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FIRST IN

STEVE WEINMAN, EDITOR

WINTER IS COMING, as someone once said, and it will bring challenges for UK divers as for everyone else. But if we can draw some encouragement in facing what lies ahead, it is that this summer could have been so much worse.

Rich Somerset, Territory Director for PADI EMEA, covers many areas, the UK being a key one, so he has a great overview. Diving recently from Cornwall to Hull, he has been impressed by how busy every dive-site has been. And he confirms that the agency has seen a trend of increased local diving and domestic certifications at all levels and across all regions – significantly more than before the pandemic.

Usually just over a third of PADI certifications of UK divers at all levels are issued in home waters. This summer it's been 55%. OK, you'd expect that divers unable to travel overseas would turn to home waters, but Rich thinks there could be more to it than that.

"I think a lot of people have had this pause, re-evaluated what's going on in their lives and asked: 'What makes me happy, what am I going to do?' And I think that's driven the people who used to hop on a plane to Egypt, but also members of the public who watch *Blue Planet 2*. We should know by the end of the year how many new people have been engaged in the sport compared with normal."

UK dive-centres faced huge challenges early on in the pandemic, the closure of swimming pools in particular being "a real crushing blow." PADI focused initially on working with the inland dive-sites, says Rich, alongside Swim England on pools and DEFRA on boats added to the collective voice of members of the British Diving Safety Group.

"I think it was a really nice example of the diving industry working collectively towards a common goal based on commonsense and safety," he says. "And now with the pools open we've seen a lot of people starting to dive for the first time.

"Every dive-centre I call says: 'I can't talk now, I'm too busy!' Some tell me they're absolutely rammed *[though presumably maintaining social distancing!]*. So I think there is a staycation effect going on, where people have a little more money in their pockets and want to enjoy their time.

"We saw a big spike in speciality courses, and in continued education, especially around the Advanced Open Water Diver level. Then more recently there was a big spike at professional level, with people doing whole-life re-evaluations, or being made unemployed and deciding that diving was the route they wanted to take."

IN THE UK, HARDLY ANY PADI-affiliated dive-centres have closed to date. "I think that's extraordinary," says Rich, who believes they owe much to the furlough scheme but also to their willingness to be "really innovative with technology". Nitrox training using Zoom – why not?

But winter *is* coming. "Winter is tough for any outdoor activity, but if we can support the industry through to spring 2021 and have another good summer, we could be seeing a boom. Our goal is to get places like Cornwall back to the sort of level they enjoyed years ago, and we're collaborating with BSAC and the clubs on this."

The strategy for winter? "We all need to get out and support our local dive-centres one way and another – even if it's just buying a clip or an octo hose," says Rich. So make good those deficits in your dive-bag, think about extra courses – make this a dive-positive winter.

DIVER

the magazine that's straight down the line…

OCTOBER 2020 Volume 65 No 10

Published monthly by Eaton Publications Ltd,
Suite B, 74 Oldfield Road, Hampton,
Middlesex, TW12 2HR
Tel: 020 8941 8152

HOW TO GET DIVER MAGAZINE
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.

NEWSAGENT: If you prefer to buy DIVER over the counter, please order from your newsagent. All newsagents can obtain DIVER, but in case of difficulty notify the Subscriptions Dept at the above address.

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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DIVER Britain's best-selling diving magazine

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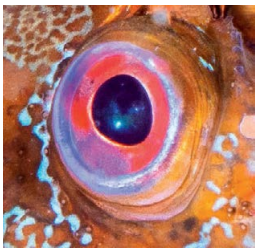

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400-year-old shipwreck shines amid new Baltic Sea discoveries

THE BALTIC SEA, one of the few places in the world where timber shipwrecks can survive for centuries, is where the action is as a new wreck has been discovered and two others have yielded further secrets.

Baltic waters offer historic shipwrecks protection through a combination of low salinity, absolute darkness, and very low water temperatures year-round.

The environment doesn't support the shipworms that can quickly ravage wrecks in other parts of the world.

Technical divers have now found a well-preserved – and very rare – Dutch-style merchant sailing ship in the Baltic's Gulf of Finland – and this one could be as much as 400 years old.

The discovery was made during a seabed survey between Finland's Hanko peninsula and the Estonian island of Hiiumaa. The 85m-deep wreck seems to originate from the early 17th century.

Two dives have now been carried out on the shipwreck by technical divers from the Finnish group Badewanne, which for more than 20 years has been documenting wrecks in the Gulf of Finland (which was known as Badewanne during WW2).

When they visited the site, which had been identified during a seabed survey, they had been expecting to find a 20th-century relic from one of the world wars.

Instead the divers were able to identify the largely intact wreck as a *fluyt*, a narrow type of three-masted cargo ship designed in the Netherlands.

Fluyts were unusual in that they were unarmed and had an advanced rigging system that allowed them to be operated by small crews.

Also unusual for the time was the fact that the entire crew occupied the same space between decks and all dined at the same table.

The combination of small crew, no guns and large holds was intended to maximise the cargo capacity.

Fluyts dominated the Baltic trading that thrived between the late 16th and mid-18th century, yet finding such shipwrecks is rare.

The divers found the wreck resting upright with most of its rigging scattered around, although a trawl-net appeared to have dislocated the stem, damaging the poop-deck and the top part of the transom.

All the side-planking remained in place, and even damaged parts of the transom decorations lay on the seabed.

The vessel is thought to have capsized in a storm or to have sprung a leak.

The divers showed their stills and video footage to marine archaeologist Dr Niklas Eriksson of Stockholm University in Sweden. He confirmed their identification, though he was unable to tell whether the vessel was Dutch or a local copy of the *fluyt* design, operating solely in the Baltic.

"The wreck reveals many of the characteristics of the *fluyt* but also some unique features, not least the construction of the stern," said Dr Eriksson. "It might be that this is an early example of the design.

"The wreck thus offers a unique opportunity to investigate the development of a ship type that sailed all over the world and became the tool that laid the foundation for early modern globalisation."

The Badewanne team says that it will continue investigating the wreck alongside the Finnish Heritage Agency of Antiquities and Dr Eriksson.

There are also plans to study customs archives in Denmark, in case the vessel entered the Baltic Sea through Danish waters.

Portside hull view of the stern of the wreck. Decorated stern cabin window holes are visible.

Anchor windlass in the bow, viewed from the starboard side.

The main cabin in the stern.

JOUNI POLKKO / BADEWANNE.FI

An 18th-century *tjalk*.

WAS THIS 18TH-CENTURY SHIPWRECK LOADED

FURTHER EAST in the Gulf of Finland, glass bottles are among the first artefacts to have been raised by Russian scuba-divers from an enigmatic 18th-century shipwreck discovered two years ago.

Specialists from the Underwater Research Centre of the Russian Geographical Society (RGS) are studying the finds, recovered from what they believe to have been a Dutch ship sailing to what was then the new capital city of St Petersburg.

The wreck is code-named Butilochnik after the hundreds of bottles found aboard and thought to have contained alcohol. The wreck-site was located by chance by a Russian Baltic Fleet vessel. It lies at a depth of 50m near Moshchny Island, 75 miles west of St Petersburg.

RGS divers carried out an initial survey in 2019 and found that the ship's timbers had survived in the cold Baltic conditions, although there was no sign of masts.

The vessel was believed to be a *tjalk*, another type of Dutch merchant sailing ship, and to have sunk around the middle of the 18th century.

BRETT SEYMOUR

The fish barrel – the orange fragments are sturgeon remains.

BRETT SEYMOUR

Brendan Foley uses a JJ rebreather while excavating the trench.

BRENDAN P FOLEY

Recovered sturgeon bones and scutes.

Big 'propaganda' fish found on wreck

ANOTHER well-preserved Baltic Sea wreck giving up its secrets has been the royal flagship *Gribshunden* – revealing a big fish that a 15th-century Danish king planned to use in his bid to seize the Swedish throne.

King John had recently taken the Danish throne in 1495 when he sent a delegation on his flagship to Kalmar in Sweden, for talks with the separatist forces of Sten Sture the Elder.

John planned to claim the Swedish throne, and the *Gribshunden* was laden with goods designed to show off Denmark's wealth and power.

But the 35m vessel caught fire and sank with all hands off Ronnenby in what is now south-eastern Sweden.

It lay at a depth of around 10m for nearly 500 years before being found by local divers in the 1970s, and archaeologists learnt of its existence only in 2000, going on to confirm its identity in 2013.

It is now considered to be the world's best-preserved example of the type of ship used by Christopher Columbus to sail the Atlantic.

A team of 40 marine archaeologists from 10 countries, led by Swedish universities Lund and Södertörn and Blekinge Museum, carried out three weeks of diving on the *Gribshunden* last year, as reported in DIVER.

Their finds included one of the earliest firearms ever found on a shipwreck, beer barrels and a crown-engraved tankard – as well as the distinctive bones and scutes (bony plates) of a sturgeon.

Packed in a wooden barrel, the researchers believed the fish to be the European species (*Acipenser sturio*) found in the Baltic Sea in the 15th century.

However, DNA analysis has now revealed that it was the less-common Atlantic variety, which would have been calculated to impress the Swedes of the time.

The Atlantic sturgeon (*Acipenser oxyrinchus*) is virtually extinct today. The research also showed that it was 2m long, and even analysed how it had been cut up for packing.

"For me, this has been a glimpse of what the Baltic Sea looked like before we interfered with it," said Maria C Hansson, the molecular biologist at Lund University who carried out the DNA analysis.

"Now we know that the Atlantic sturgeon was presumably part of the ecosystem. I think there could be great potential in using underwater DNA in this way to be able to recreate what it looked like previously."

The discovery was said to underline the high status of sturgeon. The fish was valued for its roe, flesh and the swim-bladder, which was used to produce the *isinglass* collagen from which gold paint was derived.

"The sturgeon in the King's pantry was a propaganda tool, as was the entire ship," said Brendan P Foley, marine archaeologist at Lund University and project co-ordinator.

"Everything on that ship served a political function, which is another element that makes this discovery particularly interesting."

The significant fish is now the subject of a paper in the *Journal of Archaeological Science*.

Even without the sturgeon's help, John succeeded in becoming King of Sweden two years later.

A diver examines the wooden barrel.

BRETT SEYMOUR

Highly prized: an Atlantic sturgeon.

FWS.GOV

WITH GIN BOUND FOR THE LAND OF VODKA?

A detailed study is now under way, with divers finding hundreds of glass bottles of various shapes and sizes, some factory- and others hand-made. Most were broken, but it is thought that they could have contained gin or other spirits.

"Most likely the ship was sailing to St Petersburg and was carrying bottles of alcohol on board, but what exactly was in the bottles is difficult to say, because now there is just a rotten substance," said RGS underwater archaeologist Roman Prokhorov. "Several bottles smell of pine-needles, eucalyptus." Juniper, the prime botanical used in gin, smells like pine and eucalyptus can be used as an ingredient.

Dutch gin, or *jenever*, was exported from the Netherlands in large quantities during the 18th century.

Russia is more usually associated with vodka, a word first found in official documents at around the time of the Butilochnik's sinking.

The RGS says that so far no record of such a vessel has been found in official archives.

Glass bottles found on the Butilochnik.

RUSSIAN GEOGRAPHICAL SOCIETY

Shark champion Erich Ritter dies


Shark devotee Erich Ritter.

SHARK-DIVING PIONEER Dr Erich Ritter died in his sleep at his Florida home on 28 August at the age of 61. While his death was unexpected, he was reported to have suffered from a heart condition.

Ritter was born and grew up in Zurich, and gained degrees in zoology and paleontology in Switzerland and a PhD in fish behavioural ecology at the University of Miami.

He also became a scuba-diver and instructor, and was early to adopt the cause of shark protection.

Later referring to himself as a "shark behaviourist" and "shark whisperer", he started carrying out practical research into their behaviour patterns from the 1980s.

However, he became well-known across the global diving community only after surviving a bite from a bull shark in 2002.

He had been standing surrounded by the circling sharks in shallow waters in the Bahamas, telling British TV presenter Nigel Marven that the sharks "couldn't care less about them".

The attack was caught by Discovery Channel cameras filming the interview for *Shark Week*.

Ritter lost his left calf and was fortunate to survive a massive loss of blood, but the incident did nothing to shake his conviction that "there are no dangerous sharks, only dangerous situations". His approach tended to divide opinion between those who saw him as an insightful champion of sharks and detractors who regarded his theories as unscientific and his attitude as reckless.

Much of his shark research was carried out in the Abacos islands in the Bahamas, where he ran the Shark Education & Research Centre, but he came up with the idea for organising "Sharkschool" field courses in Florida in 1996.

These schools went on to become regular events around the world in locations such as the Bahamas, Philippines, South Africa and Mexico, involving daily shark dives and seminars for an ever-growing body of adherents.

As a pundit Ritter came up with terms such as "angstination" – the combination of fear and fascination inspired in humans by sharks – and his ADORE-SANE mnemonic for gauging the relative safety of a shark interaction (Attitude-Direction-Origin-Reference-Environment – Scenario-Action-Nervousness-Experience)!

Ritter analysed and reconstructed shark-related incidents for the Global Shark Attack File at the Shark Research Institute at Princeton, and also campaigned for shark-protection and in particular an end to commercial shark-finning.

He wrote a number of books and scientific papers, contending among other issues that shark attacks on surface swimmers were not the result of mistaking them for seal prey, as was commonly assumed, but involved "light" bites intended as target practice, play or a follow-up to the victim's initial reaction.

He also argued against the belief that human blood attracts sharks.

John Bantin joined Ritter on baited bull-shark dives in the Bahamas in 1999, and wrote for **DIVER** at the time: "Dr Ritter, a man whose speech patterns put me in mind of Peter Sellers' Dr Strangelove, has many theories, and he was quite prepared to risk his safety to prove them.

"This included floating closely over a dead fish and allowing a big shark to take it from under him."

Ritter told Bantin: "I don't do what I do because I'm a daredevil. I want to show that you can swim with notorious species. We want to find out what people do to trigger the wrong reaction. We do stupid things like putting fish-blood on our hands to test our theories. The shark is a really smart animal. When you lose your fear, you begin to see what it really is.

"We are trying to develop a body-language system to build a bridge to the animal, to try to trigger favourable reactions rather than the wrong ones.

"We have to do this with species with a known record for attacks – reputed man-eaters.

"As you have experienced, we can swim with a pack of hungry sharks and do it safely. There really is nothing to worry about."

Paying tribute to his close friend Ritter, Robert Wilpernig of Wirodive, the German travel company that provided the "back office" for his Sharkschool, wrote that: "You gave everything for the sharks – your life and your home were the seas of our world, and the inhabitants, the sharks, were your children."

IRISH NAVY PASSES FIRST WOMAN DIVER

SUB-LT TAHLIA BRITTON has become the first-ever female diver in the Irish Naval Service. Having completed the challenging 11-week training course, on 14 August she was ceremonially presented with her diving log-book alongside two male colleagues at the Haulbowline naval base in Co Cork.

The diving course, which has a 70% drop-out rate, is considered the toughest physically and mentally to be undertaken by members of Ireland's defence forces, with the exception of that for the Army Ranger Wing.

The 30 or so elite divers who make up the naval diving unit are responsible for search and recovery, underwater engineering and explosive ordnance disposal operations.

Normally undertaken in winter, the 2020 course had been delayed by the coronavirus pandemic.

The 10 participants were required to carry out 100 hours of dives to a maximum depth of 38m, and Sub-Lt Britton and her two colleagues were the only ones to last the course.

Sub-Lt Britton, who is 29 and from Donegal, has been in the Irish Naval Service for six years and is Gunnery Officer on the offshore patrol vessel *LE James Joyce*. She is a former member of Ireland's surfing team.

Following a further five-week mixed-gas diving course she was set to return to her ship, ready to respond in her new diving role when called upon, and was also likely to be sent on a mine-clearance course in Canada.

In the UK the Royal Navy used female divers before deciding that they were more at risk than men of suffering decompression illness.

This policy was rescinded in 2010, when Lt Catherine Ker became the first female to graduate from the RN Diving School as a Minewarfare & Clearance Diving Officer.


Sub-Lt Tahlia Britton.

IRISH NAVAL SERVICE

Heritage Malta adds three plane wrecks


HERITAGE MALTA / UNIVERSITY OF MALTA / MALTA TOURISM AUTHORITY

Junkers Ju88 as shown in the Virtual Museum.

THREE DEEP WW2-era aircraft dive-sites have come under the control of Heritage Malta as the national agency continues its programme of bringing the islands' wrecks into active management – taking the total to 15.

The Maltese islands are among the most popular destinations for UK divers, with the wrecks playing a major part in attracting them.

Heritage Malta's Underwater Cultural Heritage Unit (UCHU) has been researching and documenting the sites for the past two years, so that they can be "protected and accessed by divers in a controlled and managed manner".

The additions to UCHU's roster are two US military aircraft – a Consolidated B24 Liberator and a Douglas A-1 Skyraider – and a German Junkers Ju88, all sunk in Maltese waters in the 1940s and suitable for technical divers. Diving can be arranged through dive-centres accredited by Heritage Malta.

The Liberator and Ju88 bombers both lie at around 55m and are featured on the unit's new Virtual Museum: Underwater Malta website, announced in **DIVER** last month.

The Skyraider, a 12m single-engined fighter wrecked after the war, lies beyond 100m deep and was discovered in 2009.

"The identification and opening of these sites are the result of our collaboration with the Armed Forces of Malta, Transport Malta, the University of Malta and the Superintendence of Cultural Heritage," said UCHU head Prof Timmy Gambin.

"We look forward to furthering our collaboration, which will result in the launching of new sites in 2021."

Heritage Malta has also launched an underwater photographic competition to collect divers' shots of any of the 15 wrecks.

There are two categories – Historic Wrecks, and Interaction Between Wildlife & Underwater Cultural Heritage – and the submission deadline is 30 November.

WORKING HARD FOR UNDERWATER RECORDS


Vitaly Vivchar pumps iron – not generally recommended for freedivers.

A RUSSIAN PROFESSIONAL weight-lifter and amateur freediver is claiming a Guinness World Record for bench-pressing a 50kg barbell 76 times beneath lake waters on a single breath.

Vitaly Vivchar trained for two months to perform the feat at Lebyazhye Lake near his home-town of Tomsk in southern Russia on 13 August.

He said that his best result while training had been 65 repetitions – just enough to beat the existing GWR record for "Most Consecutive Bench Presses Underwater".

That is held by Greg Wittstock of Illinois, USA, who pumped out 62 reps last October.

Vivchar, a Russian and Eurasian bench-press champion, said that his record attempt had conformed to GWR requirements, though it had yet to be verified.

The same applied to a claim for a Guinness World Record for an ocean clean-up event organised in Taiwan on 15 August.

A total of 591 divers participated in the event, claimed to be the largest gathering of divers in an ocean clean-up within a 12-hour period.

Organised by the Discovery Channel working with Keelung City government to raise awareness of ocean pollution, the main event was held in the city's Chaojing Park while others took place at different locations across Taiwan, including Taichung, Tainan and Penghu County.

According to Discovery, 920kg of rubbish was being collected per hour off Keelung City.

The 12-hour event over a range of dive-sites appeared to be a bid to create a new GWR category.

In July last year, Florida dive-centre Dixie Divers organised an event at the state's Deerfield Beach in which 633 divers set the record for "Largest Underwater Clean-up in 24 Hours".

With all divers working at the one site, the operation was completed in 150 minutes and 544kg of collected rubbish was later recycled.

"According to locals, the clean-up has significantly improved the water quality for marine life in the area, and residents are hopeful that it will increase populations," said Guinness World Records which, while verifying the Deerfield record, called for more environmental record attempts to be made.

Giant ghost net lifted at Hand Deeps

PHOTOGRAPHY: GHOST FISHING / CHRISTINE GROSART

TEN SCUBA VOLUNTEERS with ocean-conservation charity Ghost Fishing UK have removed an abandoned 200m-long fishing net from the popular Plymouth dive-site Hand Deeps.

Back in action over the hot weekend of 8/9 August following a lull caused by the Covid-19 pandemic, the dive-team were responding to reports that the net was endangering marine life as well as divers.

Christine Ingram of Plymouth Sound SAC had been one of the first divers to come across the net, strewn across two pinnacles at depths of 20-30m. "It was quite shocking to see how much damage these nets cause and I felt I had to report it straight away," she said.

Following a survey dive from the dive-boat *Seeker,* the Ghost Fishing UK divers formed a plan and returned to retrieve the net. Back at the surface they worked in "scorching" surface conditions to disentangle 115 trapped crabs, lobsters, a large pollack and other marine creatures, returning most of them to the sea alive.

"This net is huge but on reefs it is sometimes very difficult to pinpoint exactly where the ghost-gear is," said Ghost Fishing UK trustee, instructor and photographer Christine Grosart.

"Fortunately we had excellent information from several reports, and with good co-ordinates we were able to find it within eight minutes."

"Hand Deeps is one of the most biodiverse reefs that we regularly dive and as such is a very popular spot for our customers," commented James Balouza of Plymouth's In Deep dive-centre, who skippered *Seeker.*

"Ghost-nets, such as the one recovered this week, pose a threat to a vast array of marine life. Their swift and effective removal significantly decreases the impact to the marine environment and industries that depend on the health of our coast."

Ghost Fishing UK depends on being able to train new volunteers to take part in its underwater operations efficiently and safely. "Covid-19 set us back with our new recruits," said Grosart, "but over the past five days we have been able to bring several of our newly trained divers out on their qualifying 'live' dives and continue building our amazing team."

As part of this programme the volunteers recovered lost pots and other detritus during two days' diving off Portland and Lyme Regis in Dorset.

Established in 2015, Ghost Fishing UK now has 70 active volunteers, and encourages divers and fisheries to inform it about lost nets and pots, undertaking to return lost gear to owners where possible.

It also works closely with the SeaLife Trust, Seasearch and the Cornish Plastic Pollution Coalition.

The charity depends on volunteers and welcomes donations – learn more at ghostfishing.co.uk

PHOTOGRAPHY: GHOST FISHING / CHRISTINE GROSART

'Infinite hollow' turns out to be first undersea cenote

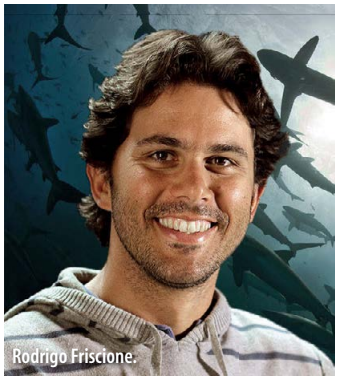
A MEXICAN underwater photographer has made a series of surprising discoveries 14 miles off the Yucatan Peninsula – five freshwater *cenotes* lying beneath the Caribbean seabed. Yucatan is well-known among divers for its *cenotes* or sinkholes, but this is the first time any have been recorded offshore.

Rodrigo Friscione has been coming across the *cenotes* since 2016 but their discovery was announced only recently through news agency EFE.

Friscione was diving off the north-eastern coast of Quintana Roo when he found the first *cenotes*, between the islands of Mujeres and Contoy.

He dipped into what he described as an "infinite hollow" on the seabed, after realising that it had no bottom and that the water inside it was much colder and appeared to be flowing.

He came across the same phenomenon while diving in the area again in 2017, and then found three more *cenotes* two years later.



Rodrigo Friscione.

They are thought to be karst *cenotes* – limestone caves that would have been on dry land thousands of years ago, but flooded as sea-levels rose. Despite being so far off the Yucatan coast, they are likely to be connected to the huge underground network popular with cave-divers on the peninsula.

The undersea *cenotes* were kept secret as divers with the Great Mayan Aquifer Project, who have long worked to map the vast Yucatan submerged cave system, planned to launch a scientific expedition to explore them this year.

This had to be postponed because of the coronavirus pandemic, which has hit Mexico particularly hard.

Friscione was set to take part when the expedition does get under way, while famed underwater explorer Robert Ballard was reported to be contributing an AUV and an ROV.

These vehicles will be used to provide advance information before rebreather divers enter the freshwater *cenotes* – the extent and depth of which is still unknown.

Friscione grew up with scuba and freediving because his family ran the Solo Buceo dive-shop in Cancun, and he has won a number of awards for his marine-life photography.

He is particularly associated with big-animal photography and his work with Mexican conservation charity Pelagic Life.

ANDRÉS NIETO PORRAS

FILM-MAKER DIES ON MALLORCA

AN UNDERWATER film-maker well known in the Spanish scuba-diving community died on what appeared to have been a solo dive on his 31st birthday.

Fernando Garfella Palmer was reported to have been caught in strong downcurrents in an area with a maximum depth of 70m during a dive off his home island of Mallorca.

The incident, on 9 August, also left another diver hospitalised after a failed rescue attempt. Garfella Palmer's body was retrieved two days later by the Civil Guard's Underwater Activities Special Group.

The Mallorcan film-maker had specialised in making marine-life documentaries in the Balearic Islands. Over the past 10 years he had carried out hundreds of dives in what is now the Dragonera marine reserve, which he had helped to set up and monitor.

This was also where the fatal incident occurred, in the channel between the island of Sa Dragonera and the coast of Andratx in western Mallorca.

When Garfella Palmer failed to resurface his girlfriend alerted another local diver, who went to try to find him. The diver later reported that Garfella Palmer had been trapped in some way, and his protracted bids to free him meant that he left it late to make what had to be a rapid ascent.

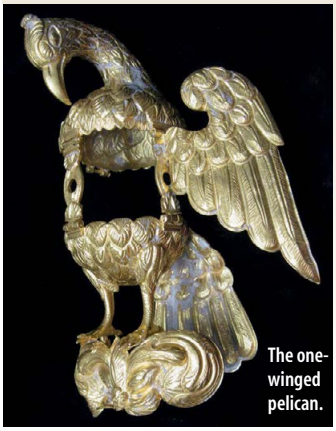
He suffered decompression illness as a result and was airlifted to hospital for treatment, where he was said to be in a serious condition.

Garfella Palmer ran his own production company, Bogar Films, and was also associated with volunteer work and filming for the humanitarian organisation Open Arms, set up to rescue North African migrants landing on Spanish shores, as well as Mallorca Blue, which guards against threats to the local marine environment.

Palmer was the second diver to die in the Andratx area in a matter of weeks. The body of 55-year-old female diver Lenka Juskanicova, an underwater photographer from the Czech Republic who lived locally, had been found by divers off Cala Marmassen on 24 July.

GOLD WING DISCOVERY ENDS 10-YEAR QUEST

A GOLDEN WING found this summer by scuba-divers off Florida's Atlantic coast has completed a discovery made almost 10 years ago – when a diver came across the 300-year-old statuette of a one-winged pelican.



The one-winged pelican.

1715 QUEENS FLEET JEWELS

That 14cm-tall golden figurine and the separated wing came from a Spanish ship wrecked in 1715.

The statuette was found in August 2010 by diver Bonnie Schubert, using an underwater metal detector over sand about 300m off Frederick Douglass Beach, Fort Pierce.

The wrecked vessel was one of a fleet of 11 treasure ships bound from Cuba to Spain that ran foul of a hurricane on the last day of July, 1715.

Their loss earnt the area between the towns of St Lucie and Sebastian the name "Treasure Coast". US divers search for artefacts there between May and September each year.

Despite missing a wing, the bird was sold for $150,000, says the salvor with rights to the wrecks, 1715 Fleet Queens Jewels. The state takes 20% of the value of any artefact found.

Now the wing, with attached chain, has been found in sand near where the rest of the pelican turned up.

The fortunate divers were Henry Jones, captain of the boat *Perfect Day*, and crew-member Tracey Newman. They had scoured the area for the missing pinion many times over the past decade – as had Schubert.

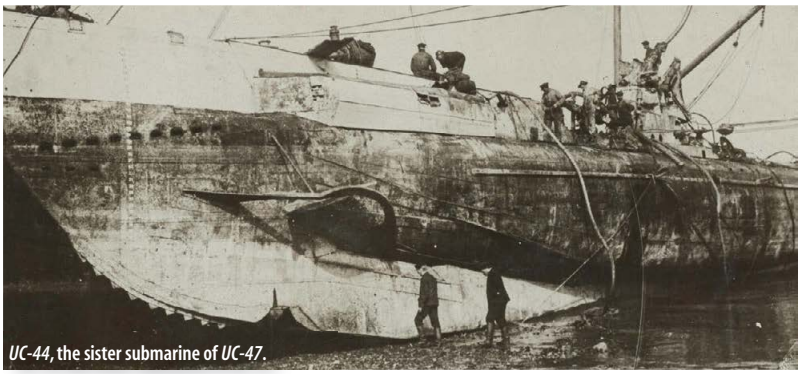
Tracey Newman with the wing (*right*).

