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Tragic Triangle

Indonesia
Dampier Strait

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Graf Zeppelin

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Training
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Opinions
Shark Diving

Austria
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MABUL.RAWA:POM POM

Malaysia

COVER PHOTO BY ELISABETH LAUWERYS

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COVER PHOTO: Emperor shrimp on Spanish Dancer,
Pom Pom Island, Malaysia. Photo by Elisabeth Lauwerys.

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Skunk-striped anemonefish, Mabul Island, Malaysia. Photo by Brandi Mueller



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The Many Gifts of Diving

It was only this past week that a Danish diver posted a really neat video of a newly located but unknown wreck in the Baltic Sea. It appeared to be a tall ship, with a wooden hull, which was quite obviously, from, what I would guess, the 1800s, but possibly older.

But who knows? Finding out is no small part of all the excitement that comes on top of the adventure of first finding the vessel—whether it is the result of a deliberate search or stumbling upon the wreck by accident. Then there is the excitement of diving it.

What was it? Where did it come from? Why did it flounder? Did the crew survive? What can be learned? Is it historically significant?

I totally get it why some divers get carried away by the detective work and spend long hours searching records available online or visiting archives.

Personally, I am more into the nature and wildlife encounters that can be found under the waves. When I think back on the many great experiences I have had underwater, locally or abroad, I always feel uplifted and privileged—even if I am in the middle of some kind of drudgery, like accounting and bookkeeping... perhaps especially then.

I have been enriched by close encounters and interactions with big pelagics, such as sharks, orcas, dolphins and manta rays, that, in many cases seem just as inquisitive about me as I am about them. I have surely been thoroughly ogled more times than I can count.

Also many, are the times I have been intrigued by some other-worldly-looking critter, weirdly shaped and psychedelically coloured, which I have stumbled over in some coral or bed of kelp and had to look up afterwards.

Over the years, not only has my understanding and knowledge of the world beneath the surface grown, but also my appreciation for it. There always seems to be something new to find, discover or notice. It never seems to get old, and I always come back up from the depths in a better mood and improved perspective on life and its challenges.

Unless you lead a landlocked life in the middle of some continent—with not even a decent lake in reach—there are adventures to be made on our doorstep. As much as I fancy darting off to some exotic location, I always look forward to the next local dive after work. In some small way, we can all be explorers and certainly have some good fun and company in the process.

Now get out there and get wet!

— Peter Symes
Editor-in-Chief
X-Ray Mag



News edited
by Peter Symes

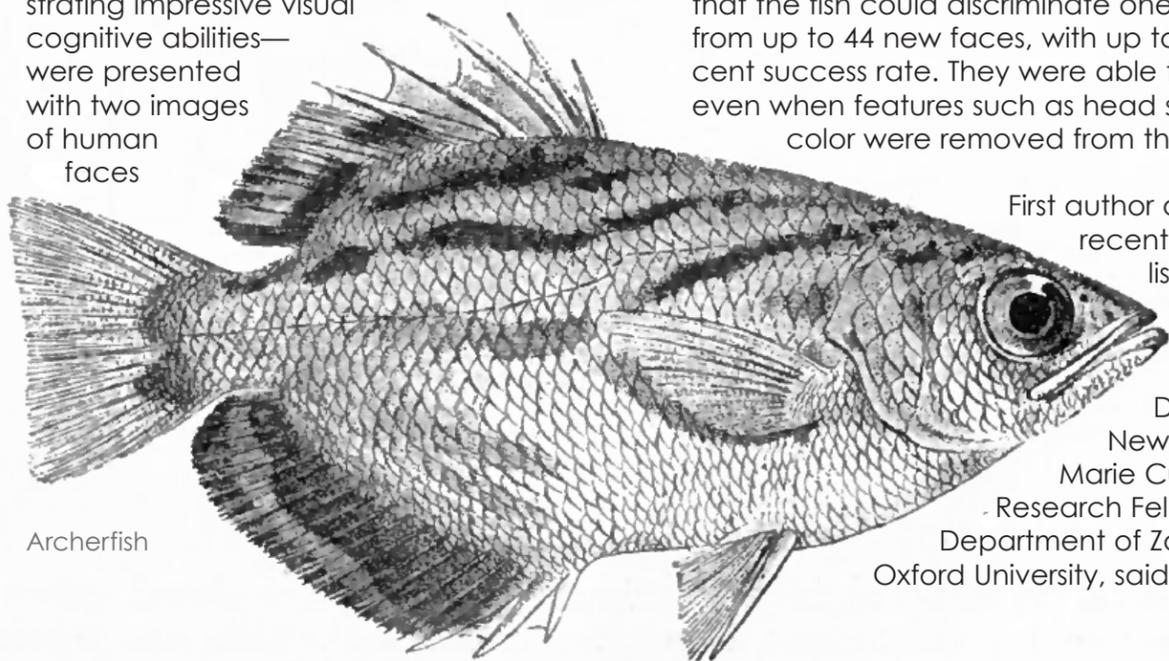
from the deep
NEWS

Fish are able to recognize human faces

Archerfish demonstrate ability to distinguish between human faces, with a high degree of accuracy.

Despite lacking the crucial neocortex part of the brain, which other animals use for sophisticated visual recognition, fish are seemingly able to distinguish between human faces.

In laboratory-based tests, archerfish—a species of tropical fish well known for knocking down aerial prey with jets of water, relying heavily on vision to detect small prey against a visually complex background and demonstrating impressive visual cognitive abilities—were presented with two images of human faces



Archerfish

and trained to choose one of them by shooting a jet of water at it. The fish were trained by providing them with different options and giving them a food reward to select a particular one.

81 percent success rate

In subsequent tests, the archerfish were presented with the learned face and a series of new faces. Researchers found that the fish could discriminate one face from up to 44 new faces, with up to an 81 percent success rate. They were able to do this even when features such as head shape and color were removed from the images.

First author of the study recently published in the journal *Scientific Reports*, Dr Cait Newport, Marie Curie Research Fellow in the Department of Zoology at Oxford University, said: "Being



Picasso triggerfish

able to distinguish between a large number of human faces is a surprisingly difficult task, mainly due to the fact that all human faces share the same basic features. All faces have two eyes above a nose and mouth, therefore to tell people apart we must be able to identify subtle differences in their features. If you consider the similarities in appearance between some family members, this task can be very difficult indeed."

In her lab at the Department of Zoology at Oxford, Newport demonstrated a similar level of visual perception in Picasso triggerfish. The brightly colored tropical fish were able to successfully pick out a black colored disc mounted on a board surrounded by white discs. ■
SOURCE: OXFORD UNIVERSITY

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How "color-blind" cuttlefish are able to perceive color

Supposedly colorblind, the behavior of cephalopods indicates they are nonetheless able to distinguish color. The answer to this paradox may lie in the strange shape of their pupils.

One of the greatest puzzles in biology is how and why cuttlefish are able to put on their dazzling displays of color, to signal other members of their species and camouflage by closely matching the coloration of natural backgrounds, considering they are color blind.

At least, studies have shown that

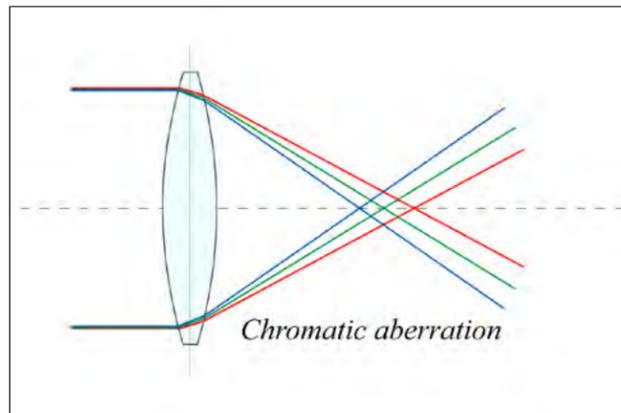
with just a sole known exception, cephalopods lack multiple photoreceptor types and the multi-color visual pigments that are responsible for trichromatic (and sometimes tetrachromatic) color vision, which are common in humans and many other animals.

Also, cephalopods fail certain behavioral trials designed to test for color vision by opponent spectral channels. Obviously, their view of the world must be monochromatic. Or is it?

According to University of California at Berkeley graduate student Alexander Stubbs, not so. Cephalopods may actually be able to detect color—albeit in a manner profoundly differently from any other animal. The clue lies in the convoluted shape of their pupils, which may be U-shaped, W-shaped or dumbbell-shaped such as the depicted cuttlefish (left).

What happens when light passes through the lens of an eye and is focused on the retina? The lens acts like a prism,

Chromatic aberration manifests itself as "fringes" of color along boundaries that separate dark and light parts of the image, because each color in the optical spectrum cannot be focused at a single common point.



BOB MELLISH CC-BY-SA-3.0

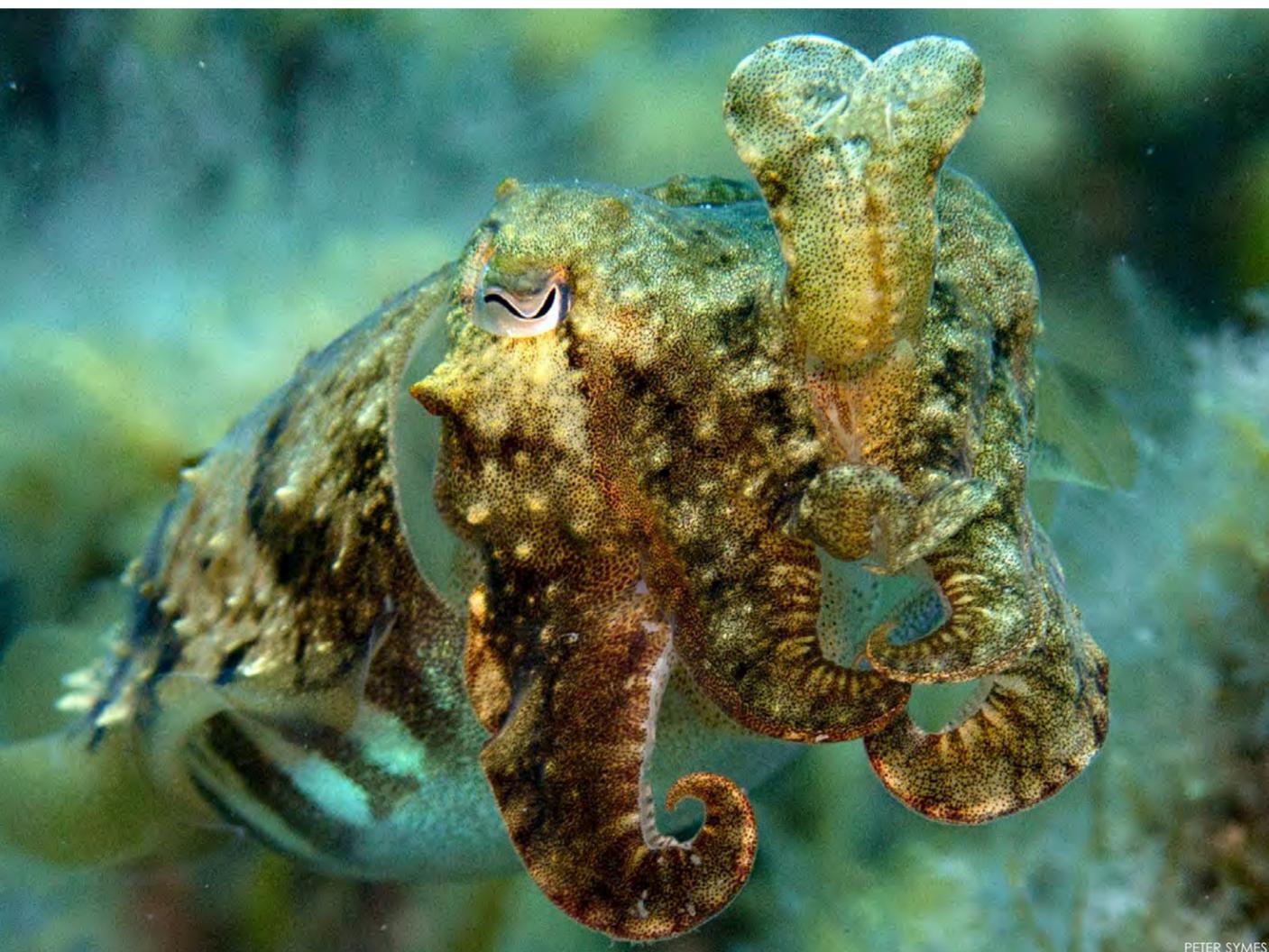
causing white light to split just a little into its component colors, which are not focused on exactly the same spot, causing an effect known as chromatic aberration. This phenomenon is well-known among photographers as the cause of the unwanted colorful fringes around objects in photographs, in particular, when lower quality lenses are used.

Lens shapes

In humans and other mammals, focusing takes place by changing the shape of the lens, and the eye has round pupils, which contract to pinholes to give us sharp vision, with all colors focused on the same spot.

In contrast, cephalopods focus by moving their retinas back and forth in relation to the lens. As different wavelengths come into focus at different distances from the lens, this movement can be exploited to achieve spectral sensitivity—in other words, to discern between colors.

The unusual shapes of the lens, which allows light to enter the eye and reach the retina from many directions, can then be seen as an adaptation that serves to maximize the spectral information—even at the expense of image acuity. In other words, cephalopods may be trading sharpness for color. Or as the researchers put it in their paper, "The spectral content of a structured scene can be deduced by sweeping through focus (i.e., changing the lens to retina distance) and seeing how the image blurring varies." ■



PETER SYMES

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Expedition member Bjorn Sloodmaekers exploring the ventilation system of the *Graf Zeppelin* wreck

Text and photos by Vic Verlinden

There have been a few times during my life as a diver that I have had the opportunity to dive an extraordinary wreck. The *Graf Zeppelin* is one such wreck. It is more than a shipwreck, it is also one of the great mysteries of the Second World War. Most people do not know that the Germans built an aircraft carrier. Here is her story.

When the dictator of Nazi Germany, Adolf Hitler, arrived at the shipyard in Kiel on 8 December 1938, he was accompanied by Field Marshal Hermann Göring and Grand Admiral Eric Raeder. Several hundred other invited guests as well as all the

employees of the shipyard and their families also attended this auspicious day. For on this day, the very first aircraft carrier in the history of the German navy was launched. Various film crews set

up their cameras just before the launch, so they could capture this historic moment on film. The family crest of the Von Zeppelin family was mounted on the bow of this mighty ship.

After a few short speeches, the ship glided from the slipway while thousands of spectators cheered, wishing the ship godspeed. The *Graf Zeppelin* rode high on the water, as a lot of the upper

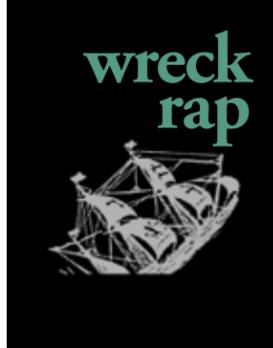
superstructure and armaments had yet to be installed. In addition, the elevators, which were needed to bring the 42 planes from the hangar to the deck, were yet to be installed. The

60mm steel deck was also yet to be covered with wooden planking. While the work progressed to complete the aircraft carrier, the situation in Europe became



The Graf Zeppelin

— *Diving Hitler's Aircraft Carrier*



Rebreather divers swimming over the deck of the Graf Zeppelin



Graf Zeppelin

worse. However, upon the start of World War II in September 1939, the ship was still not yet finished.

Because the building of U-boats had priority over the completion of the Graf Zeppelin, the ship was laid up in the port of Gdynia, Poland. Here, the vessel was out of reach of the bombers of the British Royal Air Force. However, on August 27, the British air force did attempt an attack, with 12 Lancaster bombers to destroy the ship. Due to bad weather, the attempt failed.

In the following years, the ship was used as a depot for military materials. And finally on 27 April 1945, the vessel was to be sunk with the use of explosive charges to prevent the ship falling into the hands of the approaching Russian troops.

A second life

When the Russians found the Graf Zeppelin upon their arrival, the vessel was not completely submerged and was presumed intact. After a brief inspection, the damage became apparent and repairs to raise the ship were started immediately. In September 1945, it was reported the ship was floating again near Stettin.

However, due to the start of the Cold War, little news about the ship came out. Some sources reported she was serving in the Soviet navy. Others presumed

she had been sunk by a mine whilst loaded with looted artefacts and other spoils of war.

The truth finally surfaced in July 2006, when a Polish oil company was researching the seabed of the Baltic Sea, about 40 miles north of the port of Wladyslawowo. A short while later, the Polish navy investigated with a submersible robot and confirmed the finding of the Graf Zeppelin. It is still not known what the cargo of the ship was.

Organizing a dive expedition

I planned to dive this unique wreck as early as 2012. I contacted my good friend Sebastian Popek from Poland. He chartered a ship, which could cover the distance to the

wreck, and he also gathered a group of technical divers who could make such a dive. Two weekends were proposed, so we would have a reasonable chance of sailing to the wreck. It was necessary to have stable weather to do the technical dives. Shortly before my departure, I received a message that the weather in the Baltic was not good, and we would try again the next week. But the next week, the weather was still too bad for diving, and our trip to Poland was cancelled.

In 2014, a new opportunity to dive the wreck presented itself. My colleague, Robert Grzesecki, left me message on Facebook about bringing together a group to go to the wreck. As one of the divers had to cancel,



Historical photo of the Graf Zeppelin, launched in 1938



Technical diver prepares to enter the water



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THIS PAGE: Expedition members prepare for the dive

a spot had opened which I could take. The date of the trip was set for July 12-19. During this period, we had the best chance of good weather in this region.

A journey of obstacles

One of other Belgian divers who joined this expedition made it easier for me to get to the departure point by offering a lift to Poland, and so we drove there together. Bjorn Sloodmaekers, who would also be diving on a rebreather, would be my buddy for the dives to the Graf Zeppelin. The Italian diver, Aldo Ferucci, with

whom I had done several expeditions would also be joining our team. The other participants were English and German divers.

Expedition leader, Robert Grzesecki, prepared dive plans for the whole week. The plan was to dive some known and some unknown wrecks. However, the planned dive to the wreck of the Franken was cancelled due to a recent accident in which two Polish divers had perished.

On the first day of the expedition, we made a test dive in the harbor of Hel. During this dive, we had the opportunity to check our rebreathers one



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final time and adjust the amount of dive weights we used.

From the next day on, however, there was a lot of wind and fairly high waves. Therefore, we decided to stay close to the shore, as this provided calmer waters. However, the visibility was limited to 1.5 meters, rendering underwater photography impossible.

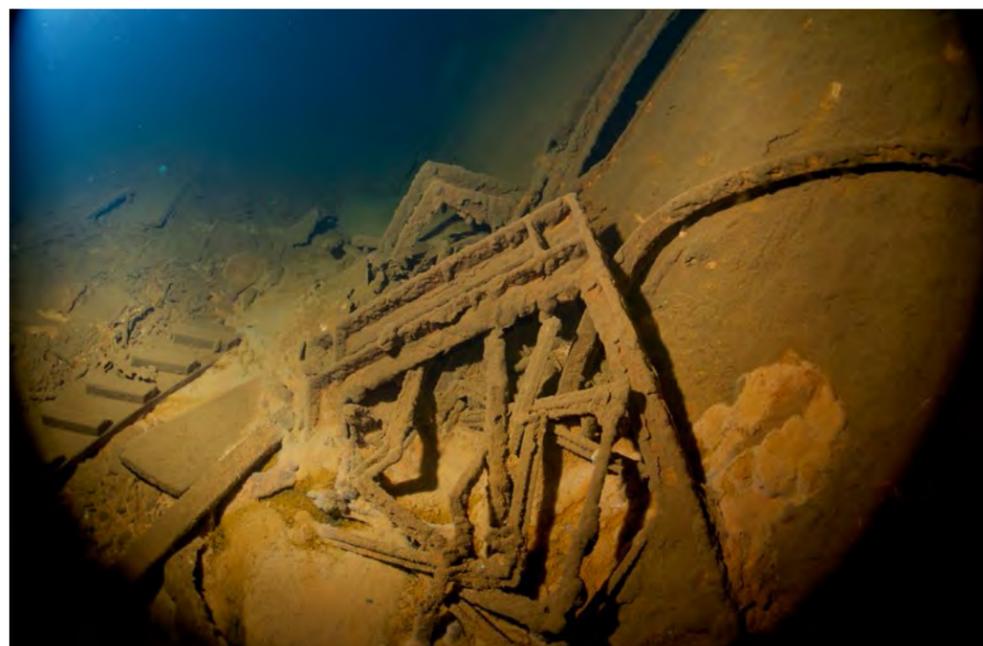
Finally on Wednesday, we were able to moor the dive boat further out to sea, at an unknown wreck site which we had planned to dive. The wreck lay at a depth of 65m and was only dived upon once last year. When I started the descent, the visibility was limited to 4m, but beyond the thermocline at 15m, the water became clear and much colder. The wreck itself was heavily damaged and overgrown with small shellfish. Everywhere I looked, I saw heavy fishing nets, which covered the wreck, creating dangerous obsta-

cles for the unwary diver.

Unfortunately, when I wanted to use my camera, the flash would not respond, and the battery appeared to be empty. Most likely, I had left the pilot light on dur-

ing the last dive.

At first sight, the wreck did not reveal many recognizable parts. It was only in the last moments of our dive that we encountered a piece of the wreck standing straight up,



Debris inside the wreck; The airplane elevator resting upside down (top)

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Divers on the wreck of the *Graf Zeppelin* (right) and views of the ventilation system inside the airplane garage (left) and the wall of the airplane garage (below)

depth between 70 and 90m. The water temperature was only 4°C at this depth. During the descent, we passed through another thermocline with bad visibility, but below 20m, the water became clear. At a depth of 50m, I could already see the shadow of the wreck, and at 70m, I landed on the deck.

First, I prepared my camera and decided to swim along the deck where a large hole was visible. I could clearly see the chain and its sprocket that was used to move the elevators up and down. A little further on, a part of the ventilation system mounted in the elevator shaft was visible.

We now found ourselves at a depth of 75m and had to constantly look up so as not to swim



about 10m in height. Here, there were also lots of nets present, and we had to be very careful not to get caught in them. After completing our ascent, we were picked up by the dive boat via a lift on the boat. Robert told us that he found the steering wheel and telegraph on the higher parts of the wreck. Unfortunately, we had ended our dive at that point and missed these finds.

Finally, the Graf Zeppelin!

Thursday brought too much wind to dive, but we decided to spend the night at sea anyway, as Friday promised to bring a window of calm weather. If we departed early enough for the wreck site, we would indeed be able to dive the Graf Zeppelin.

In the morning, the waves were about two meters high, but we still had to sail for three hours to the location of the wreck. However, the wind died completely upon our arrival at the wreck's location.

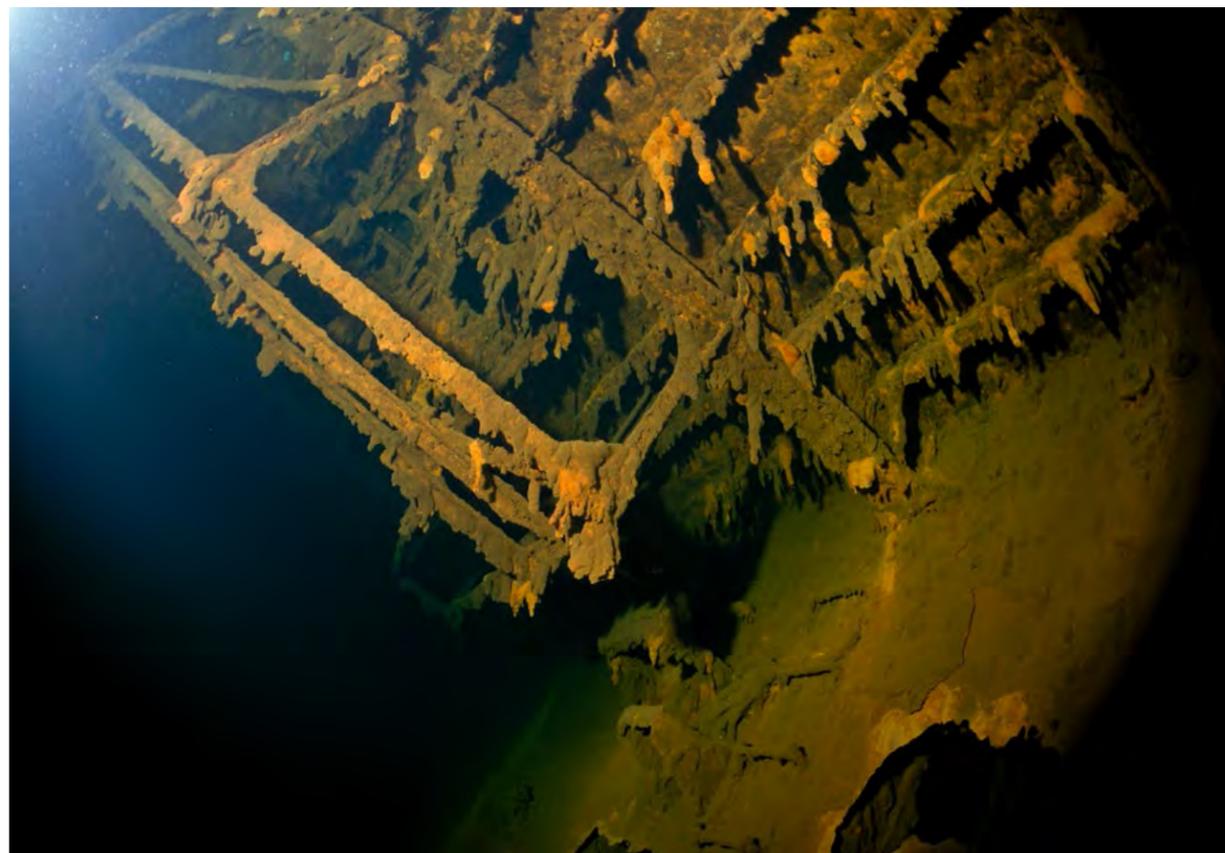
After a short briefing, expedi-

tion leaders Robert and Natty prepared themselves to make the first dive. The agreement was to wait for their report before a second team would enter the water.

When they completed their decompression stops, they came back with bad news: A large fishing net was caught on the down line. It stretched 45m up from the wreck, supported by floaters. It would be too dangerous to send all the expedition teams down at this location, so we decided to reposition the down line at a different spot on the wreck.

When the repositioning was completed, I would be able to go down to the wreck with the third team. This team included Bjorn Sloodmaekers, Aldo Ferucci, Marcello Bussotti and myself.

The wreck lay on a



into an enclosed space. I could now see one of the elevator platforms lying upside down in the elevator shaft. The water was freezing at this depth, and my hands slowly started to cramp up, which led me to decide to swim back to the down line.

On the deck, we encountered another team that just completed their descent. For us, the 20 minutes of bottom time was up, and we had to start a long period of decompression time.

