and abroad. Visit: www.wellsdivers.co.uk or Tel: Rob, 07832 141250. (69653)

TridentDivers.co.uk (find us on Facebook) Cardiff-based SAA club taking on new trainees and crossover members contact us on 07547 398802. (71656)

Wiltshire's newest Scuba Diving Club - JC Scuba Dive Club. Friendly active dive club based in Swindon, all affiliations welcome. Pool sessions, UK & Worldwide trips, shore, boat & liveboard diving, regular socials. Affiliated training school, fully insured. Exclusive member benefits. www.jcscubadiveclub.co.uk

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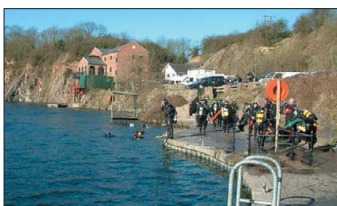


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Divers have been picking up intact Victorian beer bottles from Scotland's *Wallachia* wreck for a long time now – the beer might be 126 years old but now it turns out that a vital part of it is still alive. A chance encounter set ANDY PILLEY on an interesting journey – he takes up the story...

'I found a beer-bottle on a dive – now I seem to have a brew!'

WHEN I STARTED DIVING

10 years ago, I would never have thought that recovering a couple of bottles of beer from a shipwreck in the Clyde Estuary would result in a recreated recipe and a drinkable beer from 126 years ago. Let me explain.

I'm based in Glasgow on Scotland's west coast, and learnt to dive with one of the local sub-aqua clubs. We're fortunate to have on our doorstep a large tidal estuary with a rich maritime history – from the former shipbuilding yards where almost 30% of the world's ships were built, and the transatlantic trade conducted from the dockyards, to being a key military anchorage during both world wars.

With the high volume of shipping moving around the area over the past 200 years accidents inevitably happened, resulting in a large number of shipwrecks now accessible to divers.

One of the most notable and popular in the Clyde is the *Wallachia*, a single-screw cargo steamer owned by William Burrell & Son and used on regular trips between Glasgow and the West Indies.

On 29 September, 1895, she left Queen's Dock at 10am bound for Trinidad and Demerara. On board was a valuable general cargo including whisky, gin, beer, acids, glassware and earthenware, plus building materials and footwear.

Three hours later she had settled on the seabed of the Clyde estuary, after colliding with another ship in a fog bank.

The wreck was forgotten until 1977, when it was found by a local dive-club.

The *Wallachia* lies on an even keel on sand about 34m deep. The wreck is largely intact and has six holds, three forward and three aft. In the rearmost are thousands of bottles of beer with corks and contents intact, some still inscribed with the maker's name, McEwans of Glasgow.

DEPENDING ON weather and tidal conditions, visibility on the wreck can be 10m on a very good day, or less than 2m if there has been a lot of rain and a lot of particulates in the water.

Other elements are tide, which can vary in intensity, and boat traffic. The wreck lies near a ferry route and care must be

taken not to dive when the ferry is close by.

Despite the challenges, *Wallachia* is very rewarding and offers divers plenty of places to explore and items to look at.

The main point of interest for most has been that hold in which bottles of beer and also whisky were stored. Most of the whisky was removed in the 1980s but bottles can be found sometimes.

The hatch leading into the hold is relatively small, particularly when you have a twin-set on and are descending feet first! Other hazards include the amount of silt that has built up in the hold, because stirring this up reduces the vis to zero.

This is not a place in which you'd want to be stuck should conditions deteriorate.



I understand that someone died after becoming disorientated in the hold some years ago. There are plans for a commemorative plaque on the deck.

On one of our regular trips out to the wreck in 2018, I recovered a bottle of beer from the cargo hold, intending to keep it as a souvenir.

Talk to any local divers and many will have bottles from the wreck in their garages. The smell coming from the corks is pungent, to say the least.

However, after a chance discussion with a friend over dinner, I was put in touch with a company called Brewlab, based in Sunderland. It specialises in providing specialist brewing training and laboratory services such as quality assurance, product development, chemical/microbiology testing and long-term research options.

I asked Keith Thomas, Brewlab's director, if he would be interested in analysing the beer and investigating whether it could be recreated.

My proposal piqued his interest, and the bottle was duly shipped to the lab.

After a couple of months, Keith sent me a preliminary report about the tests conducted so far. Thanks to the relatively

stable conditions on the wreck, with near-darkness and a relatively cold temperature (6-14°C depending on the time of year), Brewlab had been able to isolate and recultivate some live yeast structures that had been present within the beer.

This particular strain, noted as *Debaryomyces*, is uncommon in modern brewing processes, raising interest levels among the academic community.

Could we get more samples so that the research could be expanded? I was asked.

DURING THE SUMMER of 2019, we managed to recover four more bottles from the wreck and sent them off to the lab.

Luckily, these samples were all of the same type of beer (a stout) and relatively well-preserved, with no seawater contamination.

Covid lockdown restrictions put a temporary halt to the research, and it wasn't until last November that we received the full lab report and, more importantly, the recreated beer!

I'm no expert on flavour profiles but when we tried the samples I got hints of coffee and chocolate, and the alcohol content was around 7.5%.

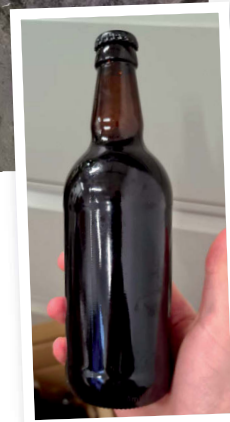
I'm told that this was fairly standard for export-grade beers during the late 1800s, and this would have reduced over the course of the voyage to its destination.

It's very drinkable, and we're working on other types of brew such as an IPA and Porterhouse to see which other flavours we can work with. We hope to secure a production and distribution deal with a brewery to reproduce the beer on a larger scale and offer it to a wider audience.

I have also recently found out that there are other types of beer to be found on the wreck, specifically an IPA style.

Once we're allowed to begin diving again, I hope to return to the *Wallachia* and recover some of these bottles for analysis, so that we can keep the project moving forward.

In the meantime, cheers!



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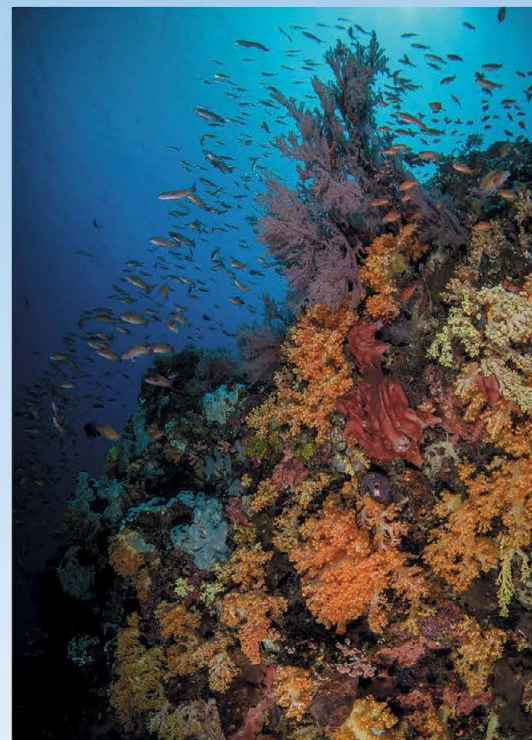


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