The crew used blowers to open up a hole in the sand for the divers to search with their metal detector.

The statuette, known as the *Pelican of Piety*, is thought to have been a reliquary, made with a cavity to contain holy relics. The pelican, a mother drawing blood from her breast to feed starving chicks, represents Christ the Redeemer shedding his blood on the cross.

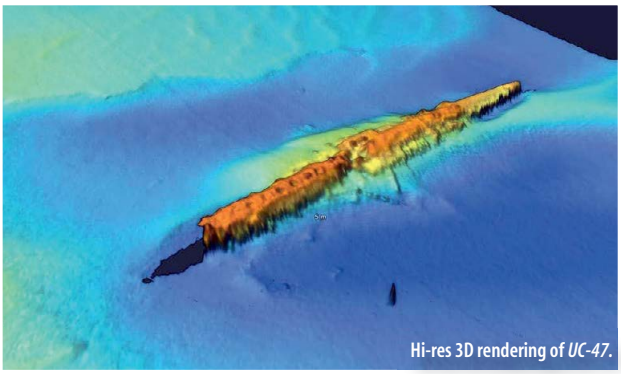
The *Pelican of Piety* is valued at $885,000. Now its buyer is reportedly keen to reunite bird and wing – if the price is right.

TRACEY NEWMAN / 1715 QUEENS FLEET JEWELS



US NATIONAL ARCHIVES & RECORDS ADMINISTRATION

UC-44, the sister submarine of *UC-47*.



TOLMOUNT DEVELOPMENT

Hi-res 3D rendering of *UC-47*.

Lethal WW1 U-boat surveyed off Yorkshire

TOLMOUNT DEVELOPMENT

Raw echo-soundings rendered in hi-res 3D.

TOLMOUNT DEVELOPMENT

ROV footage of *UC-47*'s hull.

An ROV is deployed.

A GERMAN U-BOAT, sunk by the Royal Navy off Yorkshire in 1917 and thought to have been penetrated by its salvage divers the next day, has been surveyed for the first time.

The investigation of *UC-47* was led by a team from the University of Southampton. They used sonar-scanning and an ROV to obtain hi-resolution video footage of the wreck, including the large hole in the port side of the otherwise intact hull.

Resting at a depth of 50m, the wreck was said to show "an astonishing level of preservation".

UC-47 has been visited by scuba divers over the years, and featured in **DIVER**'s *Wreck Tour* series, but had not been the subject of a scientific survey.

The university was working with offshore-survey companies MMT and Reach Subsea, its longtime collaborators on such underwater research projects. They investigated the wreck from the vessel *Topaz Tiamat* on behalf of Tolmount Development, which was preparing to lay pipeline in the North Sea some 20 nautical miles off Flamborough Head.

The 52m mine-laying U-boat was reported to have been responsible for sinking 56 vessels in 13 patrols in the course of little more than a year, but her reputation as a "lucky vessel" ended abruptly on 18 November, 1917.

The patrol-boat HMS *P-57* caught *UC-47* at the surface and rammed her before deploying depth-charges. The U-boat sank with the loss of all 26 crew.

"Today the vessel is only marked on the navigation charts as a shipwreck and until now very little was known of the submarine's condition," said team-leader Dr Rodrigo Pacheco-Ruiz, co-director of the long-term Offshore Archaeological Research (OAR) project being carried out by the university's Centre for Maritime Archaeology.

"It has been a privilege to be able to explore a wreck in such good condition and have the opportunity to find out more about its past."

The day after *UC-47* went down, the submarine is believed to have been penetrated by Royal Navy hardhat divers, who retrieved its code-books and charts. Famed diver and "tin-opener" Dusty Miller has long been associated with this and many similar WW1 exploits – the full story was told in the June 2020 issue of **DIVER**.

Material recovered by divers gave the Royal Navy a vital intelligence advantage over the Germans.

Maritime historian Stephen Fisher commented: "Further investigation of historical sources – when access becomes available as lockdown eases – combined with this detailed imagery of the wreck might enable us to ascertain if she was indeed visited in November 1917."

Southampton's OAR project targets archaeological sites that require modern technology, academic research and industry partnerships to survey, as with *UC-47*.

"These sites tend to be hundreds of miles offshore and can only be reached with specialised sub-sea equipment, which is normally a barrier to their study," said Dr Pacheco-Ruiz. "Projects like ours demonstrate that these sites can be surveyed even in these very difficult times, as the world struggles with a dangerous pandemic."

Past OAR collaborations between the University of Southampton and MMT/Reach Subsea include last year's discovery of an intact 500-year-old shipwreck at 120m in the Baltic Sea, as reported in **DIVER**, and the Black Sea MAP project of 2016-18.

EMERGENCY SERVICES TURN OUT FOR DIVERS IN DISTRESS

DIVERS were among the many sea-users thanking England's rescue services for helping to bail them out during the warm days of August.

Off Swanage in Dorset, two divers were picked up after drifting more than four miles from their starting point near Old Harry Rocks on the evening of Sunday 23.

A Mayday distress call was sent from their boat at 6.30pm when the divers failed to emerge from their drift. In stormy conditions and with a strong ebb tide they had been carried further than planned, and both the Swanage all-weather and inshore lifeboat were launched to begin a search.

A member of the public spotted the pair off Durlston Head. They were recovered by a local boat and the lifeboats stood down.

In Yorkshire, six members of Selby SAC were set to provide an appreciative donation to the RNLI after their dive-boat broke down 13 miles off the coast on 16 August.

They had been diving the WW1 U-boat wreck *UC-39* but their boat engine had failed to restart.

One diver still in the water had tied himself to a buoy and was picked up by another dive-boat responding to the Mayday call, while the inshore Flamborough lifeboat towed the boat back in.

KATE WINSLET: BREATH-HOLDING FOR BRITAIN?

BRITISH FILM-STAR Kate Winslet puts everything into her acting roles, and lately she has been carrying out underwater breath-holds that could give her a winning place in the UK freediving team should she decide on a sudden career-shift.

The 44-year-old received expert tuition in freediving for her role in the yet-to-be completed *Avatar 2*, and her static apnea record is reported to be a breath-taking 7min 14sec, which she describes as "crazy, crazy stuff".

In James Cameron's $1 billion movie, the second in a projected five-part saga, Winslet plays Ronal, one of a race of sea people called the Metkayina, who live on underwater reefs on the moon Pandora.

The actor claimed that she nearly drowned while making *Titanic* with Cameron, when her coat got caught and trapped her under water (the director has denied that she was ever in serious danger). But for *Avatar 2* she has come back for more, insisting on doing all underwater scenes herself rather than using a body double.

Cameron has been filming in a 2.25 million litre tank, and the whole cast had to be trained to freedive to allow for extended underwater takes without resorting to scuba. They were coached by well-known US freediver Kirk Krack.

"You see Kate going under water and she just felt so comfortable," says producer Jon Landau, who describes his surprise on seeing her rehearsing in the tank one day. "She's just walking on the bottom, left and right, left and right, left and right. Then she sees me in the window and she just waves. I couldn't believe it!"

DIVER put it to leading competitive freediver Beci Ryan, who sits on the British Freediving Association (BFA) committee, that Winslet appeared to be outperforming the stars of the national team.

"This is an impressive breath-hold by Kate Winslet and we're delighted

GABBOT

to hear how passionate she is for the sport of freediving," said Ryan. "Kirk Krack is well-known in the freediving world for his work with Hollywood actors such as Tom Cruise, training them for underwater apnea work in films.

"The current UK women's static record is 6min 58sec, held by Alice Hickson and set at the AIDA Pool World Championships in Belgrade in 2015," said Ryan. "Alice's record currently places her 13th in the world.

"It would be interesting to know if Kate's static breath-hold was performed without the aid of oxygen, which would help prolong holding your breath. The UK freediving team all train for their performances without the aid of oxygen."

Ryan was also concerned about Winslet's apparent solitary walkabout in the tank. "At the BFA we promote safe freediving practice and it appears that Kate was practising breath-hold on her own – we strongly advise people never to hold their breath on their own, not even in the bath!"

But she welcomed the idea of Winslet getting involved in competitive freediving: "If Kate had any desire to perform on the British team, we would wholeheartedly encourage her to do so!"

Coronavirus has delayed both live-action filming of *Avatar 2* and virtual production work, and the movie is now unlikely to hit screens before 2023 – some nine years after its original projected release date. ■

The underwater-themed *Avatar 2* is provisionally subtitled *The Way of Water*.

Freda's Diver Dishes

In our *40 Dives 40 Dishes* book we feature a chocolate-biscuit cake recipe. We always used to have this on the day we dived the *Leopoldville* at the end of a Normandy trip out of Cherbourg.

After a long hard dive followed by the return trip across the Channel to Portland, it always seemed to be well-received. This month's recipe is the vegan version, which we have introduced this year for divers on our day-boat *Sea Leopard* out of Portland marina. It goes down a treat! Portions are served individually wrapped, as in the picture.

Vegan Chocolate Biscuit Cake

Ingredients

7 x 100g dark chocolate; 5 tbsp Golden Syrup; 250g dairy-free spread; 400g packet of digestive biscuits; rose or fresh marigold petals.

Method

In a large pan over a medium heat melt the spread, chocolate and golden syrup until they are completely combined into the most sumptuous molten chocolate mix you have ever seen! Take off the heat, add broken biscuits and mix well until the biscuits are completely covered.

Line a tin 32 x 18 x 3cm baking tray with greaseproof paper. Tip the mixture into the tray and spread out evenly. Roughly flatten and sprinkle with your choice of petals. Marigolds are available in abundance at this time of year but dried rose petals work just as well.

Set in the fridge for a few hours, then cut into 12 large or 16 smaller squares. This cake is quite rich so, if you wish, you can cut each square again diagonally, creating two triangles. Then you can save one half for later consumption, maybe after your second dive of the day.

Top Tip

This tray bake freezes really well – that is, if you have any left over. We never do! You can also use gluten-free biscuits to make it a GF and vegan tray bake, pleasing everybody. A little bit of chocolate never did anyone any harm; dark chocolate is rich in antioxidants and packed with nutrients. Enjoy!

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

Tourist board talks down oil-spill – protesters march to differ

THE WORST FEARS of Indian Ocean diving destination Mauritius were allayed, following extensive efforts to clean up the oil spillage caused after Japanese bulk-carrier mv *Wakashio* ran aground there on 25 July.

However, the subsequent strandings and deaths of some 50 dolphins and whales in the affected area have seen popular protests in the capital of the Indian Ocean island.

Tourism, a key pillar of the Mauritian economy, had already been hard-hit by the border closure brought about by coronavirus.

So the Mauritius Tourism Promotion Authority (MTPA), which in mid-August issued an upbeat report on the incident, was naturally keen to minimise fall-out from the spillage.

It reported that damage to the island's lagoons, shores and ecosystem remained localised in the south-east, with no more than 4% of the coastline affected, and clean-up operations said to have been progressing well.

Most of the scuba-diving in Mauritius takes place further north on the island, where many of the resorts are located, particularly on the best-known dive sites of the sheltered north-west,


Environmental protesters in Port Louis.
ECO-SUD

The Mauritian authorities worked with experts from around the world to contain the spillage, with salvage teams succeeding in emptying the *Wakashio*'s tanks of their heavy fuel-oil, leaving only a small amount in the engine-room. Oil that spilled into the south-eastern lagoons had been removed and disposed of in secured locations, said the MPTA.

The *Wakashio* was carrying 4180 tonnes of oil when she ran aground off Pointe d'Esny, and from 6 August an estimated 800 tonnes leaked out from a cracked tank.

Further spillage was stopped three days later after emergency teams had pumped 500 tonnes of oil out of that tank. The vessel then broke in two on 15 August, the rear half remaining on the reef and the fore section set to be towed away. There was no further spillage at that point, said the MTPA,

Volunteers had turned out in force to support efforts to contain the spread and remove oil already spilled in the lagoon. In total 3184 tonnes of oil was pumped from the tanks, and 884 tonnes of oil liquid waste and 524 tonnes of solid-waste sludge and contaminated debris collected.

The MPTA estimated that the oil-spill had affected between 6 and 7.5 miles of coastline, leaving more than 190 miles unaffected. "Encouraging reports confirm that even major beaches of the south-east as well as the Blue Bay Marine Park are unaffected," said the authority.

"Beaches and lagoons on most of the south and east part of the island as well as in the north and west have not been affected."

However, the multiple deaths of dolphins and whales in the wake of the spill provoked demonstrations in the capital Port Louis on 29 August.

Environmental campaigners were demanding a full investigation into the causes and effects of the oil spill, with independent experts involved.

The government said it was setting up a commission, and would carry out *post mortems* on the 47 dead dolphins and three whales that had been found to determine the cause of their deaths.

Preliminary reports had indicated no evidence of oil on or in the two bodies initially examined.

Local environmental group Eco-Sud raised the possibility that vessels equipped with sonar involved in the *Wakashio* salvage operation might have contributed in some way to the cetaceans' deaths.

Eco-Sud said its crowdfunded disaster appeal had resulted in donations of 25 million rupees (about £470,000) for lagoon rehabilitation and to support workers affected by the disaster.

"The mv *Wakashio* has damaged livelihoods considerably, leaving local economies vulnerable," it stated.

"Many fishermen, skippers and others living from the sea have lost their only source of income. The funds will also be used to restart their subsistence."

On 1 September a further disaster occurred when a tugboat leaving the *Wakashio* wreck-site collided with the barge it was towing in heavy seas off the north-east coast and sank, killing at least three sailors. ■

Guardian of the Reef **This iconic statue by British-born Canadian sculptor Simon Morris has become well-known to divers in Grand Cayman, but it's one of a projected limited edition of four. We hear that *Guardian 2* could be heading to England's South Coast soon.**

PADI Adventures **This new free app is giving away a whole series of 2021 diving holidays through weekly "Ultimate Dive Vacation Sweepstakes". Also use it to learn about and book current diving and this year – download it from an app store or go to travel.padi.com**

Ultimate Explorer **The amazing Mary Rose Museum and the 11 separate attractions under the National Museum of the Royal Navy umbrella have linked up to offer unlimited access to all areas in Portsmouth and beyond on one annual ticket, historicdockyard.co.uk**

Hard Coral OD **Unexpectedly, in Japan they are bemoaning the spread north of acropora coral in place of fishable seaweed habitats. Yes, for once it's a case of ocean-warming doing corals a favour!**

Simply Scuba under new ownership

DIVING EQUIPMENT retailer Simply Scuba, which went into administration in May as reported in **DIVER**, is now part of the Internet Fusion Group.

Simply Scuba had stated at the time that it hoped to continue under a new owner. Based in Kent, it was part of the Simply Group (TSG), which covered various outdoor activities and fashion and employed 32 staff.

Though mainly associated with online sales, it had a physical retail outlet in Faversham, and had been a serial **DIVER** Awards winner.

The Internet Fusion Group, based in Louth in Lincolnshire, is an e-commerce business associated with outdoor activity, sports and fashion products, though not until now scuba diving. ■

US instructor went missing off Ambon

AN AMERICAN scuba-diving instructor who had been stranded in Indonesia for six months by the coronavirus pandemic went missing while diving from her yacht in early August.

Her husband, also an instructor, reportedly waited more than two hours for her to surface before raising the alarm.

Carol "Laila" Lakien, 56 and from California, had been out diving with her husband Kevin Pool, 57. They had sailed to Ambon on their yacht *Aquabago* in February and, unable to return to the USA because of Covid-19 restrictions, had stayed anchored in the south of the island.

Noted for its coral reefs and diving, Ambon is capital of the Maluku archipelago in the Banda Sea, midway between Sulawesi and West Papua.

The couple had dived regularly in Ambon Bay and had done so on the morning of 7 August.

The yacht was anchored only about 150m out from a hotel in the village of Amahusa, at a reef site noted for its marine life.

After early bad weather cleared, Pool had dived solo for an hour from about 9.30am before Lakien joined him. After his dive Pool had boarded the boat to wait for his wife but, according to the Ambon Search & Rescue Office, had not raised the alarm until around 1.40pm.

As bad weather set in again and strong currents were reported, the search and rescue operation did not get fully under way until 10am the following day, using three teams of navy divers as well as a National Search & Rescue Agency team, Maluku Police sea and air units and volunteer divers.

The operation was set to continue for a week but there were no reports that Lakien had been found.

AMBON SAR OFFICE

Teenage snorkellers die in unusual circumstances

TWO TEENAGE snorkellers died in separate incidents in August, in Spain and French Polynesia.

A 16-year-old Spanish boy lost his life following a suspected attack by a spotted weever off Playa d'Aro in the Costa Brava.

The parents of the boy, who was named locally as Arnau B, raised the alarm on the afternoon of 15 August when he failed to return to the beach after about half an hour. When his body was eventually recovered by lifeguards, unusual marks were noted on his throat and face.

A *post mortem* concluded that he had gone into anaphylactic shock, potentially as a result of a discharge of venom, although toxicology reports were still pending.

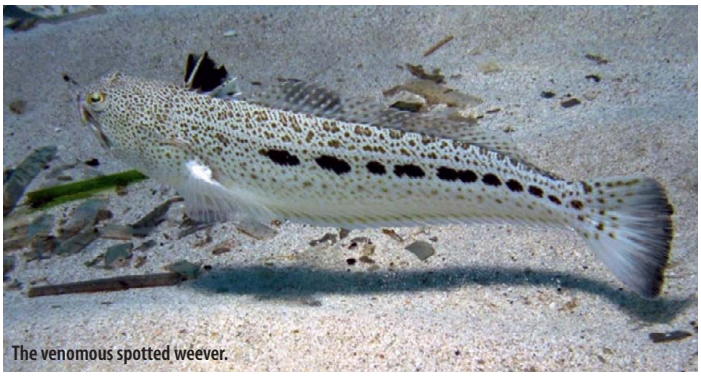
The police took the boy's action-cam in the hope that it would explain what had happened. His parents told local press that it showed their son about 100m off the beach following a jellyfish before coming across a "strange and colourful fish with a harmless-looking face".

He had been filming it from a distance for half a minute when it was said to have attacked him, apparently around the jaw area, causing "instant death".

Spotted weevers (*Trachinus araneus*) can grow up to 45cm long. The three black spines at the front of their first dorsal fin and backward-facing spines on their gill-covers are highly poisonous.

Weevers often bury themselves in sand with spines protruding to catch small fish or crustaceans, so injuries tend to be sustained by paddlers or swimmers treading on them.

While the sting is extremely painful it is not usually fatal, but it has been known to trigger heart attacks or cause severe allergic reactions. Application of hot water is the recommended treatment, and the spines can be removed using tweezers.



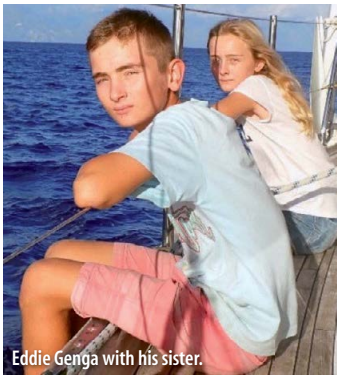
The venomous spotted weever.

ROBERT PILLON

The family was visiting the Costa Brava from the inland village of Montagut i Oix.

Meanwhile off the island of Moorea in French Polynesia a teenage boy from the Channel islands was killed after being struck by a speedboat while snorkelling.

Fourteen-year-old Eddie Genga was in the sea near his parents' yacht, which they described as their "liveaboard home". Harry & Barbara Genga had sailed west from Jersey via Panama 18 months before, with their son and his sister Amelie, 12.



Eddie Genga with his sister.

They had spent the past nine months in French Polynesia, their stay extended because of Covid restrictions, and had been anchored off Moorea.

"Cremation is not possible locally and we cannot leave our boy behind in a foreign country, hence we must repatriate his body for a burial back in England," explained the Gengas.

Because their insurance did not cover the cost of repatriation, the family launched a crowdfund appeal to raise the £15,000 required – and were amazed to find the target exceeded within only four hours.

The appeal has now raised more than £40,000 donated by 740 supporters, with excess funds and any accident compensation pledged to a trust for young musicians.

Eddie Genga was said to be a gifted musician and had "an amazing zest for life – a lovely boy and so bright with talent and kindness, who loved adventure and the sea".

Egypt warns against full-face snorkelling masks

DIVE-CENTRES and other members of Egypt's Chamber of Diving & Water Sports (CDWS) have been asked to discourage Red Sea snorkellers from using the full-face masks that have grown more popular in recent years.

According to the CDWS its advice is based on recent investigation of several incidents that indicated a "recurrence of accidents and injuries" resulting from use of the masks.

Acting in co-operation with Egypt's Ministry of Tourism & Antiquities, the chamber has drawn attention to "the risk of inhaling the accumulated carbon dioxide inside of the mask produced while breathing".

Snorkellers using full-face masks.

It says that breathing CO_2 can lead to headaches, dizziness and in some cases unconsciousness, which could lead to drowning.

Full-face snorkelling masks have been linked with in-water fatalities before, notably following a spate of incidents in Hawaii last year, though the link was not conclusive.

The tightly fitting head-straps have also been claimed to make the masks more difficult to remove in an emergency.

Advocates of the masks claim that the natural style of breathing helps to keep users relaxed, and that not being required to grip a mouthpiece makes extended snorkelling more comfortable.

A number of full-face snorkelling masks, which are generally inexpensive, were converted into emergency respirators for use by medical teams in the early days of the coronavirus pandemic.

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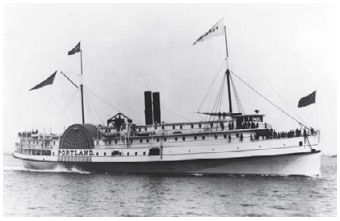
VIRTUALLY WRECKED

Live-streaming events is a big deal. As well as ordinary telly you can get pay-per-view sports, watch parliamentary proceedings or pretty much anything at all, really.

And that now includes shipwreck exploration, as researchers from the famous Woods Hole institute sent video from their latest project around the world, courtesy of the Internet.

One of their target wrecks was the steamship *Portland*, which went down



in a storm in 1898 with huge loss of life, and another was an unknown collier. Both are in a protected area close enough offshore for sea conditions to be similar to those for diving in the UK.

I got quite excited as I planned my dive, carrying cylinders around the garden until I was out of breath just like when I get onboard the boat and kit up, grabbing some ice-water to dribble down my neck to simulate the inevitable drysuit leak, and running a cold bath so that I could do some deco on the ascent, obviously with my eyes shut to match the usual sensory input delivered while hanging on a line in the North Sea.

Then I tried to find the site online and at the first attempt found that I couldn't access it because I was in the UK. Blown out of a virtual dive. Amazing! Just like the real thing! Only cheaper.

Something to do

Illayaram Sekar from Chennai, India has just claimed a world record for solving Rubik's cubes under water on a single breath. In preparation for his attempt he practised *pranayama* yoga techniques to improve his control and allow him to spend more time under water on a single breath.

Remarkably he had never learnt to swim but his record attempt took place in a small glass tank, so all he needed to do was take a deep breath, sit down and concentrate on his cubes.

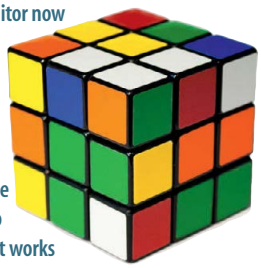
Two minutes, 17 seconds later and six Rubik's cubes had been solved. Confidence boosted, Illayaram has declared that his future holds more records, and he has re-

dedicated himself to his craft. His day job, apparently, is teaching people to solve Rubik's cubes.

Which reminds me. I have a Rubik's cube I bought in 1980 when they first came out. It has never been solved, not once, despite hours of frustrated twiddling.

Can I claim the record for the longest-ever time to not solve a Rubik's cube?

(The Editor now informs me that there has always been a very simple formula to solve it – it works every time, so most people just get bored and quickly forget about Rubik's cubes. Don't tell Illayaram.)



Keep it to yourself

Things not to say out loud: A diving friend tells me he took a cruise last year, and was asked if he'd like to join a tour of the vessel.

"Oh, no," he said, "I'd rather wait until it sinks and then dive the wreck."

Leave well alone

Apparently the Molokini Crater off Maui in the Hawaiian islands is full of unexploded ordnance, because it was used in WW2 as a practice area for bombers.

It is now an underwater wonderland and a conservation area where local operators take scuba and snorkel trips, so imagine the reaction when the idea of blowing up the munitions for safety reasons came up.

And that set me thinking. I mean, lots of wrecks have munitions aboard.

The mortar shells and battleship projectiles are an integral part of the dive-plan on *Thistlegorm*, for example, and I remember running machine-gun bullets through my gloved hands when I dived the *Oslofjord* wreck off South Shields years ago.

Thing is, they don't go bang. Not without quite a lot of effort, anyway, so you can leave them alone. And that was exactly the conclusion that the Hawaiian authorities came to as well. What a remarkable application of common sense!

Can't blame Chris

You know Chris Hemsworth? Well, you probably won't actually know him, he's a movie-star, so we just get to watch him being Thor or whoever else he's getting paid to pretend to be.

Anyway, he likes to go diving. As a movie-star he doesn't need to book a space on a boat, but he still needs the kit, just as we all do.

Which brings me to the headline used on a celebrity gossip website, which recently announced: "*Chris Hemsworth Wears Skintight Wetsuit to Go Scuba Diving with his Dad*".

This leads me to believe that the reporter might know summink about Chris Hemsworth, but knows beggar-all about scuba diving.

Of course the wetsuit was skin-tight. They all are, if they fit properly, they have to be, that's how they work. *Sheesh!*

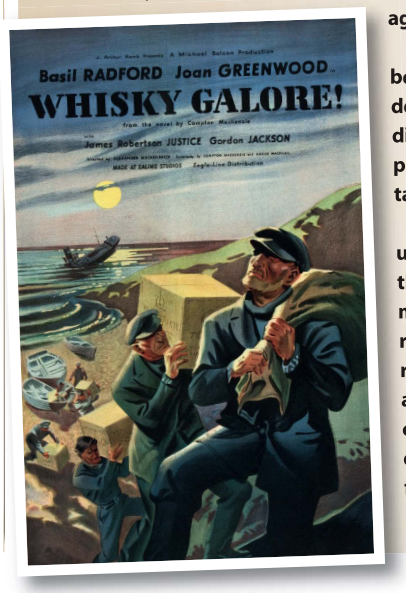
Politician that goes on giving

Back in 1942 the ss *Politician* sank off Eriskay in the Outer Hebrides. Resisting the temptation to suggest that this would be a good place to sink many more politicians, the cargo of the vessel included whisky. Lots and lots of whisky.

The locals, and not-so-locals, some travelling from as far away as Lewis, immediately set to work recovering as much of the liquor as they could. If the story sounds familiar it was the real-life basis for Compton Mackenzie's book *Whisky Galore*, filmed in 1949 and again, less successfully, in 2016.

Fifty years after the sinking, bottles were still being found, despite the wreck having been dispersed with explosives to prevent further plundering of tax-free hooch.

Later again, divers working on undersea cables rediscovered the wreck and, er, liberated a few more bottles. One of these recently went on sale and realised six grand, despite being advertised as not fit for human consumption. You did also get a diving helmet, a couple of firebricks and a poster for the 2016 film for your dosh, mind.



Tiny rust-biters

Back in the day, wreck-divers were blokes with twin-sets and lump-hammers and lifting bags, and their calibre was determined by the amount of stuff they could bring up. If they got an intact porthole with glass and stuff they were diving gods.

And the marine life on the wreck? Well, it was OK if you could pull out the odd mackerel between dives or snag a lobby from under a plate, and congers were always fun, but basically they just got in the way.

Not according to Erin Field, a microbiologist at East Carolina University in Greenville, who investigated the wreck of a WW2 warship off the Outer Banks of North Carolina and discovered more than 4800 species of bacteria on the remains.

What was really interesting was that some of these bacteria actually eat away rust, so they're literally eating their own home. See, for years we've been blaming the lump-hammer brigade for spoiling wrecks, when all long it's been bacteria. Now, where did I put that crowbar?

FREE SCUBA CAMERA ICEBERG

Erik the Red, exiled from Iceland in 982, sailed west and, after several weeks at sea, landed in what he called Greenland – probably as a marketing ploy to make it sound appealing for colonisation. In fact four-fifths of Greenland is covered in ice. Today the world's biggest island is being rediscovered, not by settlers but by divers seeking encounters with giants – whales, glaciers and icebergs. Text and images by TOBIAS FRIEDRICH

FOR A DIVER WHO HAS to make a living from underwater photography, destinations are viewed from a different perspective. It's not only about being somewhere nice, diving from a liveaboard or having time to chill. Everything changes once your hobby becomes your main job.