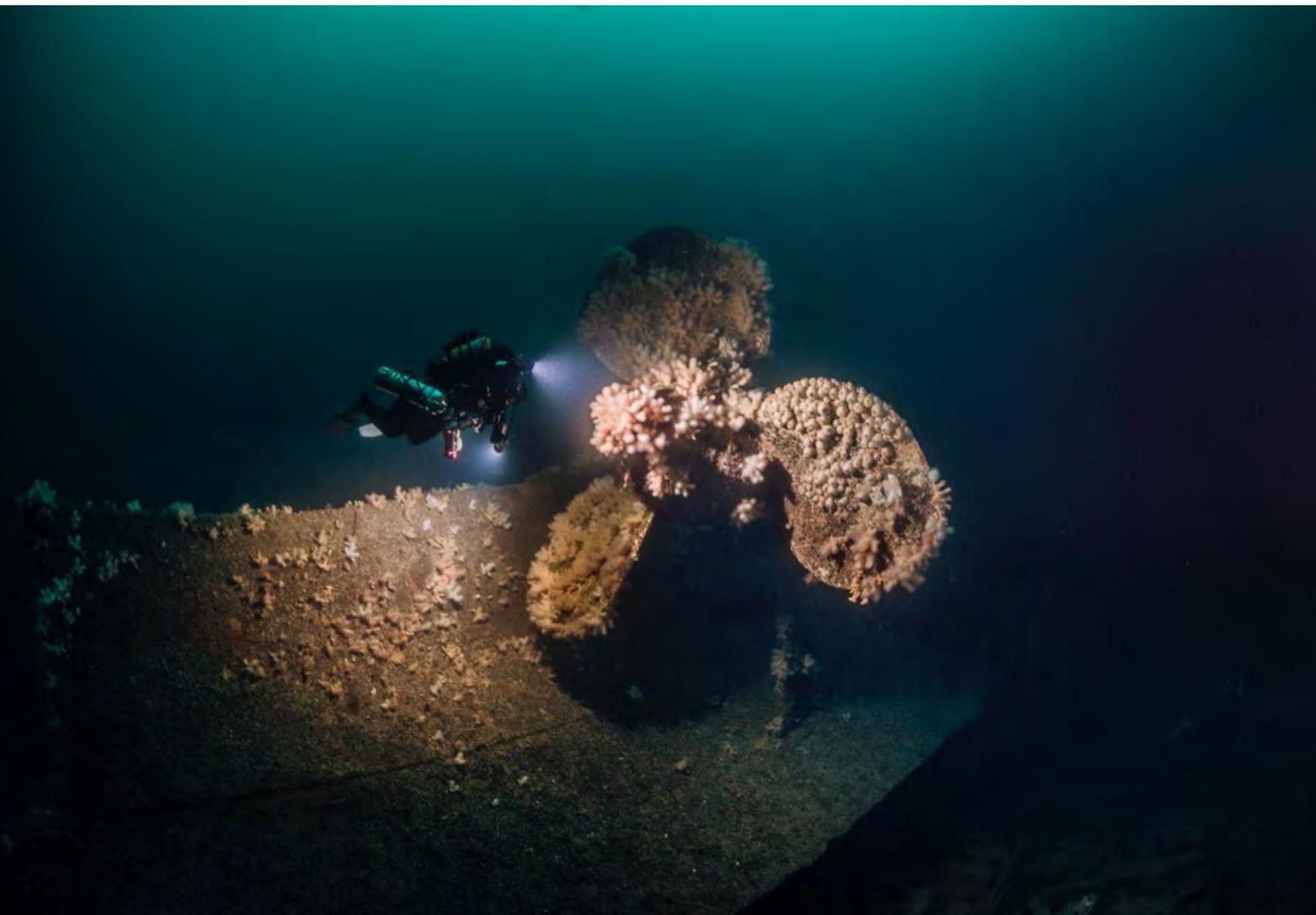
After the dive, everybody agreed that this was a beautiful dive

and certainly worth all the troubles. After three years of waiting, I had finally made a dive on this magical wreck. It was a shame that the wind picked up again, making a second dive impossible, but I can't wait to make more dives on this giant with a secret past. ■

Having dived over 400 wrecks, Vic Verlinden is an avid, pioneering wreck diver, award-winning underwater photographer and dive guide from Belgium. His work has been published in dive magazines and technical diving publications in the United States, Russia, France, Germany, Belgium, United Kingdom and the Netherlands. He is the organizer of tekDive-Europe technical dive show. See: tekdiver-europe.com.

WWI cruiser HMS Hampshire surveyed

Underwater photos courtesy of Rod McDonald



The port propeller of HMS Hampshire



The upturned bow of HMS Hampshire in 68m of water

The ship carrying Lord Kitchener, Britain's Secretary of State for War, and his staff to Russia to discuss mutual war aims and strategy is rumoured to have been carrying a fortune in gold bullion.

The 10,850-ton armoured cruiser HMS *Hampshire* departed Scapa Flow in Orkney on 5 June 1916 on a voyage around the north cape of Norway to the port of Archangel in northern Russia. As she struggled up the west coast of Orkney in a severe gale, approximately one and a half miles off Marwick Head, she struck a mine laid by the German Submarine U-75 a week before on 29 May—and quickly sank. Of the 749 people aboard, only 12 managed to reach the shore alive. Lord Kitchener who famously featured on the “Your country needs you!” recruitment

posters, and his staff were lost. He was being transported to Russia at the time for a secret meeting with Tsar Nicholas II.

HMS *Hampshire* played a minimal role in the Battle of Jutland, between May 31 and June 1, before being reassigned as Lord Kitchener's personal transport. Today, HMS *Hampshire* lies at a depth of approximately 70m (230ft) near the northwest tip of Orkney in an exposed area open to North Atlantic storms and strong tidal flows. The location makes diving HMS *Hampshire* a challenging undertaking.

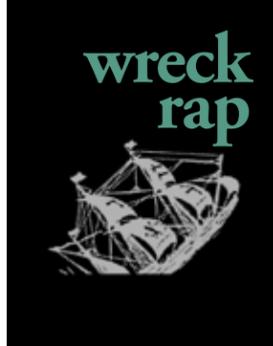
Expedition leader Rod Mac-

donald, a shipwreck explorer and internationally renowned diving author explained:

“The story of HMS *Hampshire* is of historical importance and her loss forms an important element of the WWI naval story. The expedition objective is to undertake a detailed survey of the shipwreck, to record it using stills and video photography using the latest underwater photogrammetry techniques.”

Mine damage

University of the Highlands and Islands Archaeology Institute reported the expedition uncovered



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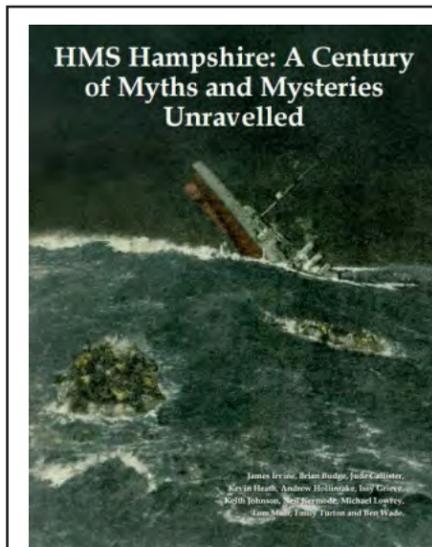
HMS *Hampshire*, here seen on a photo dated 1903, went down off Marwick Head in Orkney after striking a mine laid by a German submarine on June 5, 1916—with the loss of 737 lives. Among those lost was Lord Kitchener, the secretary of state for war, who was being transported to Russia for a secret meeting with Tsar Nicholas II.



new information and data concerning the wreck and provided insights into the mine damage at the bow of the vessel, the impact of salvage efforts, and the natural deterioration caused by the sea.

The Roving Eye Enterprises ROV survey confirmed previous findings that HMS *Hampshire* capsized as she sank and lies with an upturned hull on the seabed in approximately 60m (200ft) of water. The superstructure itself is compressed and is buried in the soft silt of the seabed. The

hull is damaged in places throughout the length of the vessel, exposing various elements of the interior, including torpedo tubes and machinery. Guns from the ship's secondary armament were also identified on the surrounding seabed at a distance of up to 30m (100ft) from the main body of the wreck. The location of these breech loading 6-inch MK VII guns may be related to the sinking event or salvage activity on the wreck. ■



Book

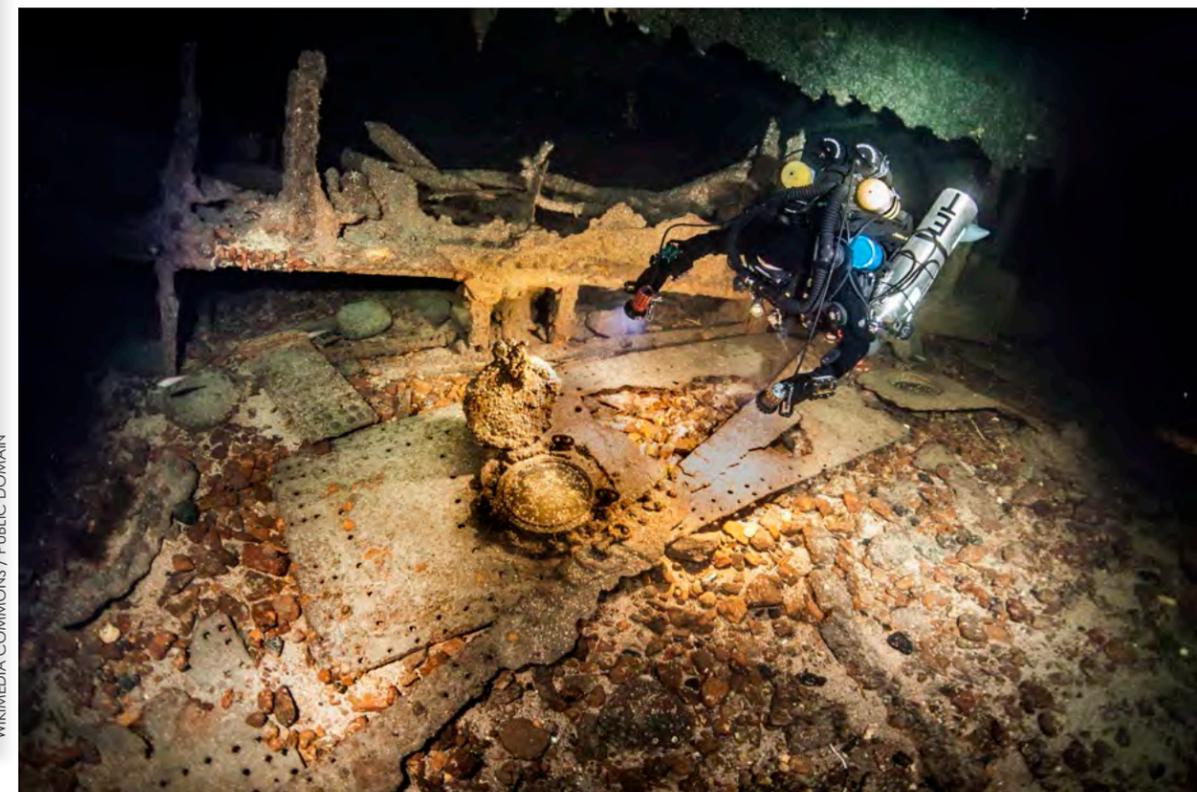
Orkney Heritage Society announces the forthcoming publication of a book to commemorate the centenary of the loss of HMS *Hampshire* entitled, *HMS Hampshire: A Century of Myths and Mysteries Unravalled*.

The book assembles hitherto unused contemporary evidence to explore the causes and circumstances of the loss of HMS *Hampshire* on 5 June 1916 and the associated myths and mysteries. This A4, 120-page, illustrated case-bound book will be launched on 30 August 2016 and retail at GB£25 plus postage and packing. All proceeds, including authors' royalties, will go to the Orkney Heritage Society for the Kitchener Memorial refurbishment project. **More info >>>**



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"Lord Kitchener Wants You" was a 1914 recruitment poster that continues to be considered a masterful piece of wartime propaganda as well as an enduring and iconic image of the war.



Emily Turton inspects a port side porthole of HMS *Hampshire* with its deadlight open (above); The port anchor of HMS *Hampshire* is still in its hawse pipe (top right).

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Divers from the Ghost Fishing Foundation remove derelict fishing nets from the seafloor. Ghost Fishing founder, Pascal van Erp, will be a guest speaker at EUROTEK.2016



TOM BOYD

Meet divers with true grit at EUROTEK.2016

Text by Rosemary E. Lunn
Photos courtesy of Laurent Ballesta, Tom Boyd, Peter Symes

It is soon obvious that when you look at the headline speakers at EUROTEK.2016—the fifth European advanced and technical diving conference taking place in Birmingham, United Kingdom, in October this year—that perseverance is key.

Laurent Ballesta

Deep photographer and marine biologist Laurent Ballesta is a classic example of this. Ballesta had a vision: to photograph the rare coelacanth fish in a cave in a specific manner. He wanted to use



PHOTO COURTESY OF LAURENT BALLESTA

Laurent Ballesta

a strong light to silhouette the unique profile of this 65 million-year-old species. Ballesta captured the image in 1/15 of a second after taking 15 days, 11 divers and 120 hours to get the shot. Ballesta described the challenge:

"Anyone can take a mixed-gas course and learn how to reach a target depth and safely return to the surface. It is a different matter to do so in a 4m (13ft) swell with a 2-knot current and then perform a task when you get to the bottom.

"In 2000, I heard that Peter Timm had actually seen a coelacanth in South Africa off Sodwana Bay on a deep dive to 122m (400ft). This is dangerous for anyone without the necessary skills, and I did not have the skills to get the shot. I put the work in. By 2008, I was regularly doing eight or nine-hour dives in rough seas to 201m (660ft).

"My goal was to run an expedition with Peter Timm to photograph coelacanths. It was very successful. National Geographic ran some of those first images. There was a lot of excitement about the fact that we had gone so deep and got the shots."

Ballesta was determined to return. After many rejections, his gritty strength of purpose was rewarded when the luxury watch manufacturer Blancpain agreed to sponsor Ballesta's "Gombessa Project" in April 2013 (*gombessa* is the South African name for the coelacanth).

Ahmed Gabr

Ballesta is not the only speaker to demonstrate true grit at EUROTEK. The deep-

est scuba diver in the world—Ahmed Gabr—is also tenacious. On 18 and 19 September 2014, Gabr took 14 minutes to reach 332.35m, on open circuit scuba. This extreme dive took 13 hours 50 minutes, 93 tanks, 15 in-water divers and a 10 person surface-support team to complete.

Gabr's record-breaking Dahab dive really began back in 2008. At the time, the South African technical diver Nuno Gomes held the world deep scuba record at a depth of 318.25m (1,044ft).

"I took two years to evaluate whether I could do the dive," Gabr said. "I then undertook a four-year, hard-core training programme to improve my mental and physical fitness—yoga, cardiovascular, cycling, running, swimming—whilst following a Pescatarian diet (a plant-based diet with the inclusion of fish). I wanted to become a vegan, but that is pretty chal-

lenging. I actually delayed the dive five times until 18 September to ensure that everything was as perfect as it could be."

Herbert Nitsch

It would seem that the Red Sea has a lot to answer for, because in the late 1990s, EUROTEK speaker Herbert Nitsch booked a holiday to the Egypt. Unfortunately, his scuba diving equipment was lost in transit, so he went snorkelling instead, taking photographs of the underwater environment. Spurred on by a friend, he measured how deep he could go. He was diving to 32m (105ft) without any

training. Herbert was hooked.

"I was exposed to the oceans at a young age, and when you're diving, it's an experience that you don't want to miss," he said. "If you are a hamster living in a cage, you are happy to go in the hamster wheel. But if you explore the world, you don't want to go back in the cage."

Today, Nitsch is the current freediving world record holder with the title "The Deepest Man

on Earth." He was christened this when he set the No Limits freediving world record of 214m (702ft) in 2007.

"Every time I think I have reached a limit, there is a door. It opens and the limit is gone," said Nitsch. He proved this five years later in 2012, when he dived to 253.2m (830.8ft), again in the No Limits freediving discipline.

His dives were not without incident. He suffered decompression sickness, physically paying a high price. At one point, the simple act of brushing his teeth with his weakened right hand was a challenge. It has taken time for his body to heal.

Expert speakers

I am really excited about the talks that



PETER SYMES

Meet expert speakers doing remarkable things in the dive world





TOM BOYD

Divers from the Ghost Fishing Foundation (left and right) remove derelict fishing gear from the seafloor, which often keep capturing and killing marine life

failing scrubber canister under two conditions: a typical dive in which there is moderate exercise early in the dive followed by a longer period of relative rest; and a less typical dive in which moderate exercise is maintained throughout."

Something for everyone

I am often asked by recreational sport divers if they can and should come to EUROTEK. Of course! You don't need to own an Aston Martin to appreciate the car. Not every diver is going to dive below 30m, let alone 100m. The fact you don't dive deep doesn't make you less of a diver. You are a diver. We all are. And your current diving qualification does not stop you from hav-

are going to be given on the 8th and 9th of October. I know that deep wreck photographer Leigh Bishop has been sourcing some pretty amazing speakers.

As you can see, we have already got some great headline acts confirmed for this year, including Deep Sea Detective Richie Kohler, shark advocate Cristina Zenato and Ghost Fishing founder Pascal van Erp.

One of the lovely things about EUROTEK is that you will often find that talks are given by divers of whom you have never heard. They are the ones out there, doing some remarkable diving in quite remote destinations.

Dive medicine

And, of course, we have the top diving doctors speaking too. In 2014, Dr Neal Pollock talked about thermal stress before recording a special EUROTEK TEKTalk about gradient factors (and you can view this online). In 70 days time, Pollock is going to fly into Birmingham to discuss diving physiology.

Diving research remains a hot EUROTEK topic, with Drs Nick Gant and Simon Mitchell unveiling the latest intelligence in sorb

research.

There is a lot of interest in strategies to optimise and monitor CO₂ scrubber performance in rebreather diving. And the Auckland University team has recently completed two relevant investigations.

"In the first, we studied the effect of storage strategy on the performance of partly used CO₂ scrubber canisters on subsequent dives," said Mitchell. "Specifically, we compared the effect of storing partly-used canisters unprotected (exposed to environmental air) versus sealed in an airtight container on subsequent scrubbing performance. We studied two storage periods (overnight and 30 days).

"In the second study, we investigated the performance of temperature sticks in predicting the breakthrough of CO₂ from a



PETER SYMES

The International Convention Centre in Birmingham hosts EUROTEK; Guest speaker at EUROTEK (center)



PETER SYMES

ing "a glimpse behind the curtain" and hearing real exploration stories that you normally would only be able to watch on television.

Access to experts

One of the lovely things about EUROTEK is that the speakers have time for you after their talks. I often find an explorer stood outside of their hall answering questions from divers long after their talk has finished. Getting this kind

of interaction with experts is priceless.

If I had to describe EUROTEK to a non-diver I would say it is the "Glastonbury of Diving". You get unprecedented access to top talent across the world. The weekend has a packed programme of 30 different talks—none are repeated—covering everything from diving HMHS *Britannic* to finding the connection between salt water and fresh water cave system. EUROTEK has it all!

Social events

This is a great social weekend too.



TOM BOYD

Our popular black-tie-and-long-posh-frock Gala Award Dinner is truly good-humoured and great fun. Over 200 delegates, including Analox, AP Diving, Dive Rite, Fourth Element, GUE, KUBI, Light Monkey and IANTD, have already booked their tickets for this year's dinner!

Tickets are still available at GB£65 per head for a four course meal. Incidentally, we are going to be raffling off a fully-loaded AP rebreather, Otter drysuit, Shearwater Perdix computer, Suex scooter and a Lust4Rust Holiday. The money raised will be going toward diving research.

Party favours

Attendees won't go home empty handed either. We understand that divers need the right equipment to transport their gear. Hence, we have teamed up with Fourth Element and the respected

Swiss watchmaker, Blancpain, to create something rather special: a rugged bag, ideal for an adventurous diving weekend away. The first 400 divers to book a weekend pass will receive a gorgeous limited edition Blancpain-Fourth Element dry duffle dive bag worth GB£65!

This is the first time Blancpain has sponsored EUROTEK. Did you know Blancpain was the first company to incorporate a rotating bezel on its Fifty Fathoms watch? It has been really exciting working very closely with a company that helped create a small but significant piece of dive history.

It is not surprising that there has been a brisk trade in weekend tickets (GB£80 each). We have divers flying in from 15 different countries. If you want to guarantee your place, it is recommended that you book your weekend pass now via: Eurotektickets.com.

IANTD founder, Tom Mount, said EUROTEK is "the best dive show I have ever been to". You don't want to miss out on the diving event of the year! ■

Rosemary E Lunn, co-founder and co-organiser of EUROTEK, acknowledges the assistance of Stephen Frink with this article.





Edited by
Scott Bennett

Turkey: No immediate tourism fallout claimed from failed coup

Despite Turkey's recent failed military coup, the country's tourism minister is claiming visitors are continuing with their holidays. "There is no problem with the tourist sector at this time," said Nabi Avci, Turkish Minister for Culture and Tourism. "The tourists that were already in Turkey are still enjoying their holidays there. There has been no sense of panic,"

Avci added.

As a result of Turkey's guarantees of additional aviation security measures, all restrictions have been lifted on regular passenger service between the Russian Federation and Turkey, including carrying Russian citizens from Russia to Turkey and transit passengers via Turkish airports to other global destinations. ■



(File-photo). Blue Mosque, Istanbul

Mindanao to open first hyperbaric chamber

New facility to strengthen promotion of Samal Island

According to Philippine Department of Tourism Director (DOT) Robert Alabado, the facility is expected to open at the Southern Philippines Medical Center (SPMC) in Samal this October. The hyperbaric chamber will ensure divers receive efficient medical support when diving off Samal Island, situated off Davao in Mindanao.

Once in operation, tourism is eager to market Samal Island as one of the best dive locations in the country. "When we market diving as a tourist activity, there is a requirement because diving can be dangerous if improper procedures are made. We are going

to lessen the risks by having an equipment such as this chamber. Our tourists will be assured that they are in safe hands," added Tourism Assistant Secretary Art Boncato Jr.

The still-functioning hyperbaric chamber in Cebu will be transferred once the new facility million is completed. Samal had a hyperbaric chambers eight years ago, but



(File-photo). Inside a hyperbaric chamber

closed it down when owners decided to transfer the facility to Manila due to lack of market. ■

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Henrik Rosen: henrik@wakatobi.com
or Karen Stearns: karen@wakatobi.com

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Malaysia's

Mabul Island

Text and photos by Brandi Mueller

— *Eco-Diving in Sabah, the Right Way*





Tiny hairy squat lobster on a barrel sponge, Mabul Island, Malaysia



Local fishing village on Mabul Island. PREVIOUS PAGE: Banana nudibranch



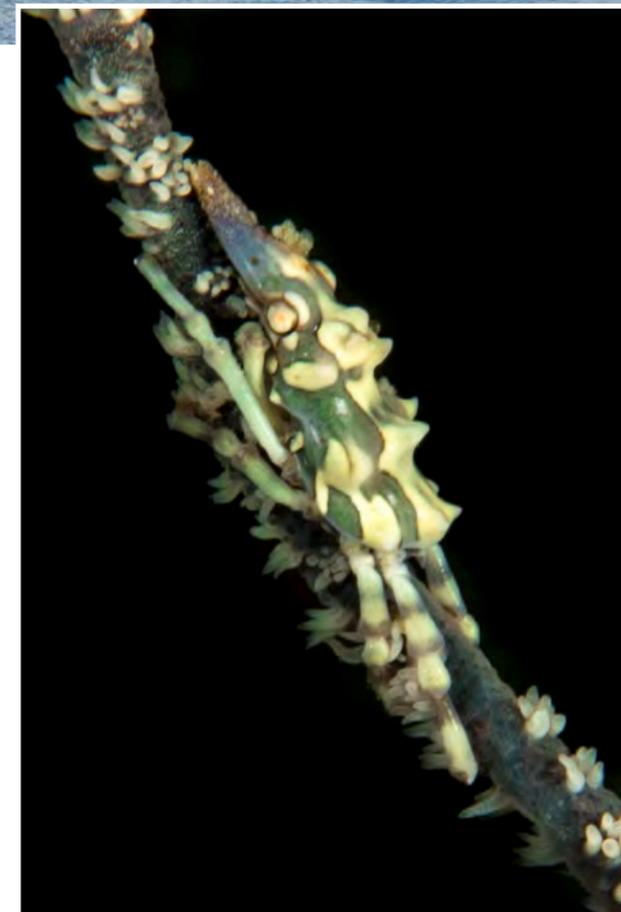
Anemone with false clownfish, Mabul Island, Malaysia

As divers, we love the ocean. We have been there, done that, and want to go back as much as possible. We love what we do and spend a lot of money and time traveling to get underwater. In the process, we become some of the ocean's biggest advocates as we share our adventures and photos, inspiring new divers. I'd venture to say most of us are at least a little environmentally conscious (and lots of us are very environmentally conscious). We learn as much as we can about the ocean, we take part in initiatives to spread the word about ocean welfare, participate in beach cleanups, donate to ocean causes, etc. Diving isn't just something we do, diving is a lifestyle.

I have just returned from diving Mabul Island, Malaysian Borneo. Part of the coral triangle, this area is literally crawling with muck critters, swarming with fish, and just in view of Sipadan, one of the world's best dive sites. Needless to say, the diving was good. I spent my time underwater alternating between shooting nudibranchs wishing I had my wide-angle lens as huge turtles and eagle rays swam by, and shooting giant groupers being cleaned inside an artificial reef structure with my wide-angle and finding a nudibranch I'd never seen before, wishing for my macro lens.

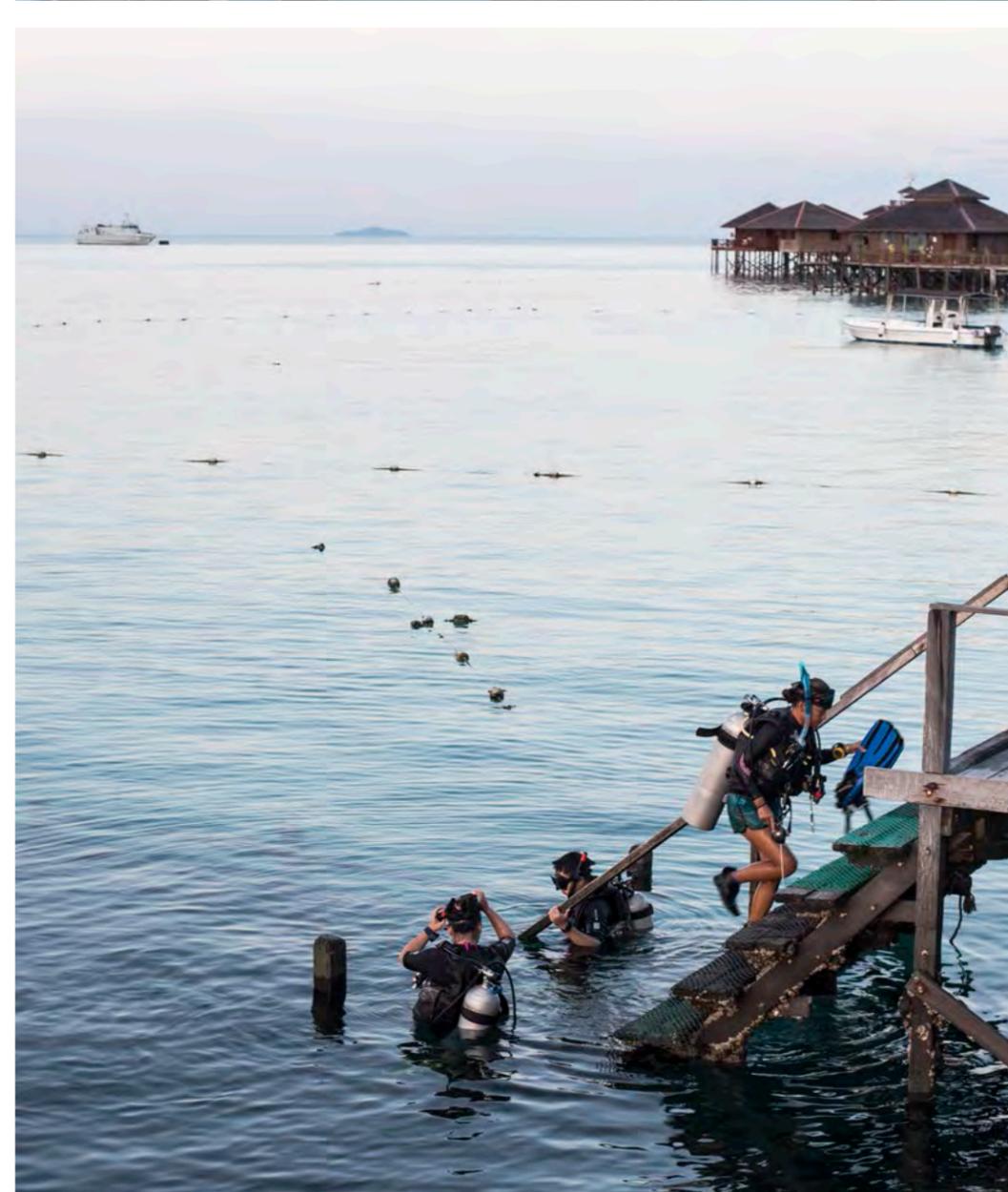
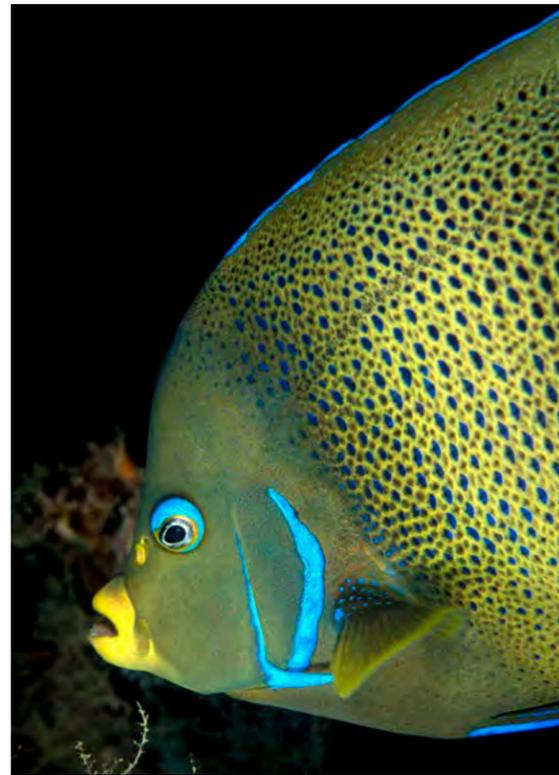
But my time staying at Scuba Junkie's Mabul Beach Resort made me think about dive travel in a slightly different way. We don't often think of the detriment our travels may be causing, such as unsustainable practices engaged in by the places we stay at or dive with. It's a bit hypocritical really. We love the ocean, we want to protect it, but environmentally unsound practices could mean that just our diving there may be causing more harm than we realize.