Before confirming a trip I need to consider how I'll be able to sell the piece and to whom. I consider different photographic angles, or finding places few divers have visited.

After becoming certified in drysuit diving I had planned to visit Norway to try it out. It was 2012 and I learnt that the tour operator Northern Explorers also offered Greenland, which seemed far more interesting than anything I had dived until then.

I booked the trip and took pictures of icebergs above and below water, the only problem being that I had visited in August. I was able to sell the story easily, but underwater visibility had not been the best because of the amount of fresh water melting from the glaciers, as well as the algae bloom that starts in early summer.

In the spring of 2015 I returned, to Greenland's east coast. Visibility was much better, though the water was also a lot colder. My dive-computer showed -3°C, though salt water can get down only to -1.8° in reality, but in these extreme conditions I was finally able to shoot some images of icebergs in 50m-plus visibility, allowing me to show these massive ice-structures as a whole.

These images also went through a lot of publications. I decided that I had to return in March 2019 to renew the images and obtain new content. What I didn't know then was that freediver Anna von Boetticher would also be on the trip.

Anna is the most successful German freediver and has held some 33 national records. She had travelled to Antarctica the previous year to dive on icebergs, but had been foiled by bad weather conditions, so she had decided to try Greenland instead.

We found out that we were on the same trip a couple of weeks before departure, so planned to do "a little bit" together.

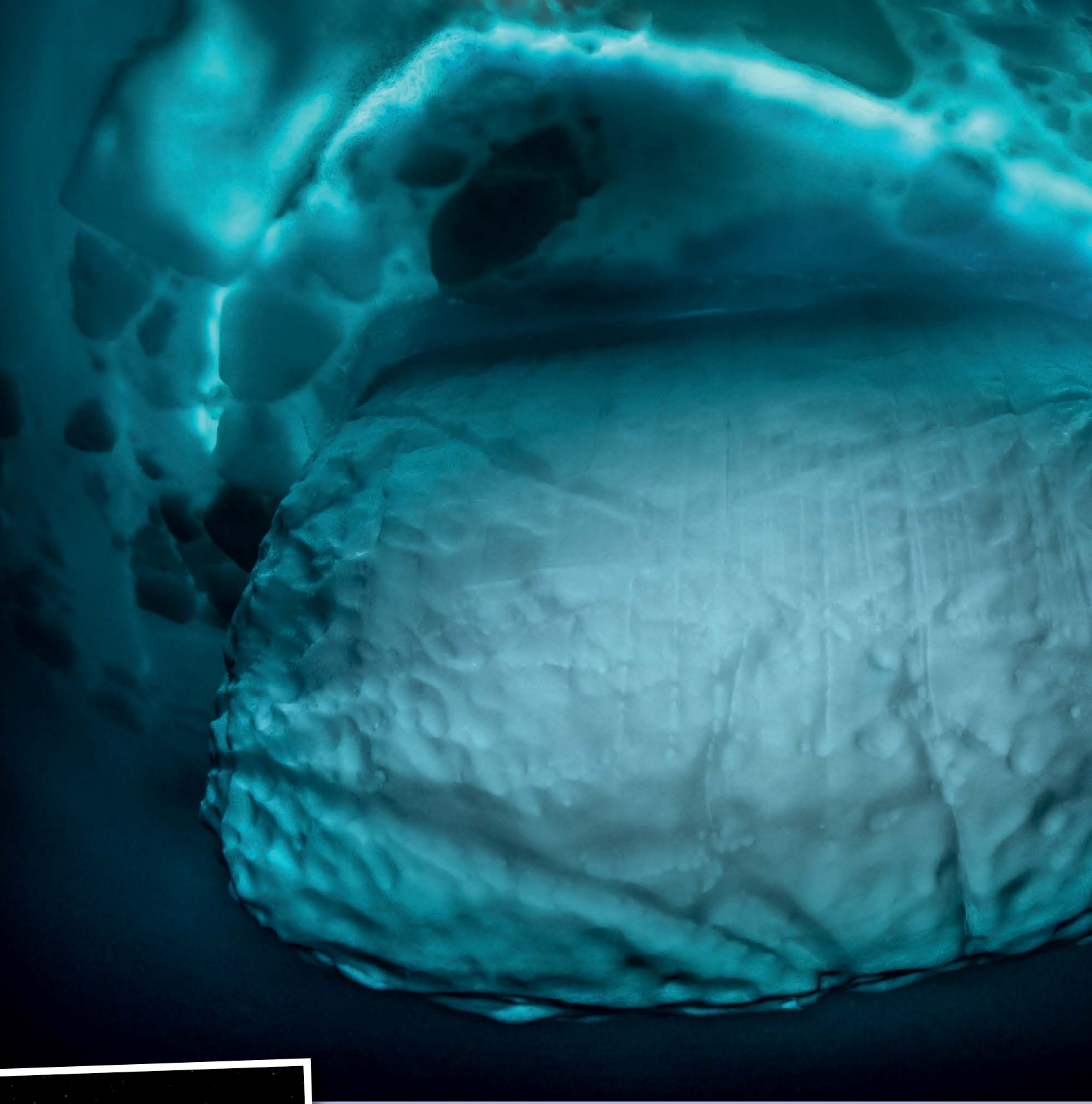
This little bit would turn out to be our preoccupation for two weeks, but there were challenges to be overcome before even thinking about taking pictures under water.

EAST GREENLAND WAS still in midwinter, with the pack-ice reaching far out of the fjords into the oceans. Boat-driving would be almost possible, especially in the frozen fjords, so we had to move all our gear by helicopter from East Greenland's only airport in Kulusuk to the town of Tasiilaq, where about 2000 Inuit live.

Before arrival one has no idea of the icy conditions. The weather could easily confine you inside altogether, for instance if a storm is coming.

It was to allow for bad weather periods that we were staying for two weeks but, luckily, the ice and weather conditions were perfect. The Tasiilaq fjord, just outside town, was frozen over into a 30-50cm layer of ice and there was blue sky with almost no wind. There were also some small icebergs frozen into that ice layer where we were planning to dive.

Reaching the icebergs was the next challenge: It was easy enough to carry the dive and photo gear including tanks over the ice with a snowmobile, but the vehicle couldn't get all the way to the dive-site because deep snow was covering the ice.



That meant that every day we would have to cover the last few hundred metres towing the sledges, loaded with a few hundred kilos of gear, back and forth.

At the site we picked a reasonably big iceberg and tried to get some holes into the ice. It's easy to do this with a proper saw and drill, but you never know in advance how thick the ice is. Sometimes it could be 1m thick and impenetrable.

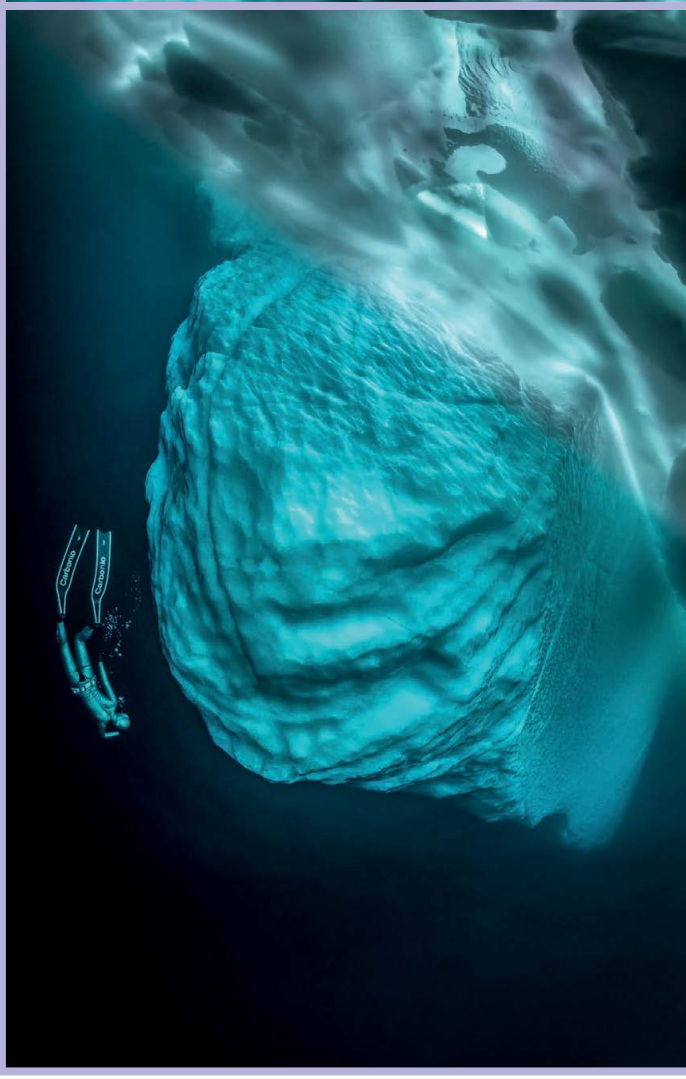
And because we needed more than one hole around an iceberg just for safety, it sometimes took a few hours just to prepare the dive-site.

The next problem was the cold. In thick clothes you get sweaty underneath very easily, which isn't normally a problem but is a big thing in these conditions. If you're sweating too much underneath the sweat has nowhere to go and cools you down.

Once in the water, this also means you getting cold very easily. In almost -2° water this could end your dive after a few minutes.

The solution was to work through the activities on the ice as a team, taking turns so that nobody heated up too much.

ALSO PROBLEMATIC WERE the regulators and other dive-gear. The top layer of water is fresh, and this freezes faster than salt water. Once in the water you can't breathe through them immediately because the second stage will



freeze and a free-flow will result, emptying the tank fast. So the safety precautions had to be more stringent than on a regular dive.

The trick is to deflate the BC and sink to at least 1m before taking that first breath. It's a little challenging to trust your equipment to this extent but that's how it had to be.

We still experienced free-flows because of the sheer coldness of the water. Pouring hot water into the second stages and also the BC valves, which also froze from time to time, helped a lot.

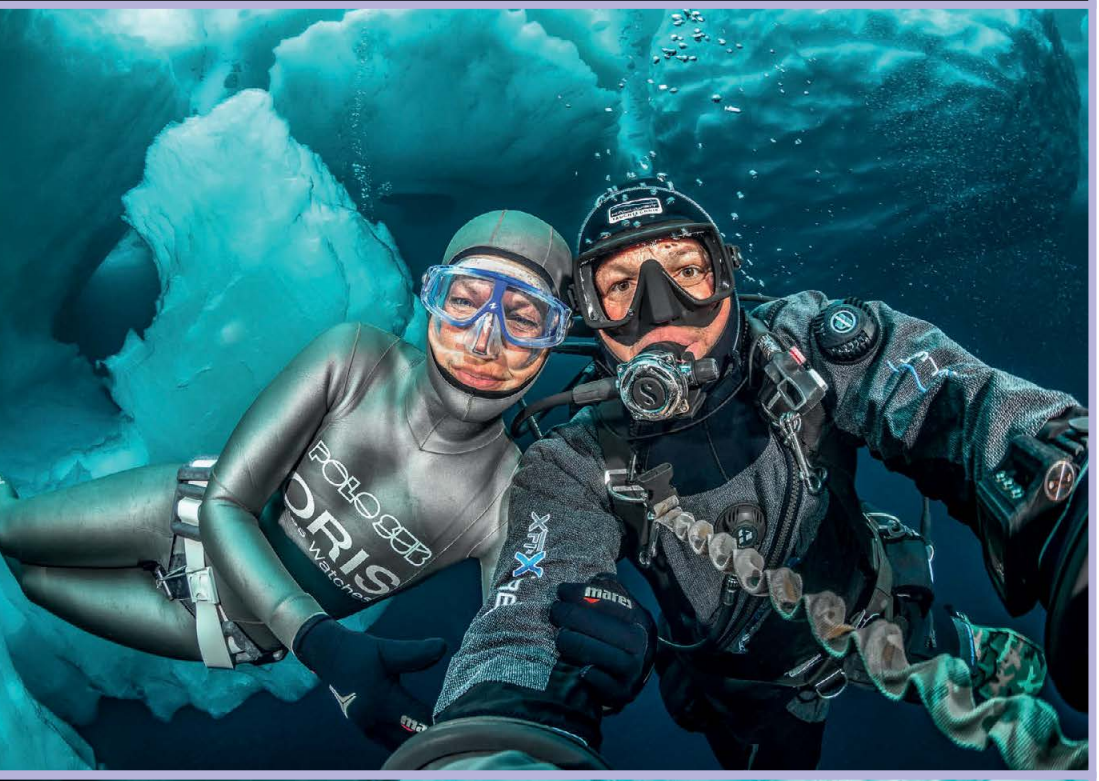
Once in the water it feels like a regular coldwater dive, besides the lips and other exposed parts of the face get numb after a few minutes and don't hurt any more.

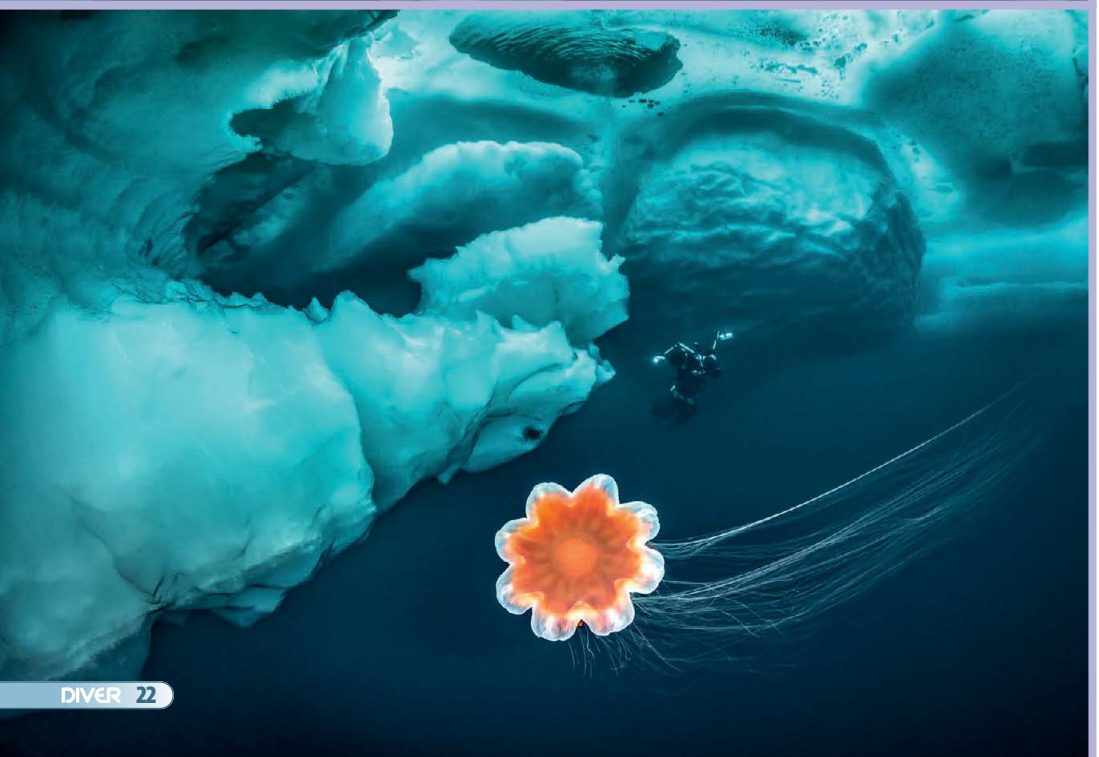
You want to wear everything you can under your drysuit. Some people use heated undergarments, but that also means bringing big, heavy battery tanks with you.

For me, heated kidney- or back-pain belts worked very well. They react with oxygen and last at least a couple of hours.

In the water people with good blood circulation have the advantage. Others, like me, will probably get cold hands and feet very quickly.

A half-hour under water shouldn't be a problem, but staying longer will call for either mental stamina or a lot of activity to keep the blood circulating.





Once out of the water the body reheats quickly, especially the hands, but standing on the ice all day doesn't help with the feet. Pouring hot water into your booties can help a lot. With no wind and hot tea it's easy enough to heat up between dives, but if there is wind and a low outside temperature, everything becomes much more difficult.

One day we had an outside temperature of almost -20°C with strong wind that made it feel more like -30°. After a few minutes out of the water everything that is liquid will freeze, including the drysuit you're still wearing. Such conditions made a second dive almost impossible.

At least I was wearing a drysuit that kept me dry inside – unlike Anna, who was wearing only a 6mm wetsuit in the water. However, because of the amount of activity involved in swimming up and down and holding her breath, she was able to dive for 15, and sometimes even 20 minutes, giving me time to get enough shots of her next to the icebergs.

This was important because we did several dives a day when possible, and in changed locations to get different-looking scenarios under the ice. Also important was to be able to portray a small human beside a huge iceberg to give scale to these incredible pieces of frozen water.

ON THE FIRST DIVES we both had safety-lines attached to help us find the exit hole easily. After a few dives we felt comfortable enough to dive without the line. This was riskier, but the line would no longer disturb Anna's diving or the images. She had to trust me both as her photographer and as her safety diver.

I would watch her all the way back to the hole, suppressing my instinct to immediately review my images.

But this additional safety rule proved very important on one occasion when Anna was coming up a little too early and

FACTFILE

GETTING THERE ▸▸ Most flights are via Iceland, from where prop planes fly into Kulusuk, south-eastern Greenland's only airport.

DIVING & ACCOMMODATION ▸▸ Northern Explorers can arrange trips, northern-explorers.com

WHEN TO GO ▸▸ August-September

MONEY ▸▸ Danish krone

LANGUAGE ▸▸ Greenlandic (Inuit), Danish and a little English

PRICES ▸▸ Northern Explorers charges 3550 euros pp for a week-long iceberg-diving tour, which includes boat transfers, half-board apartment accommodation (two sharing); all boat and land excursions and activities; and an average of two dives per boat day depending on conditions.

VISITOR INFORMATION ▸▸ visitgreenland.com

couldn't locate the hole. I knew what was happening when I saw her looking around, and immediately swam towards her while pointing to the exit hole.

Anna is professional enough to stay calm in such a situation and, once she had looked at me, was easily able to swim back to the hole.

Extreme conditions call for extreme safety precautions. This is why Anna, who could hold her breath easily for many minutes while moving, was diving for no more than 90 seconds at a time, leaving a good buffer in case anything unexpected should occur. She was the real hero when it came to fighting the cold in these conditions, as well as changing out of her wetsuit in -20°C temperatures.

DURING THE DIVES I would come up to talk to Anna only occasionally to discuss where and how she needed to dive.

The objective was clear: to obtain as many shots from different angles of a freediver with an iceberg. The priority was to get enough different perspectives of the two to avoid boring the viewer.

In some shots Anna would appear very far away; in others in the middle of the ice. We got a good portfolio of shots together very quickly and could then consider other ideas and perspectives.

On one occasion Anna took one of my Keldan video lights to use as an extra light source to illuminate the ice from below. Another time I told her to sit upside-down on a piece of ice or just to stand on the surface, the other way around.

We created some nice perspectives, at least for the sitting, because the freshwater layer was almost 1m thick, so in the photo in which she is standing her legs appear completely covered in that layer.

We did get some stormy days in Greenland, but luckily the first days were so good that we were able to pretty much complete the set in the first week.

Conditions can change quickly in Greenland and just two hours after our departure the whole of the ice in the fjord broke off and floated out to the sea, marking the end of any diving opportunities anyway.

So we were very lucky with the conditions, and in forming a team that worked so well together. I'll look forward to further projects of this kind.

LEOPARD'S LAIR

NIGEL MARSH has dived all around the world looking for sharks, but discovered a unique gathering in his own backyard.

THE LEOPARD IS ONE of the most beautiful of all the sharks. It is big, docile and exquisitely decorated with a wonderful spotted skin pattern. But for divers encounters are rare – unless you visit the Leopard's Lair.

The leopard or zebra shark (*Stegastoma fasciatum*) is the only member of the family *Stegostomatidae* and is easily identifiable by its skin pattern and the ridges running along its body.

It has an exceptionally long tail, too, almost as long as its body. Maximum length is 2.5m, although many shark books inaccurately state 3.5m.

Leopard sharks are oviparous, laying large, leathery egg-cases, but little is known about their reproductive behaviour. They reach maturity at six or seven, but their reproduction strategy might be more bizarre than ever suspected – a female in a Dubai aquarium was recently documented as cloning herself, laying eggs that hatched without any prior mating, and the young sharks having identical DNA to the mother.

Young leopard sharks have a zebra-like skin pattern, hence the other common name, and reach adult size in around two years.

Leopard sharks are most often seen resting on the seabed throughout the day and are thought to feed at night.

With their rows of small teeth set in powerful jaws they feed on molluscs, shrimps, crabs and small fish.

They are found in tropical to subtropical seas in the Indo-West Pacific region, from South Africa to Japan and the northern half of Australia to Samoa.

Most reference books label these sharks as rare or only locally common, and there are only a few places where you can guarantee a sighting.

You can see them in Australia, occasionally on Ningaloo Reef in Western Australia and on the Great Barrier Reef, but the best location is around southern Queensland and northern New South Wales, the small stretch of coastline I call the Leopard's Lair.

When I moved to Brisbane in 1990 local divers told me of seeing them regularly, but after a year of diving a variety of local sites I had seen none.

Then, in April 1991, I received an excited call from a friend, Kev Russell. He told me he had just found a new dive-site with resident manta rays.

The next day I headed out to what is now called Manta Bommie, off North Stradbroke Island. Within seconds of hitting the water I saw a large reef manta.

I followed it for several minutes until I spotted four leopard sharks lazing side by side on the bottom. The manta forgotten, I headed for the much rarer sharks.

I couldn't believe my luck. In a dozen trips to the GBR I had seen only a handful of leopard sharks, and never more than one at a time. I took several photos of the closest shark

Pictured: Leopard sharks are large, docile and generally easy to approach.

Above: One discovery Nigel made after diving with so many leopard sharks was that they often had groups of copepods (small crustaceans) covering their nose.

before it lifted off the sand, disturbing two of the others.

The fourth shark stayed in place, allowing me to capture many close-ups.

Over the next 45 minutes I would photograph manta, shovelnose, eagle and sting rays, turtles, wobbegongs and, more importantly for me, a dozen leopard sharks in only 6-15m of water.

Manta Bommie was something special, especially for someone who loves photographing sharks and rays, so every chance I got I dived the site.

For the next month there were leopard sharks everywhere, resting in the gutters and out on the sand.

On one dive I counted more than 20 all over the bottom, looking a bit like large speed-bumps. However, at the beginning of May they had suddenly disappeared!

Over winter there were none to be seen, I didn't know where they'd gone, but suspected that they didn't like the cooler winter water. By November the waters off Brisbane had started to warm again and the leopard sharks returned in force at Manta Bommie.

Where they had gone for their winter holiday was a mystery; had they headed north to warmer water or gone into deep water?

That summer, after numerous Manta Bommie dives, Kev mentioned that leopard sharks could sometimes be seen at nearby Flat Rock. This was a deeper

site with coral gardens and steep walls in 10-36m of water.

I had done several dives at Flat Rock and never seen a leopard shark, so was curious to follow up on Kev's comment.

We moved the boat to the site, jumped in on the western side and enjoyed a lovely dive – but no sharks.

At the end of the dive we headed into the shallows for a safety stop. Visibility was around 30m and, staring into the distance, I was surprised to see a leopard shark swimming around in shallows.

Following it through a gutter I saw another, then another and another.

Around a dozen leopard sharks were swimming in the shallows – no wonder I hadn't seen them there before – I had never spent time in these shallow gutters.

Not having my camera, I stopped and studied what was happening. The sharks weren't just swimming around, but appeared to be following each other.

I noticed that it was the males following the females, so could this be a mating aggregation?

All the sharks were quite large at more than 2m, and there appeared to be an even ratio of males to females.

IN THE SUMMERS of 1992/93 and 1993/94 I again dived with the leopard sharks as often as I could. They could always be found at Manta Bommie during the season, November to April, but not always at Flat Rock.

In February 1994, rumours of leopards saw me heading 60 miles south to northern New South Wales to dive Cook Island off Tweed Heads. Going no deeper than 15m I had a great dive and found a dozen leopard sharks resting on the sand.

After the dive local divers told me that leopard sharks were always seen in the area over summer, not only at Cook Island but also at nearby Nine Mile Reef and Fido Reef.

Further research revealed that over the summer months they were also found in good numbers 50 miles further south at Julian Rocks off Byron Bay.

North of Brisbane, the next main sites were Wolf Rock and Round Bommie off Rainbow Beach, 120 miles north.

Clearly southern Queensland and northern New South Wales was a leopard shark hotspot, a 240-mile stretch of coastline – the Leopard's Lair. Nowhere else in the world saw such a concentration of these wonderful creatures, and no one seemed to realise it at the time.

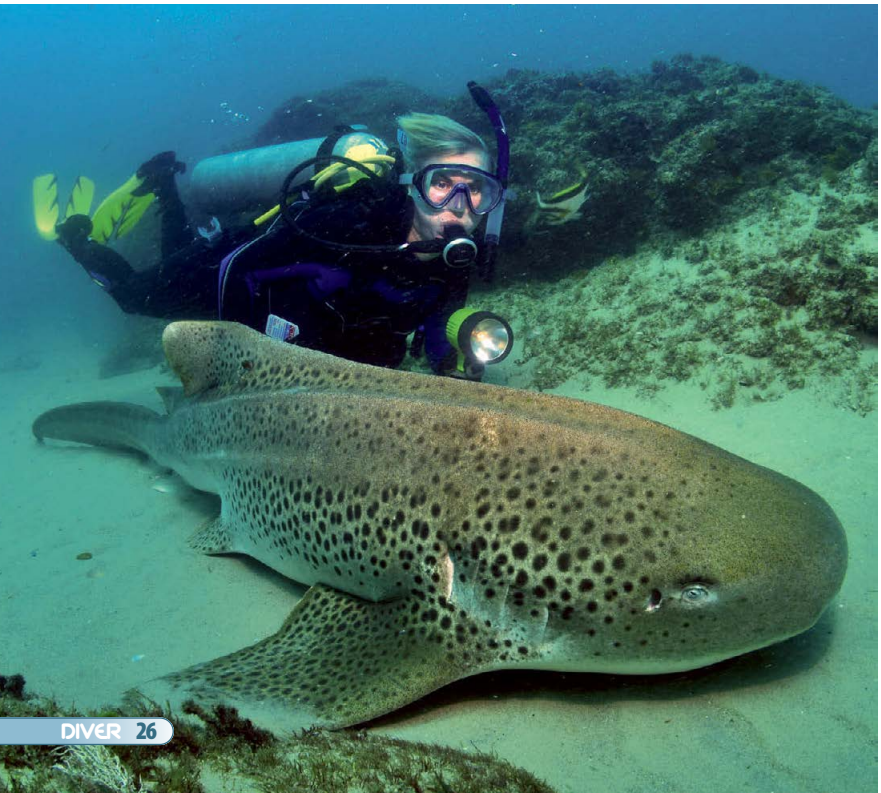
IN DECEMBER 1994 I was called by Scott Michael, a US marine biologist, shark expert and author of the great book *Reef Sharks and Rays of the World*.

He was in Western Australia photographing wobbegongs and chasing me for shark photos. I mentioned the leopard sharks and the possibility of a mating aggregation and he promptly cancelled a trip to the GBR and arrived in Brisbane the following week, eager to see a leopard shark. His business card featured a drawing of a specimen yet he had never seen one in the wild.

With rough conditions at Manta Bommie we headed to Flat Rock, but after 20 minutes had found only one shy shark. I then saw two swimming off in the distance.

We followed and, once over a ridge, found ourselves at the rarely dived northern end of the island, with dozens of sharks swimming around us. We quickly returned to the boat and relocated it.

Changing tanks, we descended to be surrounded by leopard sharks, some swimming along the bottom, others in midwater, and a few even close to the surface.



Above: Leopard sharks lift off the sand by pushing with their pectoral fins.

Below left: A diver encounters a leopard shark in a sandy gutter at Manta Bommie.

With 20m visibility I did a quick headcount while turning and counted more than 30 in view, so estimated that there were at least 50. This was the greatest concentration I had yet seen.

After a few minutes it become clear that this was a mating aggregation. The ratio of females to males was even, and I soon saw the "following" behaviour again.

Whether in pairs or groups, it was always a female followed by one or more males, and the males all looked sexually mature, with long, battered claspers.

I watched one pair winding up the reef, the male very close to the female, almost like a pair of synchronized swimmers.

The female gave a shudder and stopped in mid-water, allowing the male to put his nose close to her cloaca. This lasted only a second before she continued up the reef with the male in hot pursuit.

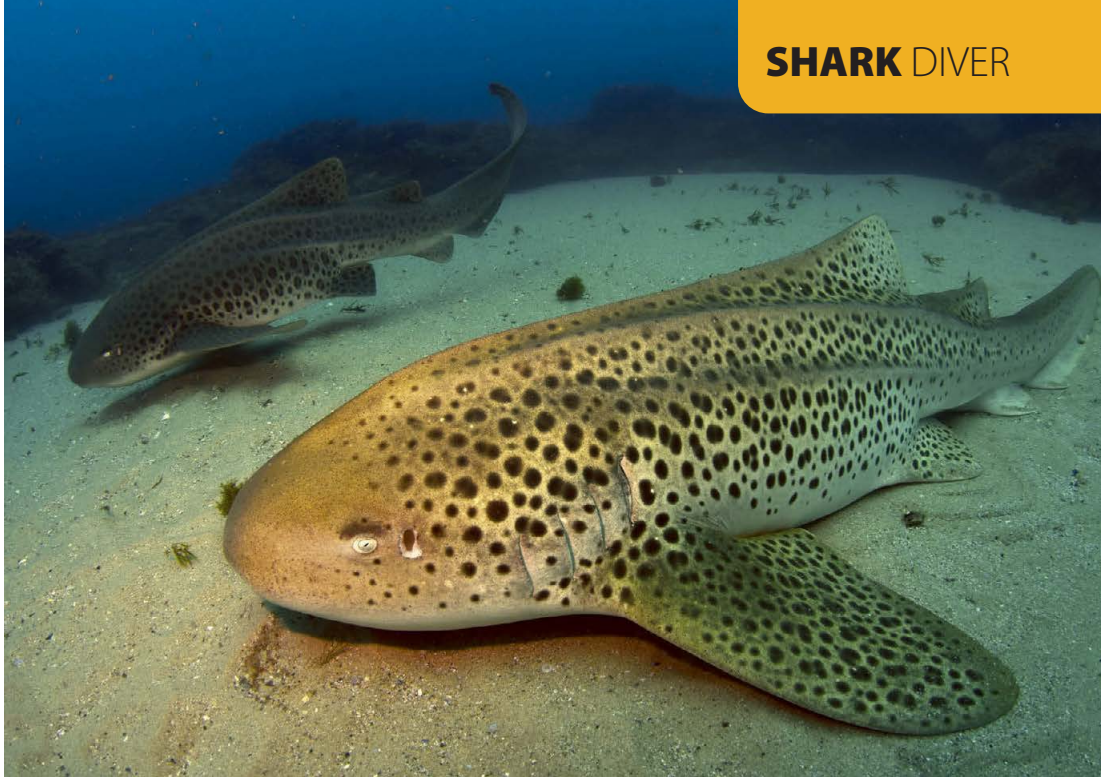
For the entire dive I was absorbed watching these beautiful sharks. I had hoped to observe some mating, but after an hour we exited the water without seeing any contact between sharks.

Scott and I were both ecstatic, and agreed that this was a mating aggregation, but when would they mate – at night or in deep water? I still don't know.

I WROTE SEVERAL articles after that amazing experience, letting the cat out of the bag and attracting the interest of research scientists. In 1999 a tagging programme began but it was never completed.

I saw a few of these tagged sharks, but as most of the tags were quickly fouled and rendered unreadable by algal growth, they became useless to science.

In 2003 Dr Christine Dudgeon, from



the University of Queensland began a more comprehensive study at Manta Bommie to better understand the migratory movements and genetic effective population size of the sharks.

Using photo-identification – each shark having a unique spot pattern – Chris was able to identify 388 sharks at Manta Bommie, with some recorded multiple times over a 12-year period.

Recreational divers had a big hand in this research, providing images for a Spot the Leopard Shark project.

Chris estimated a local population of some 460 leopard sharks using the Manta Bommie site. She and her team tagged a number of the sharks, to confirm that the spot patterns didn't change over time, and fitted 18 acoustic tags.

Receivers placed at sites along Australia's east coast told them that the tagged sharks headed north to warmer water in winter months as suspected, off Hervey Bay, Bundaberg and Gladstone,

One was even recorded travelling 800 miles to Townsville. Most of these sharks returned to Manta Bommie the following summer, but some ventured even further south to the Solitary Islands off Coffs Harbour, 250 miles south of Brisbane.

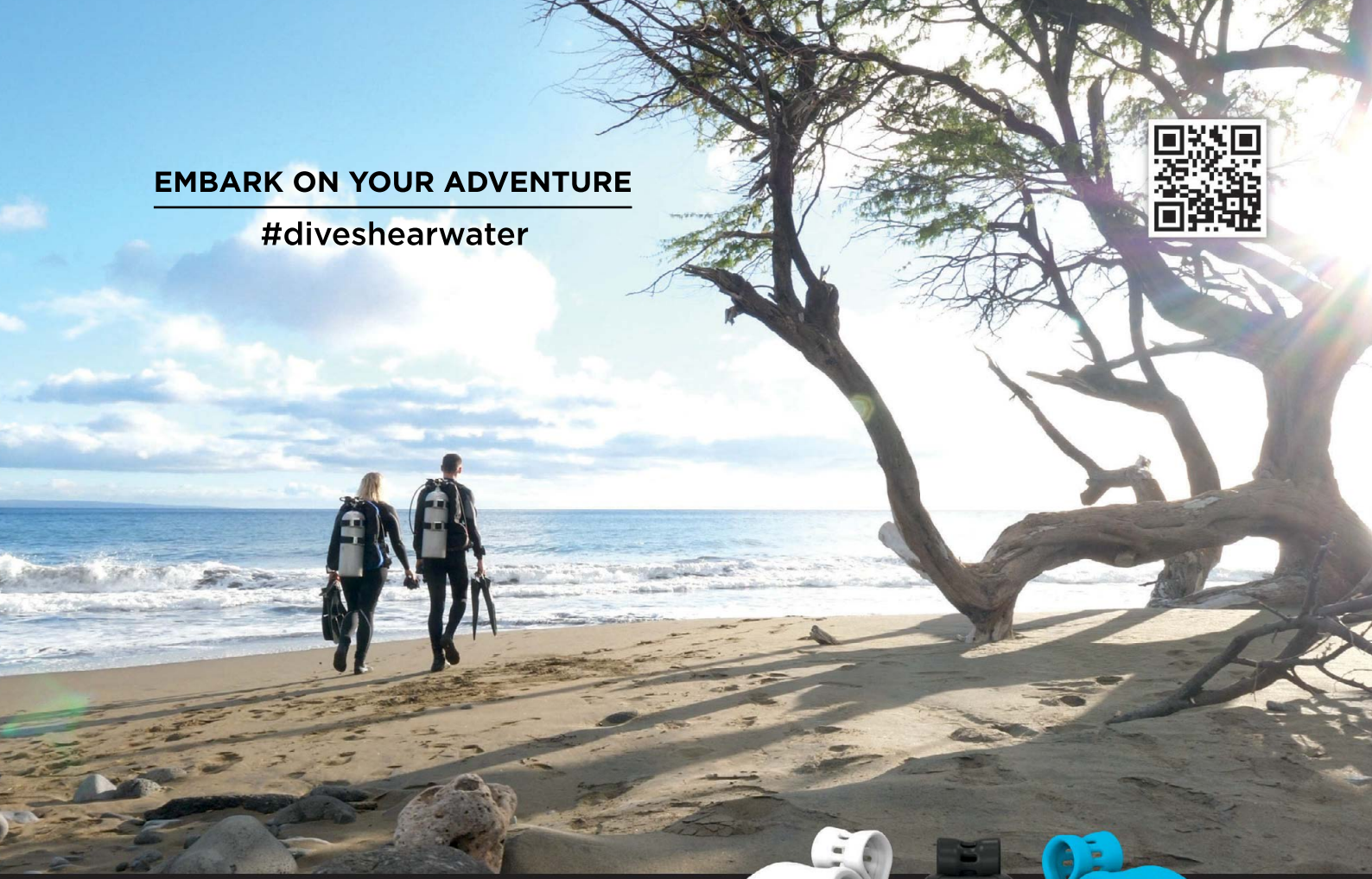
Chris and her team also found that the sharks preferred a water temperature above 22°C, quickly disappearing if the water cooled, and didn't enjoy rough conditions. They moved on if seas were greater than 1.5m.

Why they aggregated at Manta Bommie was still not clear. It's obviously a daytime resting spot, but they might also gather there to mate and feed.

While the research has unlocked a little of the secret world of leopard sharks, much remains a mystery. I eagerly await each summer for them to arrive in local waters, and spend much time searching for eggs and juveniles, but have yet to find any of these locally and suspect that both are in warmer northern waters.

I have travelled the world to photograph sharks, but feel very lucky to have the unique Leopard's Lair right on my doorstep.

Above: Why the leopard sharks gather at Manta Bommie in such large numbers remains unclear.



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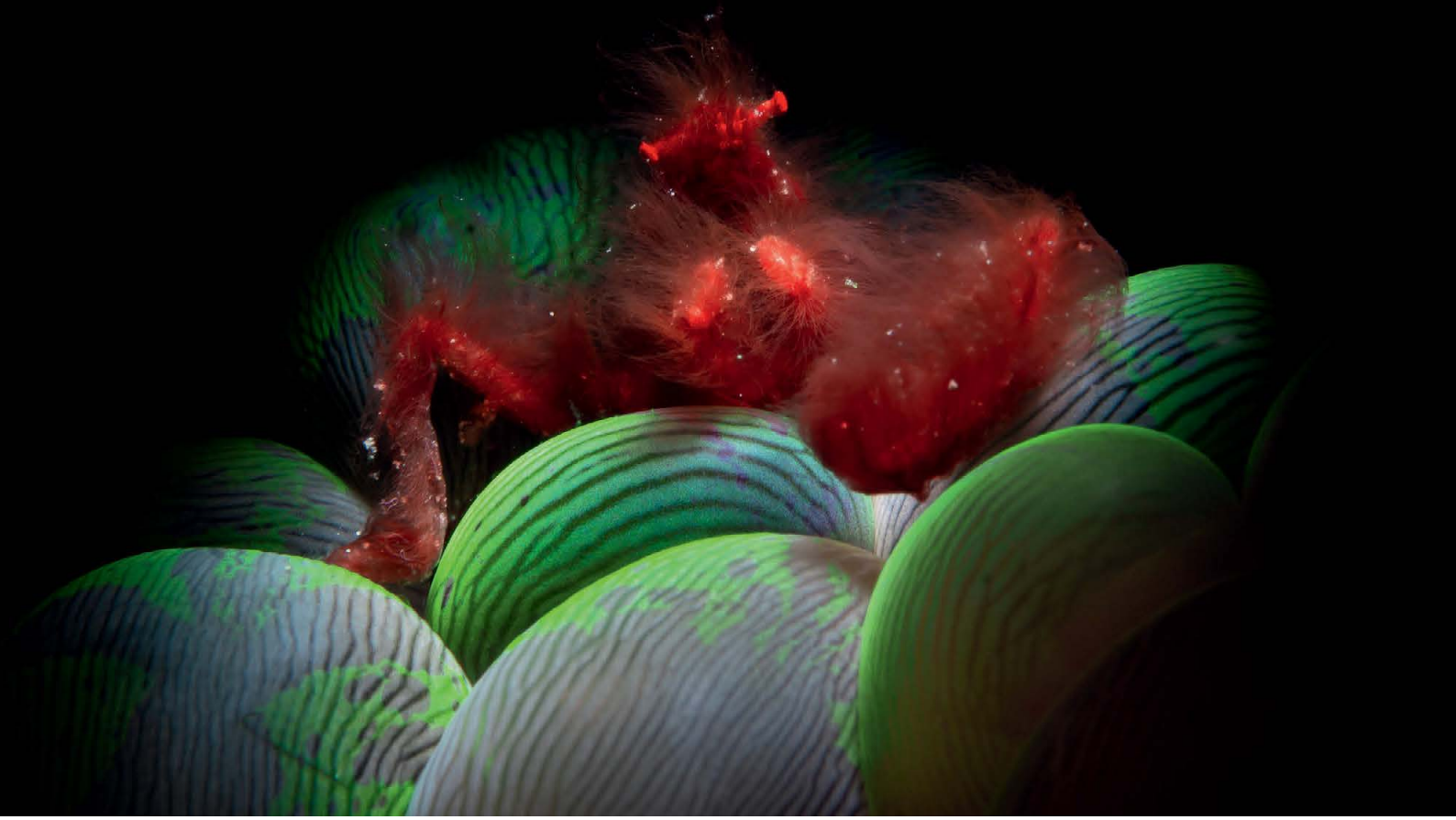


Destination: Santander, Samboan and Sumilon Island in Cebu, Philippines. Heard of them? If not, let HENLEY SPIERS and JADE HOKSBERGEN give you a heads-up – and start making plans

WHEN THE MOMENT comes to safely resume our international dive adventures, it will surely be accompanied by an even keener sense of appreciation.

Being locked down at home lent itself to daydreaming of our next dive destinations, and a carefully thought-out selection process can at least commence within these restricted surroundings.

Perhaps social-distancing principles will now carry over into our choices. For us, having a dive-site without crowds has always been an immense attraction, and when we were living in Cebu in the Philippines we took the opportunity to explore the island's secret dive-spots in search of underwater solitude.

While Moalboal and Malapascua have become Cebu's world-famous dive locations, Santander and Samboan are quiet, undeveloped areas at the southern tip of the island, where tourism is just starting to gain a foothold.

Visitors here are usually interested in the many nearby waterfalls, or using it as a base to visit the controversial whale shark feeding site in Oslob. The diving scene is so virgin that even finding nitrox fills is a tricky proposition.

For those wishing to escape the crowds, here lies the opportunity to drift over world-class corals without another dive-group in sight. Sumilon Island, the first marine sanctuary in the Philippines, is nearby too, and a good place to go looking for bigger animals.

With its west-facing orientation, the sunsets in Santander and Samboan are spectacular, the sky painted from a new and unique colour palette every evening, with the mountain range of neighbouring Negros providing the perfect backdrop.

A 3-4-hour scenic drive takes you from bustling Cebu City to Santander's quiet coastline. Emoha Boutique Dive Resort is a newly built passion project of Jean-Michel Caille and Lottie Tau. It delivers a decadently beautiful home-away-from-home experience, more akin to a luxury resort than your typical dive hotel.

Aside from a lack of crowds, another particular quality we look for is a great house reef, and Emoha's is the kind of place you could happily dive all year without getting bored.

ANTICIPATION BUILDS as we look through the glassy surface at an alluring coral garden, consisting of immense aggregations of finger corals.

This spot is great for snorkelling too, so if travelling with children or non-scuba-divers they won't feel left behind.

We take our time marvelling at one large coral bommie after another. They form part of an interesting topography whereby the seabed dips into a large

Above: Orangutang crab in bubble coral at Bato Pier.

Left: A goby.

Below: The Panorama site is Crinoid City.

trench, before rounding back up again.

As you return over the ridge, there is a small step at 30m, neatly arranged and stretching past the limits of the dive-site.

We can't help but ponder how this unusual underwater scenery could have occurred, as if built by Poseidon himself. Anthias crowd around the hard corals as we make our way to the shallower water, and a lionfish glides in search of a meal.

Sandy patches between the corals are home to an unusually large colony of ribbon eels, with three colour variations corresponding to their stage of maturity: the juveniles are black, and will first progress to the blue body with yellow trim of a male, before completing a final colour and gender transition to a fully yellow female ribbon eel.

Strong currents can occur in this region, where the Tañon and Cebu Straits come together. However, they rarely pull downwards and the dive-sites slope out gently, making this a very pleasant place to drift along coral reefs. It's common to take in multiple dive-sites in a single splash, as the water whizzes you along.

AS WITH THE REST of the region, the Eden dive-site is unusually rich with anemones, hosting a variety of different anemonefish. Nemo (or the false clown anemonefish) might have gotten all the acclaim, but with 25 species it's worth shopping around a bit before you decide on your favourite.

Each anemone is ruled by the largest anemonefish, who is the sole female. If she dies, one of the males will undergo an organic sex-change and take her place (gender reassignment would seem to be a recurring theme among marine animals).

Visiting the anemones around sunrise or sunset makes for attractive photo opportunities because they are balled up, exposing their colourful skirts. This also restricts the restless anemonefish to a small space, making it easier to capture them closely packed and well-posed.

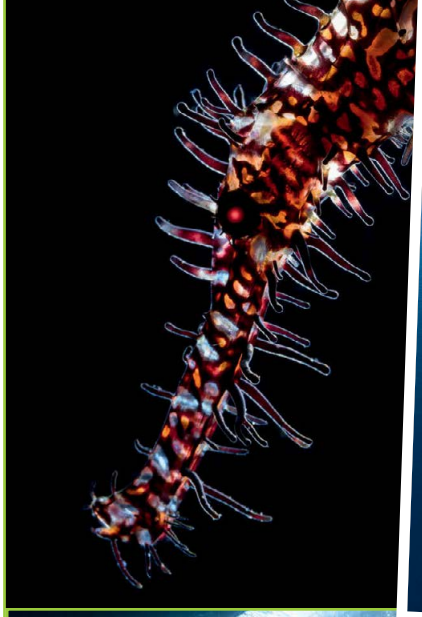
On ascent we spot a jellyfish with trailing tentacles, another irresistible picture opportunity, made stress-free by the lack of boat traffic in the area.

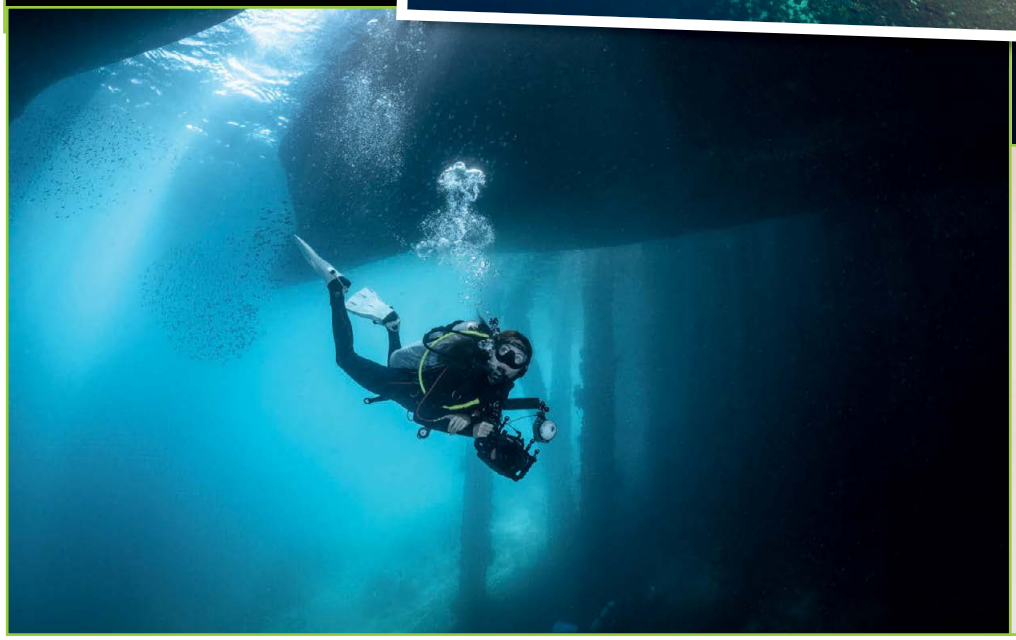
A firm favourite, the Panorama site is a treasure-trove of featherstars and nudibranchs. The topography is a gentle slope dotted with large coral bommies, each one a mini ecosystem warranting further investigation.

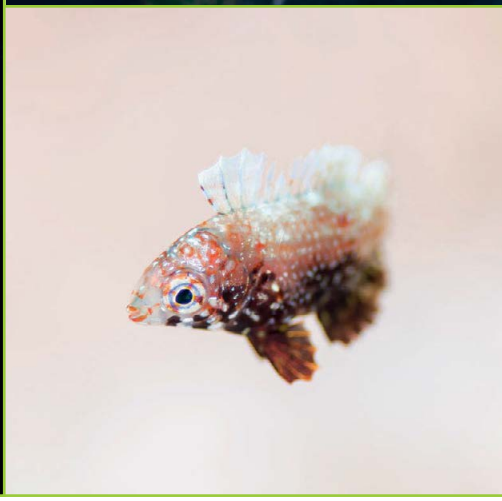
It's Crinoid City here, with featherstars adorning almost every surface, coming in an array of different colours.

The pure yellow crinoids have a magnetic appeal to cameras, contrasting perfectly with the surrounding blue water.

Laced with a sticky mucus, featherstars are adept at collecting food from the water column.







Their waving arms also easily get stuck onto neoprene, so be extra careful with your buoyancy with so many flapping crinoids around, or risk surfacing with tell-tale, guilty fragments on your wetsuit.

The featherstars also act as a protective host to several species, each carefully camouflaged within. These include crinoid shrimp, crinoid squat-lobster, ornate ghost pipefish and clingfish.

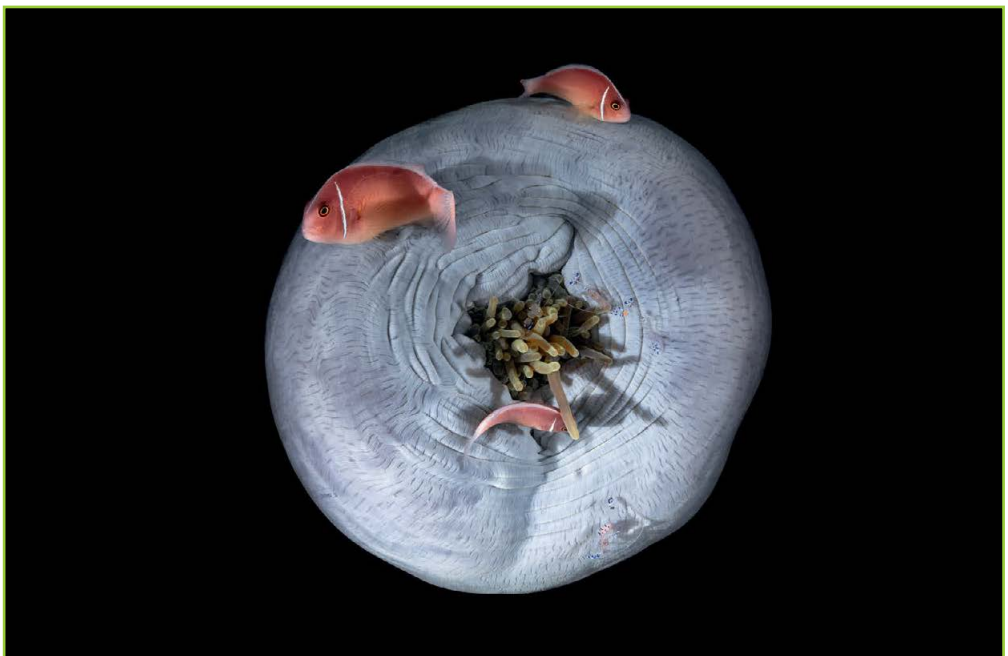
Clingfish resemble tadpoles with soulful eyes on the sides of their flattened heads, and are undoubtedly in the "cute" category of reef fish.

The clinging part of their name refers to a disc on the underside of their belly that can attach to various surfaces with incredible powers of suction.

If the abundance of crinoids is the first thing you notice here, the second is the profusion of nudibranchs. We are drawn to nudis' kaleidoscopic colours and it's certainly a curious phenomenon to see these soft-bodied, vulnerable creatures so blatantly flaunting their presence.

Above, clockwise from top left: Ghost pipefish; *pangas* off the coast; nudibranch; juvenile wrasse; Jade beneath Bato Pier.

Below: Balled-up anemone at Eden.



Nudibranchs are confident enough to do so because they have evolved a defensive, chemical arsenal that ensures that most predators foolish enough to take a bite will regret it immediately.

In some remote Alaskan and Chilean cultures people eat nudibranchs, and have described it as being like chewing rubber.

Neville Coleman, who devoted his life to the study of nudis, describes them as being extremely bitter-tasting.

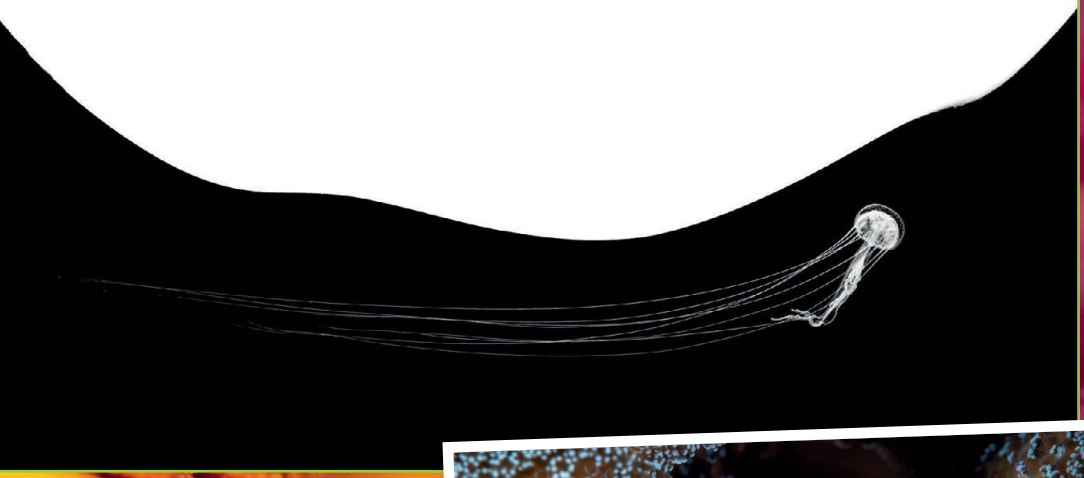
The lesson seems pretty clear for all: no nudis on the menu, please!

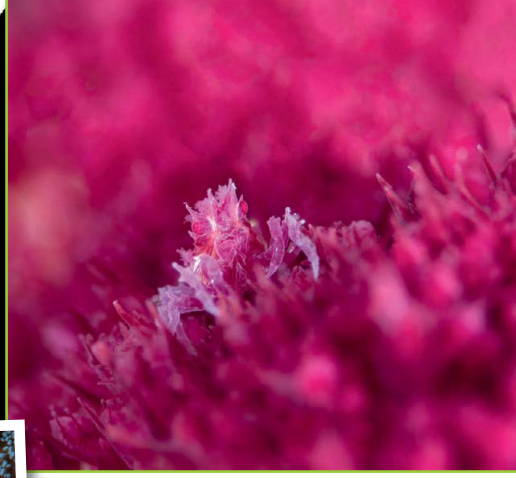
PANORAMA IS THE kind of site where the challenge lies less in finding nudibranchs, more in seeing how many species you can uncover in a single dive.

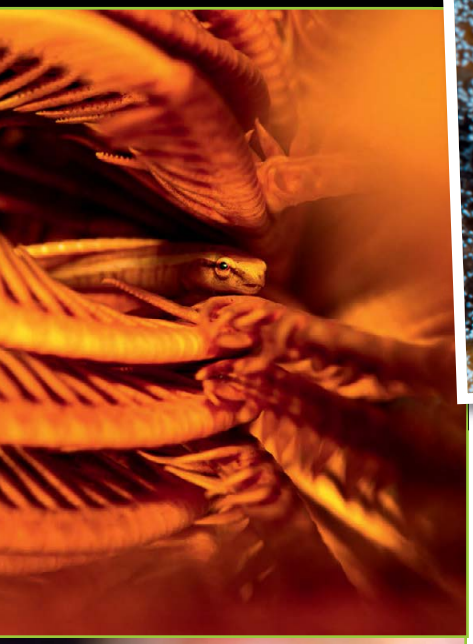
Juvenile frogfish are believed to adopt vibrant colours as a way of mimicking nudis and putting off predators, and they can also be located here by a good spotter.

Samboan, Santander's neighbour to the north, is host to Colase Marine Sanctuary.

Visibility in this area tends to be slightly worse, but this is balanced out by the fact that the marine sanctuary has







Top, from left: Jellyfish trails at Eden; candy crab.

Above: Porcelain crab.

Left: A tiny clingfish.

Below left: Juvenile ribbon eel.

Below: A ball of jack.

allowed fish populations to bounce back in greater numbers. There are the resident blacktip reef sharks, but they proved rather skittish and camera-shy when it came to underwater visitors.