Enter Scuba Junkie.



Xeno crab on whip coral

Purple giant frogfish tries to blend in with some purple sponges (left); Divers on Scuba Junkie's dive boat head out to a dive site (right); Divers coming out of a training dive (lower right); Semicircle angelfish (below); *Chromodoris coi* nudibranch (lower left)



else?"

Don't get me wrong, I am not saying that other dive operations or resorts are not making any efforts to be eco-friendly. I know many are, and I'd like to think most try to do what they can with what they have in their specific locales. For

The environment is a priority for this company and they are doing everything they can to run an eco-friendly operation. The list of awards and accolades they've received goes on and on, and all are much deserved.

I spent a good part of my trip chatting with and diving with their two full-time Environmental Officers, David McCann and Cat Cassidy. Overall, I was left asking myself this question: "Does this really not happen everywhere

every place and every operation, the logistics will be different. In some places, you will not be able to do certain things. But in every place, something can be done. And something should be done. We as consumers, divers and ocean lovers need to demand it.

So what is Scuba Junkie doing that's so special? They use water catchment and solar power to heat the water (I never had a cold shower; in fact, most of the time, I had to turn the heat



Scorpionfish on artificial reef structure



Diver and large green sea turtle on reef

Blue-spotted stingray (right); Green sea turtle nest is clearly marked and protected with wire mesh (lower right)

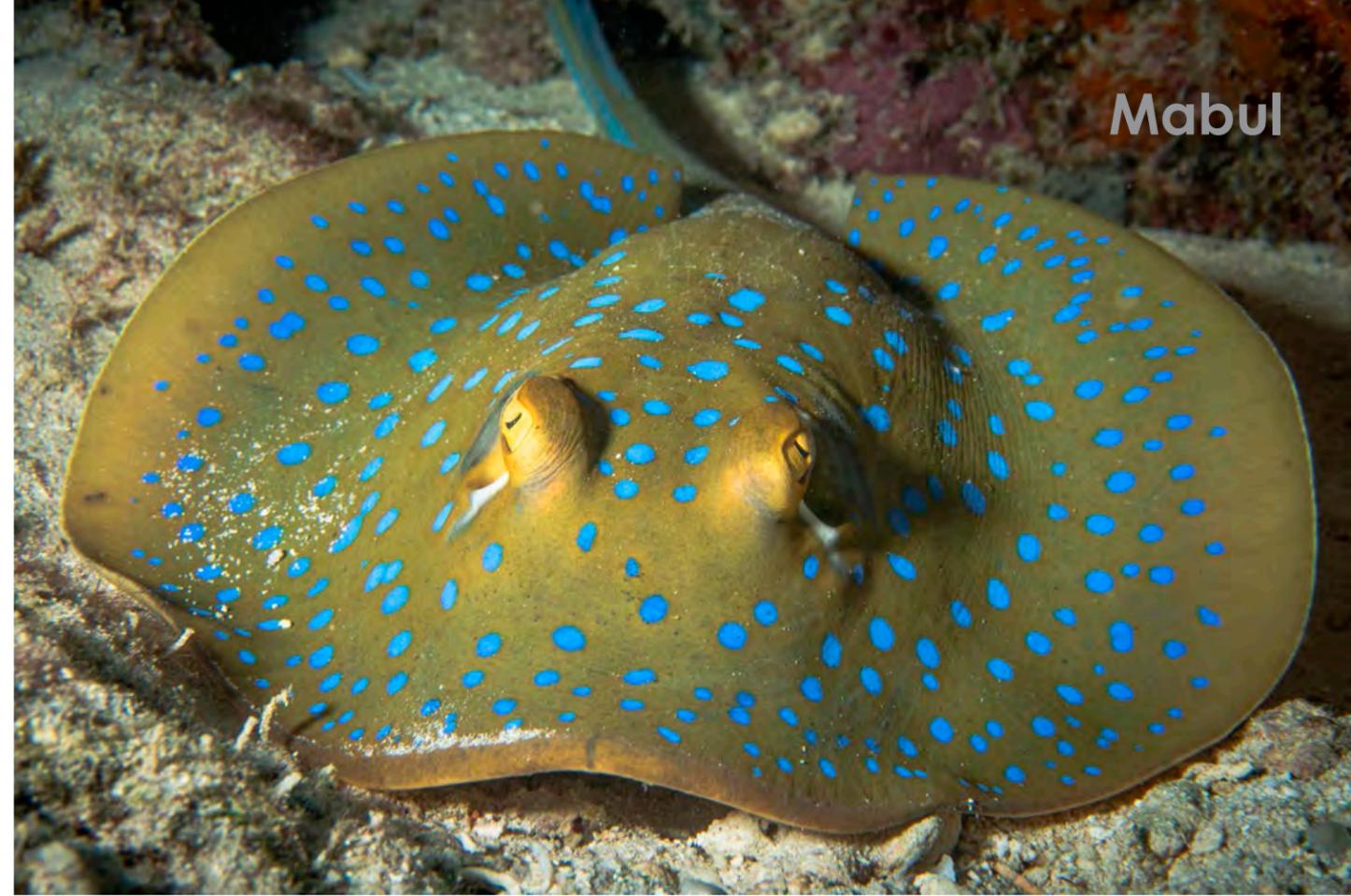
age benefits from the compost created post-flush (after going through a complicated-looking system that uses microbes and lots of different tanks in the back of the resort. They are more than willing to show you, if you are interested.) And that's not all.

Environmental projects

One thing I particularly admire is Scuba Junkie's realization of how important it is that the people of Sabah are involved in their projects and that the project goals are also beneficial to them. Scuba Junkie does not believe in the top-down approach in which they are just telling the local population, "Don't do that." Instead, they come up with ways to solve problems that are collectively positive for the people, the businesses, the tourists, and most importantly, the ocean. Their solutions aim to benefit everyone.

Mabul Turtle Hatchery and Rehabilitation Center.

This program is my favorite. Turtle eggs (sadly) are a black market commodity and can be sold for extravagant amounts to be used in different types of traditional medicine. These practices have led to turtle



Turtle with fibropapilloma. Having just discussed this turtle illness with one of Scuba Junkie's environmental officers, who said he had not yet seen this occur in Mabul, we saw this turtle with it the next day. Very sad to see.



down), they use biodegradable cleaning products, and they recycle (something which is not easy in Asia). Aluminum gets delivered to one place where it is melted; plastic bottles are delivered to seaweed farmers who can use them, etc. (There's no "one-stop" recycling venue in Semporna.)

They have a sewage system. I know what you're thinking—Sewage? Gross! who thinks about that? Doesn't every place have that... but they don't. Ask that question the next time you are at a resort or—gasp!—a liveaboard: where does it go when you flush it goodbye? At Scuba Junkie, it is not into the ocean. Rather, the lush green foli-



Resort guests helping with beach clean up (left); Local kids pitching in at the beach clean-up (right)

we were out diving and saw a turtle covered with the tumors. Unfortunately, they might be putting their rehab center to more use in the future.

Shark sanctuary.

Semporna has a healthy shark population but is an area where sharks are definitely at risk, both directly from potential shark finning and indirectly as by-catch from fishers who accidentally catch them in their nets.

Healthy ray populations also occur. On my last dive, I saw two of the largest eagle rays I have ever seen.

At first, I thought they were large mantas, but once I got closer, I could see that they were definitely spotted and sported



nests on Mabul being dug up and the eggs sold before they are allowed to hatch. To stop this, Scuba Junkie (and the Sabah Wildlife Department) offer a monetary reward for the finding of turtle nests. Eggs are then collected and re-nested at the resort's protected turtle hatchery by trained staff. When the turtles hatch, they can be "adopted" for a contribution to the project, then named and released by the adoptee. The money from adoption then supports the finder's fee for locals who find the nests. This program has helped to protect the turtles from illegal harvesting while making turtle protection worth more than the illegal sales of turtle eggs—a win-win solution for both the community and the turtles.

The resort also has the capacity to take in injured turtles. While I took a tour of the facilities, fibropapillomatosis was discussed—a terrible disease that is showing up in turtles around the world. Tumors grow on infected turtles, eventually preventing them from seeing and swimming. David told me they had not seen this yet around Mabul, then the very next day,



At least once a week Mabul Beach Resort has a beach clean-up for staff and guests to join

the broad nose of eagle rays.

Scuba Junkie wants this area to be a shark sanctuary, and they are lobbying government authorities, making petitions and also brainstorming a way to make protecting the sharks more worthwhile to the local community, instead of selling the shark fins illegally.

Beach and reef cleans. Weekly beach cleans and reef cleans occur with staff encouraging guests to join in picking up trash.

Outreach. Scuba Junkie gives lectures in-house to guests staying at their resort and also gives presentations to the local communi-

ties of Sabah, university students, schools, NGOs, government agencies and more. They participate in Reef Check, a program that collects data on coral and fish species around the world. Each year, they organize week-long Shark Week, Turtle Week and Marine Week programs, giving presentations and having special activities at the resort during those weeks.

Sipadan permit system

Malaysia, as a country, seems fairly onboard with the benefits of environmental protection, as evidenced by measures taken over ten years ago when they created a permit system for diving Sipadan. Before departing for Malaysia, I did the typical Google searches to get a general idea of what to expect.





School of anthias over hard corals; Nudibranchs everywhere! (right)

Pretty much every article mentioned two things: Jacques-Yves Cousteau describing the area as "an untouched piece of art", and that a permit system to dive Sipadan was in place.

So enters the case of an area being "too good", and of us divers basically loving it to death. How does one deal with too many people wanting to experience something to the point of detriment to that which is desired? In Malaysia, they help save an area by putting a limit on diving. Back in 2004, it was mandated that all resorts on the island of Sipadan must be relocated and that a limit would be set on how many divers could dive the island each day. Sipadan has a unique topside environment too, and was made a bird sanctuary in 1933.

Even with the restriction, 120 divers are allowed each day, with most doing three to five dives a day (no night diving is permitted). When you add it up, that is still 300 to 600 individual dives taking place every



day around what is a relatively small island (only 12 hectares, or 30 acres). Can you imagine how many dives would have taken place daily if there had not been any restrictions?



Goby on soft coral

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Diver on artificial reef with lots of crinoids

The diving

Malaysian Borneo is part of the Coral Triangle, and it is a fish-filled, critter-hunting wonderland. Specifically, the island of Sipadan has had over 3,000 species documented and is definitely a biodiversity hotspot. The spill-off to the nearby islands of Mabul and Kapalai has made them very lush with marine life as well.

Mabul Island is small, and is the location to which most of the Sipadan resorts moved when relocated in 2005. Kapalai Island is really just a sandbar upon which the Kapalai Resort built their lodgings and is now just one big island resort. Both locations have diving all the way around them, with plenty to see. Dive sites vary from mini-wall dives, with sheer drop-

offs to around 30m (100ft), to shallow, sloping coral reefs. Lots of sites have man-made artificial structures and boats that have become fantastic artificial reefs.

Artificial reefs

By definition, an artificial reef is a human-made underwater structure, typically built to propagate marine life in areas with a generally featureless bottom, to control erosion, block ship passage, or improve surfing.¹ Around Mabul and Kapalai, artificial reefs are definitely used to promote marine life and have done a really good job of this.

Man-made structures were a common sight on many of my

¹ [HTTPS://EN.WIKIPEDIA.ORG/WIKI/ARTIFICIAL_REEF](https://en.wikipedia.org/wiki/Artificial_Reef)



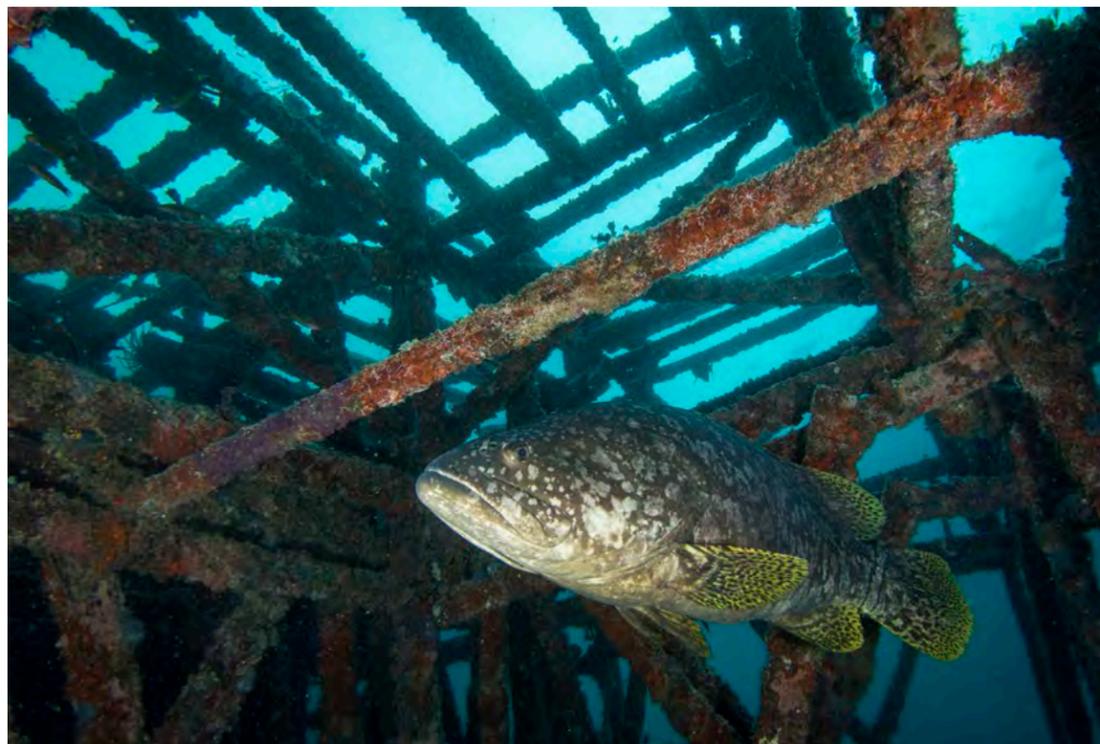
A pyramid shaped wood structure built to attract marine life (and divers)





Mabul

School of trevally swim through an artificial reef structure (left); Moorish idols and masked rabbitfish (below) and giant grouper (bottom) on an artificial structure



dives. Sunken fishing boats placed in front of resorts liven up house reefs. Pyramid-shaped wooden objects and even giant castle-like buildings are found at many dive sites. Some may consider them an eyesore, and I agree with that—from a distance, some look pretty strange, but they have done an immense job of attracting critters, especially those muck critters we love so much.

After diving a site actually called "Artificial Reef", I asked David, one of the Environmental Officers, if these sunken vessels and artifacts were being used to fix damaged areas like dynamited or eroded coral areas, and he said, mostly no. On one side of Kapalai, it is naturally sandy, and the structures have attracted life to an otherwise barren area. He also mentioned the artifi-

cial reefs' importance in dive training, as beginner divers sometimes take a little while to get skilled with their buoyancy. So, taking new divers to the artificial reefs cuts down on the potential reef destruction while these new divers are learning.

I loved the artificial reefs for their macro life. Blue dragon nudibranchs seemed to love the wooden structures, and many other species of nudibranchs were also found on them. Lots of reef fish were seen feeding on the growth on the structures and possibly using them as a safe haven from predation. Ghost pipefish, frogfish, scorpionfish, flatworms and more were found in my hunts. And not everything I saw was tiny. Huge groupers were seen several times, and also at Artificial Reef, there is a massive school of trevally



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CLOCKWISE FROM FAR LEFT: There's plenty of fish life at Mabul; Hurrying back to its hole, a peacock mantis shrimp zooms across the reef; A tiny crinoid shrimp in a crinoid; A day octopus hides under a ledge; *Hypselodoris bullocki* nudibranch; A tiny juvenile filefish floats among sponges; A moray eel being cleaned by cleaner shrimp



that swim in and out among the structures.

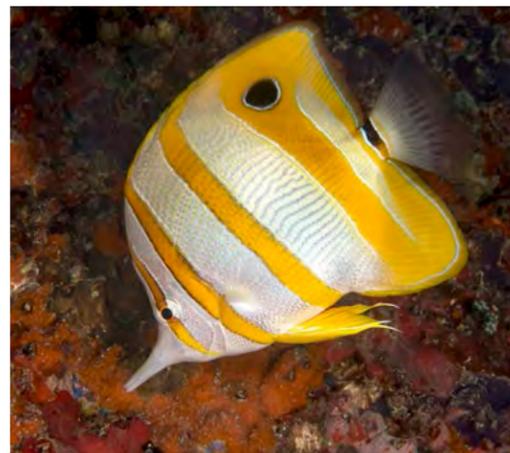
There were also some really nice coral areas that are blazing with orange, pink and purple soft corals and sponges. Similarly, bright-colored anthias flitted around the reef like colorful rain, and there were also large schools of reef fish like blue-striped snappers, goatfish and fusiliers. Turtles were in massive abundance, and they were huge! I remember seeing the first turtle and being overwhelmed by how large it was, and then right behind it, were two more giant turtle shadows swimming towards us.

I did not get to dive Sipadan on this trip, I guess you can call me a casualty of the permit system. From what other divers told me, there were large schools of bumphead parrotfish, a whitetip

shark feeding frenzy and beautiful coral reef life descending down sheer walls. They also went on and on about how fantastic it was. I guess I have something to come back for. If you do plan on making a trip here, be sure to book early during the high season to make sure you get a permit.

Dive training

Although I didn't do any dive training while at Scuba Junkie, I was very impressed by their training program. As a PADI IDC Staff



Instructor, I can't help but eavesdrop a little on instruction going on, and I was impressed with what I saw. They do a huge amount of training—a rough estimate was over 5,000 certifications a year—and with the resort taking up to 68 guests a night (they were close to full the week I was there), you can only imagine how much is going on every day, with both serious training as well as dives just for fun.

Their dedication to the environment is also clear in their teaching. New divers (and experi-

enced divers who may just be diving and not taking classes) are thoroughly schooled in environmentally-conscious diving. No fins on the reef, no touching, no taking of souvenirs, etc. It was really good to see this instruction, and see

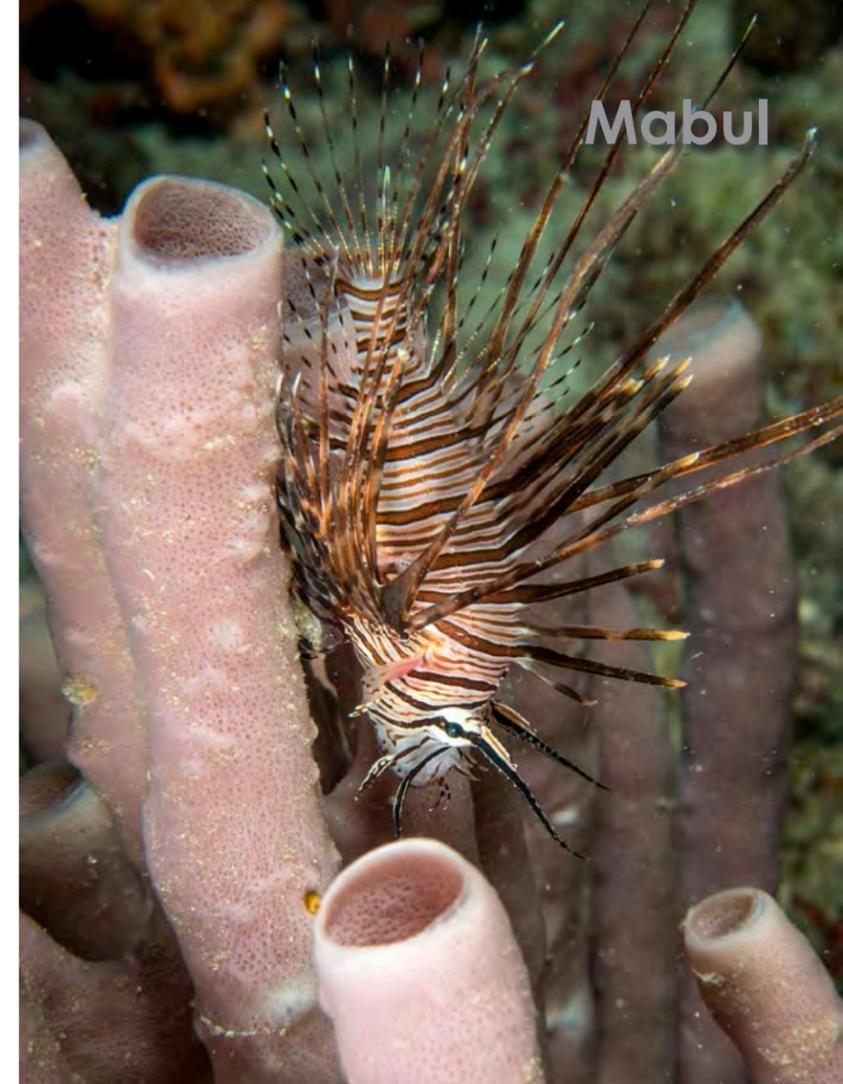
it enforced on dives. There's nothing worse than seeing a diver kick and destroy a piece of coral (even if by accident), and the dive instructors and guides do all they can to make sure new divers become good divers.

We can make a difference

I want to leave you with a challenge. Do the



CLOCKWISE FROM TOP LEFT: Crocodile fish; Trevally swim through an artificial reef; Greenish-blue devil scorpionfish; Pufferfish in artificial reef; Beaked coralfish; Blue-barred parrotfish in artificial reef



Mabul



LEFT TO RIGHT: False clownfish; Flatworm; Juvenile harlequin sweetlips; Juvenile emperor angelfish; Lionfish on sponges

these changes in our lives every day too, because even if we live in a land-locked area far from the ocean, what we do affects the ocean. Little things do matter, and it will take all of us to make a change. ■

Want to learn more about which environmentally friendly operations to dive with in Asia? Check out **GreenFins.net**.

Thanks go to Ric Owen and Scuba Junkie Mabul Beach Resort



practices by supporting sustainability and conservation. Don't support those who are unwilling to make these changes. Force them to do the right thing and run operations the right way. Hopefully, we will be able to bring our children and grandchildren to these amazing underwater masterpieces and they will still be in as good a condition, if not better, than when we last saw them.

I want to leave the dive industry with a challenge as well. Why isn't every dive resort and operation making these efforts? It will likely cost something, of course, but as an industry that relies on the state of the ocean, shouldn't the dive industry as a whole make an effort to conserve the oceans and reefs? It seems like a no-brainer, and there are many dive businesses that are already doing the right thing. We need to support these conscientious operations and demand that the other places where we spend our money make similar efforts.

We, individually, need to help too. Do we really need that towel changed today? Can we bring our own water bottles and refill them instead of buying a new one each time? Must we really spend 20 minutes in the shower? We can make

(**ScubaJunkie.com**) as well as Ness Puvanes and MIDE (**MIDE.com.my**) for their generous support and assistance.

Brandi Mueller is a PADI IDC Staff Instructor and boat captain living in the Marshall Islands. When she is not teaching scuba or driving boats, she is most happy traveling and being underwater with a camera. For more information, visit: **Brandiunderwater.com**.

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ScubaJunkie.com
Sipadan.com



Scuba Junkie Mabul Beach Resort (above and left)

research before you decide to spend money at a particular dive resort or operation. Being a diver, you, no doubt, love the ocean and at least on some level care about what happens to it and its future. Invest in dive operations that are working towards sustainability and conservation projects. Let's make operations like Scuba Junkie the norm. Require those who make a living off the ocean to do it while leaving the smallest footprint possible.

As we see here, it can be done, and it is being done at a few other cherished locations around the world too. As consumers, we can shape these



Malaysia's Pulau Rawa

Text and photos by Nick Shallcross





Located just a 20-minute speedboat ride from the coastal town of Mersing in Malaysia, Pulau Rawa offers a great alternative for those looking for a mixture of diving, beach time, relaxation and just to get away from it all.

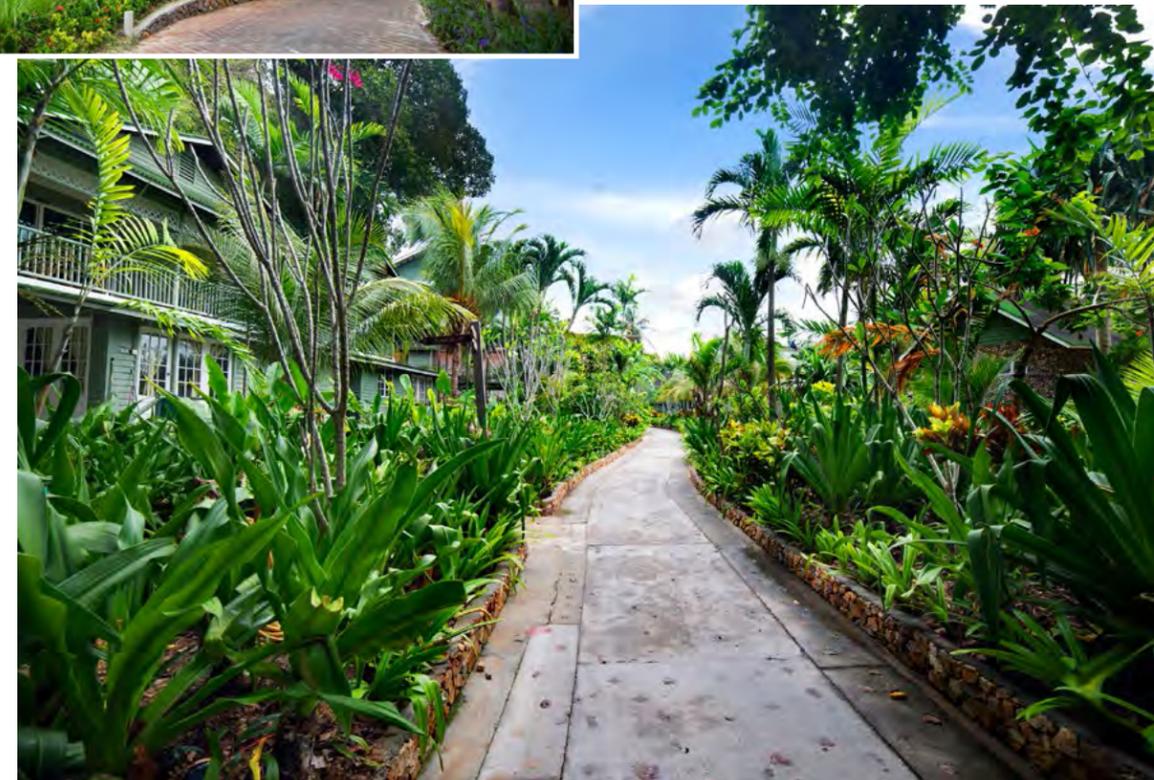
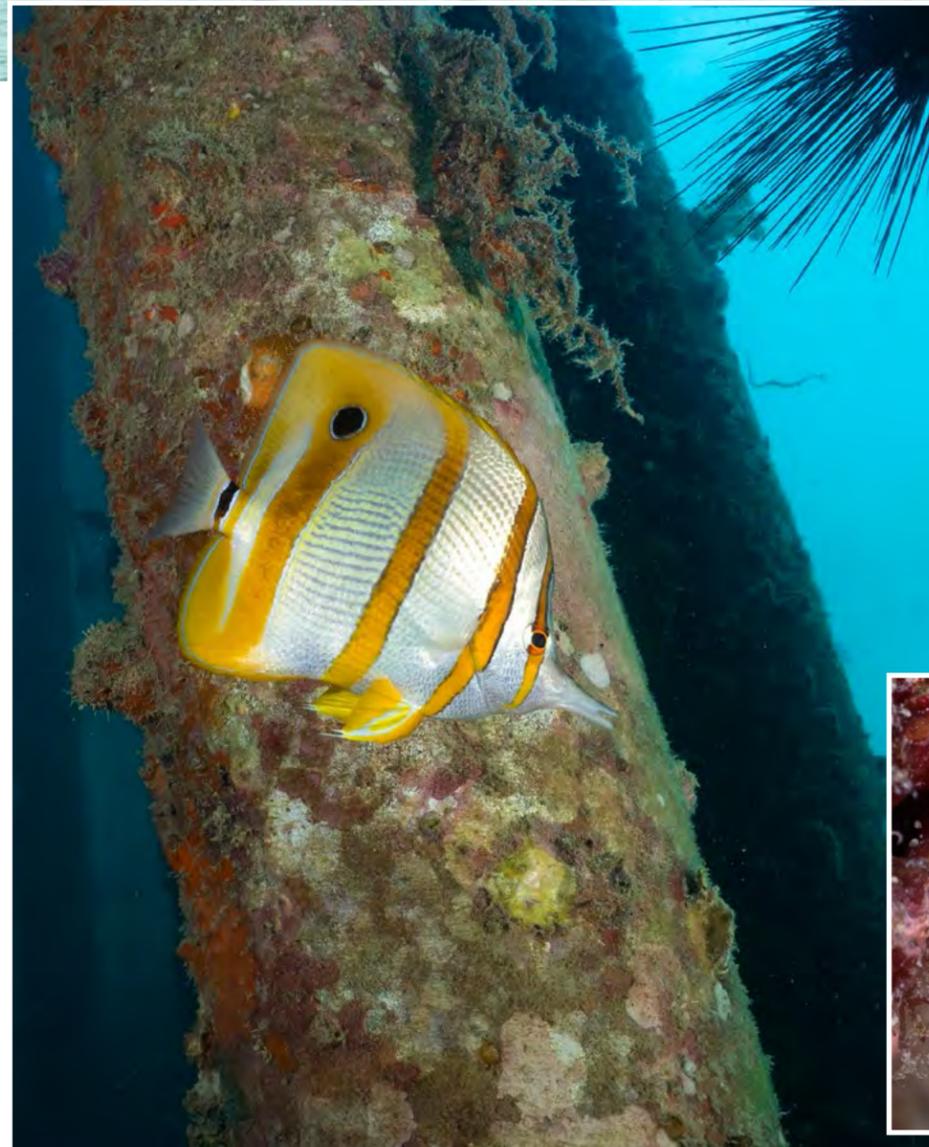
Malaysia is by far one of the most popular destinations in Southeast Asia to dive. It is home to world-class dive sites such as Sipadan Island, famous for its schooling fish, sharks and turtles; the islands around Mabul and Kapalai for their muck diving and strange critters; and the tiny island of Layang Layang for its schooling hammerhead sharks.

Some locations are also becoming more and more popular with backpackers and travelers looking to learn to dive. Places like Tioman and the Perhentian Islands are home to some great diving, and are the ideal locations to complete entry level dive courses or for experienced divers to kick back and relax.

These places are great for divers looking for a real adventure and some amazing diving, but some are a little off the beaten track or have nothing for the non-divers in your group. Not everyone wants to spend days travelling to remote areas, or to go to places where all you can do is dive, dive and keep diving. For these folks, Pulau Rawa is an attractive option.



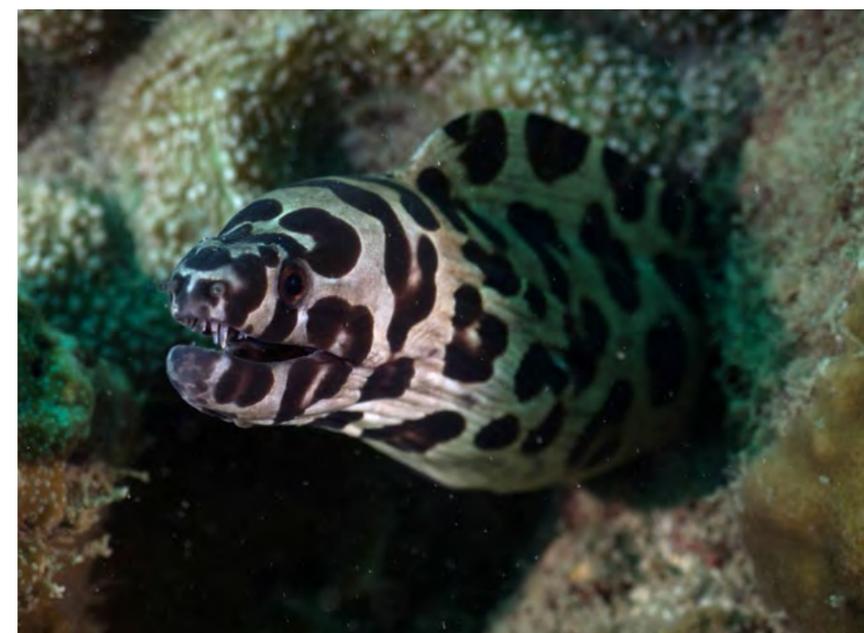
THIS PAGE: Scenes from Pulau Rawa Resort; *Hypselodoris nudibranch* (left inset); Beaked coralfish under jetty (far lower left). PREVIOUS PAGE: Anemonefish in anemone at house reef of Pulau Rawa





Pulau Rawa

Soft corals under the jetty at Pulau Rawa (far left); Close-up of anemone (left); Spotted moray eel (below); White sandy beaches of Pulau Rawa (lower right)



About the island

Pulau Rawa is very popular with families coming from Singapore (and Kuala Lumpur), for the weekend, as it is only a two to three-hour drive (depending how long it takes to get over the border) it is easily accessible for a few days away from the city. For those with families and young children, there is plenty to keep the little ones occupied, with beautiful white sandy beaches, slides going into the ocean and even a kids play room. Grown-ups are not left out either, with a beach bar and spa onsite, where one can get those all-important massages.

Arriving on the island, you are greeted by turquoise blue water, perfect white sandy beaches and the wooden bungalows of Rawa Island Resort nestled into the hill. The beautifully manicured resort

and relaxed atmosphere makes you feel at home right away, with the sounds of birds and fruit bats filling the air, including the sounds of the free roaming peacocks that are found all over the island!

The island is small, so it won't take too long to explore it all—with most of what there is to see concentrated along the west side of the island. There are no roads and no shops or restaurants except for those in the resort. But for folks who are more adventurous, there is a short island trek to the top of the hill where hikers are treated to a spectacular view from its highest point. It is from here that one gets a chance to see the rugged exposed cliffs of the east side of the island, dropping down into the crystal blue water.



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Pulau Rawa

Close-up of *Risbeccia tryoni* nudibranch (left); Glass shrimp on reef (above); Flatworm (right); View over Pulau Rawa's house reef and surrounding islands (lower left)



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Diving

Pulau Rawa is located in the Sultan Iskandar Marine Park, set up in 2013 to help protect the local marine environment. A small marine park fee of around US\$ 15 per day is charged to divers to help fund the protection of the marine park and can be paid in Mersing before leaving for the island. At the time of writing, the local marine department were in the process of reviewing the current fees to possibly make some changes.

There is only one dive operator on the island—Orca Scuba. Based in Singapore, they have teamed up with Rawa Island Resort to create Orca Scuba Rawa. The operator's main focus

from the start has been to introduce families and children to the world of scuba diving and to provide the highest level of professionalism and safety possible.

For those in Singapore who wish to learn to dive, they can complete the theory and pool sessions before getting to Pulau Rawa, saving precious time on holiday. Once on the island, the operator's team of instructors can offer a wide range of PADI courses and programs for ages eight and up, meaning even the littlest in the family won't miss out!

House reef. Diving on the island is mainly done by shore entry, with

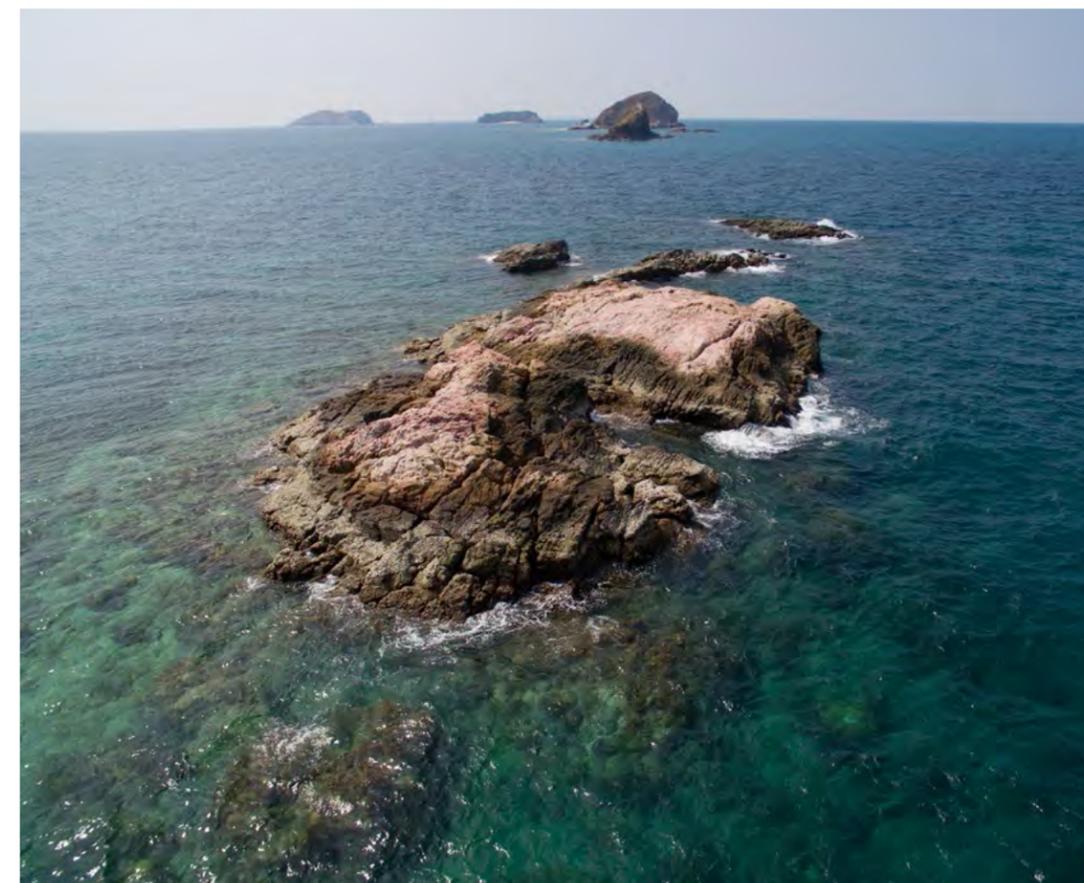
some boat drop-off dives too. All along the west side by the resort, there is a beautiful house reef, which is long enough to take three or four dives to see it all. The shallow depth of the house reef, with a maximum depth of around 12m, makes it perfect for dive training and try dives, or for experienced divers to do long, slow relaxing dives. My record on the house reef is over 90 minutes, slowly swimming alongside the stunning coral reef.

North and south end. If you are looking to do a little more explor-



Hard corals at house reef of Pulau Rawa (left); School of silversides under jetty at Pulau Rawa (below); View over north end of the island (lower right); Beaked coralfish (center)

Pulau Rawa



ing, you can get a boat drop-off round the northern or southern tips of the island. The journey only takes five or ten minutes, and you are then free to slowly swim back towards the house reef. On these dives, you can reach depths of up to 21m, and the topography changes from the shallow straight house reef, to

more dramatic boulders and coral heads.

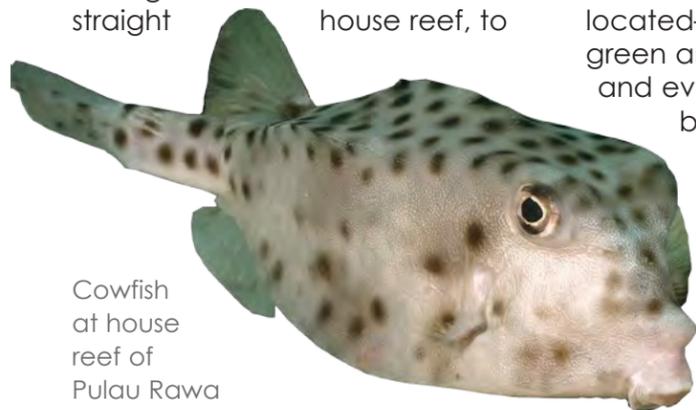
The conditions are usually very calm and relaxing, with gentle currents, if any, and good visibility reaching over 20m on a good day. My favorite dive is off the north end of the island—close to where Orca Scuba's dive center is located—where I have seen both green and hawksbill sea turtles, and even groups of juvenile

blacktip reef sharks. The corals at this end of the island are incredibly healthy, and as there has been almost no human influence on the area, are completely undamaged.



Marine life

The marine life around the island is very varied. Around the jetty on the house reef, you will find huge schools of batfish, saltwater perch and silversides. While exploring in the sand, I have found large



Cowfish at house reef of Pulau Rawa

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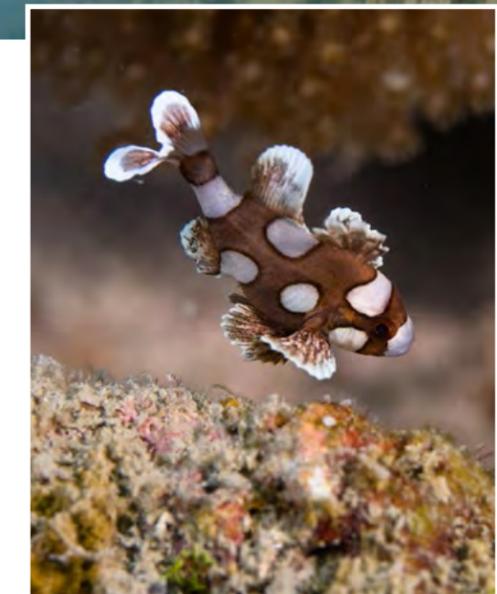
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Diver over colony of staghorn coral (left); Purple dragon nudibranch at Dragon Rock (above)



Juvenile harlequin sweetlips (left inset); Hard coral head (right inset)

crocodile fish waiting to ambush their next meal, and the bizarre-looking and poisonous Indian walkman, also known as the demon stinger or devil stinger, which is closely related to stonefish.¹

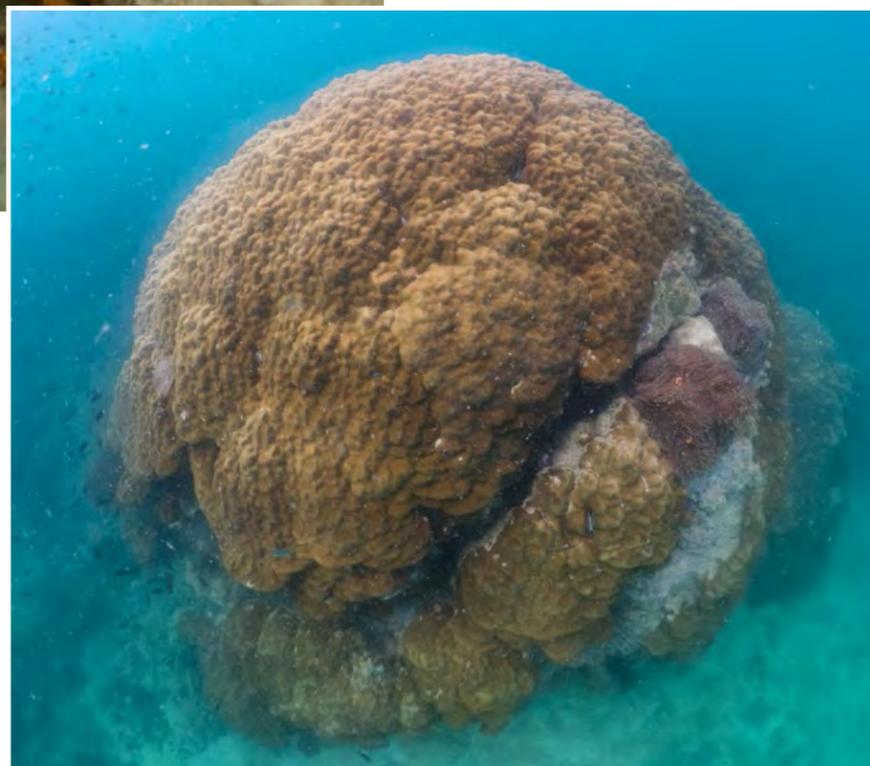
For nudibranch lovers, keep your eyes peeled and you will be in luck.

sites has been named Dragon Rock for its high number of these little purple critters.

I have also never seen so many juvenile harlequin sweetlips in one place. For those who have never seen one before, when they are in their juvenile form, they are about the size of your small fingernail and move around so fast that they almost look like they are vibrating their way along the reef rather than swimming. It is commonly said that they do this to mimic a poisonous flatworm to avoid being eaten by predators.

During my first walk along the beach, I noticed a large number of bright white cuttlebones, hinting that there would be plenty of cuttlefish on the reef. At certain times of the year, they are everywhere!

Pipefish, and sometimes even seahorses if you are



lucky, can be found in the sand just off the reef, as well as mantis shrimp hiding out in small holes on the sea bed. While exploring the sandy areas, keep an eye out for stingrays hiding underneath a thin layer

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CLOCKWISE FROM LEFT: Batfish at jetty; Eyes of stingray buried in sand; Snake eel; Cowrie; Mantis shrimp



of sand. These little rays are all over the place and sit silently, with just their eyes and tail visible. Get too close, and they disappear in a puff of sand into the distance.

Look up and you may see schools of barracuda and fusiliers up above you. I was also told stories that divers on a neighboring island have seen dugongs nearby, making me spend most of all

my dives staring out into the open water to get a glimpse of one of these bizarre gentle giants, but with no luck.

About the resort

Rawa Island Resort offers full-board accommodations, with all of your food and drinking water included in the price of your room. Meals are served buffet-style, and the cuisine is absolutely delicious. I usually find myself needing a kilo or two less on my dive belt towards the end of my stay after being weighed down by all the food! Drinks can be purchased from either the main bar, or beach bar depending on the time of day, and there is a small gift shop selling souvenirs, sunscreen and other things, like beach toys.

For the non-divers, there are a number

of watersports offered, including snorkeling, sailing, kayaking and standup paddle boarding, with equipment to rent by the hour on the beach. An around-the-island kayaking trip is a great way to explore a little more.

For the divers, the dive center has high-quality equipment rental, so there is no need to bring your own if you want to travel light. It is advisable to book your diving ahead of time to avoid disappointment when you get to the island, as their time slots can fill up on busier weekends, especially for those wanting to complete courses.

Diving conditions

Diving on the island is best between March and November. Between November and February, the northeast monsoon kicks in, making the diving con-

ditions less than desirable, with poor visibility, strong currents and large waves—a stark contrast from the clear, calm blue water for the rest of the year. As soon as the wind changes back, the perfect conditions return, and the diving is great once again. The resort occasionally closes over this monsoon period to upgrade and perform maintenance on the rooms, while all diving ceases completely.

Pulau Rawa is for me the ideal location for a quick getaway from Singapore. There are not many dive locations of this quality so close where you can leave first thing and be diving before lunch, perfect for a long weekend of diving and an escape from the bustle of the city. ■

The author wishes to thank the amazing staff at Orca Scuba Rawa, and Rawa

Island Resort for their continued hospitality.

Nick Shallcross is a British underwater photographer and dive writer based in Singapore. He offers tailor-made workshops and courses in underwater photography. For more information, visit: NickShallcrossPhotography.co.uk.

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Pom Pom Island

— *Macro Diving in Malaysia*

Text and photos by Elisabeth Lauwers





Tropical seascape and islands around Pom Pom Island, Malaysia

Blessed with some of the richest waters in the world, Borneo's Pom Pom Island offers some truly memorable macro diving. If you want prolonged, up-close encounters with some crazy macro critters and the chance to photograph the tiniest nudibranchs in the world, Pulau Pom Pom, in remote Sabah, is the place to go!

Pom Pom has become increasingly known as a macro dive destination over the last few years. The area is especially famous for its beautiful beaches and the abundance of green turtles. Its more famous neighbour, Pulau Sipadan, has long been attracting

divers by the thousands to explore the steep, deep walls surrounding the island. Meanwhile, only a few in-the-know macro photographers are diving the rich, sloping, rubble reefs around Pom Pom. Their reward is jaw-dropping encounters with numerous species of nudibranchs and other rarely encountered macro life.

I have been on the Pom Pom carousel for the last four years and have just returned from another great trip. This time, my spotter and macro-enthusiast buddy, Ah Long, took me to a new site he recently discovered. The secret site, dubbed Macromania, was said to have revealed an astounding number of rare and spectacular macro life including what some consider the "Holy Grail" of nudibranchs—the *Melibe colemani*.

Equipped with my two stacked macro wet lenses, I was eager to start photo-



Chromodoris willani nudibranch at Macromania

Sea turtle in the blue around Pom Pom Island, Malaysia

PREVIOUS PAGE: Emperor shrimp on a *Nembrotha mileri* nudibranch at Macromania



Pom Pom

graphing the 3mm to 1cm long nudibranchs Ah Long assured me we would encounter on this dive site. Indeed, it proved to be a macro-lover's paradise!

Just short boat trip from the resort, the gentle slope stretches from a shallow plateau at 5m to beyond 45m. The site, comprised predominantly of rubble, is home to some extraordinary nudibranchs, with new ones being found on a regular basis.

Our dive group spent a minimum of 70 minutes on each dive at a maximum depth of 24m before being chased to the surface by our exceedingly irritated dive computers. There was just too much to shoot in too little time. Besides all the nudibranchs found, we also were able to spend some time with a tiger shrimp!

Giddy with anticipation, we headed back to the resort to check out our

shots, and were happy to have been rewarded for our endeavours. If you are a macro critter fan, this dive site is definitely a must. It is all about the small stuff here.

Macro wet lenses

Pom Pom Island's sea turtles are great to photograph, but the real challenge was shooting the small critters in the area. My Sony RX100IV camera is great for wide-angle, but to get close-ups of the tiniest nudibranchs and shrimps, I found I needed to add wet lenses (which can be added or removed underwater).

Macro photography gives a totally different perspective of the world of the smallest reef life—a world often unseen by divers. For those who take their time and train their eyes, those boring patches of rubble can prove to

be teeming with life! Equipped with my rig and a Nauticam SMC macro diopter, I went on the first dive.

However, I soon realized I needed another wet lens to be able to close the distance. In between dives, I stacked the Inon +8 on top. Then, all I needed to do was get close to my subjects and zoom in as much as I could to create a superb magnified image.

But it proved easier said than done, as some nudibranchs moved surprisingly fast, shrimps jumped around the rubble and hydroids with Doto nudibranchs swayed in the current. It takes patience, understanding of light, positioning, composition, and of course, luck to get THE shot.

On each dive, I spent countless long minutes waiting for the right moment to press the shutter button.



CLOCKWISE FROM TOP LEFT: The "Holy Grail" of nudibranchs—*Melibe colemani*, at Pom Pom Island; Cleaner shrimp on soft coral; *Phylodesmium* nudibranch at Macromania



How to get there

There are daily flights from Kuala Lumpur and Kota Kinabalu to Tawau. From Tawau, continue the journey by a one-hour mini-bus drive to Semporna town. Speedboat transfer is from the Semporna jetty to Pom Pom Island. The boat ride takes about 45 minutes. ■

Many thanks to Celebes Beach Resort and Andy Chong for the numerous stays over the past few years. A big thank you to Nurul Yazid and dive guides Ah Long Yong and Axu Kokkonen for showing me the tiniest macro life on the reefs over and over again. See: Celebescuba.com.

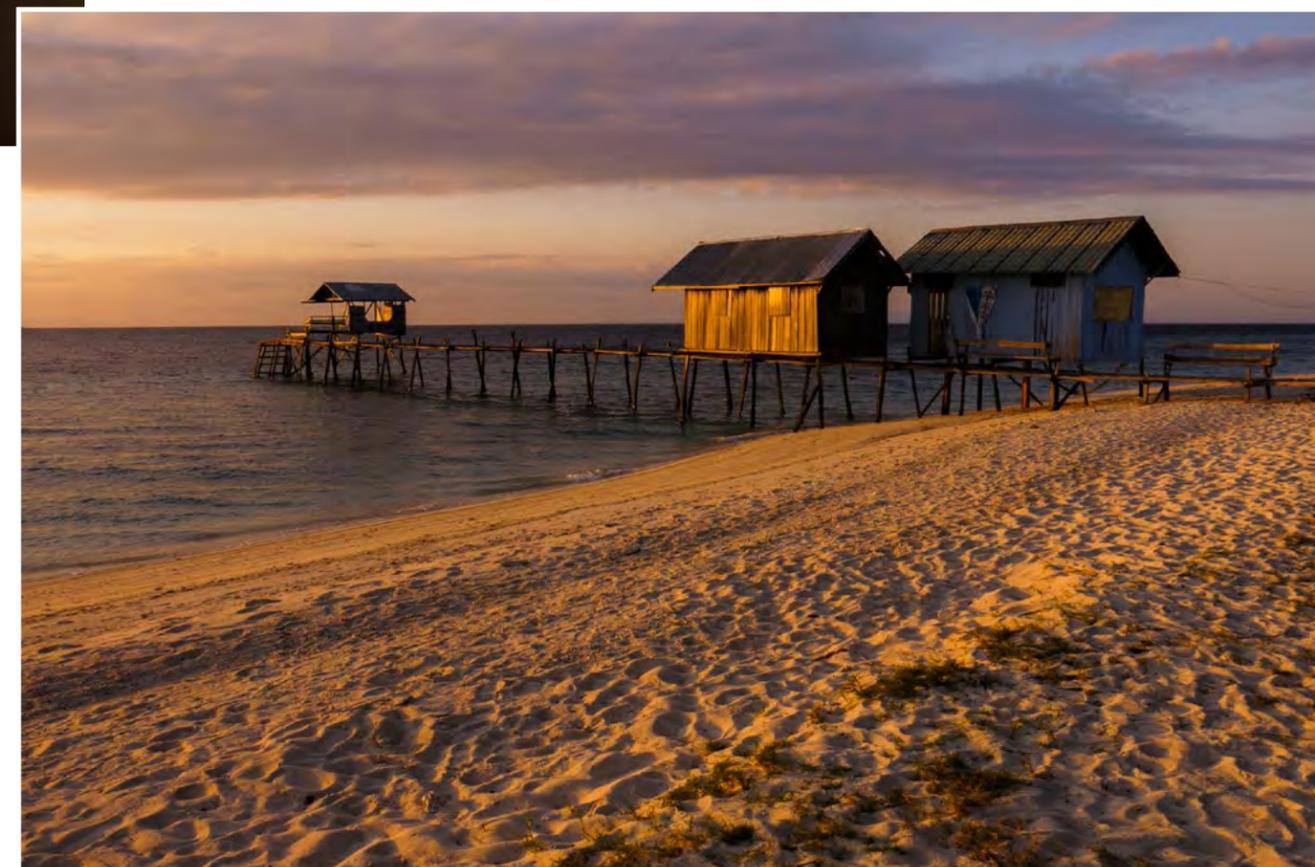
Thailand-based Elisabeth Lauwerys has long been passionate about exploring the marine depths. In 2004, she opened

Oceans Below Underwater Video Productions on Koh Tao. Since then, she has created the dive industry's first professional-level video training course; won numerous underwater video competitions; worked with the BBC and other production houses; created a new look for the PADI promotional videos; and has recently started making the transition from video to still photography. She continues to teach budding underwater videographers and

travel the world in pursuit of the most spectacular and diverse diving environments—all the while, equipped with her

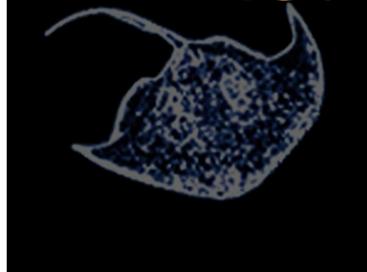


cameras and housings. To learn more about the author's work, check out: Oceansbelow.net.



Chromodoris leopardus nudibranch at Macromania (left); The jetty at Pom Pom Island (above)

fact file



Malaysia



SOURCES: U.S. CIA WORLD FACTBOOK, XE.COM, TRAVEL.STATE.GOV, POMPOMISLAND.COM, PANDA.ORG

History Great Britain established colonies and protectorates in the area of current Malaysia during the late 18th and 19th centuries. Japan occupied these areas from 1942 to 1945. The British-ruled territories on the Malay Peninsula formed the Federation of Malaya in 1948. In 1957, it became independent. When the former British colonies of Singapore and the East Malaysian states of Sabah and Sarawak on the northern coast of Borneo joined the Federation in 1963, Malaysia was formed. The new nation faced challenges in its first several years including a Communist insurgency, Singapore's secession from the Federation in 1965, Indonesian confrontation, and Philippine claims to Sabah. However, Malaysia was successful in diversifying its economy from dependence on exports of raw materials to expansion in manufacturing, services, and tourism during the 22-year term of Prime Minister Mahathir bin Mohamad (1981-2003). Government: constitutional monarchy. Capital: Kuala Lumpur

Geography Malaysia is located in southeastern Asia. It includes the peninsula that borders Thailand and the northern one-third of the island of Borneo, which borders Indonesia, Brunei, and the South China Sea, south

of Vietnam. Coastline: 4,675 km. Terrain: coastal plains that rise to hills and mountains. Lowest point: Indian Ocean 0m. Highest point: Gunung Kinabalu 4,100m. Note: Malaysia lies in a strategic location along the Strait of Malacca and the southern end of the South China Sea.