The coral reef is beautiful and particularly resplendent in the shallower water, where the stunning hard corals wouldn't be out of place in Raja Ampat.

Purple anthias bring a touch of vibrant colour to the scene. Look closely and you'll see that they have an upturned, beaked mouth.

On the way back to Emoha you can spend a second tank on a unique Marmite dive. Bato Pier makes for a very shallow dive over a small area, usually with a couple of deep-sea fishing vessels moored overhead (their crews seem to find tourists visiting the bottom of their boats an especially amusing concept!).

For macro-enthusiasts and underwater photographers, Bato Pier is an excellent location for spending a long dive uncovering small critters and capturing images. There are both wide-angle and macro photo opportunities.

The light streaming through the gaps between the fishing-boats and pier is mesmerising and makes for a beautiful backdrop to images.

Ironically, schools of silver baitfish and sweepers take shelter under the fishing vessels, and will allow for a close approach. The pillars of the pier are well-encrusted with beautiful corals.

Bubble coral thrives in the shade of the pier and resembles a bunch of delicate, oversized, underwater grapes.

The many bubbles attached to its hard skeleton body will increase in size during daylight hours, and shrink at night.

Look closely in the gaps between the coral grapes and you might see a hairy, orange limb sticking out. You've just discovered an orangutang crab, a uniquely evolved species with bright red eyes and a heavy coat of orange hairs.

These hairs are not so much a fashion statement as a way of gathering food, with small pieces of plankton becoming trapped and collected from its furry coat.

FOR YET MORE variety, try a trip to Sumilon Island, declared the first official marine protected area in the Philippines back in 1974. Maintaining this reserve has had ups and downs through the decades. Typhoons, notably Pablo in 2012, have also taken their toll on the corals.

Nonetheless, Sumilon's sanctuary status has paid off in terms of the big fish on display, and its main strength is as an adrenaline-charged drift dive in search of reef sharks, schooling barracuda and jack, and other pelagic encounters.

Sumilon Slope is a long stretch of rubbly coral that stretches far from the island's shore. A good drop is vital here to avoid a long, air-guzzling swim.

Also ensure that you get a good read on the current direction, because they sweep through with unforgiving speed, and swimming against them for a long period is an exercise in futility.

The deeper reaches of this dive-site are the most exciting, and it's worth spending as much time as you can at 25m-plus.

It's a bit of a lottery as to exactly what you'll see, but this is one of the few dive-sites around Cebu that is rich in large animals and plenty of fish.

Keep an eye out in the blue for large schools of jack and fusiliers, swimming upcurrent with surprising ease as the water flows through their gills.

Look back towards the sandy bottom and you have a good chance of spying a whitetip reef shark, lazily writhing its way along after a busy night of hunting.

The sharks are very shy around divers, which is frustrating for photographers, because they tend to stay just far enough away to discourage any chance of your strobe light reaching them.

Look up and you might see schooling barracuda. Looped into a large spiral, they too make swimming in the current look effortless, and use schooling as a strategy to deter predators such as sharks.

Once your bottom time gets close to running out, head back towards the shallower area, where a large school of resident jack awaits. The school forms a tight ball, and dwarfs any nearby diver.

FACTFILE

GETTING THERE ▸▸ Several airlines offer flights from the UK to Cebu (with a stop along the way). Cathay Pacific offers competitive pricing and a 30kg baggage allowance in economy.

DIVING & ACCOMMODATION ▸▸ Emoha Boutique Dive Resort, emoha.com.ph

WHEN TO GO ▸▸ Year-round. High season runs from November-May. June to October is the rainy season with a chance of typhoons.

HEALTH ▸▸ Nearest hyperbaric chamber is in Cebu City.

MONEY ▸▸ Philippine peso, US dollars widely accepted.

PRICES ▸▸ Return flights around £600 if booked early. The resort can arrange a private airport transfer from about £80. A double room for five nights costs 24,650 pesos (around £380). A 10-dive package of guided boat-dives costs 16,000 pesos pp (around £250) plus fees.

VISITOR INFORMATION ▸▸ itsmorefuninthephilippines.co.uk

Above, from left: A painted frogfish; Colase marine sanctuary.

Below: Beneath the dive-boat at Panorama.

Santander and Samboan are the kind of exciting new dive location you can't wait to share with friends, and a location that could easily be combined with other Cebuano diving highlights, such as Malapascua's thresher sharks and Moalboal's sardines.

Our advice? Get there as soon as you can once the Philippines becomes accessible again, before too many people find out about this hidden gem.

BE THE **CHAMP!**

THE SPREAD / ALEX MUSTARD

Tompot blenny

CO-OPERATIVE AND characterful, the tompot blennies of Swanage Pier have long been a favourite subject for the British underwater photographer. Since before I was born, snappers have been ducking beneath the pier to bag a portrait or two.

The shaded seabed beneath the pier comes alive during the summer months. The place is infested with the cheeky chaps, and the very shallow water means that time is always on our side.

Curiously, tompots can be described accurately as both shy and inquisitive. Typically, they head for cover as soon as anything larger than them approaches, but they rarely disappear completely from view.

This is actually ideal for shooting face portraits, but more challenging if we want to try something different. I've long lusted after a wider view, placing the animal in its environment, and was very pleased when this one paused in colourful seaweed shrubbery.

The opportunity was fleeting, and while my hurried camera settings produced the correct exposure, they are far from what I would recommend!

Tompot In Seaweeds, taken with Nikon D850 and Nikon 28-70mm. Subal housing. Nauticam WACP-1, 2 x Retra flashes. 1/8th @ f/18, ISO 100.

THE WORLD BENEATH

DR RICHARD SMITH has a new book out that uses his keen eye as both a marine biologist and underwater photographer to delve deeper than usual into what divers see on coral reefs and elsewhere. Here's part of the scene-setting first chapter: Diving In

Pictured: Huge swells crash through an overhang in West Papua, Indonesia.

IN THE DECLINING EARLY EVENING light 14m beneath the surface on a remote Indonesian coral reef, a tiny seahorse strangles another with its tail.

Just 2cm long, the diameter of a one-cent coin, and perfectly camouflaged against the windscreen-sized fan-like gorgonian coral they inhabit, these creatures have a penchant for the dramatic.

For my PhD research I spent six months watching and recording the antics of these mysterious and diminutive fish, collecting data on their biology and conservation – the first recorded observations of their social and reproductive behaviours.

Denise's pygmy seahorses had only been recognised by science four years previously, in 2003. Like other behaviours that occur on coral reefs every day, these skirmishes have presumably been happening for millennia. We just didn't know to look for them.

Most of us hear about coral reefs and see them on nature documentaries, but unless we're lucky enough to experience such awe-inspiring ecosystems firsthand, it can be hard to appreciate their intricacies.

Exploring a tropical rainforest, you drip with sweat in a supersaturated and oppressive atmosphere waiting to spot an animal. A bird might call in the distance, the insect at your feet might unleash its high-pitched whine, and, perhaps, if you're very lucky, and extremely patient, something larger might barrel toward you from the undergrowth.

On a healthy coral reef, you can glimpse activity and life wherever you happen to look. Dozens of fish busy themselves with their daily commutes and travails.

In one hour on an Indonesian reef you will likely see more than 100 multihued and multiform species of fishes, if not double that – scrupulous cleaners, eccentric lovers, steadfast parents.

The nervous cometfish pokes its marionette of a tail out of a hole, attempting to convince you that it's a menacing moray eel.

Inches from your mask, a small but assertive damselfish warns you not to swim any closer to its precious algal farm.

You might not know the names of all of them, but you are mesmerised: immersed in the hustle and bustle of their daily rituals.

Coral reefs continue to surprise and delight. My work has taken me all over the globe and introduced me to them in 23 countries. I have seen fish that wouldn't even stretch across a penny and others that are longer than two London buses.

I have seen vibrant and bustling coral gardens that stretch as far as the eye can see and I have captured the first photograph of creatures that have never before been pictured alive.

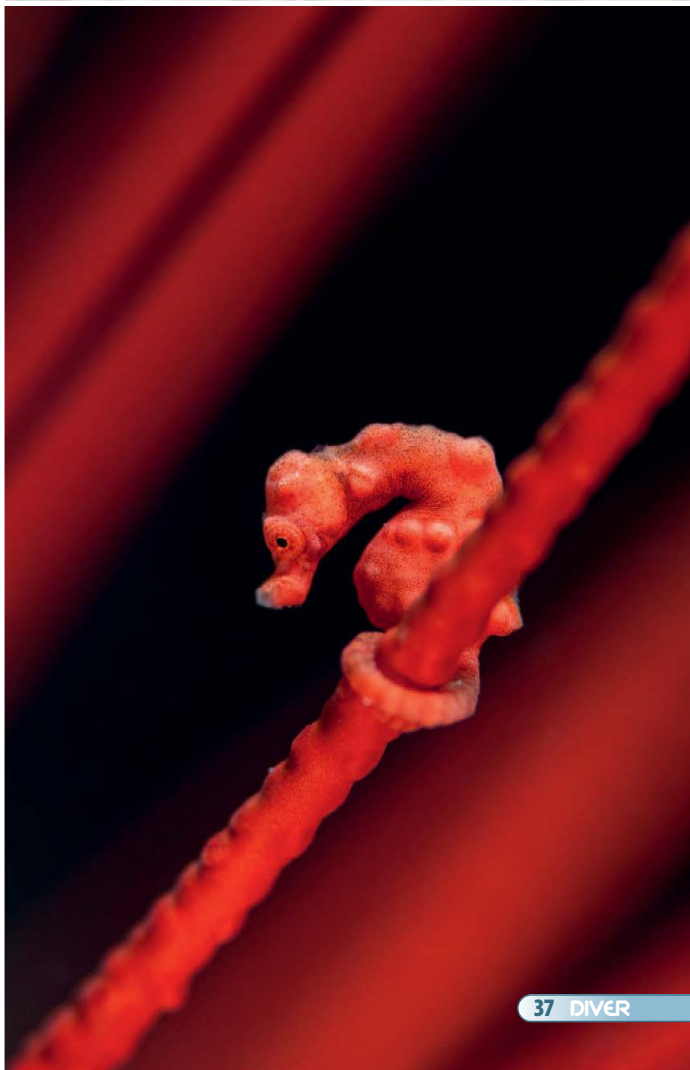
Elsewhere in the ocean, I have come face to face with a warty file snake deep among the roots of a mangrove forest in Indonesia, photographed animals and behaviours in Japan that were still unknown to science, and spent hours scouring an algal-covered rock-face to find an unnamed relative of the seahorse in New Zealand.

My aim in this book is to share some of my passion and wonder for coral reefs and the astounding variety of creatures that call them home, while allowing those who aren't lucky enough to experience this wonderful ecosystem first-hand a window under the waves.

FOR A LONG TIME, coral reefs have fascinated mankind. Charles Darwin mused about how these eclectic ecosystems could flourish in crystal-clear tropical waters where there are next to no nutrients to fuel their growth.

Today we hear about them in the news – often, articles bemoaning their loss due to devastating coral-bleaching.

When corals become stressed by environmental changes, such as warmer waters, they expel their symbiotic intracellular algae, leaving them ghostly white in appearance.



Above right: A male Galapagos pike blenny displaying.

Left: *Nembrotha kubaryana* nudibranch, one of thousands of these underwater butterflies, in Sulawesi, Indonesia.

Right: Denise's pygmy seahorse, also in Sulawesi.

Coral-bleaching has killed millions of corals over the past two decades.

Children learn about coral reefs as well, namely through the popular (though scientifically free-willed) animated coming-of-age film *Finding Nemo*.

I credit the film for this even though its makers didn't include some of the most fascinating aspects of anemonefish biology in the storyline. If the film were true to life, then, after the untimely death of Nemo's mother, his father would have transitioned into a female and another sexually reproductive male would have taken his place.

The reef is a biological powerhouse, full of fantastical creatures with amazing stories to be told.

For my godson Joey's birthday, I made a huge print of an untouched coral reef vista that I took in West Papua, Indonesia, to put on his bedroom wall. When I was a child in a rural British village, I spent hours poring over a map of the globe on my friend's wall; this had a profound effect on my view of the world.

I hoped I might inspire Joey, the way I was inspired, that I might foster within him a wonder of the natural world.

With so many kids growing up without a tangible connection to nature, it is ever more important for us to celebrate its splendour.

For those lucky enough to dive or snorkel on a coral reef, the first time is as overwhelming as it is memorable.

Imagine the European explorers as they came across the first coral reefs. As early natural historians and biologists began to explore them, they would have been struck by the stark differences between Caribbean, Red Sea, and Indo-Pacific reefs and the temperate Atlantic and Mediterranean ecosystems they were used to.

Initially, of course, the extent of an explorer's interest in coral reefs lay in the reefs' ability to wreck their vessels. Despite all the modern technology that we now possess, there are still uncharted waters that can scuttle ships.

Only a few years ago, I was on a boat that narrowly avoided disaster after encountering an uncharted reef in a remote corner of Papua.

I looked over the side of the ship and could clearly see the tiny damselfish on the reef below; they were so close.

Right: A pair of golden pygmy gobies hiding in a drinks can in Sulawesi.

Below: A feeding whale shark, the planet's largest fish, in West Papua.

Below: Juvenile fishes, such as this boxfish the size of a dice, undergo huge transformations before adulthood. This one was photographed at Luzon Island in the Philippines.

GROWING UP IN ENGLAND, albeit in the most landlocked part, I felt a deep connection with the sea, and I can relate to the wonderment of those early explorers.

My connection with it began when my father took me to rummage around tide-pools, or rock-pools as we call them, on the British south coast. I spent hours hunting between the seaweeds for beadlet anemones, periwinkles, limpets, and the odd hermit crab or shrimp.

The life in tropical tide pools tends to be less abundant due to the extremes of heat that the animals must endure in the blazing sun, but if you explore beneath the surface, the differences between coral reefs and temperate seas immediately become clear.

So far, more than 1800 different reef fish species have been found and recorded on the reefs of the Raja Ampat Islands, located off the island of New Guinea, in Indonesia's West Papua province – compared to 300 around the British Isles.

Each reef is different too; while many of the Atlantic fishes are extremely widespread, almost every Indonesian island has its own unique assembly of creatures.

We are living through a revolutionary period in the timeline of coral-reef exploration; suddenly, for the first time, scuba allows us to get to know a reef intimately.

Citizen scientists, not only academics, are contributing enormously to our understanding of this world.

Any motivated healthy adult can get certified within a week to dive down to 30m below the surface and, with a little experience, spend an hour submerged.

With the advent of accessible recreational scuba training, we are the first generation that has been able to freely explore the underwater realm.

We are diving into and cataloguing the Coral Triangle, the region of South-east Asia where the world's richest coral reefs reside, ones that have never been explored before.

I have been among the first group of divers to explore a certain coral reef – outer space is not the only place where we can "boldly go where no man has gone before." And as a direct result of expanding our horizons into uncharted

Above: An aggregation of sand tiger sharks sheltering in a cave in New South Wales, Australia.

Above right: An anemonefish suffering from a tongue-biter parasite that has replaced its tongue, in Sulawesi.

corners of the sea, we are discovering a wealth of new species.

YOU MIGHT HAVE thought that scientists have documented almost the whole diversity of the Earth, but particularly in the oceans; this couldn't be further from the truth.

In my 23-year dive career, fish identification books have doubled in size as people push boundaries in terms of what they look for and where they look.

This expansion has yet to peak. I recently worked on the scientific description of a new species of pygmy seahorse from Japan; it was hiding in plain sight and not far from Tokyo, the world's most densely populated metropolitan area.

I know of at least one more new species of pygmy seahorse waiting in the wings. The same is true of almost any group of sea animals you care to choose.

With so few taxonomists, there are great queues of species that continue to go about their daily lives, but have yet to be formally named or studied.

The complexity of coral reefs is often multi-layered and elaborate; while we tend to focus on the prominent corals and fishes vital to the reef 's functioning, they make up just a fraction of the overall number of species.

We turn a blind eye to things we consider boring, insignificant, or ugly, such as worms, sponges, sea cucumbers, and parasites.

But they are absolutely fascinating in their own right if we spend a little time considering their natural history.

I am drawn to animals that are easily overlooked or ignored, and I use underwater photography to share their beauty – hopefully imparting a greater sense of appreciation to people who haven't been able to see these animals first-hand.

It's unsurprising that some of the tiniest reef inhabitants are poorly known, but even some of the biggest, most conspicuous, and most charismatic are reluctant to reveal their secrets.

In 1986 only 320 whale sharks, the world's largest fish, had ever been recorded alive; today we know of aggregations of 420 individuals in just a few square miles.

We still don't know for sure where these behemoths go to mate or give birth. We don't know where juveniles spend their formative years; we don't even know where all the biggest females live.

Another shark, the megamouth, the world's third largest, wasn't even discovered until 1976. We still have fewer than 100 recorded sightings of the species and know next to nothing about its biology and ecology.

ONE PHENOMENON that we must be aware of when it comes to coral reefs, and natural ecosystems in general, is shifting baselines. The first humans to see coral reefs would most likely have experienced them in their pristine state, but sadly our actions take their toll on the health of an ecosystem.

Over the years, declines in ecosystems can be masked by perception of what a natural ecosystem looks like; with each generation, our view of how a coral reef should look and function shifts slightly.

In 1997, I was lucky enough to catch a brief glimpse of the Maldivian coral reefs before they were completely devastated by coral-bleaching.

A diver visiting the reefs today might not be aware of the changes that have taken place and consider what they see at face value. The current, depleted state of the reef becomes that person's baseline.

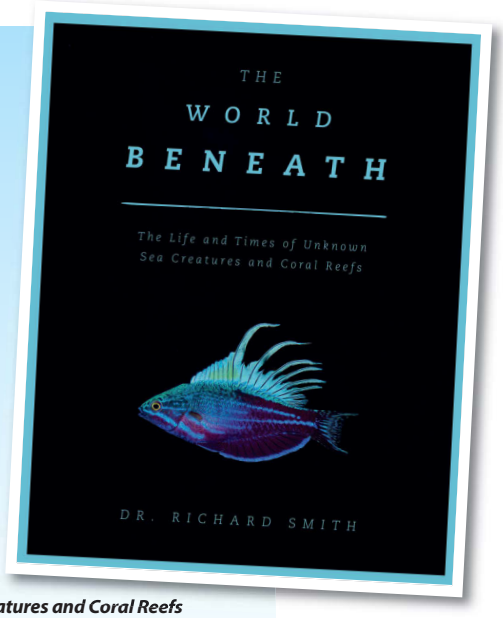
With such widespread bleaching affecting the world's reefs, one wonders if the next generation might think of their damaged state as the new normal and have a different concept of what a pristine coral reef looks like.

THE AUTHOR & THE BOOK

Dr Richard Smith, born and raised in the Cotswolds, is a British award-winning underwater photographer, author and marine conservationist who aspires to promote an appreciation for the ocean's inhabitants and raise awareness of marine-conservation issues through his images.

A marine biologist by training, Richard's pioneering research on the biology and conservation of pygmy seahorses led to the first PhD on these enigmatic fishes. A member of the IUCN Seahorse, Pipefish & Seadragon Specialist Group, he has named the two most recent pygmy seahorse discoveries from Japan, *Hippocampus japapigu*, and South Africa, *H nalu*.

Richard organises and leads marine-life expeditions on which the aim is for participants to get more from their diving and photography by learning about the marine environment.



***The World Beneath: The Life and Times of Unknown Sea Creatures and Coral Reefs* is out now. It is a 21x27cm hardback (ISBN 9781948062220) with 312 pages and more than 333 colour photographs, and costs £26.99 through book shops and Amazon. Find out more at Ocean Realm Images, oceanrealmimages.com**

OUR EUROPEAN TOUR

LINN VENNBERG and MATTIAS GRANBERG are Swedish film-makers, currently travelling around Europe for 15 months in a campervan with their two dogs to discover the continent both above and below the surface. Pt 1: Slow start in Sweden

IN THE VAN WE HAVE EVERYTHING we might need: refrigerator, charging station driven by solar panels, stove, storage for camera equipment and dive-gear and a compressor.

Our plan is to visit several countries along our European coastlines and dive in the Atlantic, Mediterranean and Baltic to discover the marine life, open caves and interesting historical wrecks to be found there.

Our dive-journey started eight years ago during a holiday in Greece. A friend of ours had done a Discover Scuba dive a couple of weeks earlier, and because Mattias and I like new challenges, this had sparked our interest.

Our hotel was next door to a dive-centre, which must have been fate, so of course we decided to book a DSD for the following day.

My 20-year fear of putting so much as my nose below the surface was all forgotten in the excitement of the boat-ride out to the dive-site, but as soon as we rolled back into the water from the boat it was very much present.

I panicked, but after a bit of a struggle we were finally able to descend and experience the underwater world close up for the first time.

Back at the surface, we agreed that we had to do it again, and booked another dive for the following day.

After that it wasn't long before we were on our way to Thailand with our open-water course booked.

Back home with our certificates we discovered the local dive-club, and were able to learn more about diving. We bought our own equipment and started diving independently.

Since then we've done a lot of dive-trips, especially to our neighbouring country Norway.

During a trip to Portugal we were diving with an Italian couple who were travelling Europe, living in their car. That's when the idea was born of travelling in a similar way to discover the diving in various parts of the world.

So we bought a van and started fitting out the interior to fit our needs.

AT FIRST THE PLAN was to drive to Asia, because that was where we had enjoyed many of our best dives. But after some thinking and research we realised that there was so much amazing diving to discover around Europe, and we wanted to show off the diving around our continent to inspire more people to

explore its waters.

So we settled for an approximate route around Europe designed to fit in as many dive locations as possible, and calculated that we would need about 18 months to be in the right places at the right time of year, and to appreciate them properly.

We also didn't want to be anywhere too hot during the summer months, because our dogs weren't used to that.

Heading out for such a trip is not something you can do without careful planning. We also needed to save up for a couple of years to be able to afford everything.

We custom-built the van ourselves, because what was available ready-made was either over our budget or unsuitable for our needs, especially in terms of storage for all our equipment.

We tried to find sponsors, and were fortunate to receive help with equipment from Reel Diving, Halcyon, Santi and Shearwater.

We also contacted dive-centres along the way and explored various shore-diving possibilities. A lot of variables would have to work out if we were to enjoy a smooth run.

We set out this May from Luleå in the north of Sweden, and our first stop was the Swedish west coast. We had originally intended to leave in April but because of the Covid-19 pandemic decided to postpone our departure for a month.

We started diving in Smögen, a place renowned as something of a mecca for nudibranchs, so our expectations were high.

OUR FIRST OUTING was a boat-dive, and because it was quite windy we went out to a rock close to shore where we could find a little shelter and calmer water.

We descended into the greenish water, and as we followed the wall deeper the light almost disappeared in the poor visibility. We just followed the wall until we were ready to end the dive and get picked up by the boat.

During the dive the strobes had not been functioning properly, and back at the dive-centre I discovered a leak in the connection between the underwater housing and the sync cord, so both had to be cleaned and dried.

The next day was about exploring the house-reef. We jumped in from the deck around the dive-centre and started swimming past the dock and through the channel at 3m.

The plan was then to follow the wall down to about 20m and explore it in search of nudibranchs and other critters.

However, as we were about to descend the wall we discovered that the seabed where we were was filled with nudibranchs and sea hares, and ended up spending the entire dive photographing and observing these fascinating little creatures. But to my disappointment, the strobes were still not fully functioning.

In springtime nudibranchs and sea hares gather in large numbers near Smögen dive-centre to mate and lay their eggs. We also found many species of crustacean, among them a great spider crab that had found a moon jellyfish on which to feast.

But that meal did not pass unnoticed. A bigger crab saw what was going on and, after an intense struggle, the smaller crab ended up losing its catch, leaving the challenger to wander off with the prize.

Before the next dive I made some more adjustments to the strobes and tried changing the sync cord. We were determined to explore the wall this time – but made it even less far than before.

As the sun descended its beams were

Top from left: Hermit crab; flatfish.

Far left, left and above right: The deck that surrounds Smögen Dive Centre.

coming in between the supports below the decking and creating a beautiful scene, with several species of wrasse to be found in the seaweed and the surrounding waters swarming with a range of jellyfish.

We ended up with a maximum depth of 5m, many jellyfish photos, and videos of sunbeams playing in the seaweed beneath the supports.

Because changing the sync cord made no difference with the strobes, I determined that the problem had to be the connection to the housing.

Above: Sea hare.

Right: Rocky Smögen.

Below: The site is known for its nudibranch population…

Below right: …and for jellyfish.

SO OUR THIRD DAY of diving in Smögen started out with a trip to the local supermarket to buy some detergent, cleaning the connection and leaving it to dry during the next dive, hoping that this would do the trick.

The wind had calmed down and we could take the boat further out in the archipelago on a wall descending to about 30m. Parts of it were beautifully covered in dead men's fingers, ascidians and sea anemones.

Other parts, on more of a slope, were filled with rocks in which we found many crustaceans and wrasse.

With the camera back on land, I could take my time to inspect the marine life and enjoy the dive to the fullest.

During the following days we did a couple more dives around the dive-centre, and to my great joy the strobes now worked.

Eventually we did make it down the wall, which meant seeing different varieties of nudibranch to those we had found in the shallows.

The diving hadn't disappointed, and neither did the after-dive, with sauna or hot tub on the deck. Our stay at Smögen Dyk och Upplevelse gave us a nice start as we got used to life on the road – or perhaps it just spoiled us, with access to all the facilities and our filled tanks always waiting for us before the next dive.

WE MOVED A LITTLE further south to Gullmarn, Sweden's only fjord. A body of water classified as a fjord needs to have a shallow entrance or threshold and a supply of fresh water over which deeper, more saline water can be pushed inside.

This is why many fjords are good places for spotting marine life that would otherwise be found only at greater depths.

Above: A rock gunnel or butterfish.

Below from left: Dusk at Smögen; next stop the UK – or that's the plan.

The unusual marine fauna in the area also makes this a popular place for marine-biological research. The first research facility established there in 1877 is one of the oldest in the world.

In 1983 Gullmarn became Sweden's first marine protected area. It is regarded as important for scientific research because of its varied and diverse marine environment and its popularity as a reproduction area for many species of fish.

The diving is easy enough. Most dives can be made from shore, and they suit everyone from beginners to technical divers.

We decided to stay by the Jordfall dive-site, because the van could be parked at a campsite just 100m away.

The site starts out with a sandy bottom and seagrass bed. You can find small flatfish, various crabs, shrimps, sand gobies and, in spring, many nudibranchs there, and the seagrass beds are also important nursing areas for a lot of species.

Further out, the bottom is muddy but there's a great deal to find in this environment that might appear lifeless at first glance. Common dragonets, gurnards, bigger flatfish, stone king crabs, giant anemones and much more can be seen as you make it down the slope.

We stayed a couple of days in Jordfall, enjoying some easy diving with friends. One day Mattias went out by boat to dive at a wall nearby.

The wall slopes right down to 90m so if you're a technical diver it's an excellent place to find decent depth. Mattias and his buddy settled for around 30m and enjoyed an excellent dive on the wall, which had some nice overhangs and was covered in marine growth.

It's time to continue our journey through Europe. See you further down the road! You can follow our journey on Facebook and YouTube (@Ocean Exposure) and Instagram (@ocean.exposure)

✹ *Smögen Dive Centre is affiliated with SSI, located by the sea and has a 9m boat. Most sites are a five-minute ride out, and divers return to the centre for refills and lunch. It offers accommodation in twin or six-bed rooms. Three-day dive packages with accommodation, meals, air fills and six boat dives start from 4000 krone (about £350), smogendyk.se*

RELEASING

'Safe Under The Sea' was a one-off Ocean Art photo contest launched in response to the coronavirus pandemic. Here are the winners…

THE WINNING UNDERWATER photographs from an Ocean Art special competition called "Safe Under the Sea" were announced in late August. Best in Show was this shot by Edwar Herreno, called *Releasing Hope* and with the title providing the sort of upbeat message the contest was hoping to deliver.

The parent Ocean Art Underwater Photo Competition is organised annually by the US-based website Underwater Photography Guide (UPG), and earlier this year the "Safe Under The Sea" offshoot was trailed in the June issue of DIVER.

The contest was intended to help bring the global diving community together creatively while raising funds to help fight coronavirus.

A quarter of all proceeds from the entry fees were pledged to the CDC Foundation, a charity created to support Centres for Disease Control in some 140 countries, and to the World Health Organisation's Covid-19 response fund.

UPG staff carried out the judging of thousands of entries from 79 countries.

"These photos showcase some incredible perspectives in a time when perspective is key," stated UPG.

"Although it was a smaller, mid-year competition, the selection of winning photographs has been no less powerful."