Economy Malaysia, a middle-income country, has transformed itself since 70's from a producer of raw materials into an emerging multi-sector economy. Under current Prime Minister Najib, Malaysia is attempting to achieve high-income status by 2020 and to move farther up the value-added production chain by attracting investments in Islamic finance, high technology industries, biotechnology, and services. The government has also taken steps to liberalize some services sub-sectors as well as boost domestic demand and reduce the economy's dependence on exports. Nevertheless, exports—particularly of electronics, oil and gas, palm oil and rubber—remain a significant driver of the economy. Bank Negara Malaysia (central bank) maintains healthy foreign exchange reserves, and a well-developed regulatory regime has limited Malaysia's exposure to riskier financial instruments and the global financial crisis. In September 2013 Najib

launched the new Bumiputra Economic Empowerment Program (BEEP), policies that favor and advance the economic condition of ethnic Malays.

Climate Malaysia enjoys a tropical climate with high temperatures and humidity year round. There is an annual southwest monsoon from April to October, and a northeast monsoon from October to February. Natural hazards include flooding, landslides and forest fires

Environmental issues Malaysia has a relatively positive track record on the environment, but still faces challenges including deforestation, soil and coastal erosion, overfishing and destruction of coral reefs, as well as air and water pollution, and problems in the disposal of waste.

Currency Ringgits (MYR) Exchange rates: 1EUR=4.15MYR; 1USD=3.27MYR; 1GBP=5.32; 1AUD= 2.86MYR; 1SGD=2.57MYR

Population 30,073,353 (July 2014 est.) Ethnic groups: Malay 50.1%, Chinese 22.6%, indigenous 11.8%, Indian 6.7%, other

RIGHT: Global map with location of Malaysia BELOW: Location of Pom Pom Island, Mabul Island and Pulau Rawa on map of Malaysia



0.7%, non-citizens 8.2% (2010 est.) Religions: Muslim (official) 61.3%, Buddhist 19.8%, Christian 9.2%, Hindu 6.3%, Confucianism, Taoism, other traditional Chinese religions 1.3% (2010 est.) Internet users: 15.355 million (2009)

Language Bahasa Malaysia (official), English, Chinese (Cantonese, Mandarin, Hokkien, Hakka, Hainan, Foochow), Tamil, Telugu, Malayalam, Panjabi, Thai. There are several indigenous languages in East Malaysia; Iban and Kadazan are most widely spoken

Visa Passport valid for six months, with at least one blank page for entry stamp. No tourist visa required

for stays less than 90 days. Note: There are strict laws against drug trafficking, including possession of heroin and marijuana, with convictions leading to a mandatory death penalty.

Travel advisory There have been recent attacks by terrorists and extremist groups against foreigners in the region. The U.S. State Department warns citizens to avoid travel to coastal eastern Sabah (Eastern Malaysia). However, the Malaysian government has placed added security (police and military personnel) at the resorts in this area. Direct transit with reputable tour companies is advised. In urban areas, it is

recommended that especially women travelling alone hail taxis by phone rather than flagging one down on the street and then checking the cab driver's license upon entry, as there have been recent violent incidents against foreigners by local taxi drivers. For more detailed information, check with your state department for the latest updates on security issues in Malaysia.

Health Contact your state's health advisory for updates on warnings and appropriate inoculations for travelers. In Malaysia, there is an intermediate degree of risk for food or water-borne diseases such as bacterial diarrhea, mosquito-borne diseases such as dengue fever, and water contact disease such as leptospi-

rosis. The highly pathogenic H5N1 avian influenza was identified in Malaysia but there is a negligible risk with very rare cases possible among visitors who get in close contact with birds (2013).

Make sure you bring adequate travel health insurance and repatriation funds.

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Edited by
Rosemary 'Roz' E. Lunn

Equipment



TORID Pulse

H2Odysey states that its TORID Pulse is "a unique signalling device" perhaps better described as "a pool toy for someone who likes playing with gadgets." The idea is that you "tag" your buddy with air rings to attract their attention in low visibility. Maybe the designers have never taken this bulky, heavy, depth-limited device "real world diving", but for divers who work extensively with children in swimming pools, this gadget looks to be a bit of a winner. To produce a perfect bubble ring, simply direct the device and pull the trigger. Bubbles can be blown vertically or horizontally through the water. And you have the ability to adjust the frequency and size—from fine-and-fast to large-and-slow. Then simply add children, water, an active imagination and let the games commence! H2odysey.com

Mesh 'n Roll

We have seen many mesh bags, but never one that comes with a set of wheels! Scubapro's latest bag is manufactured from a heavy-duty PVC coated mesh fabric. The one compartment has a semi-rigid base and is secured by a U-shaped YKK saltwater-resistant zip that has two sliders. This allows you to open the lid fully, making packing a cinch. Scubapro has considered the (rough) terrain the bag will potentially be pulled across, and protected the bag by reinforcing the corners. They have added a top pull handle, heavy-duty off-road style wheels and adjustable handles can be used backpack style or as shoulder straps. Finally, this Mesh 'n Roll bag can be folded flat, allowing you to pack it into your checked luggage. Scubapro.com



Children's Rash Guard

Children's sensitive skin needs protection from UV, sun allergies, sunburn and future skin cancer. Covering them from head to toe in a high factor sunscreen can be challenging. A less sticky, more child-friendly solution is UV clothing. The iQ-Company has developed an iQ Kids UV Shirt 300 that apparently blocks over 99.9% of UV rays. iQ-Company also states that this shirt protects against certain irritants produced by some jellyfish, sea anemones and corals. The fast drying, breathable, lightweight iQ UV300 material is perfect for all-day adventures in, under and around water, thus allowing your little aquanaut to concentrate on the more important things in life—paddling, romping, swimming and building the biggest sandcastle in the world. Iq-Company.nl



Aquilon Purge Valve Snorkel

Aqua Lung's latest snorkel has been designed with comfort in mind. The company has manufactured a 'D' shaped barrel, rather than a round barrel. What difference does this make? A flat surface sits snugger against the face. The removable, replaceable, anatomical "Comfo-Bite" mouthpiece helps reduce jaw fatigue, as does the mouthpiece section. This can be gently rotated for optimal positioning. No one likes having a 'snorkel in the face' when it is not being used. The Aquilon Purge Snorkel has a non-collapsible, soft, flexible, corrugated tube that allows the snorkel to hang away from the head.

Aqualung.com



Divesangha Calypso Aqua Shorts

Divesangha's "Calypso" summer range of shorts and swim-shorts are manufactured from ECONYL fabric. This fabric is popular with divers because it is ecological (100% recycled nylon from recovered fishing nets) whilst being soft, stretchy and quick drying. Each Calypso garment features Divesangha's Hung Dry system—a neat way to hang your clothes from poles, lines, ropes, et al, without the use of clothes pegs, and a useful boon for travelling divers. All the garments in the Calypso range provide 50+ UV protection. The shorts (shown) come in three vibrant colors—aqua, red and gray—and four sizes: small, medium, large and extra large.

DiveSangha.com



Ladies boardshorts

Fourth Element has launched a pair of ladies boardshorts, and states that these should not be ironed. (We like the "you must not iron" bit.) The four-way stretch, quick drying, easy care fabric (95% Polyester / 5% Elastane) promises to give the diver greater freedom of movement. The back pocket and the fly is secured by "hook and loop fastenings" aka velcro. There is also a drawstring attached to the fixed waistband to ensure a secure fit. These black "Submerge" boardshorts are a "Mid Fit", i.e., the 4-inch (10cm) inseam comes to mid-thigh. Available in eight UK ladies sizes from 6 to 20. FourthElement.com



equipment



The breathable fabric makes it pleasant enough to keep the suit on between dives



Hands-on review: Waterproof D9X

Text by Peter Symes

It is a great suit—the D9X from the Swedish manufacturer Waterproof—an obvious evolution, and in many ways, improvement from the original D9, which I tested a few years ago. So why do I harbour mixed feelings about it?

When the the original D9 was released, Waterproof's CEO Björn Ehlme, did impress upon me, at the time, that the then novel breathable suit was not intended for heavy duty use. The priority was to make it lightweight, with air travel restrictions in mind.

If one wanted to—as he put it—crawl about on deep wrecks and subject a suit to a lot of abuse, one should rather have a look at some other drysuits in the Waterproof range. Duly noted, I did immediately take to the D9 and ended up using it on many more occasions than just travel.

I fancied how it felt more like a windbreaker and not heavy, like a winter coat, as most drysuits do. It is easy to don, but granted, its bagginess did not make for the most streamlined profile—not that it was ever an issue. I also liked how the breathable fabric, which wicked away the dampness inside once on the surface, made the

suit pleasant to keep on between dives, when I would otherwise unzip and flap open the top part to air out.

The suit never felt flimsy, and after having used it on many occasions over the last couple of years, it still doesn't look worn out. But, ever mindful of Björn Ehlme's words, I always felt conscientious about not subjecting the suit to any abrasions and other such rough treatment.

I resisted crawling about on my knees, and frequently thought, if only the suit were a bit more sturdy and had some enforcements here and there, I would have a near ideal suit for my typical use. In other words, I wanted a drysuit like the D9x, which is made from a bit thicker fabric, with extra enforcements in exposed areas, such as the elbows and knees.

It also comes with fixed boots and cuffs, which are designed to readily accept various dry glove systems. Oh, and there is a pocket on each thigh (right).

The price of ruggedness

Bulking up and amending all these various enforcements, plus the boots, comes at a price, obviously. At 3.2 kg (7 lb)



the D9x is still quite a light suit, yet the lightness that so endeared me to the D9 has largely been sacrificed. But what does that say, really? Only that you cannot always get the best of both worlds, and priorities must be made.

Given the choice, I would, after all, go with the more rugged D9x. Since the D9 requires separate boots, the real savings on weight is less than 1kg anyway. I've been told the D9x, having a slightly thicker fabric, wicks moisture a bit more slowly, but I wasn't able to tell any difference.

On a concluding note, a prudent reminder about the TZIP dry zipper used in both models: Unless it is pulled *quite tight*, even more so than the classic steel zippers, it may not be closed all the way, which several of the reviewers learned the unpleasant way—by getting soaked. In order to facilitate closing the zipper all the way, without having to apply excessive force, it is therefore recommended to apply some silicone to the dock end. ■

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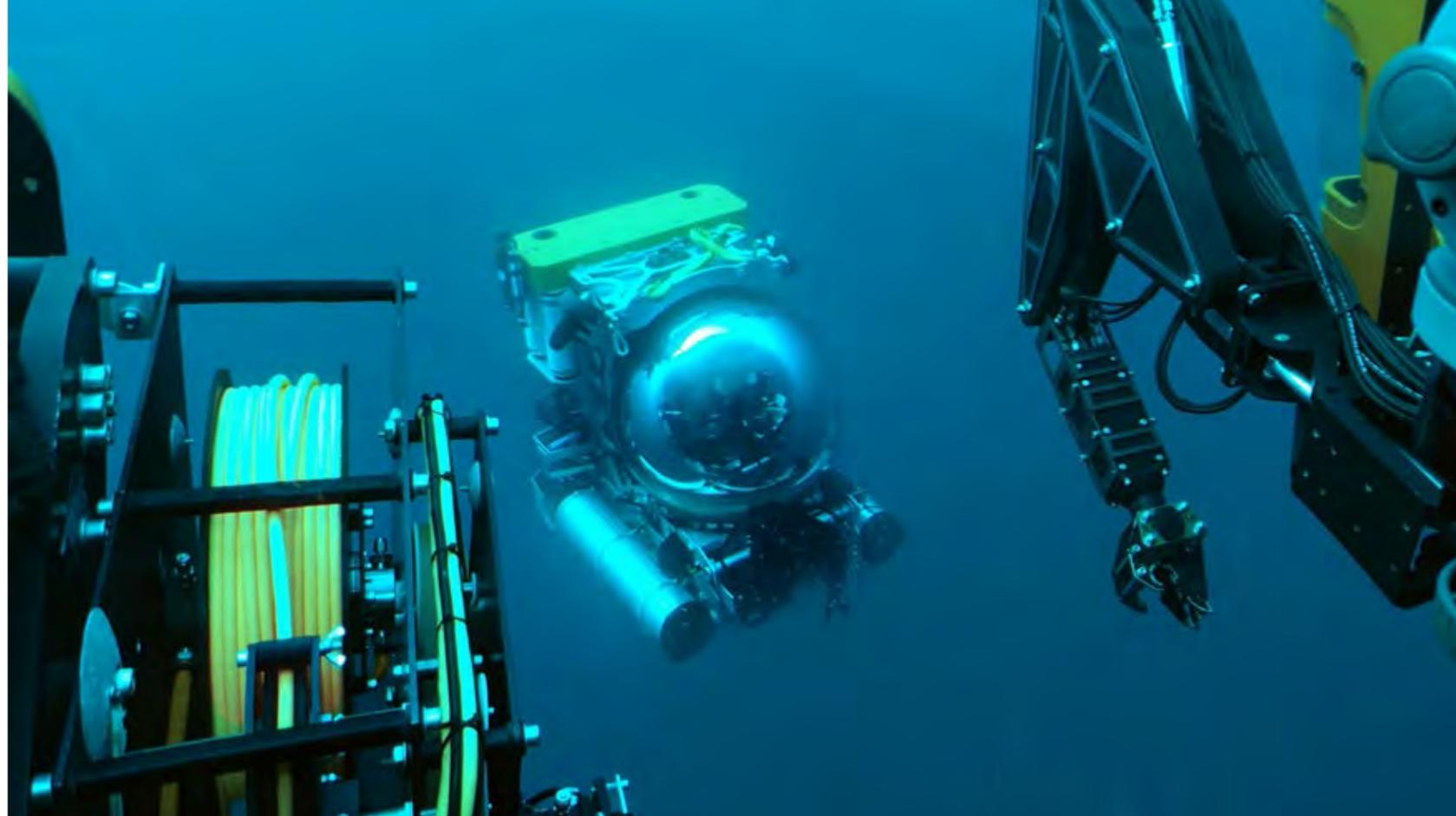


U-Boat Navigator Explores

Wrecks of Malta

Text by Svetlana Murashkina
Photos courtesy of U-Boat Malta LTD
Underwater photos by Eugene Tomashov

— *The Tragic Triangle of Valletta*



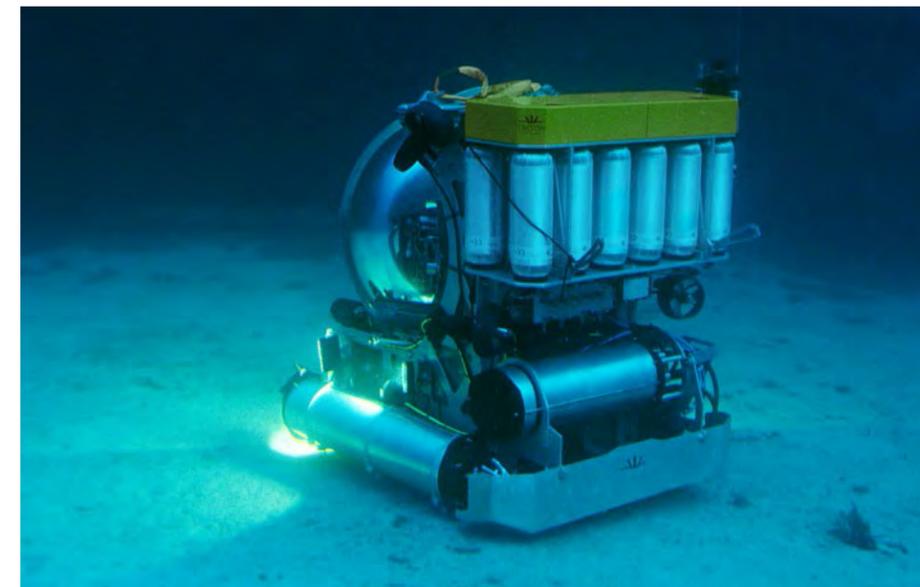
The *U-Boat Navigator* research vessel is known for its expeditions to the legendary HMHS *Britannic* (see *X-RAY MAG* issue #69¹) in Greece, but the company also does extremely interesting research in its “home” waters of Malta.

Malta, which is situated in the center of the Mediterranean Sea, always served as a crossroads of sea routes from Europe to Africa and Asia, and, over the centuries, witnessed lots of war activities, including both World Wars. Thus, there are a number of shipwrecks buried in Maltese waters, with only a few of them having been explored or even known to exist.

In reality, wrecks are the main attraction for divers visiting Malta—especially experienced technical divers, as the majority of the most interesting wrecks rests far below 40m deep. The most famous wreck is probably the 66m-long S-class submarine HMS *Stubborn*. Resting at a 56m depth, this vessel was a casualty of WWII.

There is also the “modern” civilian vessel, the *Imperial Eagle*, resting at 42m, which was scuttled in 1999. Both wrecks lay several kilometers off Qawra Point. Another wreck worth mentioning is a WWII aircraft, the Blenheim bomber resting at 42m, which is located at Xorb I-Ghagin. These name just a few deep wrecks available to technical divers. (You can read more about recently discovered wrecks in Malta, such as the HMS *Olympus*² and a WWII submarine³, on *X-RAY MAG*'s website.)

Beginning divers can also find some remarkable wrecks to dive in Malta. For instance, there is a dive site with two tugboats—the *St Michael* and the *Ten* wreck. Both were purposely scuttled together in 1998 at Zonqor Point, and rest at a maximum depth of 21m. Or there is also a shallow dive on the HMS *Maori*, which was the last Tribal-class destroyer to go to war



in the Mediterranean. She sank in 1941, having been hit by a bomb, and now lies at 12m at the entrance of Dockyard Creek in Valletta.

Valletta – The Tragic Triangle

Valletta's Grand Harbor is famous for its historical wrecks. And the fact that it is the home port of *U-Boat Navigator* does not mean that they are neglected. Every *U-Boat* voyage starts and finishes here. Indeed, the last part of the *U-Boat*'s

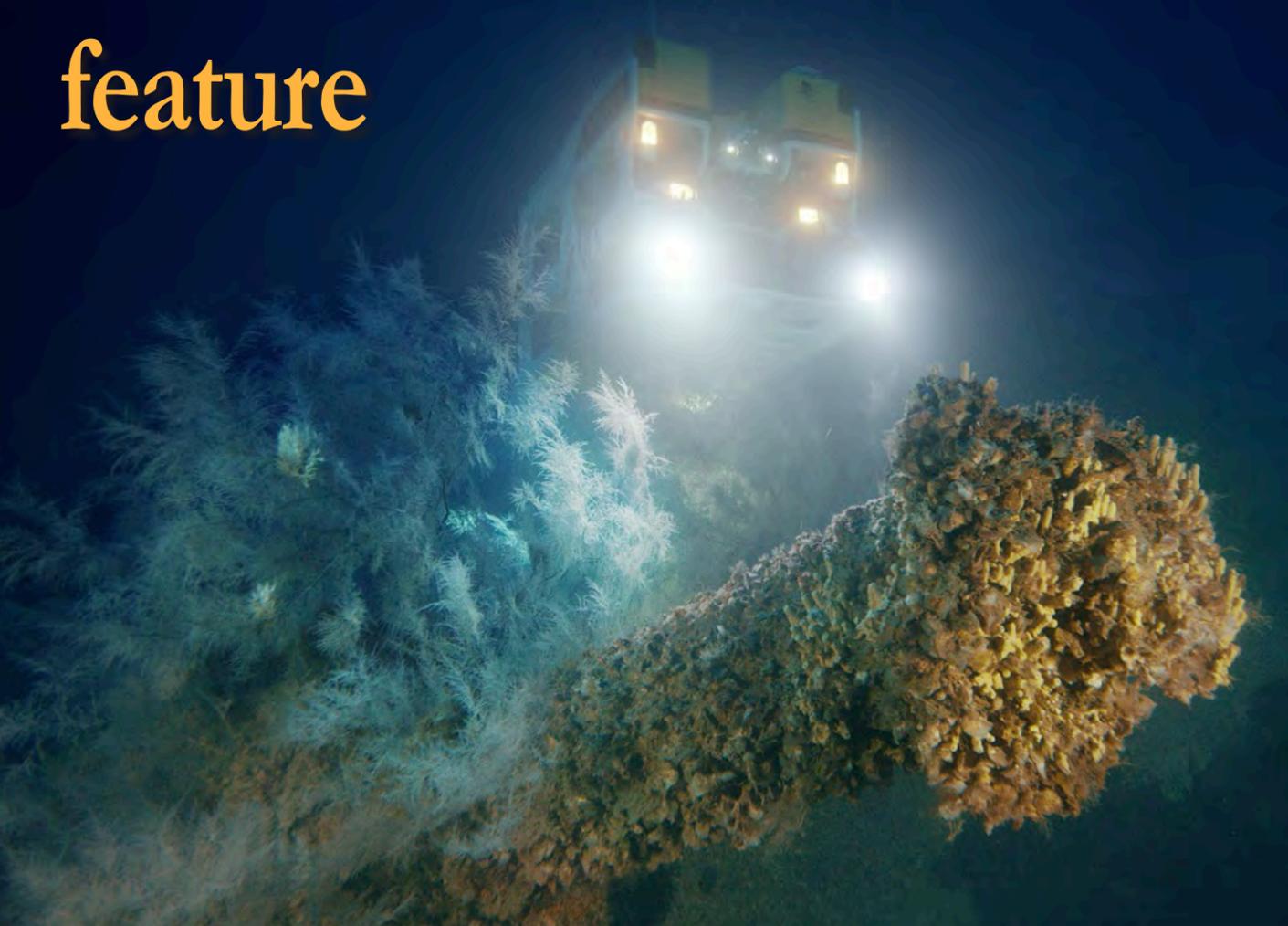
CLOCKWISE FROM ABOVE: Crewmembers prepare the solo-sub for descent; *U-Boat Navigator* with the Triton 3300/3 sub on the back; Testing of the Triton 3300/1 MD offshore, Malta; Triton 3300/1 MD on the seafloor. PREVIOUS PAGE: ROV Ageotec Perseo GTV working on HMY *Aegusa*

¹ [HTTP://WWW.XRAY-MAG.COM/CONTENT/U-BOAT-NAVIGATOR-MISSION-HMHS-BRITANNIC](http://www.xray-mag.com/content/u-boat-navigator-mission-hmhs-britannic)

² [HTTP://WWW.XRAY-MAG.COM/CONTENT/DIVERS-LOCATE-HMS-OLYMPUS-MALTA](http://www.xray-mag.com/content/divers-locate-hms-olympus-malta)

³ [HTTP://WWW.XRAY-MAG.COM/CONTENT/WW2-SUBMARINE-FOUND-MALTA-IDENTIFIED](http://www.xray-mag.com/content/ww2-submarine-found-malta-identified)





2015 expedition was devoted to the three local wrecks: HMS *Russell*, HMY *Aegusa* and HMS *Nasturtium*, lost 100 years ago, on the same day—27 April 1916. They all are also featured in the U-Film documentary project, *Dark Waters*, with the first episode of the series – “Red Cross on Water”—telling the story of the hospital ships during wartime.

When I interviewed historian Joseph-Stephen Bonanno at his workplace in St. Julians, he talked as if he was present during the events of days long past, as if he had participated in the marine operations and court procedures of the wrecks 100 years ago.

Bonanno said: “On the morning of 27 April 1916, *Russell* was heading towards the Grand Harbor. It was a bright day with a moderate breeze and a relatively calm sea. She arrived off Malta on the previous night. However, due to her



ROV Ageotec Perseo GTV over HMS *Russell*, (top left) which has become a home for schools of fishes (top right); Anchor on *Russell* wreck (above); Historical photo of HMS *Russell* (right)



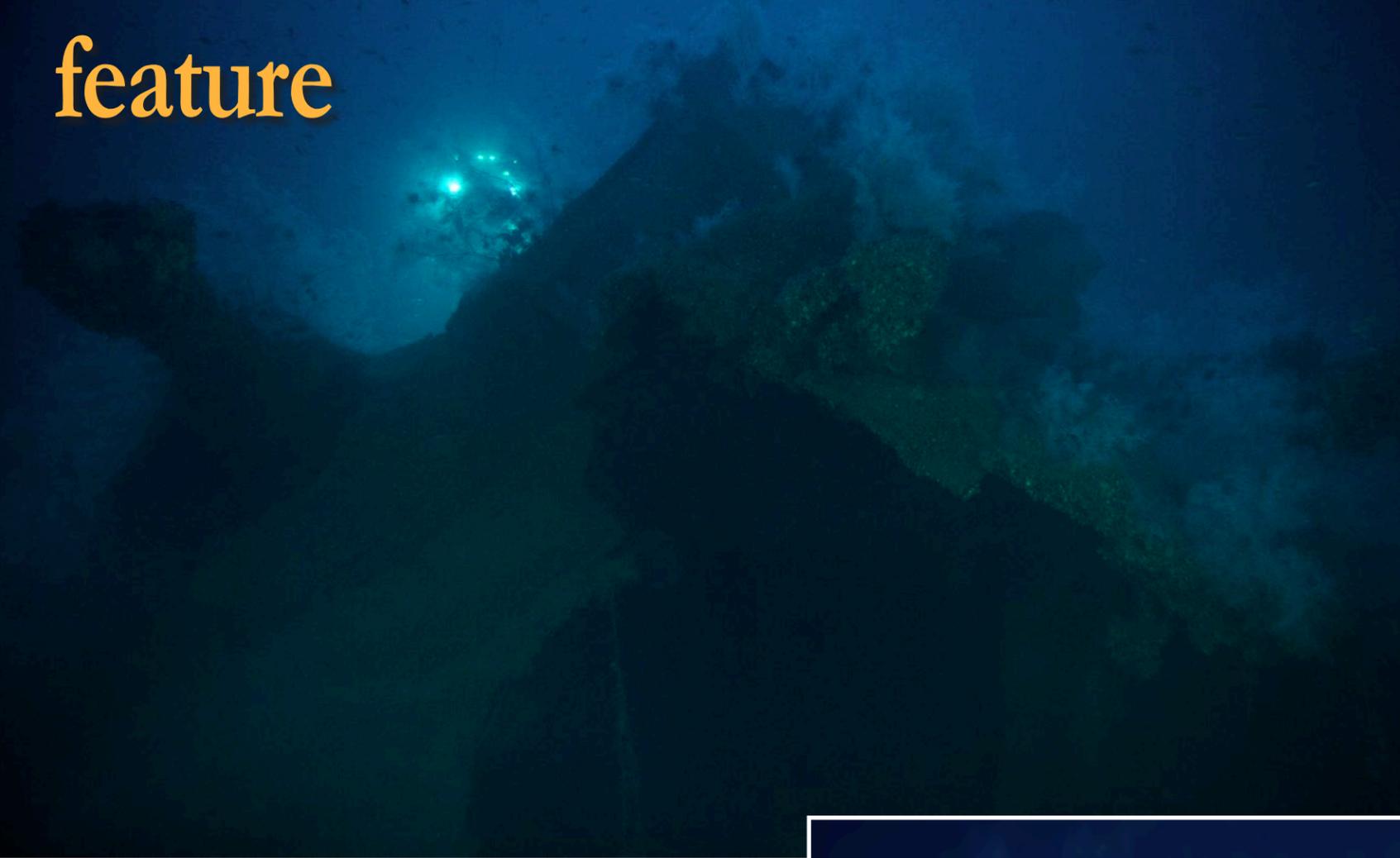
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late arrival, entry to the harbor was refused, because the boom defense had already been closed for the night, and the battleship was forced to cruise east of Malta.”

HMS *Russell*

HMS *Russell* was the first of six “Duncan” Class Dreadnoughts,

which were constructed after Britain’s Naval Defense Act was enacted with the aim of overpowering all existing marine craft—especially the Russian “Peresvet” class ships, which were being built at that time. In an attempt to exceed the non-existing features of enemy battleships (which were found out later), HMS *Russell*



THIS PAGE: Scenes from the ROV Ageotec Perseo GTV's exploration of the HMS *Russell*

Malta Wrecks

of 25 April 1916, and by midnight, it was located off the entrance of Valletta Harbor. By 1:40 a.m., the submarine's crew had managed to place 22 mines, and then disappeared.

Russell was the first to hit one of the mines early the following morning on 27 April 1916 and sank, killing 124 people—mostly officers and crew members. But the terrible war demanded new victims that day!

Today, the *Russell* lies upside-down in approximately 115m of water, and would never have come back to historical light, if not for the group of technical divers who first visited the wreck in 2003. Now it is one of the regular

sites for the *U-Boat Navigator*, whose crew has been filming the wreck for several years now. Every new immersion at the site is a reason to commemorate the memory of the HMS *Russell* crew.

HMY *Aegusa*

HMY *Aegusa* was the object of *U-boat Navigator's* last submergence in 2015, on the 23rd of December. The dive with the submersible Triton 3300/3 was supervised by archaeologist Dr Timmy Gambin from the University of Malta. It was his second visit to the wreck. The very first dive, when the ship was discovered, took place in 2014.

The Screw Schooner *Aegusa* was built in 1896 in

was launched as the first of the Duncan class ships on 19 February 1901, with the following dimensions and specifications: 123.5m length between perpendiculars; 23m width; 7.8m draft and 14,000 tons of displacement; 18,000 horse power; and a top speed of 19 knots.

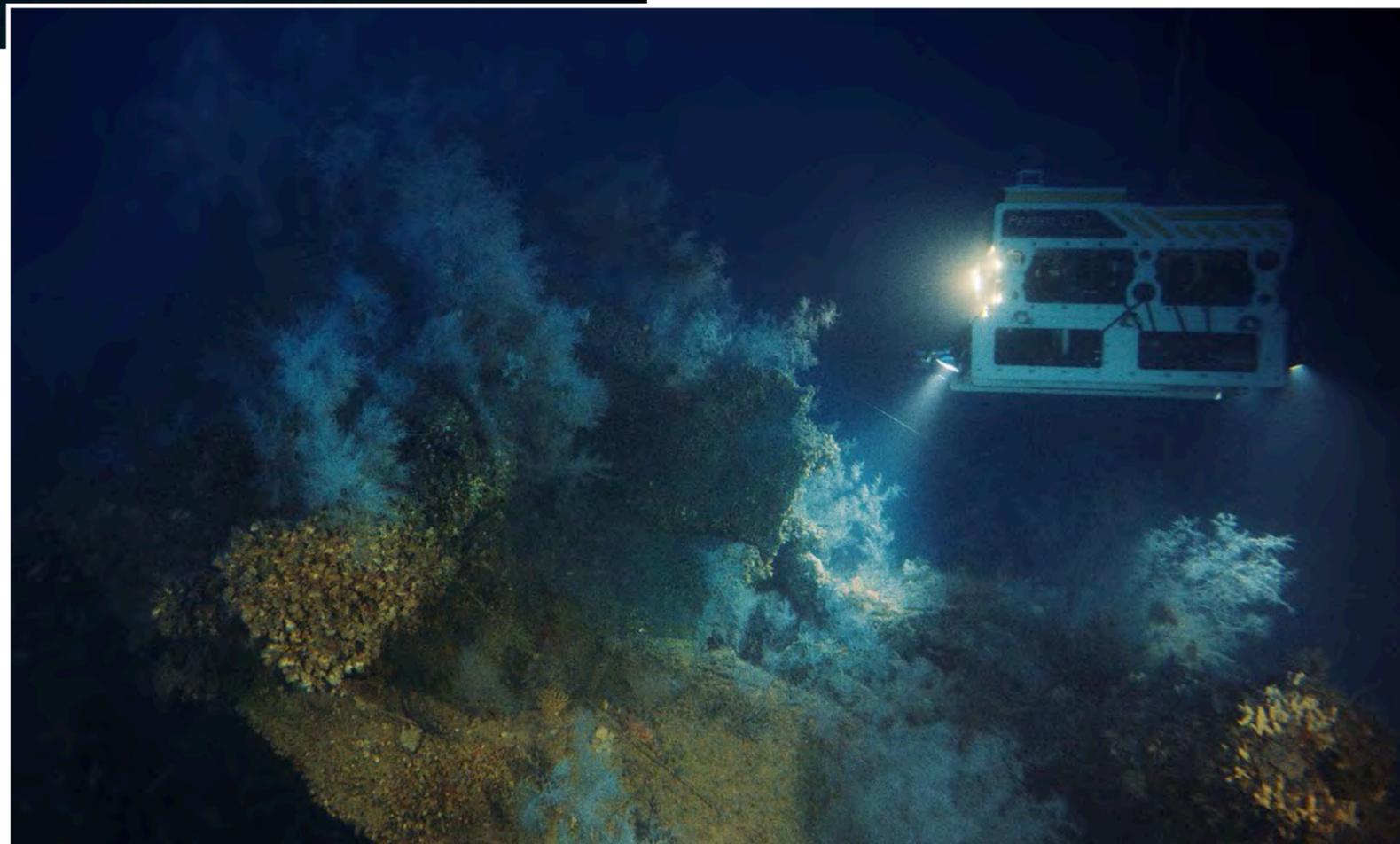
She was named after the Admiral Edward Russell, the 1st Earl of Oxford, who lived from 1653 to 1727. After changing fleets and captains because of changes in British marine policy due to dramatic fluctuations in relations with European countries during times of war and peace at the outbreak of the First World War, the *Russell*, together with her surviving sister ships of the Duncan class, were assigned to the 3rd Battle Squadron in

the Grand Fleet.

Later, during the WWI, *Russell* served in the Dardanelles, close to the Gallipoli Peninsula, within the British Dardanelles Squadron, and proved to be reliable and respected. At Gallipoli, she was among the last battleships of the British to leave the area. After the Gallipoli campaign was over, the *Russell* stayed on in the eastern Mediterranean.

“À la guerre comme à la guerre”—enemies, during war, will fight with every available means. Indeed, the Germans tried to make the most of their submarine fleet advantage and were successful. It was the submarine, SM U-73, that especially brought a lot of trouble to the Mediterranean.

The U-boat arrived off the coast of Malta on the night



100m

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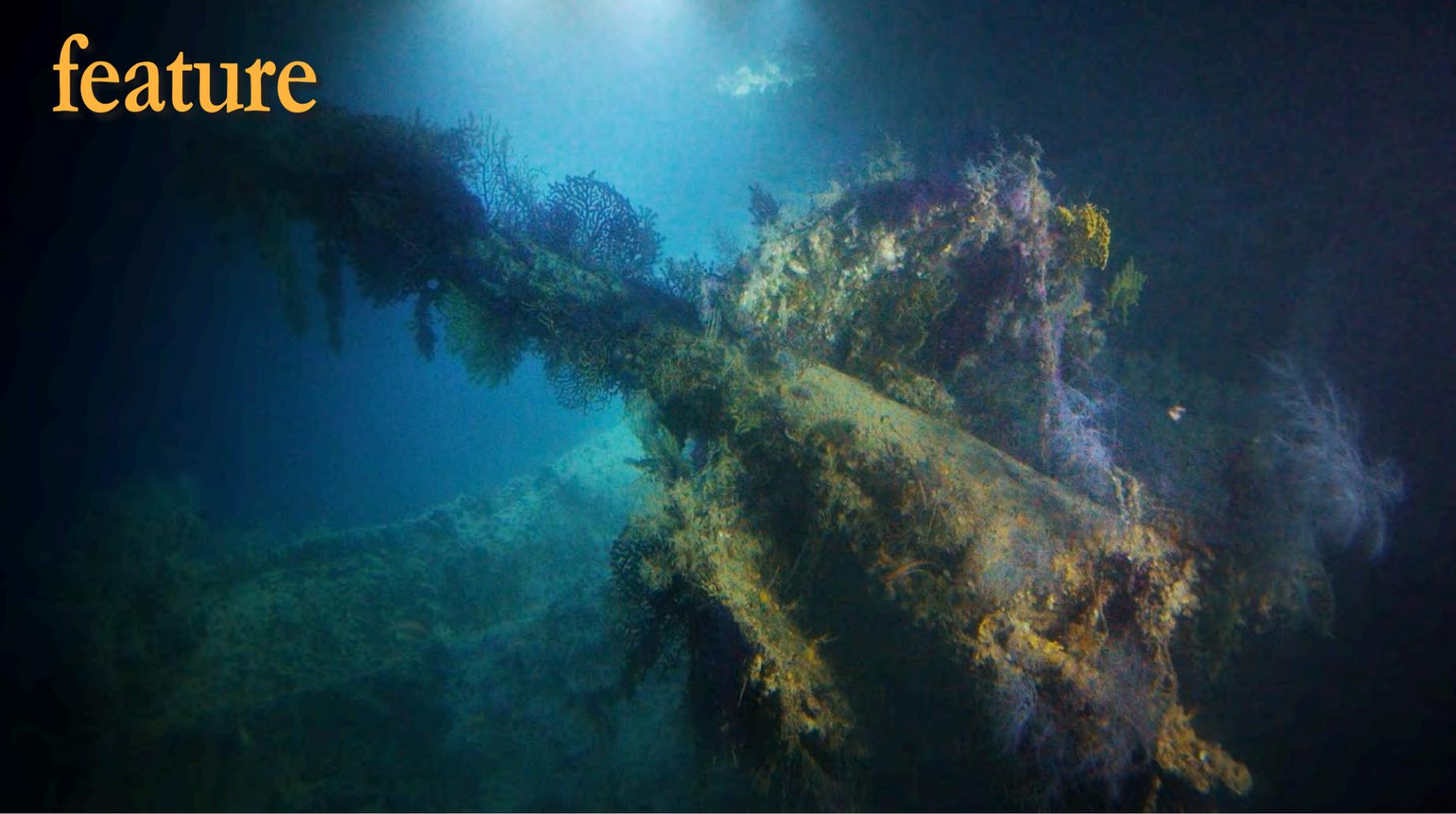
DEEP WATER RESEARCH
Triton 3300/3
ROV Ageotec Perseo GTV

U-BOAT MALTA:
SCIENCE EXPLORATION IMAGING

1000m

1250m

www.u-boat.com.mt



Scotland as a luxurious boat, one of the largest yachts of the time. She was 257.7 feet long, 31.65 feet wide, with a 18.5-ft draft. Besides that, she reached 16 knots in speed. Nevertheless, when the vessel was bought by Sir Thomas Lipton (remember the tea!) in 1899 as a tender for his racing yachts, she was reconstructed and redecorated in unbelievable luxury, including a mechanical piano in the music room, oriental art, paintings and porcelain worth a fortune, as well as collection of wines and spirits.

The ship, renamed "Erin", hosted nearly every royal personality, or very important person, of the time, espousing the vanity of her owner. But after WWI began, the vessel—returned to her previous name of HMY *Aegusa*—began serving the British Red Cross Society, was re-equipped as a hospital ship and marked with red crosses. Later, she was armed to serve as a tender to several larger ships, and her final mission was to patrol the waters of the Mediterranean, watching for German submarines near

Malta.

She struck a mine on the same unlucky day of 27 April 1916 while trying to save surviving crew members of HMS *Nasturtium*, and sunk within just seven minutes. The majority of the crew managed to abandon the vessel, but six of Lipton's former crew members lost their lives with the explosion.

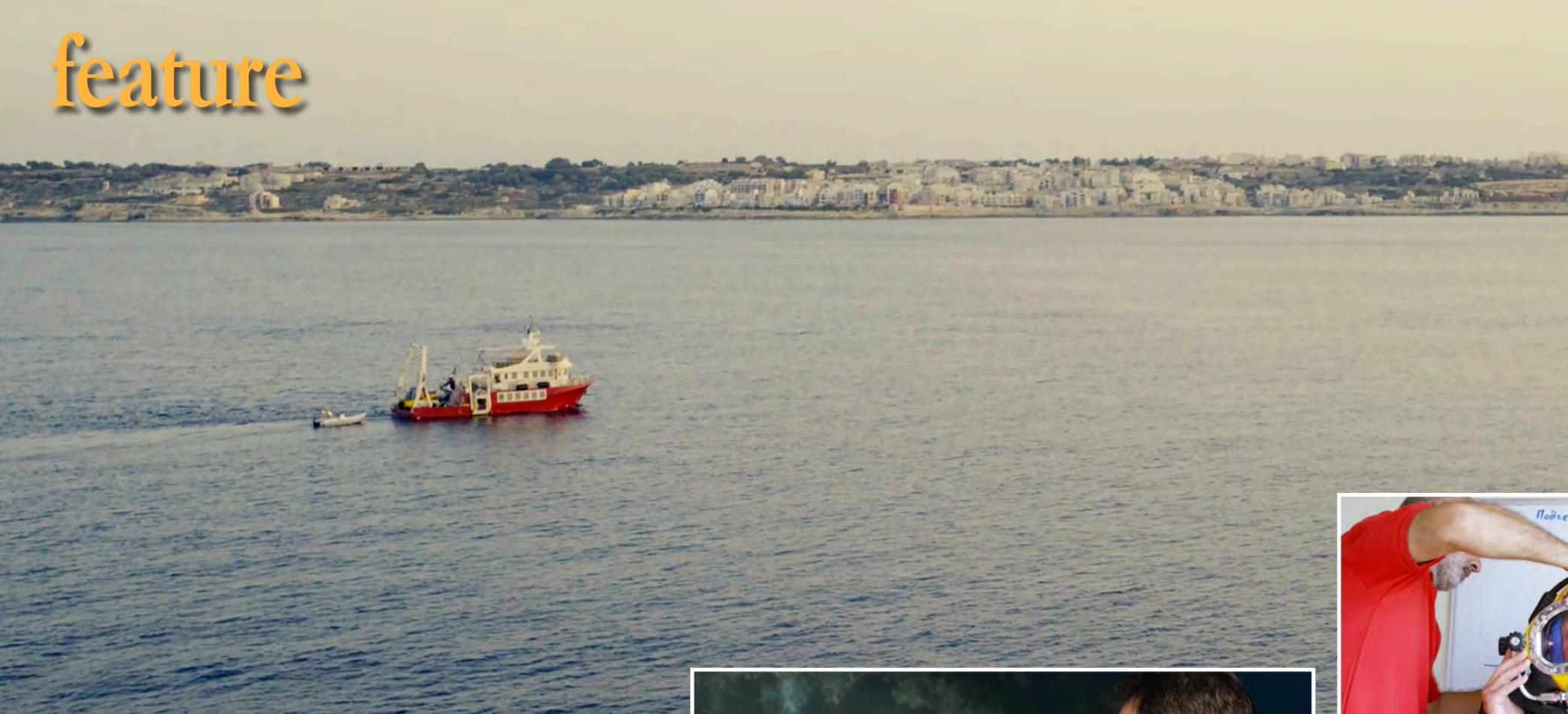
HMS *Nasturtium*

HMS *Nasturtium* was one of 36 Arabis class sloops built under the Emergency War Program for the Royal Navy in World War I, to be used as smaller anti-submarine vessels. She was launched on 21 December 1915 from one of the Scottish shipyards and had the following dimensions and specifications: 81.6m length, with a displacement of 1,250 tons, 3.58m draft, a maximum speed of 15 knots, and was designed to carry 79 people on board.

HMS *Nasturtium* served in Malta, but for just a short time. On the same black day of 27 April 1916, she was searching for



THIS PAGE: Scenes from the wreck of the HMV *Aegusa*



CLOCKWISE FROM TOP LEFT:
U-Boat Navigator at sea in
 Malta; *U-Boat Navigator* crew
 prepares a diver for a dive
 in a hard-hat diving helmet;
 Hard-hat diver in the *U-Boat*
Navigator diving bell; Triton
 3300/1 MD; Dr Timmy Gambin
 in the sub at HMY *Aegusa*

enemy U-boats south of the island of Malta, not yet aware of the HMS *Russell* tragedy and the dangerous mine-fields.

HMS *Nasturtium* continued her duties, when at 7:55 p.m., she hit a mine herself. The five stokers lost their lives immediately with the explosion. The rest of the crew was rescued by oncoming vessels, including HMY *Aegusa*. Along with the ship's engineers, the captain continued to fight for the vessel, but it finally sank later that night.

The story of *Nasturtium* and the *U-Boat Navigator* is not over, as the wreck that was considered to be *Nasturtium* turned out to be another ship, similar in size and shape. So what kind of ship was it then, that was found? And where is the real *Nasturtium*? These questions are yet to be answered in the upcoming expedition of the *U-Boat Navigator* team in 2016.

Revealing history

With the new underwater pho-

tography and videography gathered by *U-Boat Navigator*, which proves theoretical conclusions of historians, one more chapter of WWI history has been revealed.

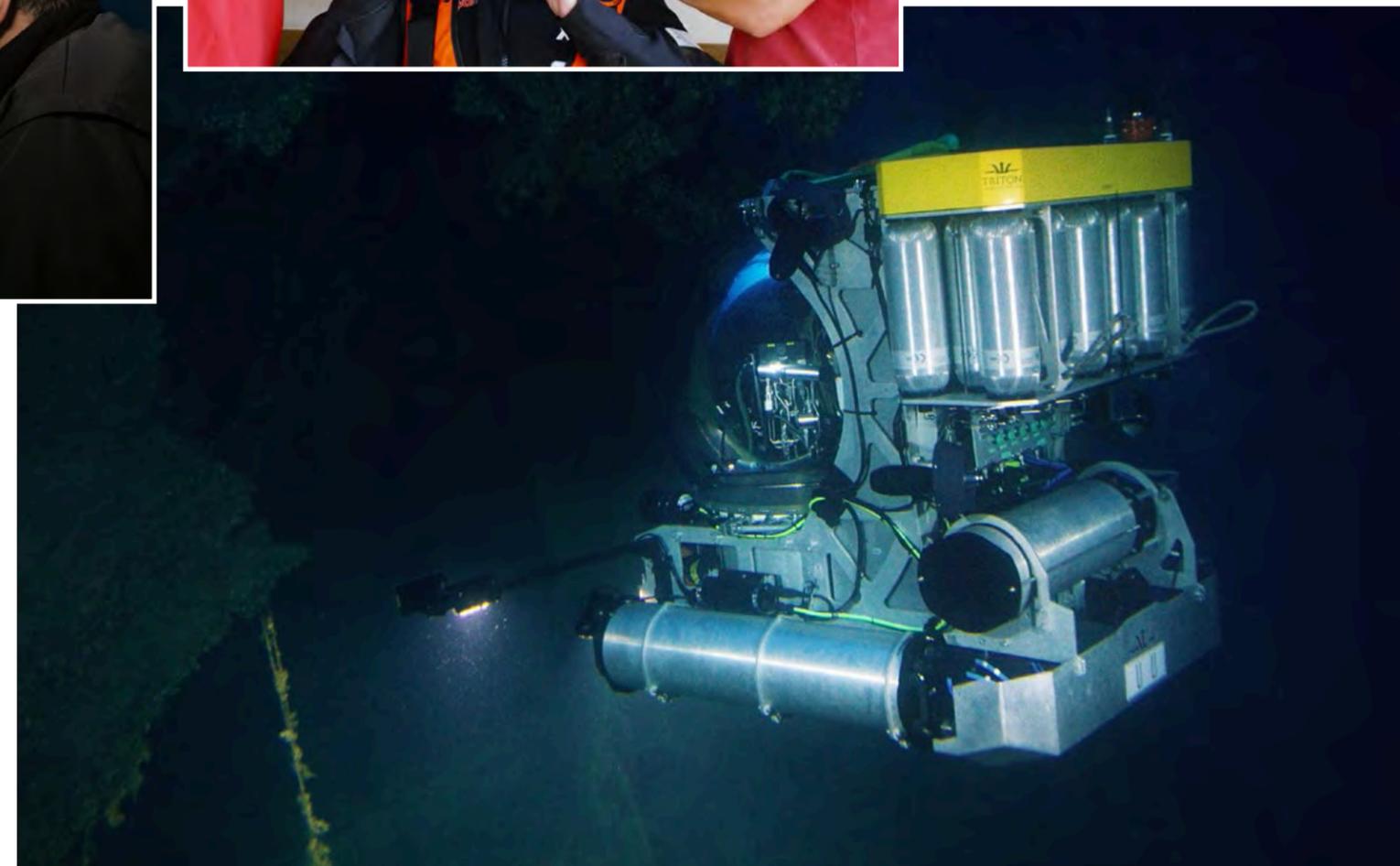
U-boat Navigator, according to David Concannon—Vice President for Flag and Honors of The Explorers Club, who was on board in 2015—is “one of the three best vessels in the world for underwater research”.

This year, U-Boat Malta LTD. added a new “toy” to their already impressive array of equipment, which includes the Triton 3300/3 submarine that dives from three to 1,000m with three persons, the ROV Ageotec Perseo GTV, all kinds of sonar—not to mention dive equipment covering all technical diving needs, including a hyperbaric chamber. This new toy is a Triton 3300/1 MD—a solo



submarine with minimal displacement and weight, capable of working at 1,000m of depth. It was constructed by world-famous Triton Submarines especially for U-Boat Malta, according to the crew's special request and technical specifications, and got wet in real conditions this season.

It is yet another technical step by U-Boat Malta to not only penetrate, but to work reliably in the depths of history. Most likely, the 2016 season's expeditions will allow new wrecks in the depths to come to light and arise from oblivion. ■



opinion



New to Diving?

Choose Wisely

— How to Spot a Good Dive Instructor

Text by Simon Pridmore
Photos by Barb Roy

This month's column is taken from a chapter in my new book *Scuba Fundamental – Start Diving the Right Way*, which aims to help people prepare for scuba diving, understand how the process works and make the right choices once they start.

The chapter "Choose Wisely" is a guide to making probably the most important decision of all: selecting the right instructor. I thought the topic might be interesting for current divers too and not only so you can advise friends who are thinking of learning to dive. Much of the advice could also be applied to the search for the right person to take you further in the sport, into technical diving, for example, or into the professional ranks.

Strange as it may seem, most people do not choose the person

who actually teaches them to dive. Instead, they just go into the dive shop or scuba club closest to their home and announce that they have decided they want to learn to dive. Or perhaps, on a whim, they make enquiries at the dive centre in the hotel where they are staying while they are on holiday. The club, shop or centre then assigns them an instructor.

This may be what commonly happens, but it is not necessarily the best way to begin. The decision as to which person will teach you to dive is far too important to be left to someone else or consigned to random chance. The dive centre, shop or club you approach and the scuba diver training agency they represent have some impact on the quality of the diving course you get. But by far the most important factor is the person who actually teaches you. The personality, ability, dedication and professionalism of your dive instructor have a direct and crucial bearing on whether your scuba diving course is the first step on the path to a lifetime

of adventure or whether you abandon the sport early, having wasted a good deal of time and money.

Yes, it is THAT important! The drop-out rate in scuba diving following completion of initial training is enormous and one main reason is inadequate teaching.

How to choose

Obviously, a good first step in choosing an instructor is to ask for recommendations from people who have already done the course.

However, that this is just a first step. Your friends and social media contacts are not necessarily a reliable source. There is a good chance that their own diving instructor is the only one they have ever met, so they have no point of comparison and are unable to be objective. They are also not you. Your learning preferences may be very different from theirs.

Once you have some recommendations, talk to the instructors directly, either by phone or in person. Interview them. After all, although they may not realise it, they are tech-

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The 3D anatomical design, with pre-bent arms and legs with stretch panels and gender specific construction ensures a comfortable fit and a relaxing body position in the water. 3D-moulded real rubber kneepads are perfect for the diving instructor who spends a lot of time on his/her knees in the water while teaching.

Double smooth-skin seals at arms and legs, adjustable neck and a 10mm spinepad, with an extra seal at the back zipper work together to keep the cold water out. Seals are designed to fit WP boots and gloves.

All zippers in top class Vislon from YKK. The Bronze slider in the back zipper ensures trouble-free function for many years. ToughTex panels at elbows and knees, Bonded HiQ Nylon Thread and 100% CR Neoprene in all panels - quality in every detail.

The W4 also features double computer strap anchors with anti slip, comfort front neck zipper, inner plush lining, seat and shoulder antislip reinforcement.



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opinion



It is always good to practice safety skills throughout training

- The students look like they understand what the instructor is saying: There is genuine communication between them.
- The instructor is willing to spend extra time personally with a student who is having difficulty with something.
- Underwater, the student divers are swimming almost horizontally, rather than at an acute angle with head up and feet down.
- The divers' hoses are secured to their BCD: they are not hanging down beneath them and dragging on the bottom of the pool or seabed.
- The students spend a large part of their time swimming or floating motionless in mid-water. They do not spend the whole session kneeling on the bottom.

nically applying for the job of teaching you to dive. Ask all the questions you can think of and assess the enthusiasm of their response. Do their answers reassure you or do they fill you with further doubts. Does it sound like they care? After all, if they don't have time for you before you've paid for your course, then you cannot expect to receive the attention you need after they have pocketed your money!

Try and get a chance to observe at first hand each instructor's attitude to training and personal dive skills. Ask the instructors if you can attend a swimming pool session as an observer or pay to go out snorkelling on a boat trip when they are teaching or guiding. Do the instructors devote 100 percent of their attention to the divers in their charge? Do you find their personality and approach to work sympathetic? Above all, are they professional?

Professional?

As a non-diver, it may be difficult for you to judge whether dive instructors are being professional or not. Let me

try to help. Here are some things that will strongly suggest that you are in the presence of someone who really knows what they are doing when they are teaching beginners.

- The student divers are wearing equipment and thermal protection that looks similar to the equipment that the instructor is using.
- The student divers are working in pairs when they put their equipment on and take it off.
- The instructor is letting the students work together independently, only intervening when a mistake goes uncorrected.
- The instructor is present ALL the time when the students are in or close to the water.
- The instructor works tirelessly teaching the divers their self-rescue skills, encouraging them to repeat them frequently so they remember them.

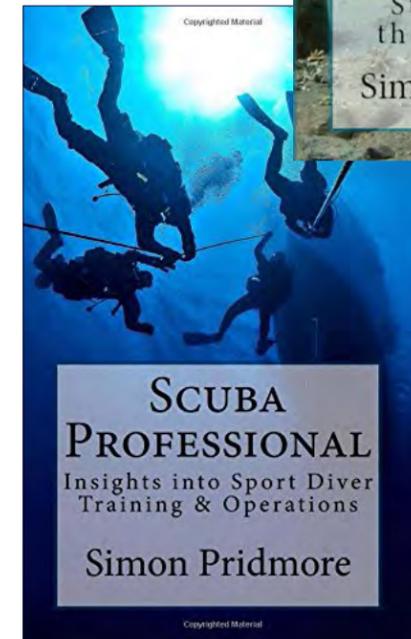
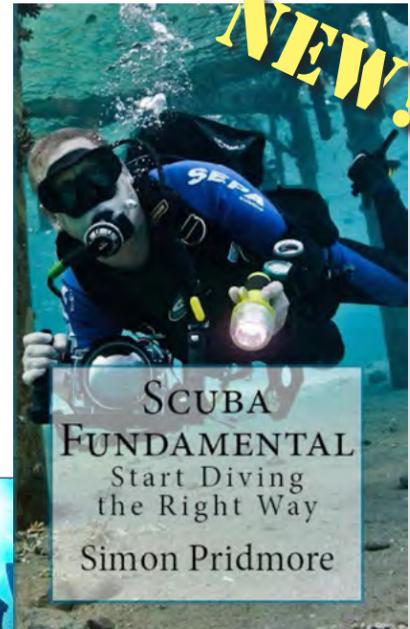
□ The instructor talks to the students in clear language, rather than incomprehensible "scuba-speak."



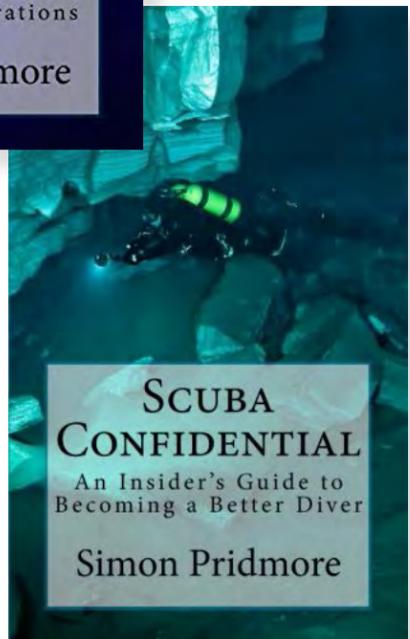
Dive buddies in class learn to help each other

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opinion

Instructor in pool with students



□ The instructor makes sure the students keep their arms tucked in front of them or by their sides when they swim.

□ The instructor is positive at all times. They do not criticise; they do not blame; they do not ignore student questions; they are always ready to explain. They keep moving but do not rush. They do not waste time; they are organised and, if they are teaching more than two students at the same time, they are smart enough to have an assistant on hand to help them.

Currency

This is a key factor that is often overlooked. All scuba instructors can teach people to dive, but not all instructors are used to working with new divers. You should choose someone who has significant recent experience teaching people to dive from scratch.

You want to learn from people who know what they are talking about, but be aware that the length of time that an instructor has been teaching may not always be a reliable indicator of quality. Someone who has been doing the same thing for a long

time can become jaded and set in their ways. A newer instructor may be more enthusiastic, attentive to detail, open to new methods and ready to put in extra time.