The successful images were said to showcase "raw, dramatic underwater moments with magnificent creatures, rare marine life behaviour, stunning portraits of miniature worlds, curious pinnipeds, eerie shipwrecks, strange critters, and many photos that showcase the prevailing beauty of our underwater world".

UPG paid tribute to the dive companies that had been prepared to sponsor the event in the prevailing economic climate. They included AquaMarine Diving Bali and the Watergarden Hotel, Atlantis Dive Resorts, Bluewater Photo & Bluewater Travel, Ikelite, Paralenz and Sealife.

"The images from this special competition, especially the winning conservation image, represent hope," said UPG publisher Scott Gietler. "Hope for our oceans, hope for our travel and dive industries ravaged by coronavirus, and hope that our nations can come together."

The winners in each of the 12 categories can be seen here, and they can also be found along with the runners-up at uwphotographyguide.com/ocean-art-safe-under-the-sea-winners

Underwater Conservation & Best in Show Edwar Herreno *Releasing Hope* ↑

"Eduardo Espinosa, a marine biologist and Galapagos island park ranger, discovered this unique hammerhead shark nursery area in Galapagos National Park a few years ago and it is truly a unique place. He is working on a manageable plan for the conservation of this now critically endangered species.

I was on a work assignment for a conservation organisation and we could only get there at high tide.

"Eduardo and his team were working tagging and studying the hammerheads and that day we captured 12 pups.

"I've been in different shark nursery areas but never seen anything like this. Besides hammerheads we saw blacktips, whitetips, baby turtles, eagle rays – it was just like in a movie."

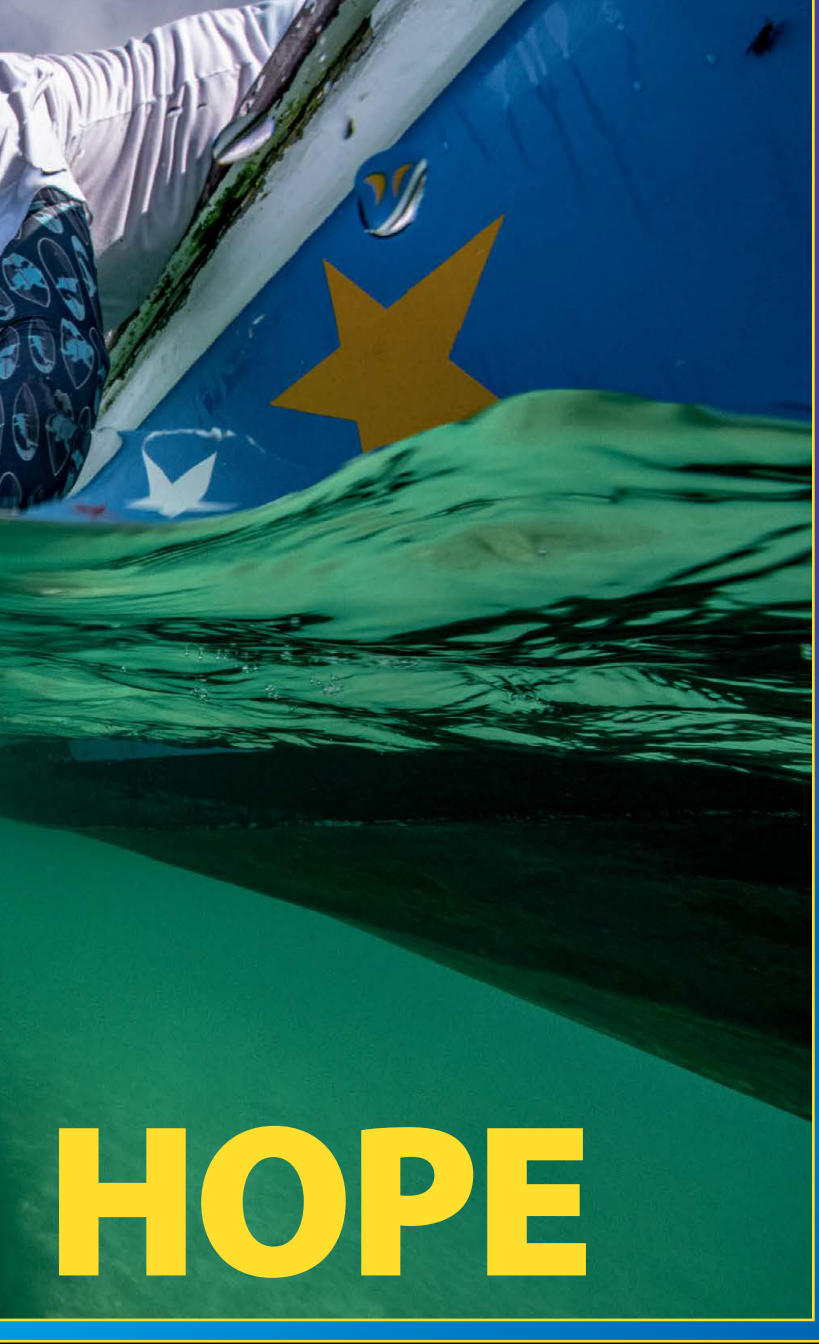
Nikon D850 & 14mm lens, Hugyfot housing, 1/160th @ f/22, ISO 800

Macro Lars Michaelis *Rumble in the Jungle* →

"We were diving at the famous dive-site Arthur's Rock at Anilao, Batangas in the Philippines. I noticed two big skeleton shrimp fighting for territory on a hydroid at 15m depth. All the other smaller shrimps kept their distance and watched the fight.

"The upper skeleton shrimp hit its rival's head with one of its big claws. The lower one stumbled backwards. The scene reminded me of the world-champion fight between Muhammad Ali and George Foreman in Kinshasa in 1974.

"I tried to open the snoot to get more of the hydroid in



the picture and reduced the light to fade out the other backgrounds."

Olympus OM-D E-M5 Mark II and M.Zuiko 60mm macro lens, Olympus housing, Sea & Sea YS-D1 strobe, Inon S2000 strobe with Mangrove snoot, Nauticam CMC-1 diopter, 1/100th @ f/14, ISO 200

Wide-Angle
Paul Cox *Arms Wide Open*

"The quick drop to the pelagic zone on the South Kona, Hawaii coast, will on occasion reward a shore-diver or swimmer with a bluewater-type animal encounter.

"This was one of those occasions. A female pelagic manta found us and we spent a long six minutes together.

"A quiet ballet might be a way to describe it; emotion in this image was the result. Clear water, sunlight and the compact size of the Sony mirrorless camera enabling maneuverability helped but mostly the two dazzling models with arms wide open made my swim gigantic."

Sony A6500, Tokina 10-17mm fisheye, Sigma MC-11 Sony E to Canon EF adapter, Ikelite housing and 6in dome-port, 1/500th @ f/7.1, ISO 400

Marine Life
Yung Sen Wu *Mola mola*

"This is a shot of the cleaning behaviour of large, slow-moving ocean sunfish at a depth of 37m at Lembongan in Indonesia.

"Sunfish are susceptible to a wide variety of skin parasites, sometimes more than 40 species on a single fish – they are literally habitats that move. Many of these parasites are hosted by the jellyfish that the sunfish consume.

"Fortunately, being charismatic has its perks and sunfish have developed some unique interspecies relationships to help them cope with parasites.

"They have a symbiotic relationship with a large variety of species, from seagulls to wrasse, and signal these species whenever they need to attract cleanerfish."

Sony A7R III & 12-24 F4 FE lens, Seacam housing, dual Seacam 150D strobes, 1/100th @ f/8, ISO 640

Coldwater
Joanna Smart *Curiosity*

"As I swam through the dense kelp forest of Anacapa Island off California I felt a tug at my fins. Turning around, I found a harbour seal, with large gazing eyes and a tubby, plump figure staring back at me from within the kelp.

"His enormous cartoon-like eyes and notable lack of neck was undeniably cute. He stared at me for a moment more, before darting forward. Swimming gently up to me, he grabbed onto my arm with his flippers. I nearly recoiled in shock from this surprisingly human gesture.

"As I regained my composure, I looked up to find him staring at me, eyes filled with curiosity.

"He stayed with me for an hour and a half, darting in and out of the kelp, watching me swim. I couldn't help but wonder if he was as curious about me as I was about him."

Panasonic Lumix GX9, Olympus 14-42mm lens (at 14), Nauticam housing with a WWL-1 wet lens, two Inon S-2000 strobes, 1/100th @ f/5, ISO 400

Portrait Jacopo Brunetti
Vertical Approach

"I took this shot during one of our mako-shark expeditions in Cabo San Lucas, Baja California Sur, Mexico. Mouth gaping in sharks has been considered to be either a threat display or a response to their innate territorialism, especially when multiple makos are around.

"They are also attracted by the electricity of the camera; that's why they sometimes gape at divers and bite the camera dome.

"This mako was a real player. He bit my dome four times on the same dive, and this photo is the instant before a bite.

"He was around 2.5m long and showed up from the deep on a typical vertical approach, like a silver rocket – amazing, pure adrenaline!"

Nikon D500, Tokina 10-17mm fisheye lens, Aquatica housing, Aquatica Mini dome-port, 1/400th @ f/8, ISO 400

Shipwrecks Taner Atilgan *Famous Motorcycle of Thistlegorm*

"The idea of backlighting the motorcycle in the Red Sea's *Thistlegorm* wreck is definitely not new, but this picture was taken in 2013!

"I was a novice photographer and unable to post-process this shot properly. In the following years it lost its eligibility for competitions because of time restrictions and very successful versions had been published by other photographers.

"Il noticed that the Safe Under The Sea 'Shipwreck' category had no time restriction, so I took my chance one more time."

Nikon D7100, Tokina 10-17mm fisheye lens, Nauticam housing, Ikelite DS-161 strobes, 1/80th @ f/8, ISO 640

Underwater Art Rodger Klein *Bubblewand*

"This image was taken during an experimental shoot in my studio pool in Venice Beach, California.
I was working with artist/body-painter Michael Bui and his wife, the model Mida.

"Because the pool is more than 3m deep, I was shooting on scuba while Mida was freediving. After about six hours of body-paint work and several hours of preparation in the pool with fabric backdrops and numerous underwater strobes placed around it, we made this image.

"Mida's bubblewand is a painted piece of PVC pipe attached via a hose to a koi pond aerator that created the bubbles. I removed the hose from the image during post-production in Photoshop."

Nikon D800E & 16-35mm lens, Nauticam housing, Icon Z240 & Sea & Sea YS-250 strobes, Nauticam optical glass dome-port, 1/250th @ f/9, ISO 160

Compact Macro Uwe Schmolke *Beauty*

"I've spent some days in the Tulamben area of Bali shooting macro images. This particular nudibranch I found on an orange sponge attached to a rotten old fishing rope on the sandy ocean floor."

Canon G12, Patima housing, Ikelite strobe, Subsee +10 Diopter, 1/500th @ f/8, ISO 100

Blackwater Eric Hou *Red*

"The most fascinating part of blackwater diving is that you don't know what will happen the next second.

"On a dive in Anilao, Batangas, Philippines, suddenly this blanket octopus appeared in front of me, dancing in the water."

Canon 5D MK IV, Sigma 50mm lens, Nauticam NA-5DIV housing, Inon Z-240 strobes, Force Light RGBlue System-02, 1/250th @ f/25, ISO 640

Compact Behaviour Stan Chen *Lemon Goby*

"These lemon goby parents in Lembeh Strait had spawned their eggs on a glass fragment that caught my eye, and I decided to take the shot to record how fish can coexist with human garbage.

"The parents were very shy and kept moving around. I waited about 40 minutes and finally, they gathered together and one opened its mouth while protecting their eggs as I took the shot.

"It was an unforgettable moment to see how great these fish are, using human waste to hatch their eggs. And I know new life will continue on to the next generation."

Sony RX100 M4, SMC2 macro lens, Inon strobe, LSD , 1/250th @ f/11, ISO-250

Compact Wide Angle Yannick Bruynoghe *Welcome to Tubbataha*

"It was an exceptional trip in Tubbataha Reef in the Philippines for my birthday. We dived the *Delsan* wreck site and after encountering two whale sharks decided to dive again at the same spot.

"My buddy and I decided to jump a little farther away, to avoid other divers, so we counted before jumping: '3,2,1, goooo!' A minute later we had reached around 20m and saw a massive shoal of barracuda following the whale shark.

"It was a few minutes before they disappeared. I had time to shoot only a few images."

Canon G7XII, Nauticam housing, dual Inon D200 strobes, Inon UWL-H100 dome-port, 1/235th @ f/5.6, ISO 125

Qualified disasters

LOUISE TREWAVAS

WHEN YOU'RE LEARNING TO DIVE, your qualification is everything. I'm tempted to write that once you're qualified to dive, your qualifications are nothing – and how you actually dive is everything. Sadly, I can't.

The evidence shows that people care passionately about their qualification and your affiliation to one training agency or another is often fraught with a vicious tribalism.

In diving terms this usually equates to extra scrutiny and scepticism from the dive-shop if you turn up with anything other than a PADI C-card (or an equivalent from its own agency).

You might get a few snarky remarks between divers who trained with opposing agencies. And inevitably there's a total "war of words" on diving social media from the keyboard warriors.

Our qualifications matter to us. They're an intrinsic part of who we think we are. When self-doubt strikes or people sneer, we turn to our qualifications as the cold, hard proof of our worth and prowess.

It's a short step from there to believing that our qualifications and our training agency confer a kind of status, even if it's only inside our own head. What more important place could there be? Mess with someone's qualifications and you mess with their very psyche.

This summer we've witnessed tears, tantrums, outrage and the thirst for revenge. Government education ministers have learnt the hard way that standing between a person and a qualification to which they feel entitled is akin to slow-motion suicide.

And yet a whole world of pain could have been avoided if politicians had simply paid more attention to British scuba-divers.

IN FEBRUARY 1999 the British Sub-Aqua Club suggested scrapping its Dive Leader qualification. To those in charge it seemed logical to include the skill of leading a dive in the Advanced Diver qualification.

The proposers were National Instructors: divers at the top of their game, confident in their own skills and secure in their position. None of them had anticipated the frenzy of anguish that ensued.

Those divers who had qualified as Dive Leaders felt demeaned by the very suggestion. That hard-won qualification demonstrated to everyone in their dive club that they were vastly superior to mere Sport Divers. Now they were in danger of being robbed.

The fear of losing their (marginally) elevated position in the diving pecking order was simply unbearable. Hell. Hath. No. Fury.

On the receiving end of this wrath was the National Diving Officer at the time, Bob Boler; an absolute sweetheart. Lovely guy. Unfortunately, even if your proposal has been made with the best will in the world, a raging, self-entitled mob requires somebody to blame and be punished. A little piece of BSAC's soul got shredded that year.

So let's take a breath. The sea doesn't care about your level of qualification. The marine life won't reserve their appearances for divers of one training agency or another. The wreck is still there on the seabed, no matter who comes down the shotline.

A study of diving incidents in Mexican and Floridian caves revealed a worrying trend. A large proportion of the deaths involved open-water diving instructors. The same is true at Dahab's Blue Hole.

Can a diving qualification be the cause of fatal over-confidence? Yes. But only if you give it that power.

MAKO BREAK

If you want to dive with the 'ultimate shark', let alone capture its photo, you'll have to be up for a challenge. But JAMIE WATTS is here to help with the info and a handy map – photography by MALCOLM NOBBS & ANDY MURCH

ANDY MURCH

"HOLY SH*T! WHERE DID THAT come from?" Like a star destroyer coming out of hyperspace, there had been deep dark blue, and then a fraction of a second later the most magnificent, sleek predator I had ever seen was right in front of me.

I have been fortunate to have photographed great whites, threshers, tigers, bulls – just about every big shark you can think of, in the wild. But this was an animal on an entirely different level.

For many years Malcolm had been unlucky with makos, even in places where sightings were "virtually guaranteed". So he signed up for two 2020 Cabo San Lucas trips with Andy Murch's Big Fish Expeditions.

From day one they had great shark encounters – of all the wrong species of shark. Malcolm decided it would be prudent not to mention to the other guests that he was the jinx, that the lack of sightings was his fault.

But then, among other sharks that somehow now looked crude, sluggish and primitive, appeared that magnificent, super-confident shortfin mako. Oh yes!

Makos are still reasonably abundant, but are far from easy to encounter.

A bit of bait sets a scent trail, but this doesn't guarantee that they will even arrive, much less stick around.

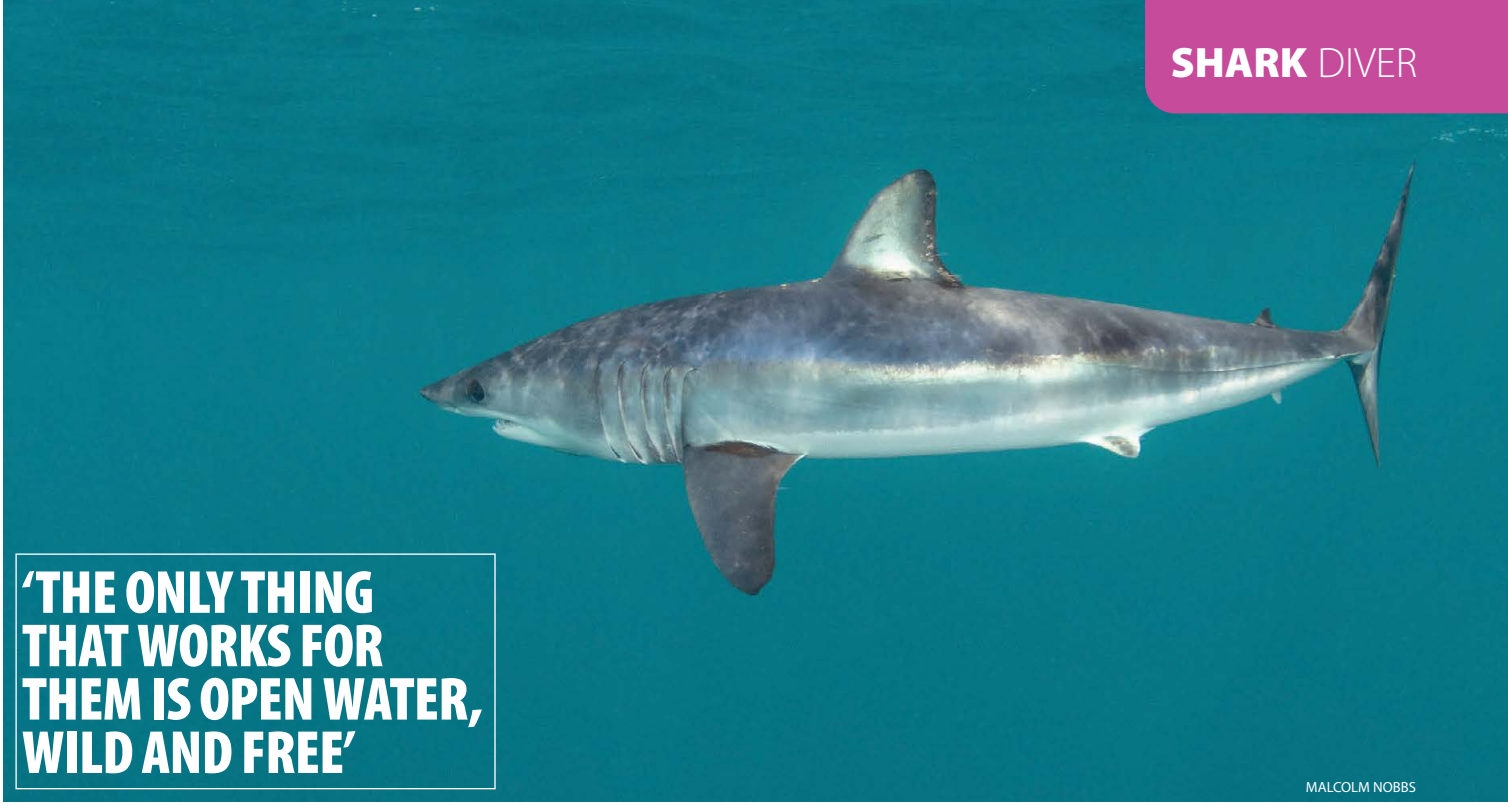
Some places encounter makos on snorkel only, some with scuba. In Andy's experience, they approach the boat at great speed and explore everything that might be edible. They often mouth anything metallic that might be giving off a tiny electric signal; such as propellers or even the keel.

Unlike other open-ocean sharks such as blues, makos tend to lose interest rather quickly and disappear. Once in a while, a fearless mako will hang around for hours, offering extraordinary photographic opportunities. Andy generally has pretty good luck with them when he goes looking for them.

The name mako means "shark" or "shark tooth" in the Maori language. For me, the mako has no competition for the title of the ultimate shark.

Great whites, tiger sharks, great hammerheads, six and sevengills and sleeper sharks all get larger. But without question, without peer, pound for pound, by far the most powerful, active, hydrodynamic and fastest shark on Earth is the shortfin mako. I'd add that it is the most beautiful of all sharks, albeit with a rather terrifying beauty.

Makos take the shark bodyform to an entirely new level, and no amount of familiarity with other sharks prepares you for the sheer, sleek perfection of this racing shark. The sharp snout cone flows into a muscular, barrel-shaped body,



'THE ONLY THING THAT WORKS FOR THEM IS OPEN WATER, WILD AND FREE'

MALCOLM NOBBS

which in turn tapers to the slender, keeled tailstock holding the large wing-like tail.

The huge gill-slits give a clue as to how much oxygen this hyperactive shark needs to extract from the water. The mako slides through it with barely a ripple of disturbance. Even the colour – dark, metallic blue on top, baby blue on the sides and silvery white below – is gorgeous. Makos look fast even in a still picture, and they are never still.

The warm-blooded mackerel sharks

THE MAKO'S FAMILY has five members, each of them far more active and powerful than sharks from any other group. These five species ecologically hold their own alongside the air-breathing seals and dolphins, nature's most powerful ocean predators, in some of the most productive and competitive ocean environments on Earth.

They are rather different animals to the relatively sedentary reef, bull and tiger sharks. Slender as they might look, makos of the same length weigh almost half as much again as any of these other big sharks. They are more solid, with more muscle and a denser skeleton, and a huge oily liver that offsets their otherwise negative buoyancy.

Makos and their cousins are partially warm-blooded, maintaining in the case of makos a body temperature that can be 7-10°C higher than the surrounding water.

Warming the muscles gives them a huge power advantage over almost every other shark or fish. This mammal-like warm-bloodedness brings with it an almost mammal-like metabolism, which requires a lot of feeding.

A mako needs two to three times the calories a similarly-sized tiger, bull or oceanic whitetip shark would need.

The metabolism that makes makos such spectacular athletes also obliges them to forage in richer, cooler oceans than other sharks can access, forcing them into competition with concentrations of marine mammals. Tropical seas just don't provide enough food.

Makos prefer near-surface water at a temperature of between around 16 and 22°C. When summer warms the temperate seas where they live, makos seem to migrate onto continental shelves and inshore to take advantage of the summer bounty, moving back towards the subtropics as temperatures drop for the autumn.

Usually living in the top 50m, the smaller-bodied youngsters appear to avoid thermoclines or colder seas.

Big makos, however, seem to make use of their large, warm body cores to take them into colder, richer seas, and to dive deeper during the day into cold water to hunt spectacular prey such as swordfish.

Only the great white, porbeagle, salmon shark and longfin mako, in the same family as shortfin makos, have a somewhat similar build and this pseudo-warm-blooded metabolism (one species of thresher shark also seems to have some core muscle warming).

The first three are incredibly robust and stocky – proportionately heavier-built and smaller-tailed than makos – and hunt in short bursts of speed.

Porbeagles and salmon sharks manage to live and hunt in even cooler, richer seas than the makos, seeking schools of oily fish. Andy heard that a salmon shark had been clocked sprinting even faster than a mako by a US submarine sonar.

Great whites specialise in cramming in seal fat calories to see them through a slower-paced rest of their year. The slender longfin mako lives a little deeper, in warmer seas, where it hunts smaller schooling fish and squid.

Above: Shortfin mako shark breaks Malcolm Nobbs' jinx at San Jose del Cabo in Mexico this March.

Left: The mako shark is designed to leave an impression.

Open-sea hunters

AMONG ALL THE sharks, even their close cousins, only large adult shortfin makos (usually the big females) chase down the fastest fish in the sea in open water. Prey includes tuna, marlin, sailfish and especially swordfish, sometimes nearly as big as the shark itself.

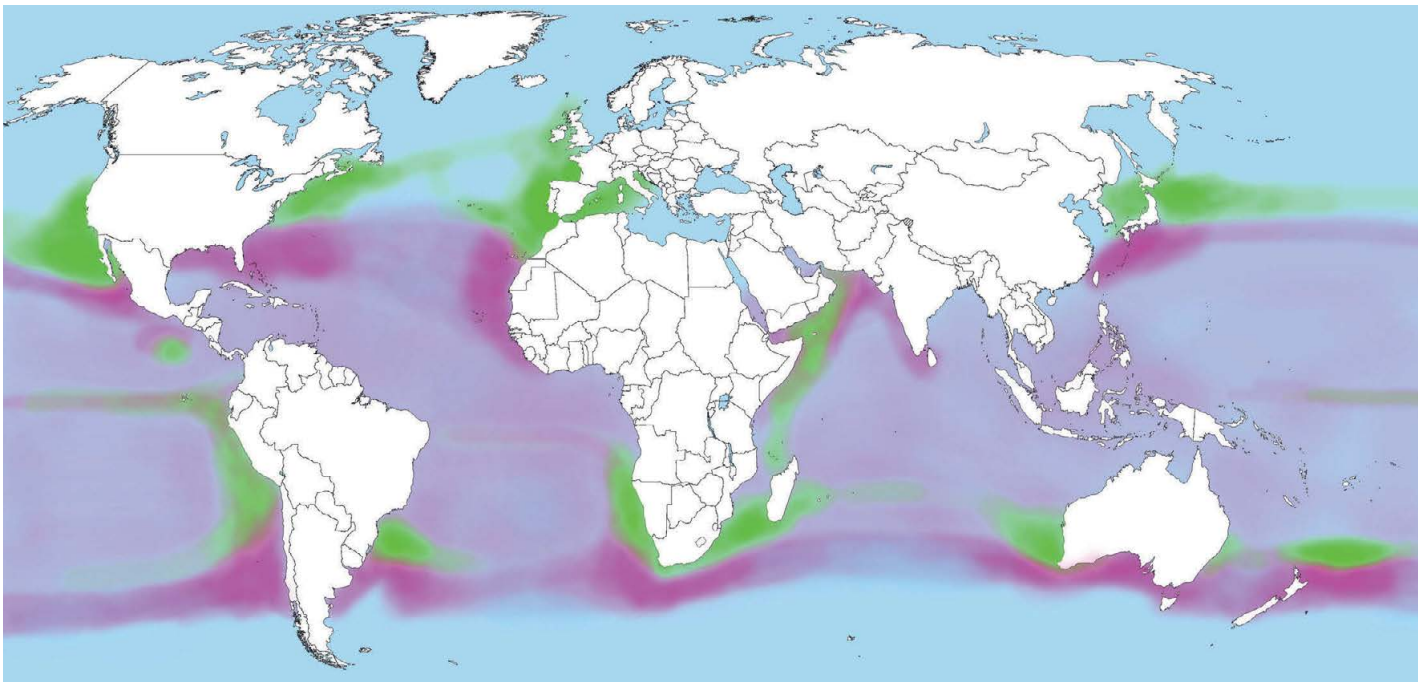
They sprint, and then they sustain the chase. How fast? It's rare to find controlled conditions to accurately measure such open-water speed, but it seems that they are capable of bursts in the 42-45mph range.

This is significantly faster than any dolphin, including the orca. The only living things in the ocean that have been recorded faster are swordfish, marlin and sailfish. But even these magnificent sprinters can't outlast their mako predators.

The largest makos also catch the smaller species of fast, agile open-ocean dolphins. Makos more than 3m long (almost all females) have broader and flatter teeth than smaller makos, as they step up to tackle bigger prey.

Like their cousins the great whites, makos often hunt smart, and get a little beneath their prey, watching for silhouettes and hunting from beneath by ambush where they can. They don't seem to use electro-reception so much as their big eyes to zero in on their prey.

Swordfish live some way offshore and beyond diving depths, and the rich seas in which they live generally have limited visibility. It makes me sad, but the oceans' ultimate high-speed predator-prey



JAMIE WATTS

interaction is almost impossible for us to see. The best we can do is to tow bait at speed behind a boat with a towed camera, and we can chum the nearshore waters where smaller makos hunt, and attract them in for glimpses.