Value

Scuba diving courses do not cost the same all over the world. To add to the confusion, you may be quoted prices that vary widely even when you ask around on the same beach or in the same town. How can you ever know if you are getting a good deal?

In the world of scuba diving, rest assured that you almost always get what you pay for. So, once you have found an instructor who seems professional and caring and who you feel is someone you could work well with, pay what they ask. If they seem to be more expensive than others you have found, this is probably because they like to teach classes with fewer students so they can offer more personal attention, are good at what they do and pay their

assistants well. The fact that an instructor can charge more and still stay in business may also mean that your research has been successful and your good feelings about the instructor are well placed.

If, on the other hand, your chosen instructor seems to be offering a cheaper deal than you would expect, check how many students will be in the class and decide if you are comfortable with learning in a larger group. Ask also if learning materials, equipment, boat dives and any extra tuition necessary are included in the price. If you are learning to dive at home, a cheap price is not necessarily a sign of a poor quality course. It may simply mean that the instructor only works in diving part-time or is a dive club volunteer.

If you are shopping for a dive course on holiday, never make your choice simply on the basis of price. A cheap course will always mean rushed lectures, short dive times, a tight schedule and little time for questions, individual

assessment or remedial work. If the course seems cheaper than courses offered elsewhere, it is certain that the instructor will cut corners. You will not notice when this happens or know which corners have been cut.

Learning to scuba dive takes time. Time costs money. The more contact time with an instructor you have, the more in-water time you have, the better the course and the better value you are getting for your money. ■

Simon Pridmore is the author of the international bestsellers, Scuba Confidential – An Insider's Guide to Becoming a Better Diver and Scuba Professional – Insights into Sport Diver Training and Operations. He is also the co-author of Diving and Snorkeling guides to Bali and Raja Ampat and Northeast Indonesia. This article is adapted from a chapter in his new book for not-yet-divers and absolute beginners called Scuba Fundamental – Start Diving the Right Way.

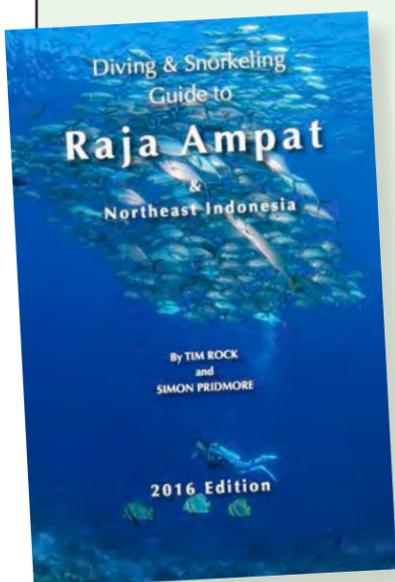
New Dive Guide to Raja Ampat

As part of their series of 2016 Diving and Snorkeling Guides, authors Tim Rock and Simon Pridmore have produced a brand new guide to Raja Ampat and Northeast Indonesia.

Diving or snorkeling in this remote region at the edge of the Pacific Ocean is a life-affirming, bucket-list-topping experience! Abundantly rich in marine life, these seas are proving to be a gift for divers that keeps on giving. Raja Ampat is the superstar destination, but other areas such as Cenderawasih Bay, Triton Bay and Southwest Halmahera are shining brightly

too and acquiring similarly mythical status.

This richly illustrated, detailed and informative guide is the first to cover all of these incredible places! It tells and shows you—the adventurous travelling diver—what to expect from this remote, fascinating and often downright astonishing part of the world. It will help you plan your trip, enhance your experience when you get there and provide you with the best possible souvenir of your visit. Available on **Amazon.com**



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Diving Indonesia's **Dampier Strait**

Text and photos by Don Silcock

— *On Foot in Raja Ampat*





Luscious coral garden on seamount in Dampier Strait (above). PREVIOUS PAGE: Brilliant soft corals under jetty at Arborek Island

Located in the far east of the vast Indonesian archipelago of almost 18,000 islands, Raja Ampat has truly captured the imagination of the global diving community, with tales of the underwater adventures that abound there.

It is one of the hottest locations, and at the start of the main dive season in mid-October, liveaboard dive boats start to arrive in Sorong in droves. In Sorong—the main town of the Bird's Head peninsula—just ten years ago, you could count the number of those boats on the fingers of both hands and still have a few digits

left. But these days, there at least 50 boats operating during the season, and Sorong harbour has become a very busy place!

So popular has Raja Ampat become that there are now boats catering for all levels of diving travellers, from super luxury vessels for which you don't even need to bring any dive gear (they have it all on board for your convenience) to backpacker boats that still get you to the same places, albeit in a slightly different, more economical style.

I have been to Raja Ampat many times over the years, but always on a liveaboard, and am very much of the opinion that it is the only way to get to all the main locations, which indeed it is, given the large area that

Raja Ampat covers. But what if you don't want to, or can't afford to do a liveaboard? Is there an alternative?

On my trips to Raja Ampat, I have seen a significant number of land-based resorts being established offering "local" diving, following the model first established by Max Ammer, the original pioneer of diving in Raja Ampat, with his first dive camp on Kri Island in the Dampier Strait. I was curious to see how land-based diving would compare with the liveaboard-based experience I have had, so when I received an invite from Wicked Diving to try their new dive resort in the Dampier Strait, I decided to accept and see the reality for myself.



Traditional dive boat used in Dampier Strait (above); School of batfish at Cape Kri in Raja Ampat





CLOCKWISE FROM LEFT: Entrance to town of Waisai on Waigeo Island in Raja Ampat; View of Dampier Strait from dive boat; Busy ferry terminal at Sorong; Flanking reef corals

Diving Raja Ampat

— *Some basic geography*
Raja Ampat, or the “Four Kings”, refers to the four main islands of Waigeo,

Salawati, Batanta and Misool, but there are some 1,500 smaller islands in Raja Ampat that make up the total land area of about 15,000 sq km and a total

area of around 40,000 sq km.

You get the picture—it’s a really big place. And to see the incredible biodiversity of the area, you need at least a two-week liveaboard trip to get to the main areas.

Most liveaboards start their trips with a couple of days in the Dampier Strait, which separates the “mainland” and the islands of Batanta and Sulawati in the south from the large northern island of Waigeo. Then they usually head south to the Misool area and the fabulous dive sites on the Sagof-Daram and Southern Archipelagos in the southeast, often breaking their journey to dive the sheltered black sand critter sites on the southwest coast of Batanta.

The Dampier Strait

—*Where it all began!*

Named after William Dampier, the English explorer-adventurer who first charted the area in the 17th century, the Dampier Strait is where the

Indonesian Throughflow first touches land in Indonesia. The Throughflow is the largest movement of water in the world and is the basic reason for the incredible biodiversity of Raja Ampat.

When those huge volumes of water enter the Dampier Strait, they are funneled through its shallower depths producing some very strong currents that surge around the seamounts and reefs of the Strait. The cycle of life those currents create is staggering, and it was the diving in the Dampier Strait that first brought the liveaboards to Raja Ampat—all history now—but it is true that the sites in the Strait tend to get overshadowed by the ones in the south.

So the offer to do some intensive diving in the Dampier Strait was too good to decline and I set off for 10 days in Raja Ampat—by foot!

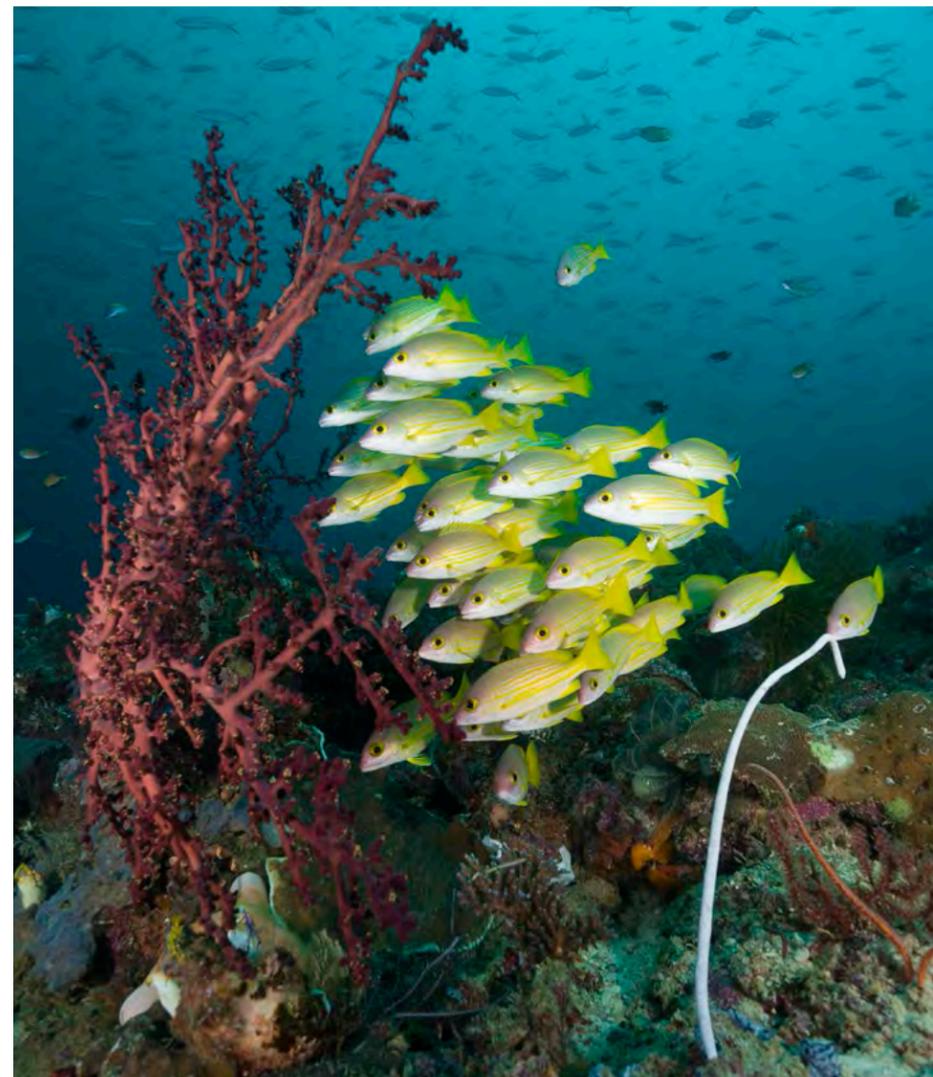
Getting there

I have to admit, it was all quite a bit different from doing Raja Ampat by





Sea fans on seamount in Raja Ampat (left); Whitetip reef sharks rest under ledge of seamount; School of blue-striped grunts on seamount in Dampier Strait (right)



liveaboard in which the hardest part is getting to Sorong, and from there, all the logistics are typically organized for you, and you are whisked away from the airport, either straight onto the boat, or to one of the numerous modern hotels that have sprung up in the last few years.

You can also arrange for the land-based resorts to pick you up, but it's not cheap because of the distances involved. By far, the most cost-effective way is to get the ferry over to Waisai on the island of Waigeo. The ferries operate daily and are quite efficient, but you have to get down to the terminal

to buy your ticket and then get all your gear out to the ferry, which in my case, was quite a task, with full sets of diving and underwater photography equipment—a problem that was quickly resolved by hiring one of the numerous porters who hang out at the terminal.

Although it is the capitol of Raja Ampat, regency Waisai is a fraction of the size of Sorong, but it's a neat and friendly enough place, and Max from Wicked Diving gave me the full 10-minute tour of the town when I arrived on the ferry!

About the dive operator
Co-founded and run by Bali-based

American expat Paul Landgraver, Wicked Diving is an interesting business that focuses on the younger end of the diving spectrum and differentiates itself in a crowded market with its strong focus on what it calls "ethical diving". I was frankly more than a little bit dubious about it, initially, as it sounded like a cute marketing tactic, but it does seem they don't just talk the talk—they walk the walk too! A key element is their "2% policy" whereby 2% of their total revenue is used to help the local communities and ecosystems where they operate. Examples of this include their support of the Baan San Fan Orphanage north of

Phuket in Thailand, as well as the dive guide internship program for villagers in Komodo, Indonesia. They also practice "low impact" diving, which they define as leaving as little evidence behind that they were even there, which is a big topic covering everything from rechargeable batteries to organic biodegradable shampoos.

Diving logistics

Frankly, this was the element of diving the Dampier Strait by foot that I was most concerned about, because the currents generated by the Indonesian Throughflow are complex, and at their strongest, a



force of nature not to be taken lightly!

Diving the Dampier Strait from a well-operated liveboard typically involves it acting as the mother-ship and inflatables acting as tenders to get the divers in the right position to enter the water and then provide surface cover in case something happens. Two tenders are required as a minimum, so that one is always providing surface cover if the other one is picking up divers or returning them to the mother ship.

I was really pleased (and just little bit relieved) to see that the dive staff, led by the highly-skilled Jess Nuttridge from New Zealand, had worked out how to dive the Dampier Strait dive sites using a single small, but manoeuvrable, mother ship. Jess achieved this by

always getting in the water before we did, to survey the currents and position the mother ship in the right location—it worked, and I was impressed.

What will you see?

So, you are finally in Raja Ampat and all set to get into its famous waters. Now, what are you going to see? Well, the correct technical answer is “a lot” because the rich currents of the Indonesian Throughflow produce some of the most stunning biodiversity in the world.

The diving can be segregated in to four main flavours: the incredible sea-mounts in the actual strait, the flanking reefs where the rich currents touch the main islands of the strait, the jet-

ties on the islands that are ecosystems in themselves, and the world-famous manta ray cleaning station at Manta Sandy.

Let me give you a little taste of those flavours to whet your appetite...

Seamounts. Think of these as small underwater mountains that rise up from the seafloor of the Dampier Strait and the eastern sides of which face right into the Indonesian Throughflow. Diving the sea-mounts requires a specific technique, usually referred to as a “negative entry”, whereby you enter the water at least 50m up-current from the eastern side and get down straight-way.

If you dilly-dally about on the sur-

Yellowmask surgeonfish on seamount (above); Batfish tumbling in strong currents (top right); Sea fans prolific fish life at Cape Kri (top left)





CLOCKWISE FROM LEFT: School of grunts over leather coral (left), moray eel and wobbegong shark (top left), and luscious corals on flanking reef (above); Always use a safety sausage when diving seamounts (right)

current hits the centre of the eastern side, but which varies on the state of the tide.

On the split point, the current is negligible, and you can relax and enjoy the show because out in front of you in the current, you will see nature at it's very best as the pelagics hunt, swoop, dodge and weave! If you stray north or south from the split point, or start to ascend, you will feel the current ramp up. And if you continue, it becomes

The trick is to time your dive and air consumption so that you can sweep past the flank of the seamount and get to the calm western side to safely conduct your safety stop and regain your composure before surfacing. Never dive a seamount without your safety sausage—it could save your life if you screw up and get swept out into the Dampier Strait!

Flanking reefs. There are many of these in the Dampier Strait—some are great, most are good and some less so. The best, in my opinion, is Cape Kri, at the eastern tip of Kri Island. This is basically where diving began in Raja Ampat, with Max Ammer and his early beach-



camp. It's also where the renowned American-born Australian ichthyologist, Gerry Allen, counted a world record number of 374 different species in a single location in April 2012.

face, the current will sweep you past the site, as its velocity increases exponentially the closer it gets to the seamount. The

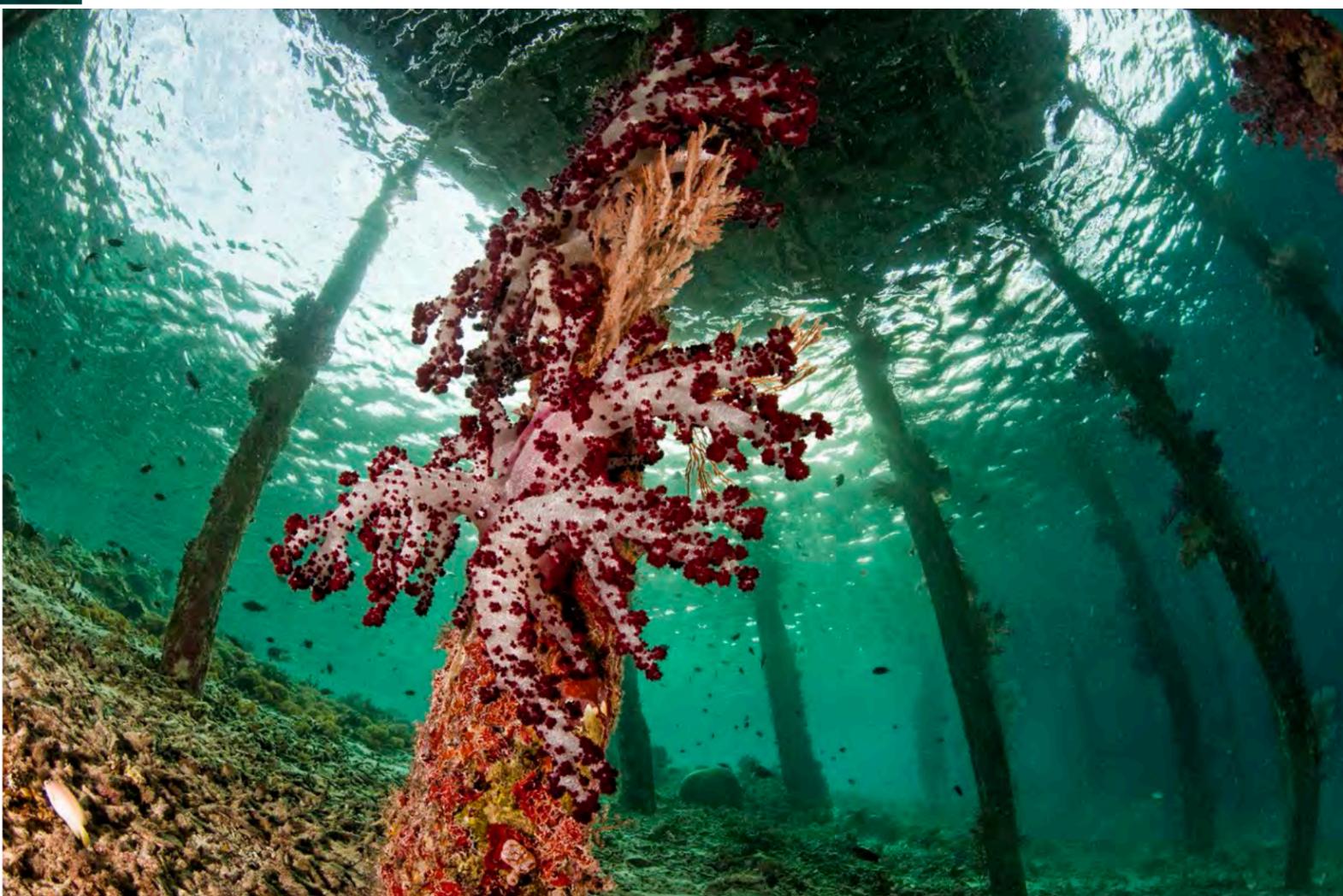
key to safely diving the seamounts and being able to enjoy the experience is to find the "split point"—this is where the

impossible to swim against, and you will have to surrender and (literally) go with the flow.





Dampier Strait



THIS PAGE: Scenes from the jetty at Arborek Island; Local kids hamming it up for the camera under the jetty (top right); Brilliant soft corals decorate the pylons of the jetty at Arborek (right)

The biodiversity at Cape Kri is absolutely stunning to see, and it seems that everywhere you look, there is something incredible to see—from schooling pelagics out in the blue to grey reef sharks patrolling the reef, with superb coral bommies all the way down the flank. To observe all that biodiversity in one location makes you realize just what an amazing place Raja Ampat is!

Jetties. There are many jetties in the Dampier Strait. There has to be, because boats are the principle form of transport. Quite why they attract so much marine life is not clear to me, but they are almost always great places to dive and explore. They also provide great photo-opportunities with the village kids, who always seem to gravitate there after school and use them as diving platforms.

Once the kids know that you want them to swim down and pose for you, they do so like playful seals trying to outdo each other by “hamming it up” for the camera, which makes for a lot of fun all round! The kids love nothing more than seeing the images taken of them, and on one trip, we even got some prints done and got the boat to deliver them the next time they visited.

The most well-known jetty is at the island of Arborek, at the western end of the Dampier Strait, which is famed for the soft coral growth on its pylons and the schools of fish that live under the jetty. But there are several others that deserve a visit, and a couple of my personal favorites include Sayandarek, where the schooling batfish offer some great wide-angle photo-opportunities, and Szonic jetty where there are many macro encounters if you take the time to search in the sea-grass that abounds there.





Dampier Strait



Manta Sandy. This site is a cleaning station, where reef mantas congregate in the morning to have their parasites removed, and is probably the single most reliable place to see these wonderful creatures in all of Raja Ampat. It is located at the western end of the Dampier Strait, not far from Arborek Island, and is on the southern side of the large reef that separates it from the much larger Mansuar Island.

I like to think of cleaning stations as the underwater equivalents of demilitarized zones where the normal dog-eat-dog (should that be fish-eat-fish?) rules of the reef are put on hold, while small cleaner fish are allowed to feast on the parasites that infest larger creatures.

At Manta Sandy the DMZ is a group of small bommies in a channel that runs parallel to the reef. Mantas start to gather there from around 8:00 most mornings—taking turns to hover above the rocks while the cleaner fish swim up in pursuit of the parasites.

The site is very popular, and to ensure the presence of so many divers does not drive away the



THIS PAGE: The cleaning station at Manta Sandy is a popular and reliable place to see manta rays.





Dampier Strait

mantas, a strict demarcation code is in place using a line of rocks laid out in about 16m of water.

The rocks are close enough to the bommies to allow divers to observe and photograph the mantas, but far enough away to allow them to be cleaned in relative peace. The thing to do is get yourself in position somewhere along the demarcation line where you can comfortably hold on against the currents and then wait.

The site is fairly shallow and so bottom time is not an issue. As the mantas complete their cleaning rituals, they often come and check out the waiting divers, with some upfront and personal interactions.

So is walking a real option?

My honest opinion is yes, it is, and I think that land-based diving in the Dampier Strait has some distinct advantages in that most of the best sites are relatively close together, so getting to them is not a big deal.

Not having the option to dive the reefs down south in Misool, or some of the other equally great sites that Raja Ampat has to offer, means that you are focused on the sites in the Dampier Strait and many of these are truly world-class, but tend to be skimmed upon when diving from a liveaboard.

Land-based diving is also typically cheaper than a liveaboard. Plus, you

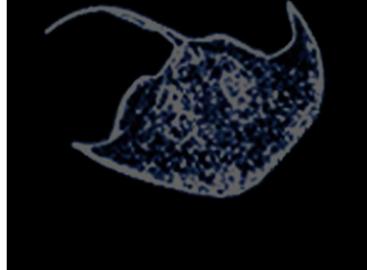
can select the number of diving days that best suits both your schedule and your budget, rather than be held to the fixed duration of most liveaboards. But if you are going to travel all the way to Sorong to dive the Dampier Strait, do yourself a favour and allow enough time there to do it justice, which I would say is a minimum of six days in the water. ■

Don Silcock is a Bali-based underwater photographer and writer whose principal focus is the diving and cultures of the Indo-Pacific region. His images, articles and extensive location guides can be found online on his website Indopacificimages.com.

Brightly colored soft corals on flanking reef in Dampier Strait; Sea fans on reef at Cape Kri (top left)

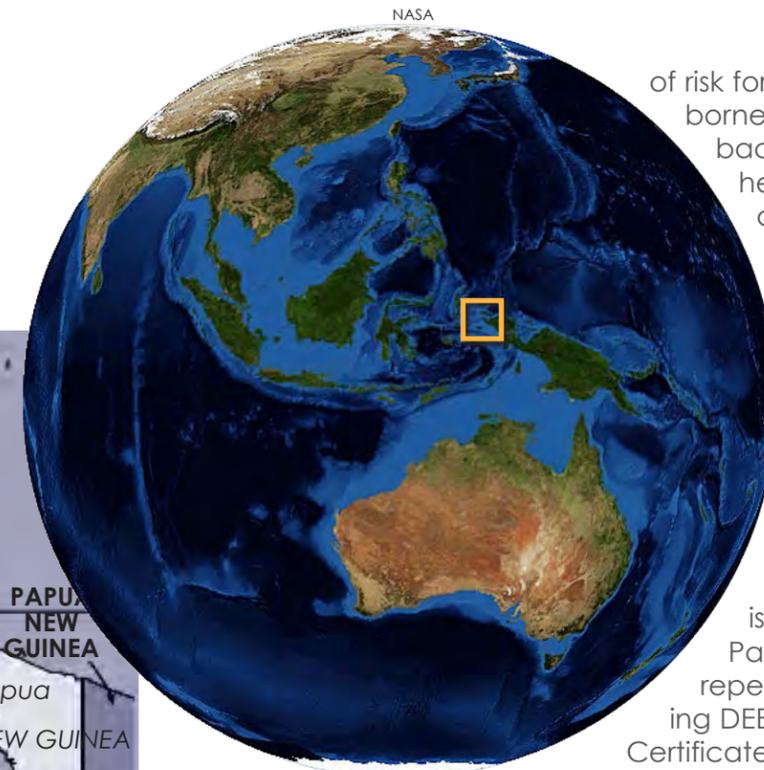


fact file



SOURCES: U.S. CIA WORLD FACTBOOK, WIKIPEDIA, INDOCRUISES.COM, MARK ERDMANN

Raja Ampat, Indonesia



of risk for food or water-borne diseases, such as bacterial diarrhea, hepatitis A and E, and typhoid fever, as well as vector-borne diseases such as chikungunya, dengue fever and malaria. Check with WHO or your dive operator for prophylaxis recommendations. Larium is not effective in Papua. Bring insect repellents containing DEET. International Certificate of Vaccination required for Yellow Fever if arriving from infected area within five days.

History Humans first settled New Guinea at least 50,000 years ago, when it was connected to Australia by a land bridge. A British attempt at colonization in 1793 colony was evacuated within two years. The Dutch were next, proclaiming in 1828 that the natives of the western half of New Guinea were to be subjects of the King of the Netherlands. They opened Fort du Bus to protect their lucrative trade with the spice islands from other European powers, but abandoned the area after only ten years. No continuous settlement was established in West Papua until 1897, and no substantial development was undertaken within the country until the 1950s. From 1942 to 1945, Japan occupied Indonesia. In 1949 the Dutch ceded sovereignty of Dutch East Indies to the Indonesian Republic, but excluded Dutch New Guinea (West Papua). A long and tortuous history followed. The controversial West Papuan version can be examined at www.newint.org/issue344/history.htm. Strife continued in Indonesia's unstable parliamentary democracy until President Soekarno declared martial law in 1957. Soekarno was removed from power following a fruitless coup in 1965 by alleged Communist sympathizers. President Suharto ruled Indonesia from 1966 until 1988. Suharto was

toppled in 1998 following a round of riots, and in 1999, free and fair legislative elections took place. Indonesia is the world's third most populous democracy, Government: Republic. Capital: Jakarta. Note: Papua is one of 27 provinces with its capitol in Jayapura. As of late 2004, Raja Ampat has a separate district government.

Geography Located in Southeastern Asia, Indonesia is an archipelago situated between the Indian and Pacific Oceans. Coastline: 54,716km. Terrain consists primarily of coastal lowlands, with interior mountains on larger islands. Raja Empat is the most western district of the Indonesian province of Papua. Raja Empat consists of four major islands off the west coast of Bird's Head Peninsula of New Guinea Island, the western half of which is Indonesia and the eastern half, Papua New Guinea. The province was formerly called "Irian Jaya".

Climate Tropical, hot and humid, with more moderate climate in the highlands. The water

temperature is normally 28-29°C (84-86°F) year round, with an occasional "chilly" 27°C (82°F) spot. Most divers use 1mm neoprene suits. However, some people prefer 3mm.

Environmental issues Challenges include industrial waste water pollution, sewage, urban air pollution, deforestation, smoke and haze due to forest fires. Logging—the rainforests within the combined West Papua/Papua New Guinea land mass are second in size only to those of the Amazon, making it 'the lungs of Asia'. In 2001, there were 57 forest concession-holders in operation around the country and untold other forest ventures operating illegally. Mining—tailings from copper, nickel, and gold mining are real threats.

Economy A vast polyglot

nation, Indonesia has experienced modest economic growth in recent years. Economic advances were made with significant financial reforms. In 2009, when the global financial crisis hit, Indonesia fared well compared to its regional neighbors. It was one of the only G20 members posting growth in 2009, alongside China and India. However, the government still faces ongoing challenges of improving the country's insufficient infrastructure, labor unrest over wages, and high oil prices affecting fuel subsidy programs.