But makos are shy, fast and don't stick around. Glimpses is all we get.

The longest humans have ever managed to keep makos alive in aquaria was for five days. They can't deal with walls and confinement.

Makos' lives are unconstrainable – the only thing that works for them is open water, wild and free.

A shark this big and well put-together is more than capable of effortlessly making a terminal mess of a human, but there are only a handful of records of mako attacks on humans in the shark-attack files.

This might partly be because makos tend to not come far enough into shallow bays where humans tend to be, although they enter bays for prey such as bluefish.

Maybe it's as much to do with how ludicrously unsleek and unappetising we humans are in the water. We don't look like good-quality food.

Above: This world map shows the distribution of shortfin mako sharks - the magenta colour shows concentrations for the austral summer (January) and the lime-green shows concentrations for the northern summer (July).

Below, from left: Great white shark; a salmon shark in Alaska.

Life-cycles

NOT SURPRISINGLY, an animal this well-engineered and this high in the food web takes ecological investment, resources and time to grow and develop.

Males mature at around eight years old, by which time they are longer than, and as heavy as, a grown man.

The larger females aren't mature until they are around 18, and weigh a quarter of a tonne. Males don't often exceed 2.5m long, and rarely get past their teens, whereas females keep growing and occasionally live into their 30s or even beyond.

Older females can be more than 3.5m long and weigh more than 350kg. Like many big sharks, they get bulkier as they get older; very occasionally monster females can exceed 4m in length and weigh 700kg.

Makos also have a long reproductive cycle. It's an 18-month gestation period, the same again resting, so these big females probably have three years between litters.

Mating seems to happen in the local autumn, births peaking in the local late winter or spring 18 months later.

Makos are ovoviviparous, meaning the eggs hatch internally, and the mother gives birth to between four and 18 live miniature makos – tiny, slender but rather beautifully formed replicas of their parents, each about 70cm long.

Satellite tracking seems to suggest that most makos might not be quite the travellers their larger cousins the great whites often are.

They move with the warmth and the productivity of the local summer, within a range of 100 or so to more than 1000 miles throughout the year, within their home region.

And they seem to habitually cruise, in between feeding chases, at a remarkably low average of one knot, slowing to half this speed at night. Which has to be pretty much zero effort for a mako.

A small handful of individuals, however, are wanderers. They've been tracked covering 40 miles or more in a day, more than 600 miles in a month, and more than 8000 miles in under nine months, about the same pace as the greatest ocean migrators, the humpback and grey whales.

MALCOLM NOBBS

MALCOLM NOBBS

ANDY BURCH

Regional populations

EACH REGION seems to have its own mako population, with its own annual cycle. East Australia and New Zealand's population has a hotspot of makos off the north-east of New Zealand's North Island.

Makos from both sides of Australia move south with the spring into the Great Australian Bight for their summer feeding season as the south warms up, cruising over the continental shelf and occasionally out to the shelf edge.

North-west Atlantic makos seem to give birth in the Gulf of Mexico, with the youngsters staying in the relatively warm southern end of the Gulf Stream, while larger animals ride the current further north each spring and summer, following bluefish, their preferred prey, into bays.

They reach New York by late June, then pass Cape Cod to reach the Grand Banks for the warmest part of the summer, with the biggest makos heading out into swordfish territory. As the season starts to cool the makos head offshore and south to winter in less chilly waters in the mid-Atlantic and Sargasso Sea.

North-east Atlantic makos seem to have a breeding area in the western Mediterranean and Gibraltar area, with a nursery area and younger animals concentrated off the Iberian peninsula for the summer.

Some big makos stay in the Med for the late spring to follow swordfish spawning events off Sicily.

Larger animals move north for the summer into the Bay of Biscay and as far as the UK. Some of these animals seem to overwinter in the Canary Islands and Cape Verde. The Azores seems to be a possible crossover area between eastern and western populations, with some of the males in particular apparently crossing the Atlantic from time to time.

The rich, cold seas off South Africa, on both sides, have historically been good places to find makos, although this might be changing. The Indian Ocean population that spends time off the KwaZulu-Natal coast seems to prefer smaller sharks as prey, and these shark populations have been heavily fished in the past couple of years.

On the Atlantic side, a little way offshore from the Western Cape a few hours from Cape Town is a hotspot.

The population in this area probably makes use of the rich food provided by the Namibia upwelling system, although their nursery and breeding grounds are unknown.

In the north-east Pacific makos, most of them small animals, arrive in the Southern California Bight in the spring and leave in the autumn.

In deeper, colder waters of the area, jumbo squid can take refuge in low-oxygen deep water from oxygen-hungry makos. When the squid migrate in or out, the makos at the shelf edge can dive briefly in to prey on these squid.

Fishing

AS WITH MANY BIG sharks, most mako populations have been hit hard by fishing, most of these populations halving with each recent decade.

Makos are widespread, and without fishing pressure would be as abundant as you could imagine a semi-warm-blooded top predator being – certainly much more abundant than great whites.

Naturally, however, makos are an order of magnitude less abundant than the blues and oceanic whitetips with which they overlap ecologically in open oceans, probably because of their ecological demands and slow maturity.

At least a quarter of a million makos are caught every year, many of them as bycatch from swordfish longline fisheries (but of course in many cases their fins are still cut off and sold). Because the swordfish are probably the primary prey source for big, reproductive-age makos, the decline in swordfish stocks also impacts mako populations.

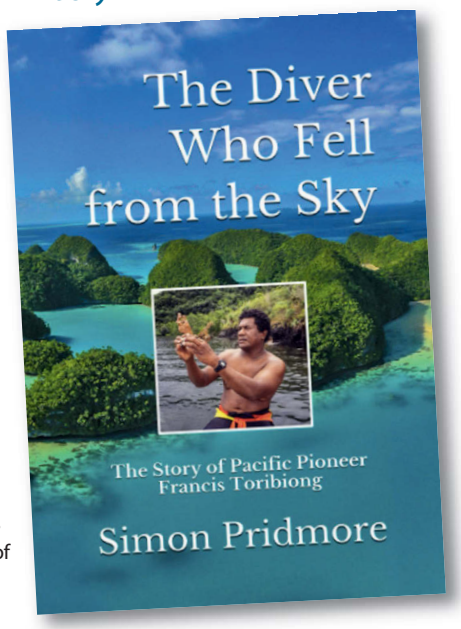
Makos, like other sharks, are becoming less abundant, and their average size is dropping. The number of reproductive-age adults is falling.

But makos are far from done. At what they do, they are unparalleled. The continual motion and offshore habits that make them enigmatic and infuriating for we humans wishing to see them also gives them the best odds for continuing to thrive, and remain the ultimate shark.

MALCOLM NOBBS

AGAINST-THE-ODDS NATION-BUILDER

The Diver Who Fell From The Sky by Simon Pridmore



I HAVEN'T DIVED in Palau, to my regret, and although I was vaguely aware of the name Francis Toribiong I knew little about him. I'm glad to have made his acquaintance after reading the latest book by Simon Pridmore, who clearly knows this hall-of-famer well.

Palau is renowned for its sharks and rays, its 60 or so Operation Desecrate WW2 shipwrecks and its incredible coral and fish diversity. It was Toribiong who found many of the dive-sites – names such as Blue Corner, Pelelieu Wall, Chandelier Cave and others have become world-famous.

He was also first to dive and survey many of those wrecks.

One of Nature's daredevils, Toribiong was known as the "diver who fell from the sky" early in his career when he became Palau's first parachutist. By going on to found the Fish 'n' Fins dive-centre and paving the way for the equally well-known Sam's Tours, he later earned the title of godfather of Palauan diving.

By all accounts he helped to turn what had been Pacific islands forgotten after the war into a byword among divers and an outsize dot on the tourist map, but it was a very bumpy ride, which is what makes this biography such a fascinating read.

If I expected this book to be a torrent of undiluted praise I should have known the author better.

While Toribiong is accorded the hero status that makes him worthy of a biography, he comes over as a complicated individual with distinct character flaws as well as virtues. He is also the product of a culture that takes some understanding, and the author does his best to supply the context.

Toribiong made mistakes that cost him dearly as when, despite the exceptional watermanship that had won him such renown, he crashed his speedboat in the mangroves with lasting effects.

Throughout his career he often veered close to disaster, usually financial, but he also had a lot of eleventh-hour good fortune.

Just as you think you have him taped, the man's complexity wrongfoots you. He has a reputation as an ardent conservationist, for example, and Palau is associated with being ahead of the curve in that respect, having established the world's first shark sanctuary in 2009 and laid down its National Marine Sanctuary Act six years later.

Much credit for laying the groundwork for this goes to Toribiong and his brother Johnson, who just happened to become the nation's president. But the idea of sustainability is embedded in Palauan culture in a concept called *bul*, whereby an overfished area would be left alone until it recovered, and it seems that if anything Toribiong feels that Palau went too far in indulging tourists at the expense of its citizens' interests. As I say, complex.

Also smart. For instance, realising that he could save a fortune in advertising, he engaged early on with one particular US photo-journalist who acted as an ambassador for Fish 'n' Fins and Palau over the years.

Such symbiotic relationships can grate on magazine readers – unless the diving is outstanding enough to justify it, as Palau's clearly is.

Simon Pridmore always makes for an easy read – think of his writing as a drift-dive on which you can put in minimal effort, just applying the brakes occasionally to savour some passing treat. The book is divided into bite-sized sections separated by giant asterisks, which makes it easy to hop from one to the next, although I felt that this approach could also interrupt the smooth flow at times.

The basic softback version of the book has mono images; there is a far more expensive colour version, or you can opt for the e-book in colour, which is how I read it on my phone. An audiobook is on the way.

However you read it, you'll love it if you've been to Palau. If you haven't, it will probably leave you keen to go. Getting to know this unusual scuba hall-of-famer is a pleasure.

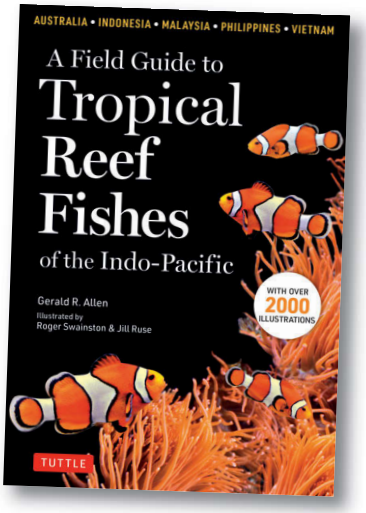
Simon Pridmore
ISBN: 9798649236508
Softback, 314pp, 15x22cm, £11.99

TOP 10 BEST-SELLING SCUBA-DIVING BOOKS

as listed by amazon.co.uk (28 August, 2020)

1. **100 Dives of a Lifetime: World's Ultimate Underwater Destinations,** by Carrie Miller & Brian Skerry
2. **Deco for Divers: A Diver's Guide to Decompression Theory and Physiology,** by Mark Powell
3. **Fifty Places to Dive Before You Die,** by Chris Santella
4. **Underwater Photography: A Step-by-Step Guide,** by Maria Munn
5. **Scuba Diving,** by Monty Halls & Miranda Krestovnikoff
6. **Scuba Diving Hand Signals: Pocket Companion for Recreational Scuba Divers,** by Lars Behnke
7. **The Last Dive: A Father and Son's Fatal Descent** (audiobook) by Bernie Chowdhury
8. **Amazing Diving Stories – Incredible Tales from Deep Beneath the Sea,** by John Bantin
9. **Stars Beneath The Sea: The Incredible Story of the Pioneers of the Deep Sea,** by Trevor Norton
10. **Reef Life: An Underwater Memoir,** by Callum Roberts

IT'S IN HERE SOMEWHERE



A Field Guide to the Tropical Reef Fishes of the Indo-Pacific by Gerald R Allen

HOW MANY FISH have been identified by underwater photographers referring to past editions of this book? We've had dog-eared copies in the **DIVER** offices for as long as I can remember (and before that, because it's now 30 years since the original *Marine Fishes of South-East Asia* first appeared). And still it's being updated and expanded.

This is the fifth incarnation of Dr Gerald R Allen's masterwork, which includes 1670 fish species found in the seas of tropical south-east Asia, the south Pacific and Australia. It is comprehensive. If your latest sighting isn't in here somewhere, there's a good chance it's new to science.

Marine illustrators Jill Ruse and Roger Swainston are still beavering away with their watercolours – more than 2000 species are depicted, including 36 additional species, often showing both the male and female, and juveniles too.

I suppose It all comes down to whether you find it easier to identify fish by using underwater photographs (there are only a few in this book, in the introductory sections), or artistic depictions like these.

My instinct would be to go for photos, but there are drawbacks. In many photo-based ID books the images are small, and light conditions don't always show off the species to best advantage, or distinguish them well from the background.

The advantage of using artists of the quality of Ruse and Swainston is that they can capture their subject in its ideal or typical state for ease of identification. And without distracting

backgrounds, the cut-out fish can be grouped in logical, eye-catching ways and, importantly, be drawn to scale.

It's not easy to derive the relative average sizes of fish from photos, but wrasses, for example, vary in size from giants such as humpheads to tiny fairy varieties. The illustrations are the stars in this authoritative guide.

Editorial changes from the previous edition aren't dramatic, but both common and Latin names of species have been overhauled.

This is in line with a recent initiative by the Australian government to sort out global confusion caused by particular fish species being accorded multiple names depending on geography or their stage of growth.

I immediately wondered whether the Queensland groper would now be called a grouper, because I had always imagined the spelling to be some sort of aberration, but checking the book I see that it isn't.

In fact where I might have expected a whole section on groupers I find that they are all varieties of rockcods, along with everything from certain basslets and perchlets to cod and coral trouts, so never mind, I'll just go with the flow. An invaluable book.

Tuttle Publishing
ISBN: 9780804852791
Softback, 316pp, 16x24cm, $24.99

CONJURING UP A STORM

Irma: Life Lessons from the Worst Storm in Atlantic History by Mark R Wilson

THE FIRST THING you notice is that this book has no page numbers. Odd, but don't worry, it doesn't matter. You'll hardly notice the pages passing, and for me a book offers no greater blessing than that.

The title hadn't given me much of a clue about what I was in for either. What it turns out to be is the autobiographical account by a diving instructor and marine conservationist in, I guess, his 40s, of events leading from a seminal basking-shark encounter and an out-of-nowhere criminal conviction through many jobs to an impossibly dramatic climax in the teeth of a fearsome hurricane.

Mark Wilson is clearly a many-sided character, veering from tattooed nightclub bouncer and bodybuilder often apparently numb to the feelings of others to a sensitive conservationist and a dive professional who puts other people first.

You might expect an instructor's life story to be woven from tales of trainees' daft mistakes mixed with colleagues' daredevil exploits and cynical behaviour, but *Irma* defies all expectations.

It moves at a gentle but compelling pace, and it isn't all about diving but about what goes into shaping a diver. It embraces such serious themes as child cruelty and mental-health issues, and how a blemished record can affect a career.

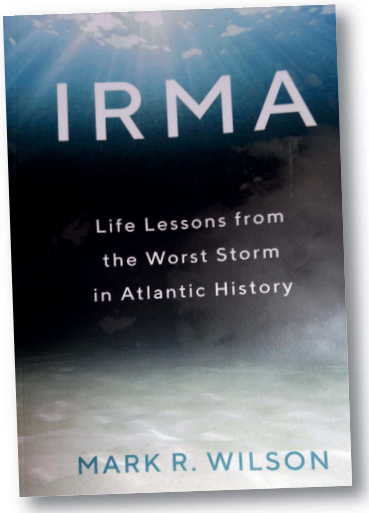
The author isn't afraid to shine a light on his vulnerabilities and shortcomings, and you get the sense of someone trying to figure out what makes himself tick in the process of writing the book.

That might sound indulgent, but from very early on you find yourself caring about where both he and the book are heading.

But before I make it all sound too introspective, it is also ideal reading for anyone who has ever thought about becoming a dive professional or career ecologist. The action takes in diving hotspots from South Africa to the Caribbean as well as the UK.

Hurricane Irma in September 2017 caused widespread destruction. It was the first Category 5 hurricane to strike the Leeward Islands, which was unfortunately where Wilson had recently rocked up, eager to continue diving for a living.

His description of his experiences at the doomed St Martin dive-centre is



powerful. It lives up to the task of conveying what it's like to live through such an elemental phenomenon.

He was surprised to have survived that wind – a lot of people didn't.

The book has few shortcomings for me. It is a little overstated in places, with a few protracted passages of dialogue, but I'd be quibbling to say that this affected my enjoyment.

Among this year's new dive-books *Irma* is one of most pleasant surprises, and I heartily recommend it.

Mark R Wilson
ISBN: 9781089822639
Softback, 260pp, 15x23cm, £5.50

Reviews by Steve Weinman

LISTEN TO THIS

Dolphin Way: Rise of the Guardians (audiobook) by Mark Caney

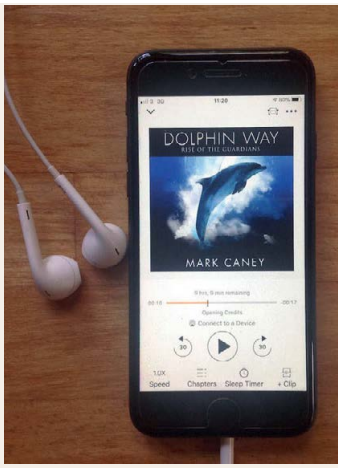
If the title is familiar, that's because the debut novel, now released in audio for the first time, has been out for nearly nine years now.

It's a dramatic, no-holds-barred insight into the plight of the world's oceans as seen through the eyes of young male bottlenose dolphin Sky and the other creatures he encounters.

I've always admired the levels of knowledge and imagination that went into this well-written and plotted novel. Directed at adults, it steers clear of sentimentality and is invested with a diver's insights into the underworld.

And now it turns out that Mark Caney also has an excellent voice for narration, clear and compelling. Is there no end to the man's talent?

Well, he isn't perfect. Nine years on, whatever happened to the promised follow-up, *Dolphin Way – Captured*? I put the question and



was told that it was partially written "but I've been lazy, I guess! My excuse is that I did get very busy."

Fair enough, he is still a senior PADI Worldwide executive, with many other responsibilities besides.

And after all we do have *Rise* – a treat in audio, especially for divers on the move. Immerse yourself.

dolphin-way.com
Download through Apple Books, Audible or Google Play
9hr 8min, £6.84-£6.99

TOP 10 MOST GIFTED SCUBA-DIVING BOOKS

as listed by amazon.co.uk (28 August, 2020)

1. **100 Dives of a Lifetime: World's Ultimate Underwater Destinations,** by Carrie Miller & Brian Skerry
2. **Reef Life: An Underwater Memoir,** by Callum Roberts
3. **Diving in Indonesia: The Ultimate Guide to the World's Best Dive Spots,** by Sarah Ann Wormald
4. **Fifty Places to Dive Before You Die,** by Chris Santella
5. **Dorset Dives: A Guide to Scuba Diving Along the Jurassic Coast,** by Will Appleyard
6. **Scuba Diving Hand Signals: Pocket Companion for Recreational Scuba Divers,** by Lars Behnke
7. **Diver Down: Real-World SCUBA Accidents and How to Avoid Them,** by Michael Ange
8. **Snorkelling Guide to Marine Life: Florida, Caribbean, Bahamas,** by Paul Humann & Ned DeLoach
9. **Amazing Diving Stories – Incredible Tales from Deep Beneath the Sea,** by John Bantin
10. **Scuba Confidential: An Insider's Guide to Becoming a Better Diver,** by Simon Pridmore

WISHING ON A STAR TURN

UCCISEA1970 / PIXABAY

We're not getting too much incoming about packages to the few overseas diving destinations that are available to UK divers at present, so we need to look ahead and be optimistic about old favourites opening up again.

Many of the positive messages are coming from the Maldives at the moment, and Manta Expeditions, closely affiliated to the Manta Trust, is certainly optimistic. It says that "travel bans are lifting, borders are opening up and adventures can be embarked upon!"

It also says it is offering 20% off selected expeditions next year, including a Maldives South week at the end of March and 10 days in the "Far North" in October/November, as well as separate weeks off Thailand and Burma in March.

Bookings can be made with no payment and free cancellation for the first 60 days.

If you're confident of gaining access to a liveaboard out of Mexico by the turn of this year, Manta Expeditions is also organising two citizen-science trips out to popular but remote Socorro and the Revillagigedo Archipelago aboard *Nautilus Undersea*.

The sailings are from 12-20 December and 5-13 January, and you get eight nights and four dives a day, guided by and at the same time assisting marine biologists Robert D Rubin and Annie Murray, for US $2595pp plus flights.

mantaexpeditions.com

Sailing on in Thailand

Thailand has yet to open to UK visitors but Blue o Two says its two sailing liveaboards there, the Phinisi and the Junk, are back in business for when it is.

The operator is offering a 25% discount on all remaining departures this year and asking for only a 10% deposit, with full payment due 30 days before departure, though the booking must be made by 1 October.

Prices range from a four-day trip on the Junk to the Similan and Surin Islands out of Khao Lak for £798, to a six-day trip to the same locations on the traditional Phinisi yacht for £1163.

blueotwo.com

MORE IN THE MALDIVES

On offer from Dive Worldwide are trips to Filitheyo Island Resort on the island of Faafu as soon as the Maldives is deemed safe for UK visitors.

Located on the eastern side of the atoll, the tour operator says that Faafu offers a range of dive-sites including overhangs, shallow reefs and coral bommies, and a "vast array" of marine life, including manta rays and whale sharks. Highlighted is a trip to "Route 66", where encounters with eagle rays, critters and shoals of snapper are encountered.

The resort has 125 air-conditioned villas, infinity pool, spa and a selection of restaurants. The operator says that prices start from £2620pp (two sharing), including seven nights' half-board, unlimited diving, seaplane transfer and return flights from the UK.

diveworldwide.com

Portugal's Atlantic islands are still open to divers

Portugal was very put out not to be on the original UK travel-corridor list, but by late August when it came in, it found itself one of the few European coastal locations available to divers. Sadly, just as **DIVER** was going to press, it was back out in the cold.

The only upside was that the outlying islands of the Azores and Madeira, where diving goes on year-round, remained options for UK divers.

If you're keen on a trip you might like to check the website of Portugal Dive, which has various packages from which to choose.

These include an eight-day trip to Madeira with five days' diving (10 dives) for 909 euros pp. You're based in Funchal or Porto Santo and diving usually centres on the Garajau Natural Park. The price includes transfers, seven nights in a 3* hotel or apartment (two sharing), equipment hire and local support.

Further west, you might consider eight days on Santa Maria in the Azores from 949 euros pp.

This too includes 10 dives, seven nights in a 3* hotel or apartment, transfers and dive-gear. Flights are not included with either package.

portugaldive.com

Preparing Atlantis

Ultimate Diving says it has been working closely with exclusive partner Atlantis Resorts to ensure that stays there, once the Philippines is accessible again, will be Covid-secure for divers. "We expect to see guidelines evolve to a point where the resorts can provide as much of the 'full experience' as it is safely possible as they transition to opening," says the tour operator.

The two resorts in Dumaguete and Puerta Galera are implementing measures including pre-work health checks for all staff, temperature checks on anyone entering the resorts, thorough disinfecting on all guest transport, private transfers, social distancing, face coverings, emergency plans and more.

Seven-night packages at either resort starts from £1895pp (two sharing) including estimated flights from the UK, airport transfers, accommodation and two dives a day.

▸▸ ultimatediving.co.uk

EMPEROR'S LUCKY DIP

Through to the end of September Emperor Divers has been offering the chance to book a "Best of the Maldives" itinerary at the reduced price of £809 and be allocated space on one of the liveaboards *Voyager, Serenity* or *Leo* on arrival.

Its "Lucky Trip" concept is to avoid the current "understandable" tendency towards last-minute bookings, which make it difficult for the operator to guarantee departures on any particular vessel.

The Maldives is still not a permitted destination for UK divers (as of early September) but advice can change at any time.

"Currently the diving is uncrowded and Emperor hopes its Lucky Trip offer will make it easier for divers to come and experience some great diving in the near future," says the operator.

▸▸ emperordivers.com

There when we're ready

Euro-Divers Maldives reports that it has been reopening its dive-centres with their host resorts since mid-August, when LUX* South Ari Atoll became accessible to those travellers allowed into the Maldives.

Another four have since reopened, with a further five scheduled during October and popular Vilamendhoo due to complete the set at the start of November.

"If quiet sandy beaches, a warm ocean and amazing diving… have been plaguing your thoughts during lockdown, hitting a 'book now' button is guaranteed to put a smile on your face," says Euro-Divers

Its advice: "Escape as soon as you can!" As if we need telling!

▸▸ euro-divers.com

SO WHERE CAN WE TRAVEL TO DIVE?

Last month DIVER ran a guide to diving destinations that the UK Foreign & Commonwealth Office list had deemed safe for citizens to visit for non-essential purposes (such as scuba-diving).

Complicating matters, the Department for Transport had issued its own list of destinations that could be visited without requiring a two-week quarantine period on return, and the two lists are not the same.

We included notes on access to permitted countries in terms of flights, admittance and rules about quarantine on entry.

The number of nations that emerged as relatively easy to get in and out of is now depressingly smaller than ever, and those lists are constantly shifting.

Soon after the September DIVER appeared, Croatia lost its travel-corridor status. Portugal came in briefly as a European diving substtitute but then was gone again, though the Azores and Madeira remain accessible.

In the Caribbean, first the Turks & Caicos Islands and then Tobago became no-go areas for UK visitors, but Cuba was taken off the quarantine-on-return list.

French Polynesia was added to it and other destinations have altered their entry stipulations.

In the following list locations marked Q2 indicate that two weeks' quarantine would still be required on arrival or return.

NDF indicates that no direct flights may be available from the UK; a problem if it means having to transit via a non-compliant nation (eg, the USA).

Check each destination's individual testing, screening and certification requirements at fco.gov. The list reflects guidance as of early September – as it also started to diverge more between the devolved nations of the UK.

EUROPE

Cyprus
Denmark
Gibraltar
Greece (limited entry)
Ireland (Q2 on arrival)
Italy
Norway (Q1.5 on arrival)
Sardinia (Italy)
Turkey

AMERICAS

Barbados
Bermuda
Canada (No entry from UK)
Cayman Islands (No entry from UK)
Cuba (limited entry)
Curaçao (NDF)
Dominica (NDF)
Grenada
St Kitts & Nevis (No entry from UK)
St Lucia
St Vincent & The Grenadines (NDF)

ASIA-PACIFIC

Australia (No entry from UK)
Fiji (No entry from UK)
Malaysia (No entry from UK)
New Caledonia (NDF, Q2 on arrival)
New Zealand (No entry from UK)
Sri Lanka (No entry from UK)
Taiwan (NDF, Q2 on arrival)
Thailand (No entry from UK)

ATLANTIC

Azores (Portugal)
Madeira (Portugal)
St Helena (NDF, Q2 on arrival)

WELL AND TRULY TESTED

STEVE WARREN finds plenty to get off his chest when it comes to a heated vest that can be used with wetsuits as well as drysuits, and a lightweight BC designed to suit travelling divers with minimal compromise

HEATED VEST
FIX **5200FB**

WINTER IN THE RED SEA. Water temperature is 24°C, it's the second dive of the day and my students are hanging about in 15m.

But an hour in and, despite the thick, multi-layered wetsuits, they're all feeling cold, beginning to shiver and gulping air.

I'm fine, but then I'm in a drysuit. I'm teaching an underwater-photography class at Roots and the group is moving slowly looking for subjects, then remaining stationary for long periods as they shoot them.

The students are rapidly chilling. It doesn't help that some of them are mature students.

Cold is debilitating. There used to be a debate about whether your decision-making was affected physiologically by your brain becoming chilled or simply mentally by how distracting being cold is.

I neither know nor care what the outcome was. What matters is that cold can be as dangerous as narcosis, because it impairs judgment.

It also diminishes dexterity, making it harder to undertake a routine drill such as deploying a DSMB or executing a self-rescue skill such as dropping weights, or is frustrating because you can't operate your camera.

Now, more than ever, we're being faced down by the cold. Advances in diving equipment, such as dive-computers that allow far longer multi-level first dives, shorter surface intervals and generous repeat dive-times compared to tables, and the introduction of single cylinders the capacity of which exceed that of some twin-sets, all means that our time under water can be much greater than it used to be.

And something else has changed the way we dive – the digital camera.

Increasingly divers take photos, and to get a decent image takes time. Not for us the forced march set by the dive-guide as he leads a dozen people along the reef, jabbing left and right at points of interest while desperate to get back to the boat within the allotted 60 minutes so that he can hyperventilate on a cigarette.

For photographers, the objective is not to cover ground, but to move slowly in search of prized subjects we might work with for 10 minutes or more. One day, non-photographers will discover the joy of the idle meander through the seascape and the pleasure of intimate encounters with wildlife that, given enough space and time, becomes comfortable enough to come to you.

But the price for this tortoise v hare race is that we can often freeze, making repetitive dives especially miserable. Moving slowly or pausing means that you're often not generating heat anything like as fast as you're losing it.

Even the warmest water will eventually cause hypothermia. It's just a matter of how long it takes.

In commercial and, more recently, technical diving, long exposures in even temperate water has necessitated a move away from passive heating, which basically exploits your limited supply of body heat.

Wetsuits and drysuits rely on this and can only slow heat-loss. They slow down getting cold, rather than making you warm.

Active heating adds warmth. For commercial diving heated water, supplied through hoses from topside, is circulated through wetsuits and the breathing gas can also be warmed.

For technical diving, battery-powered undersuits are used, worn under drysuits.

The Concept

The FIX 5200FB Under Warmer is a little different to most of its competitors. It can be worn under a drysuit, but it's also been designed for use with a wetsuit.

To hardened coldwater divers it might seem strange to combine a heated vest with a wetsuit to stay warm instead of simply using a drysuit.

But FIX is primarily a manufacturer of underwater-photography equipment, and might well have spotted a niche.

That is, the recreational diver who regularly dives in temperate water and doesn't want to dive dry but also doesn't want to feel cold.

Generalising, many UK-based divers dive only in warmer climes. In the tropics, such as the Philippines, staying warm for a fortnight of repetitive day-in, day-out diving isn't a problem for most. But nearer to home, such as in the Canary Islands year-round or the Red Sea outside of summer, getting as cold as my students did is a probability for many.

Use a drysuit and the problem of cold is mostly solved, but it introduces others. Good drysuit courses exist but there's no guarantee of getting a good instructor. Diving dry has a learning curve attached to it, and I'd argue that you need to build experience using a drysuit over quite a few dives before adding the complexities of other tasks, such as handling cameras or decompressing.

There are also major fail-points, such as ripping a neck- or wrist-seal as you kit up. So many people find drysuits unappealing. Besides, they're expensive.

Covid-19 might also be persuading more UK and European divers who normally dive only overseas in wetsuits to at least tentatively test

The remote receiver allows the wearer to test the vest operation before donning.

their own waters, but they might not willingly commit to diving dry until convinced that local diving is for them.

Cold is a common reason I've heard for divers either not diving in Britain, or quitting.

The Fix 5200FB initially appears to offer all these groups a solution, with the added value that it can be used under a drysuit if they later take that route.

The Design

The vest is made from triple-layered polyester with heating elements located in the torso, covering roughly chest to navel in front and from the small of the back to the upper shoulders behind. There's a side zip for getting in and out.

The test vest came with a zip-in expansion panel (for people with a pot belly, says FIX) and a crotch-strap, neither of which I used.

Two lithium-ion batteries are supplied. These are water- and pressure-proof, so don't need additional casings or further preparation for diving. Each cell has a heavy-duty cable built in, with a tough strain-relief coil at the battery end and a single-pin connector at the other.

This push-fits into another single-pin connector on the charger, which has a Y lead for charging both batteries at once.

The wrist-worn remote is easy to use, and displays are visible in strong light.

Once charged, the power-packs connect to the vest. These are wet connectors so, again, there are no maintenance concerns beyond keeping them clean. Attached caps protect the pins for storage.

The two connectors built into the vest are on short cables and there are four vertical pockets, two in front, two at the back, for wearing the batteries inside your dive-suit.

This lets you place the packs where they are most comfortable, because they're going to dig in if other kit, such as your tank, is sitting over them.

Two extension cables are included that allow you to route the flex through gaps in your wetsuit to reach the cells if you prefer to mount them outside.

A wrist-worn wireless remote lets you turn the heating on and off or select low, medium or high heat settings. These correlate to temperatures of 45, 50 and 55° respectively.

Maximum burntimes from the 5.2A/hr cells are low 310min, medium 180min and high 150min. The remote has a USB charger.

In Use

I had a wetsuit that I'd donated to Gibraltar SAC – a famous-brand 7mm jacket and longjohn semi-dry. In theory it fitted me, but in practice it didn't – water gushed through it.

Even when I packed a shortie and vest underneath, I'd be feeling cold after 45 minutes or so, and after an hour I'd be shivering uncontrollably, and my breathing would go into overdrive. Which is why I'd given it away.

I grudgingly picked it out from the loan rack and threw it on over the FIX vest. With a single battery (I didn't know you were supposed to use both) installed, the neoprene easily stretched to accommodate it.

The power-packs are easy to disconnect, but if worn outside your suit need to be rigged so as not interfere with jettisoning your weights.

At the water's edge, as we went through pre-dive formalities, I hit the oversized push-button on the remote. The first press turns on the vest, lighting up one of the LEDs on the console as well as one on the vest itself. The receiver in the vest also buzzes and vibrates once to confirm that it has received the signal.

A second push advances the heating to level 2 and the buzzer sounds and vibrates twice.

The next press takes you to the highest heat setting and is indicated with three buzzes and vibrations, which are pretty much impossible to miss. One long press turns off the vest.

Knowing that the water would be 14°C, and wary of a suit that didn't really work, I went straight to max! Within a minute or two, I could feel the vest warming my torso.

The remote is very simple to use under water and the LEDs are easy to see in sunlight. I would change the strap for a NATO type, more secure than the Velcro-fastened one included.

Over some six dives the FIX got a fair work-out. I got towed behind a DPV, a sure-fire way of getting cold, and did slow-moving hour-long dives followed by static deco in the shallows.

I became very aware that my core was warm and of how much cold water was flushing through the suit arms and legs.

This is important, because it meant that the vest was actually overcoming the continuous flow of chilled water over my torso.

So it works under duress, and would work far better under a well-fitting suit.

In practice, it's possible to prolong battery life for repeat dives by juggling power levels or switching the vest off now and again.

The vest would, I think, also cope with the icy wind-chill that returning to shore or the mother-ship in a fast open boat often creates.

I've endured enough times like that on "warm" days in the Med and Red Sea.

I also have friends who use wetsuits for filming cetaceans and pinnipeds near the surface in the polar regions. While freediving suits can be really efficient in the water, out of it they are much less so.

As an aside, some film-crews working in remote locations are trained in re-entry decompression procedures. One of the big limiting factors to this technique is staying warm, so it's another application for the versatile wet vest.

The large battery supplied with the vest.

Drysuits

I wasn't able to test the FIX with a drysuit, but would have liked to. In those Gib waters I had retreated one night after 150 minutes' filming. The cold had stabbed through my undersuit.

When I first started using drysuits, I'd been startled at how chilled I became during ascents, especially when moving directly from 30 or 40m to decompress. The reason, of course, was that venting air from my drysuit created wind-chill.

I'd be uncomfortable, even though the stops were relatively brief.

The FIX requires no penetrations through your drysuit to wire in battery-packs or controls, so is simpler to set up than some of its competitors.

Conclusion

The FIX isn't cheap, but there's a strong argument for this heated vest. It's the same one made for drysuits and dive-computers – it extends your dive-time.

By keeping you warm, your air will last longer and your time under water will be extended.

You'll also be able to make more repeat dives in comfort. If you've never calculated the cost per minute of being under water after all your travel, lost earnings and family bribes are costed in, you're in for an economic shock.

The FIX Under Warmer was tested under an arduous combination of cold water, long dives and a consummately crap wetsuit. It excelled. It's a niche item of kit for a niche market – anyone who gets cold diving. Highly recommended. ■

SPECS

TESTER ▸▸ Steve Warren
PRICE ▸▸ £850
SIZES ▸▸ XXS, XS, S, M, L, XL, XXL
BURNTIME/HEAT ▸▸ 150min @ 55°C, 180min @ 50°C, 312min @ 45°C
DEPTH RATING ▸▸ 100m
CONTACT ▸▸ nautilusdiving.co.uk

BC
MARES **PURE SLS**

"TRAVEL-FRIENDLY" IS A TERM USED increasingly to describe BCs. All diving manufacturers face a dilemma that can't easily be reconciled. How, when you offer a range of products such as BCs, do you shout out the benefits of one without implying a weakness in another?

The problem with an ultra-light BC that would seem perfect for travel is that you might need to sacrifice hard-wearing materials to make it a featherweight, and accept a limited lifetime.

This is further exacerbated if you want a BC that has additional features to increase comfort, such as padding, weight-integration for convenience or a collection of metal D-rings from which to hang your must-have accessories.

Besides, many UK divers want a BC that is as functional when using coldwater dive suits and heavy steel cylinders in home waters as it is with a shortie and alloy tank in the tropics.

A contender in this category, then, is the Mares Pure SLS, which weighs in at a travel-friendly 3.8kg.

This back-inflation BC comes from one of diving's big players, a company that's been involved in sports diving for more than 70 years, with a line in extended-range equipment as well as freediving and spearfishing divisions.

The equipment giant also has its own training agency – SSI. So, let's see if this seemingly "can-do" BC really delivers.

The Design

The Pure is a single-bag BC, with the air-cell constructed from polyurethane to make the seal and, to protect it, 420 Cordura, a traditional and time-proven durable material. In all sizes, it provides a generous 18kg of lift.

It's doughnut-styled, meaning that the air can migrate freely throughout the bladder regardless of how you move. A horseshoe bladder does not connect where it crosses your lower back, so air can't move from the lower left side of your BC to the right, for example.

Some divers prefer the space a horseshoe offers at the base of their spine for carrying light-canisters. So doughnut and horseshoe wings co-exist – indeed, Mares offers both.

Bungee is used to keep the wing streamlined when it is only partially inflated, and connects neatly to the backpack frame, so there's no cord on the outside to catch on things.

The Pure's harness begins with a full-length rigid plastic backpack, with a wide, moulded, in-hand grip for hauling your set around, such as when loading it up onto boats.

The backpack is substantially padded. The harness straps connect to the pack, so the air-cell can move as it inflates or deflates without pulling on them and creating any chest or waist squeeze. The shoulder-straps use squeeze-release buckles that swivel, so they automatically find the sweet spot under your arms to prevent chafing.

Another pinch-clip connects the single-position chest-strap. There's no cummerbund, just a waist-strap with a stainless-steel cam-buckle.

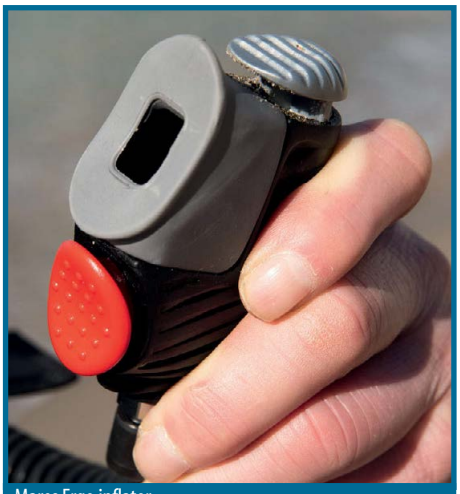
The Pure is weight-integrated, with quick-release main-weight waist-pouches and fixed trim-weight pockets at the back. There is a full complement of D-rings for clipping on accessories, plus a roll-out cargo-pocket.

Unusually, while not billed as a technical BC it can take medium-sized twin-sets, so it would seem to nicely span the rec to entry-level technical diver.

This makes the Pure a BC a beginner with extended-range aspirations might choose.

Air-flow in and out of the BC is controlled through two inflation methods and four dumps. The Mares Ergo inflator allows easy oral inflation through a pipette, against which it's easy to seal your mouth.

The push-button direct-feed inflator is progressive, so the harder you press it, the faster it supplies air. You can dump through the oral inflator or by pulling down on the Ergo inflator to open the rapid-exhaust valve on the left shoulder. Opposite this is a right-hand dump and, on the lower right, a bum-dump.


Mares Ergo inflator.

SLS system

The Pure is equipped with Mares SLS (Slide & Lock System) weight-integration. Weights load into pouches that have panels on which you can write your name for easy identification. The panels slide into slots at the waist.

SLS is similar to many other integrated-weight systems – just pull on the handgrips and out slide the weights. It's about as instinctive as emergency weight-jettisoning gets for the wearer, and unambiguous for rescuers to deploy if they don't know the mechanism.

What sets Mares SLS aside is that it doesn't just clip in with an audible click, like most similar versions. With these it is possible to think you've secured your weights into place when they haven't engaged the locking mechanism properly. With the weights held in only by friction, there's a real risk that you'll lose them.

SLS overcomes this hazard by adding two visual indicators to confirm that you're not only loaded but locked as well.

The first tell-tale, which is obvious to the wearer looking down, is that the red button in the grip will protrude when unlocked.

Install the weights correctly and you'll hear the usual click, and the red buttons will slip backwards and lie flush.

The second confirmation, visible to users who

preload their weights before kitting up, or to buddies if you slide in your weights after donning your set, is a green padlock symbol that appears in a cut-out in the weight-pouch. It's a commendable refinement.

If you prefer to load your main weights after putting on the Pure the SLS is easy to install, assisted by a D-ring to give you some purchase.

By chance, the SLS system provided had been used before I received it. One of the pouches was hard to load and, on inspection, it became clear that the slider mechanism was jamming. This does suggest that some care is needed when rinsing to ensure perfect functioning.

In fairness, the jam made it hard to install the pouch and this was clearly indicated not just by its resistance to engaging, but by the two built-in "not locked" indicators. Once cleaned, it released perfectly.

Dive-schools can use the panel on the weight-pouches to number them and match the BC and its user. This would reduce the risk of a diver installing the wrong weights when all the pouches look the same.

For better balance under water or at the surface, non-ditchable weight-pockets are mounted inside the wing on the backpack.

Accessories

Accessory-management is provided mostly by D-rings. Two pre-bent stainless rings hang from the shoulders, with two more hung from the BC's lower edge.

A small metal D-ring sits above each weight-pouch, with grommets on the left side for a Mares knife. There's also a small plastic D-ring in the back to which, I assume, a crotch-strap could be fitted.

The Pure also comes with a swivel hose-clip and an octopus-holder with a loop to go over your mouthpiece. A roll-up pocket stores neatly beneath the right weight-pouch. Once unrolled it's a bit flappy and in the way, and I'd regard it as useful for storing an unexpected find rather than for carrying, say, DSMBs or slates.

Mares Pure SLS locked in place and showing the padlock symbol, with the roll-down pocket below.

Trim-weight pocket mounted on the outer backpack wing for comfort and streamlining.

In Use

Laden with an all-up weight of 35kg – including lead, air and a podgy 15-litre steel tank – I made the half-kilometre trek to the water's edge.

The upper shoulders are barely padded, but are wide enough to spread the load. The backpack has a luxuriously cushioned – I'd almost call it a pillow – pad that spans your shoulders and base of your neck.

Another pad sits in the small of your back. This helps to place the weight onto your hips.

Because the trim-weights are mounted on the outer backpack, away from your body, you're completely unaware of them. This is a very comfortable rig in which to walk around.

Once in the water, I wanted to see how high the Pure would float me.

In a swell or chop, you don't want to be dipping your mouth into the waves or inhaling spray. This can easily happen if you run out of air at the surface, and is why some agencies recommend that scuba-divers carry a snorkel.

The Pure achieved a height of 16cm, which is about average. While this was with a 15-litre steel cylinder containing 4kg of air, and was laudable, I'm not so sure a steel twin-set wouldn't sink it lower in the water than I would be happy with.

Stability was good. I was supported vertically, so I could hold a conversation with my buddy or take a compass bearing.

Under water, stability was excellent. I was testing for trim, checking that the BC held me perfectly level with no appreciable pitch. Being streamlined, which a horizontal position provides, means less drag, less exertion and prolongs your gas for longer dives.

As a photographer I often want to get very close to the bottom without touching it, which stirs up silt. So, a great result.

I had been loaned a small Pure, which was a size too small for me. This meant that dump-valves were not positioned in the optimum position to vent freely. During trials, this resulted in stopping distances being roughly twice what I would have expected – about 1.5m for the shoulder-dump and three for the rapid-exhaust valve when I fully inflated at 10m and let go of the anchor-chain I was holding.

Extrapolating from previous experience with Mares BCs, I'm certain an out-of-control ascent could be braked quickly and safely. But my experience does emphasise the importance of buying or renting a BC that fits properly.

Get the position of the upper dumps right and either will vent air faster than the Ergo can supply it. At 10m, the Pure can be fully inflated in around six seconds.

Although the air-cell has the same lift across the sizes, a properly fitted harness might also have raised me slightly higher at the surface.

Conclusion

This is a very attractive wing for recreational diving – the buoyancy performance under water and at the surface is excellent. This is important to any diver, but as an underwater photographer and videographer, I especially prize stability and trim.

The metal D-rings are also reassuring for clipping-off expensive cameras.

From a safety perspective, the SLS system is, I think, commendable. I also like the fact that the dump-toggles and Ergo controls are hi-vis and easily identified.

As with many wings, the lack of pockets means that some thought needs to be given to carrying accessories, such as using cargo shorts.

The Pure also feels as if it will last, despite the lowish weight. Highly recommended. ■

SPECS

TESTER ▸▸ Steve Warren
PRICE ▸▸ £332
SIZES ▸▸ XS, S, M, L, XL
BUOYANCY ▸▸ 18kg
WEIGHT ▸▸ 3.8kg
DUMP VALVES ▸▸ 4
COLOUR ▸▸ Black
CONTACT ▸▸ mares.com

NEW BUT UNTESTED

The latest kit to hit the dive shops

Scubapro Aladin A2 Computer ▲▲▲▲

With six modes – Air, Nitrox, Trimix, Rebreather, Gauge and Freediving – the watch-styled Aladin A2 is designed to cover the gamut of diving activities. Gas integration is optional, via a transmitter, for up to eight mixes, the decompression algorithm can factor in heart-rate and skin temperature, and there's a built-in digital compass. The price is £465, or £765 with transmitter.

scubapro.com

Mares Magellan BC ▲▲▲▲

Barely making it to 2kg on the scales, the Magellan is proudly promoted by Mares as a travel BC. This £269 wing offers tough 420 Cordura construction, built-in weight integration and a soft padded pack for comfort, and it folds up for dive travel.

mares.com

Mares Horizon Rebreather ▼▼▼▼

Claimed to be easy to use by recreational divers, the Mares Horizon semi-closed rebreather is being launched with an SSI training programme to match. Said to be able to extend dive-times by from 3-8 times, the horizon features "triple-redundant" electronics with a head-up display to back up the main wrist-computer. It costs £3600, and there is a conversion kit for accelerated decompression diving that costs £460.

mares.com

Ball Engineer Hydrocarbon NEDU Watch ▼▼▼▼

Named NEDU for the US Navy Experimental Diving Unit, this dive-watch by Ball is packed with features designed to appeal to the diving professional. Diveable to 600m, it has a helium escape valve built into the crown for saturation diving, a chronograph that measures elapsed time up to 12 hours and highly luminous indices for easy reading in the dark. Prices start from £3490.

ballwatch.com

Scubapro Mk19 EVO / D420 Regulator ▸▸▸▸

Reckoned by Scubapro to be the perfect combination of first and second stage for deep, cold and silty diving conditions, this new regulator combination costs £695. The Mk19 EVO balanced diaphragm first stage is environmentally sealed and offers, along with two hp ports, four swivelling mp outlets plus a fifth axial take-off. The D420 second stage diaphragm is pneumatically balanced and set low for ease of breathing.

▸▸ scubapro.com

Ianos Ayyssos Watch ▸▸▸▸

The Ianos Ayyssos watch might be Swiss-made but it was designed in Greece and celebrates the ancient civilisation's invention of a seaman's navigation timing aid, the Antikythera. The 300m-rated timepiece has a hand-wound movement. It features a one-way bezel, shaped case and a rear window to view the mechanism. Seconds are indicated by an Antikythera-inspired display. The price is 1250 Swiss francs (around £1000) plus VAT.

▸▸ ianoswatches.com

Aqua Lung Blizzard Pro Drysuit ◂◂◂◂

The Blizzard Pro will see you comfortably through year-round diving in the UK, says Aqua Lung. For £949 you get 4mm Yamamoto compressed neoprene, which is said to maintain its insulation and buoyancy characteristics at considerable depth, braces for comfort, SLT fast-change wrist-seals and your choice of socks or boots.

▸▸ aqualung.com

ANDY TYRRELL

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Devon dive-site no comedown from the Coral Triangle!

Closing on Irma
Dive pro on a collision course with a hurricane

Zero to Hero
Learning to dive in the UK – the slow way

Poor Knights
Where the moray eels have a starring role

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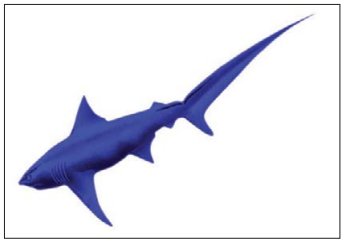

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Venture Dive Charters. For quality diving from Plymouth, visit: www.venturecharters.co.uk or Tel: 07948 525030. (73533)

DIVING MEDICALS

Diving Medicals - Nottingham. Sport Diving medicals: £55. HSE Commercial Diving medicals: £120. OGUK 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)

Diving Medicals - Midlands (Rugby) - HSE, Sports Medicals and advice at Midlands Diving Chamber. Tel: 01788 579555 www.midlandsdivingchamber.co.uk (72756)

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Active and friendly BSAC club. All year diving in local lake. New and qualified divers of all agencies welcome. Own clubhouse with 7m RIB and compressor. For further information visit www.mksac.co.uk (64403)

Alfreton (Derbys) BSAC 302. Welcomes new members and qualified divers. A small but active club with own RIB, wreck diving a speciality. Contact Angela on 07866 799364. (68370)

Appledore Sub-Aqua Club (SAA 35) Friendly club welcomes experienced divers from all agencies . Regularly dives Lundy island , own hard boat / compressor . Contact Damian 07831 152021.

Banbury SAC. Friendly, active club with weekly meetings and training sessions, own boat, compressor and equipment. Welcome divers/non-divers. www.bansac.org or call 07787 097 289. (69308)

Birmingham Underwater Exploration Club. Friendly, active dive club. Weekly pool sessions. Regular trips. Own RIB based in south Devon. Training and equipment loan available to members. Tim 07775 580033.

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.chelmsfordiveclub.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, Larkswood Leisure Centre E4 9EY. Information: www.dive365.co.uk Email: loughton divers365@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 out 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.guildford-bsac.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)

Lincoln - Imp Divers. Small, friendly, non-political diving club with our own RIB are looking to welcome new and experienced divers. Contact Richard: 07931 170205. (69383)

Lincoln and District BSAC. Active club with own RIB, compressor and other facilities. Regular trips and training. www.lincolndivingclub.co.uk (69336)

Lincs Divers BSAC 1940. Friendly, active dive club offering dive trips and training for new/experienced divers. Lincoln based. www.lincsdivers.co.uk

Llantrisant SAC, two RIBs, towing vehicle, welcomes new and experienced divers. Meet at Llantrisant Leisure Centre 8pm Mondays. Contact Phil: (01443) 227667. www.llantrisantdivers.com (68519)

Lutterworth Dive Club, active, social, friendly. Own RIB, regular trips. Welcomes qualified divers, any agency. Training at all levels. Most Tuesdays, Lutterworth Sports Centre. www.lsac.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.oddy@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.

INSURANCE

Merseyside training club, new and active divers from all agencies, weekly pool session. Own Rib towing vehicle Contact www.wapsac.org.uk or wapsacsac@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: welshflinty@hotmail.com (65305)
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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: craigbarclay31@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 divingofficer@plymouth divers.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)
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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 Thursday 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: arannie123@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)
Steyning Scuba Club, West Sussex. All divers welcome. Steyning Pool , Monday evenings at 8.30pm. Contact Andy Willett on 07786 243 763. www.seaurchin divers@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.bathbubbleclubuk.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 & liveaboard diving, regular socials. Affiliated training school, fully insured. Exclusive member benefits. www.jcscubadiveclub.co.uk

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10/20

Freshwater wreck-diving in the St Lawrence means careful prep

Canadian technical diving instructor Stéphan Senécal has made it his life's mission to wreck dive in the mighty St Lawrence River. With its ever-changing currents, cold water and wild nature it isn't for the faint-hearted but he has dived more than 50 wrecks there. NIKOLA VALTOŠOVÁ talks to him

STÉPHAN SENÉCAL IS A French/English-speaking TDI CCR mixed-gas instructor for the company Divesoft. His passion for diving began when he was in his early 20s and he has spent most of his years since exploring the St Lawrence River.

Senécal has always had a soft spot for a particular location in Brockville, Ontario at the heart of the river, in an area known as Thousand Islands. "I moved here for diving and eventually built a house close to the water so that I could dive here year-round," he told me. "The river-water flows through my veins."

With his fervour for wreck-diving, Senécal's fascination with the region is no surprise. Not only does the river contain countless wrecks dating back as far as the early 1800s, but the fresh water means that even 200-year-old timber ships can be found in good condition there.

There are also a number of steamers and steel shipwrecks to be explored, and the freshwater conditions allow hordes of organisms and coral to find their homes on them. This makes wreck-diving in the St. Lawrence all the more intriguing, says Senécal, whose task is to try to make out the long-overgrown hulls, cabins and artefacts ranged along the riverbed.

The *Petrie II* shipwreck at Picton.

ONE OF HIS favourite dives is on the *JB King*, a drilling barge used in the construction of the St Lawrence Seaway in the Brockville Narrows.

The *JB King* 's story is a tragic one. On 16 June, 1930, the vessel was struck by lightning, causing her only cargo, which happened to be dynamite, to explode.

Thirty people were killed that day, and in later years a number of divers have died there too, the result of the wreck-site's challenging location and the constantly changing currents, which can pose a threat even to the most experienced diver.

"The shipwreck lies in about 45m of fresh water, and because of its location right along the upstream edge of an island, there is always a strong current running across it," Senécal tells me. He says he always has to go the extra mile in terms of safety measures, even when diving with advanced students or others at his level.

Days before a dive, he ensures that all the divers are running the same deco gas and dive-plan, which helps to keep the group together and allows for sharing gas should the need arise. He considers all potential emergencies and goes over the contingency plans with his divers.

He also makes a point of checking the previous 48 hours' wind strength and direction. "This information is crucial for having a good idea of the current we'd have to deal with and the strategy we'd use for the descent," he explains.

Equipment preparation comes next. "On the boat-ride out, everybody visualises their dive while preparing their gear," he says.

When not instructing, Senécal always uses his Liberty closed-circuit rebreather. "It's a wonderful tool for any complex dive, for multiple reasons. There's a lot more gas time and redundancy than with an open-circuit configuration, and should you suffer a malfunction you have more options and much more time to fix it."

Having the right tools at your disposal is always important, and even more so on this sort of technical dive. Senécal stresses in his teaching that divers have to deal with two layers of water, surface and bottom, and not necessarily flowing at the same strength or in the same direction.

Knowing how to navigate these currents will help divers plan how best to enter and exit the water. When the currents are more friendly a simple drop down is all it takes, but when they're not, further calculations on how to drift onto the wreck from upriver are necessary.

Once in the water, the divers do their best to follow the dive-plan.

They are all trained to be able to finish their dive alone, but if anyone should experience problems and has to fall back on a contingency plan, Senécal and his remaining team-members will attempt to locate that diver and ensure their safety.

"That river is alive and kicking," he says. "Everything comes down to training and redundancy."

APART FROM training purposes, Senécal has other objectives in mind when diving wrecks such as the *JB King*. "Even after hundreds of dives, we still find new things, depending on where the current is pushing us," he says.

There is no point in fighting to get to any specific spot, so he says he usually just enjoys whatever the river has to offer on the day: "It's a privilege to even be in this kind of environment," he says.

Senécal is currently working as a Save Ontario Shipwreck (SOS) volunteer on the river, in charge of all the moorings in his area. His responsibilities include maintaining buoys, ascent/descent lines, concrete blocks and all the hardware – chains, shackles, and lines.

It's a labour of love, he says: "Diving tourism is counting on those mooring lines to safely enjoy the river's shipwrecks."

For wreck-divers the St Lawrence offers conditions unlike any other river, but however challenging the location, there's always something to gain from each dive, whether discovering a new wreck, finding artefacts or building training and skill-sets.

With divers getting back in the water in Canada, Senécal invites any divers able to access the St Lawrence River to consider learning more about what it has to offer. "There's a lot of history, both maritime and agricultural, lying on the bottom, and it's all there for us to discover," he says.

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