Currency Indonesian rupiah (IDR). Visa cards, Euros and U.S. Dollars (large bills issued after 1999) are widely accepted. ATM machines in tourist areas offer the best exchange rates, Travellers cheques are becoming quite difficult to use except at banks.

Exchange rates:
1 EUR=12,723IDR;
1 USD= 9,737IDR;
1 GBP=15,127IDR; 1 AUD=
9,972IDR; 1 SGD= 7,908IDR

Population 251,160,124 (July 2013 est.) Papua Province: 2.5 million—1.5 million of which are indigenous people. Ethnic groups: Javanese 40.6%, Sundanese 15%, Madurese 3.3%, Minangkabau 2.7%, Betawi 2.4%, Bugis 2.4%, Banten 2%, Banjar 1.7% (2000 census). Religions: Muslim 86.1%, Protestant 5.7%, Roman Catholic 3%, Hindu 1.8% (2000 census). Note: Indonesia is the largest Muslim country in the world. Visitors are encouraged to respect local tradition and dress modestly. Internet users: 20 million (2009)

Language Bahasa Indonesian, plus 253 tribal languages. West Papua and its neighbour, Papua New Guinea, contain 15% of all known languages. English, Spanish and German are spoken on dive liveaboards.

Health There is a high degree

Decompression chamber Raja Ampat has a new chamber at Waisai (capital city on south side of Waigeo near Dampier Strait). The next nearest chambers are on Sulawesi: Manado: Malalayang Hospital tel: +62 0811 430913 Makassar: Rumah Sakit Umum Wahidin Sudirohusodo tel: +62 0411 (584677) or 584675

Travel/Visa/Security Passport valid for six months beyond intended stay is required. There is a Visa-On-Arrival for 35 countries including USA, UK, most European and Asian countries. It is US\$25 for a stay of up to 30 days. To enter Papua, you need a surat jalan, which is issued by the local police, and arranged by your dive operator. Although there is an active independence movement in Papua, tourists have not been impacted.

Web sites Indonesia Travel www.indonesia.travel/en

shark tales



Great white shark during a cage dive in South Africa

Text and photos by Brandi Mueller

It was seven in the morning and my coffee hadn't kicked in yet. The dive guide was giving me a slightly more thorough dive briefing than normal. I wasn't supposed to wear anything colorful or shiny and black gloves and a hood were required. Also covered in black neoprene, he was putting on chainmail gloves and told me he'd have a pole with him. He said it was more for the potato cods though, not the sharks.

Taking a giant stride off the back on the boat, the chill of the water snapped me out of my early-morning haze. Below me, the sharks were already there; at least ten were circling below the boat. The food wasn't even in the water yet, but the sharks knew the drill: The boat shows up, divers jump in, and eventually, they get a snack.

Settling into a rocky area where I could stabilize myself to photograph without damaging coral, I looked around and noticed the sun shining through the water, casting a soft yellow glow on the reef. Ten or so sharks had been hanging around, but as soon as the small metal container with the delightfully smelly

shark snacks was placed, the sharks seemed to emerge from everywhere.

Controversy

Debates about shark feeding are endless, with passionate people on both sides. Those for feeding talk about how diver interaction with sharks will help sup-

port a positive image of sharks instead of the aggressive, man-eating image created by movies and television. On the other side, those against wonder about the effects these practices have on sharks' natural behavior. They also point out that having divers and sharks in such close proximity with food is bound to

eventually lead to accidents.

There is no doubt that observing wildlife in their natural habitat usually leads to people to take an interest in that animal. We care about what we know and what we have seen. Those lucky enough to see sharks in the ocean connect with them and are more likely to share their

experiences and find out more about what they observed.

This is where conservation starts. People are less likely to make an effort to protect something they have never seen.

Reversing the fearful public opinion of sharks begins with education, and some of the best education comes from pho-



To Shark Dive or Not to Shark Dive

— *The Controversy Around Shark Feeds*





Shark Feeds

business. Shark feeds (and scuba diving) promote tourism, and in many areas, create an important source of income for poor countries. Research has been done showing that a shark is worth far more in the ocean than it is being served up in shark fin soup. But shark feeds are still creating an unnatural experience, and whenever something becomes a business and money is involved, standards of safety for the sharks and for the environment may fall to the wayside when money becomes the driving force.

Changing shark behavior?

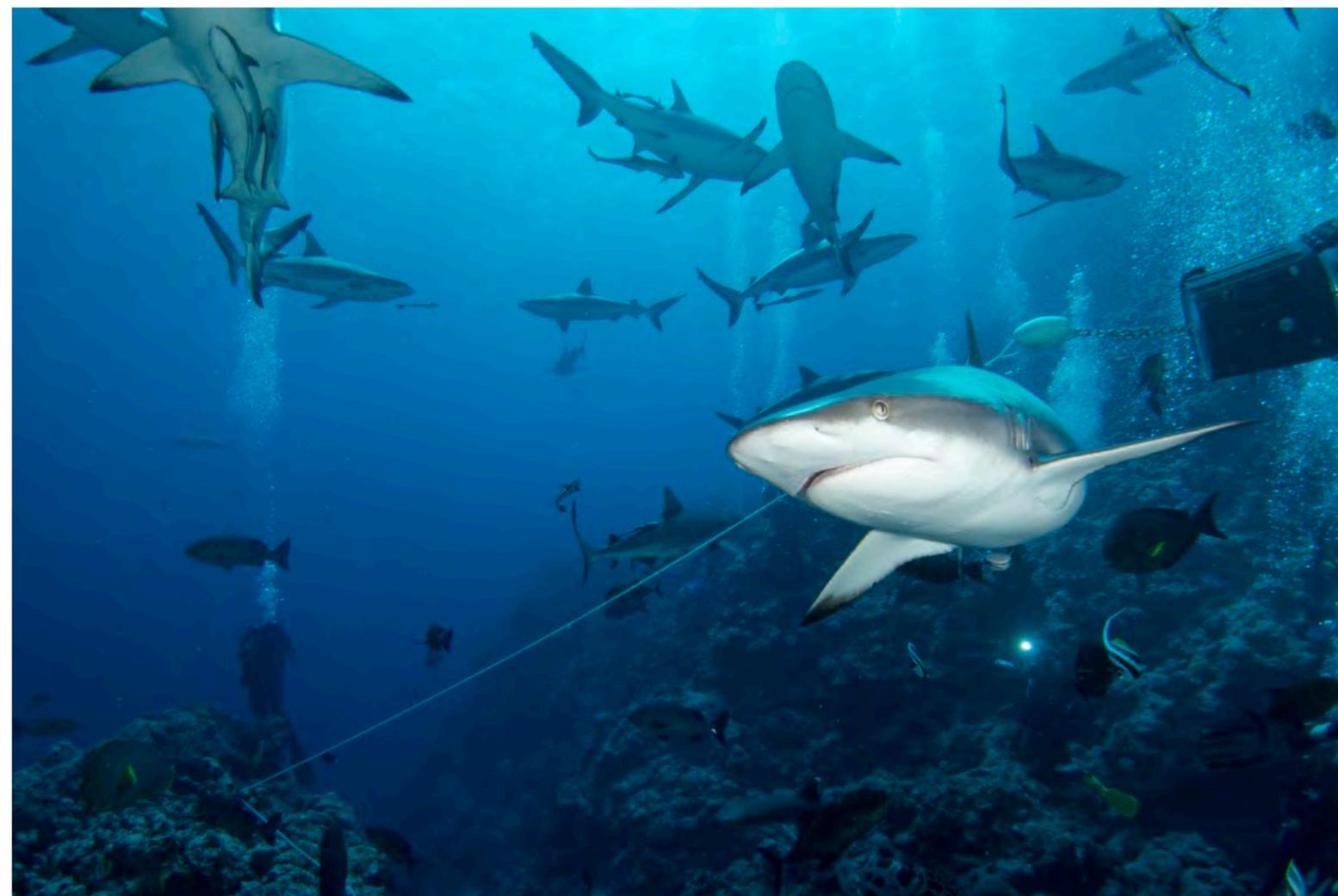
Some of the biggest and most

important questions concern whether or not we are changing shark behavior with shark feeds. I personally feel that they must have some effect on shark behavior. Sharks at dive sites, which frequently have feeds, arrive like Pavlov's dogs, just from hearing the sound of boats showing up. They are exhibiting a learned behavior, but I don't necessarily think it is detrimental to the sharks. Sharks are quite smart and appear to learn quickly.

Sharks have been using humans to get free meals (of fish) whenever they can. Fisherman, for centuries, have seen sharks following fishing boats, and sharks learn to

follow spear fisherman underwater, to try and steal a meal someone else caught.

There is some question of whether or not sharks become dependent on the feeds for survival, but during most shark feeds there are many sharks present and only a small quantity of food, so there is no way that all those sharks are using it as their only food source. In some places, shark feeds only occur a few times a week, with as many as 50 sharks showing up for one fish head. That one small bucket of food is not enough to satisfy even one shark, so it is unlikely sharks are losing their predatory instincts



THIS PAGE: Scenes from shark dive at Osprey Reef, Great Barrier Reef, Australia

tographs and real-life stories of experiences with sharks. When a group of divers see sharks in the ocean, they will go back home with their photos and videos (and all their limbs) and tell their friends and family that the sharks did not even notice they were there; the sharks were only after the shark food. This information then spreads to others, by those people relaying stories to more people about sharks not being deadly human predators.

Some argue that the stories brought back are still of fear and negative images of sharks. When a bait bucket is opened, there is nothing sweet or cute about the way the sharks go after the food, nor will photos of tiger and great white sharks probably ever be depicted as "friendly" or "lovable."

Not to mention, friends love a good thrill story about how you weren't devoured by 50 sharks in a feeding frenzy: "We dove with tiger sharks and lived to tell the tale"—these stories are still laced with fear and elude to survival of a scary event, when in reality, it wasn't scary at all.

We hope that our photos of these apex predators will help show other people that sharks are not predators of humans—but they don't often do that. So are we really changing perspectives? Shark conservation is good



Sunsets and smiles included dive vacations!

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shark tales

A diver takes photos of a great white shark during a cage dive in South Africa (right); Shark dive in Turks and Caicos (below)



Shark dive at Osprey Reef, Great Barrier Reef, Australia



or ability to hunt on their own. The shark feed is really more of a snack.

Other issues include the potential for shark feedings to lead to an increase in aggressiveness towards humans, or that sharks may become too comfortable around humans and boats, associating the two with being fed. It may be dangerous to humans to encourage these apex predators to associate people and food. But so far, this has not been documented.

Shark attacks rarely happen on scuba divers, because sharks can fully see what they are (i.e. not their prey). Shark attacks on humans are almost always due to misconception. Sometime when you are underwater, look up at the surface on a sunny day; a snorkeler or a surfer is easily mistaken for a seal flailing around in the glare.

The right way

Just like any activity, there's a right way and a wrong way to do it. Dive operators, scientists and shark divers have come up with some recommended guidelines to keep both divers and sharks safe. Some of these recommendations include not chumming on the surface or around boats; not feeding by hand; not handling the sharks; and not taking fish for the feeds from the reef or inshore areas. In some places, invasive lionfish are being used for shark feeds, which both helps to rid the reef of lionfish and does not deplete the reef of other fish for the activity.

Other recommendations address the best locations to do shark feeds. The area should be coral rubble, or sandy, and be able to handle a large amount of divers, without being destructive to healthy

reefs. Putting mooring buoys in place so boats do not have to anchor and minimizing the number of feeding sites and how often they occur, helps minimize any destructive effects shark dives may have.

Dive operations that offer shark feeds are in a unique position to have access to many people who care about sharks and can use that access to promote shark awareness. This puts them in a unique position to help with shark conservation, both by raising awareness among their customers and by being able to spread shark and ocean education to the community living around the shark feeding areas.

Divers who want to partake in shark feeds should do their homework first. Research tour operators and find out how long they have been in business; how long have they been doing shark



shark tales



Shark Feeds

Shark dive in Turks and Caicos (left); Shark dive at Osprey Reef, Great Barrier Reef, Australia (above)

dives; how the dives are done; and if possible, read reviews from former customers. Support companies that believe in shark education and conservation. Do not dive with companies that are not putting the sharks first.

My dive

As the gray reef sharks circled around us, I could not help but be amazed at the sheer beauty of these animals. I perched myself on a rock quite close to where the food was, and the sharks came extremely close, for almost an hour. It was clear the sharks had no interest in us. They moved around us to get closer to the food, but did not even seem to pay attention to our presence there.

Back on board, we raved about how many sharks there were, how close they got, how sleekly beautiful they are, and also how they

had no interest in us whatsoever. They only cared about the food, and once that was gone, so were they. A few were seen swimming along the wall, typical of most of our dives at this site, but most disappeared back into the blue. The show was over, and the sharks knew it too.

Our group dive was a typical example of how shark feeds can be a positive experience and beneficial to shark reputation, and thus, conservation. We were 12 divers, almost all armed with cameras, taking hundreds of stills and videos. We would share that media with our friends and families, and in turn, they would tell stories of how they knew someone who dived with sharks and "didn't get eaten." Then, this story would keep spreading. This is how the negative reputation of sharks can be changed—one diver at a time.

you to dive with operators who care about the sharks, the divers and the marine environment. Do your research, and if you see something that does not seem right, say something. Usually, dive guides and shop owners want to protect the environment too (they were new to shark diving once, too) and a suggestion might lead to better practices, which leads to better experiences for everyone. Do not underestimate the power of the consumer, because if we do not say something, who will?

Brandi Mueller is a PADI IDC Staff Instructor and boat captain living in the Marshall Islands. When she's not teaching scuba or driving boats, she's most happy traveling and being underwater with a camera. Visit: Brandiunderwater.com.

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shark tales

Magnuson-Stevens Fishery Conservation & Management Act §1866 Shark feeding

Except to the extent determined by the Secretary, or under State law, as presenting no public health hazard or safety risk, or when conducted as part of a research program funded in whole or in part by appropriated funds, it is unlawful to introduce, or attempt to introduce, food or any other substance into the water to attract sharks for any purpose other than to harvest sharks within the Exclusive Economic Zone seaward of the State of Hawaii and of the Commonwealths, territories, and possessions of the United States in the Pacific Ocean Area.



Attracting tiger sharks with bait, as seen here at Bahamas' Tiger Beach, is about to become unlawful in all the United States

US Congress moves to ban feeding and "attracting" sharks, unless you're an angler

A bill that would ban divers from feeding sharks in US waters has been introduced in Congress.

On 23 June 2016, US Senator Bill Nelson introduced a bill aimed at preserving and enhancing saltwater fishing opportunities for recreational anglers, and for other purposes, called "Access for Sportfishing Act of 2016". Among other provisions the proposed act amends to the 2010 Shark And Fishery Conservation Act making it unlawful for any person:

- (1) to engage in shark feeding.
- (2) to operate a vessel for the purpose of carrying a passenger for hire to any site to engage

in shark feeding or to observe shark feeding.

Attraction prohibited

The act defines the term "shark feeding" as the introduction of food or any other substance into the water to feed or attract sharks for any purpose other than to harvest sharks.

Exceptions

Any incidental feeding or attracting of a shark in the course of educational or scientific research conducted under a permit issued by the Secretary of Commerce or lawful fishing under the Magnuson-Stevens Fishery Conservation and Management Act shall not be considered a violation of this section.

In Florida, feeding fish, sharks, or other marine species while diving

or snorkeling is already prohibited. It is also prohibited to operate a boat that is hired to carry passengers to any area within state waters to feed marine species or view marine species feeding. The Fish and Wildlife Conservation Commission states that these regulations were developed out of concerns for the safety of divers, surfers and swimmers and the effects of concentrating and training sharks to associate humans with food.

Anglers may, divers not

"Chumming" or feeding fish for the purpose of harvesting marine species as otherwise allowed by FWC Commission rules is, however, permitted. In other words, it is okay if you are going to kill the shark but not if you just want to have a closer look. ■



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River Snorkeling in
Austria

Text by Arnold Weisz. Photos by Franz Hajek,
Armando Piccinini and Arnold Weisz

feature

On a hot summer day, the cool temperature of the river is refreshing (right).
PREVIOUS PAGE: Along the trip, river snorkelers enjoy underwater canyons and natural waterfalls

Curiously enough, I recently had one of my best snorkeling experiences far away from the ocean. River snorkeling in Austria was a really fun experience, even for a seasoned diver.

When the sun shines from a clear blue sky and the thermometer reaches a simmering 34°C, there is not really much else to do than to get into the water as soon as possible. So, we were in the middle of Austria, more accurately by the River Traun in Upper Austria—eight people, neoprene dressed and full of expectations, standing on a cliff about three meters above the River Traun, getting ready to jump. This was the spectacular start of a 1.5-hour snorkeling trip in refreshing crystal clear water.



Austria



FRANZ HAJEK / ATLANTIS QUALIDIVE

Freshwater crayfish are found in Austrian rivers

FRANZ HAJEK / ATLANTIS QUALIDIVE

Refreshing

On a hot day like that, it is rather refreshing to feel the 19°C water leaking into one's semi-dry suit, as you hit the water.

The short walk down to the river from the dive center and the sub-

sequent 10-minute instructions from the tour guides made everybody forget any hesitation about jumping off a cliff. When our team of snorkelers had their masks and snorkels in place, we followed the guides and headed down the river.

At the beginning of the dive, the river cut its way through a canyon, with natural waterfalls. The first stop was at a spring water source, where the water was drizzling out of the porous rock. It was our last chance for refreshment, our guide

exclaimed, before he took a big slurp of the pristine spring water.

Like pearls on a string, our group of colorful, neoprene-clad creatures paddled our way to a waterfall where we again gathered around the guide. Even though it was dif-





Beautiful terrain above and below the water line (left) where canyons with deep ravines, huge boulders and river bottom covered in light pebbles can be enjoyed



FRANZ HAJEK / ATLANTIS QUALIDIVE

FRANZ HAJEK / ATLANTIS QUALIDIVE

difficult to hear him, with the noise from the falling water, we still understood that we should try diving into the waterfall, before we headed further downstream.

During the first part of the trip, we glided slowly through the canyon with deep ravines, huge boulders and a bottom covered with light pebbles. Now and then, some of my snorkeling buddies popped their heads out of the water, bubbling over with joy and rambling on about all the fish they observed.

Rapids

Rapids are a natural part of many rivers and our snorkeling trip had to pass a couple of them. No worries, the guides were experienced and knew when we could pass the small rapids safely, or if we needed to bypass them on land. Before sending us through the rapids, the guides gathered all the snorkelers in calm water and explained the safest way to swim through them.



ARNOLD WEISZ



FRANZ HAJEK / ATLANTIS QUALIDIVE

Guide briefs snorkelers (left); Snorkeler diving into a waterfall (above) and down rapids (top right)





Jumping off a cliff into the river (left) is an exciting way to start the snorkeling trip! Snorkelers glide down the river on the current (below)

station, explaining that from here to the exit point it is all about speed and not observing nature. Moreover, that the water, which comes out of the power station, was a good three to four degrees warmer than the river we had been snorkeling for a little more than one hour. Thus, for those who were getting a bit cold during the last 20 minutes, the final part would be more pleasurable.

The final advice given was that we had to enter the outflow from the channel with three to four hard kicks, to enable us to get into the middle of the current. As

said, it was done, and suddenly I found myself in a natural waterslide, gliding quickly down the river. What a ride! Just a few kicks with the fins now and then kept me heading in the right direction of

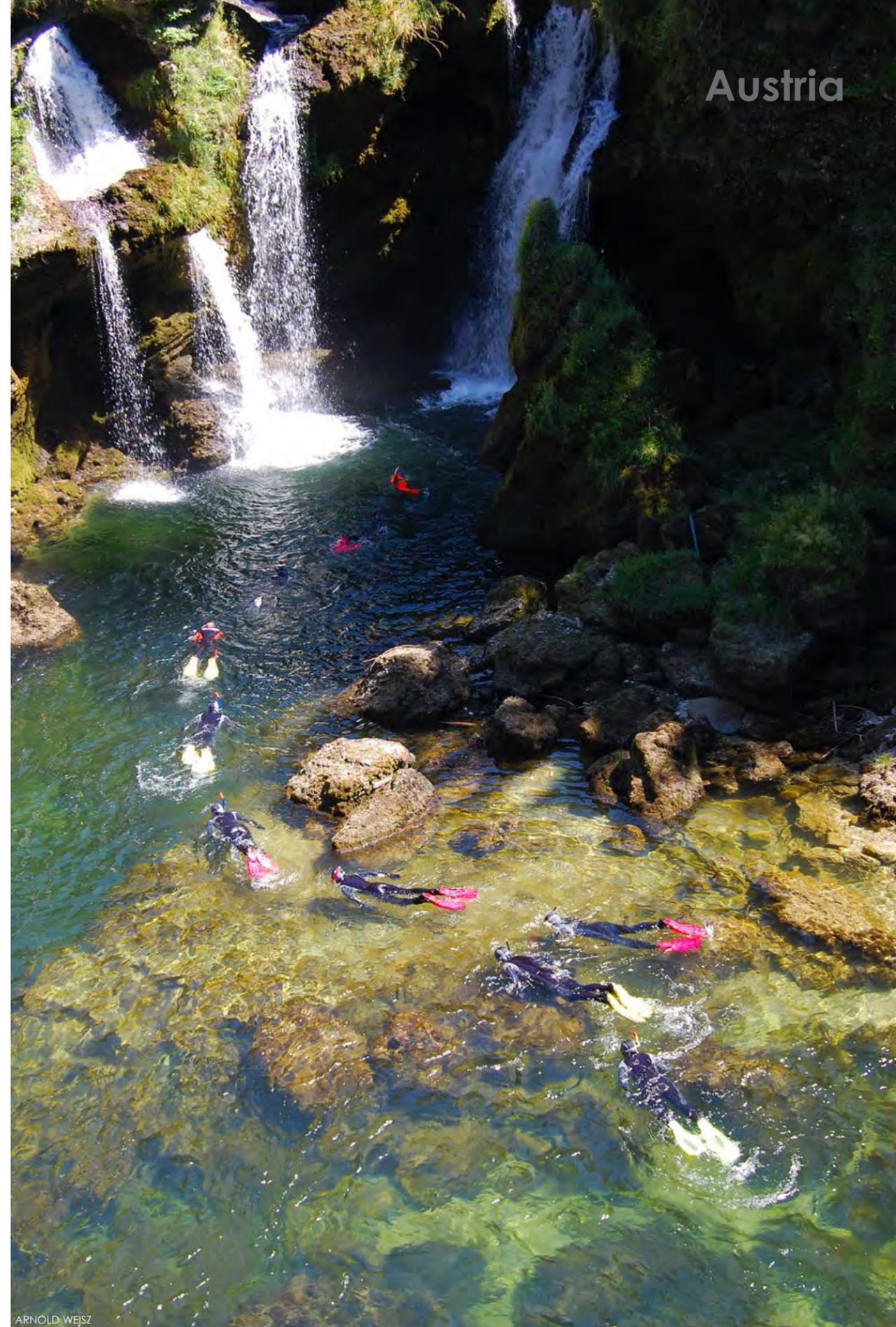
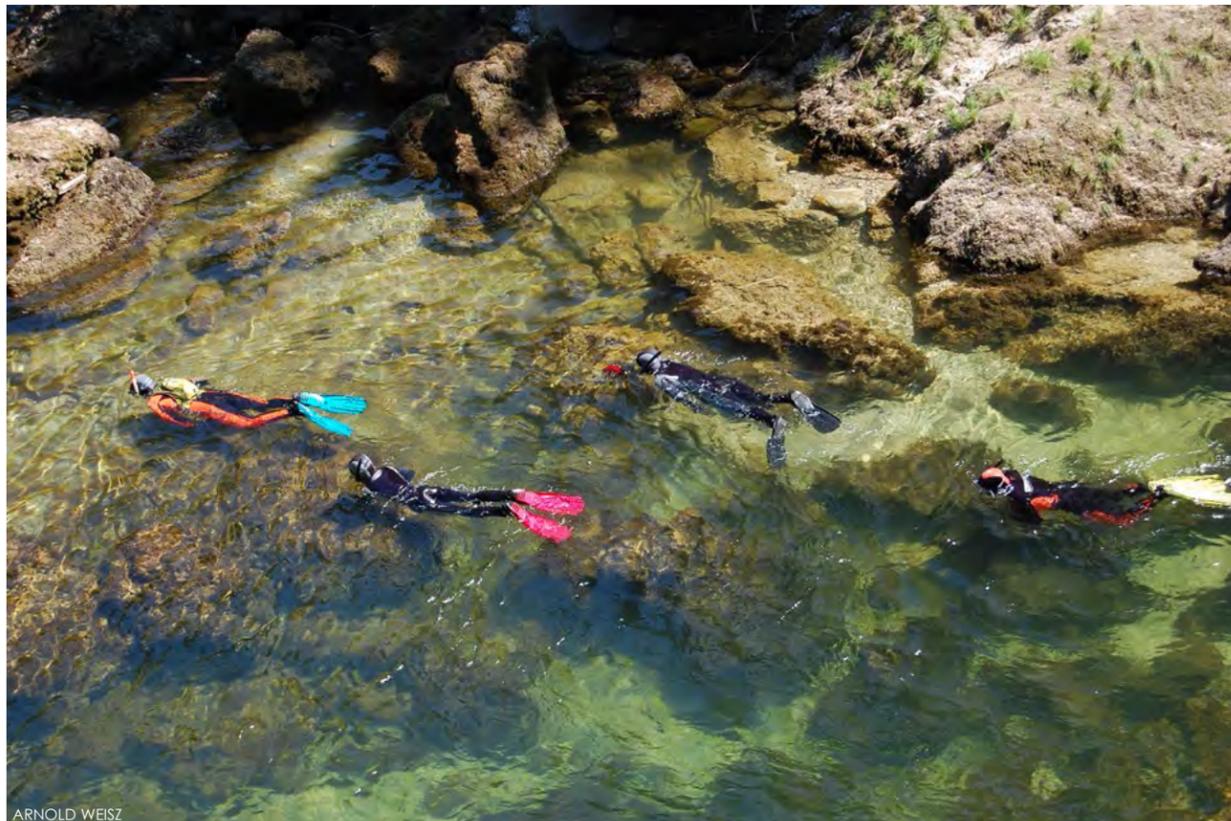
Receiving the OK sign from everyone, we soon glided into the current with our arms stretched out in front of us as bumpers, speeding through the rushing water. Flowing with the rushing water between the rocks delivered a welcome adrenalin rush. All too soon, we glided slowly through calm water again.

Speed snorkeling

For the final part of the snorkeling trip, we reached a wider stretch of the river. The guides gathered the group for a last briefing near an outlet from a power

Underwater landscape

Even though the river snakes through a beautiful, lush green landscape, the underwater landscape attracted our full attention. The underwater landscape of the Traun varies between 30cm shallow pools, to four to five-meter-deep gorges and large boulders. It was an exciting, and for many, a completely new world that appeared beyond the dive mask. Here and there, we passed pot-holes, small caves and sunken tree trunks. In the current, we saw plenty of trout, and the calmer water was perfect for perch. All along our trip, we observed crayfish.



ARNOLD WEISZ

Snorkelers head to a bend of the river with several waterfalls

ARNOLD WEISZ





ARNOLD WEISZ



ARNOLD WEISZ

Atlantis Qualidive in Desselbrunn, Austria, offers river snorkeling trips

travel.

As the river wound its way through a flatter landscape, the current lost some of its force. The guides ended this fantastic snorkeling trip



ARMANDO PICCININI / ATLANTIS QUALIDIVE

Various freshwater fish like carp, trout and perch can be found along the river

A great activity for families, anyone, as young as eight, who can swim can participate in river snorkeling trips.

Austria

by waving us onto a gravel beach, were we removed our fins and masks. We all sported happy faces as we hiked a couple of hundred meters up to the minibus, which brought us back to the dive center.

Some of the group had previous snorkeling experiences. For others, this was their first time. Nonetheless, the entire group was happy, giving our guides a big thumbs-up.

Family fun

Anyone who can swim can join Atlantis Qualidive's snorkeling trips. Depending on the water flow, weather and qualifications of the snorkeler, there are five different trips available. Check with the dive center to find out when they are running these trips. This is the perfect activity for the whole family as children from eight years old and up can take part. If you are a certified snorkeler or scuba diver, just show your certificate and you can join the trip. Others need to make a one-hour snorkeling course in calm water near the diving center, for an extra cost, before they will let you down the river. You can hire all the necessary equipment (neoprene suit, mask, snorkel and fins) on site.

Dive operator

Atlantis Qualidive (Flusstauchen.at) is a full-service scuba center and offers a range of different scuba dives, guided and unguided. Their website is only available in German, but don't let that put you off. The owner Franz Pramendorfer and his staff speak English. Franz is very experienced and started his diving career as an instructor in Egypt back in 1990. The in Austria center has been around since 1993.

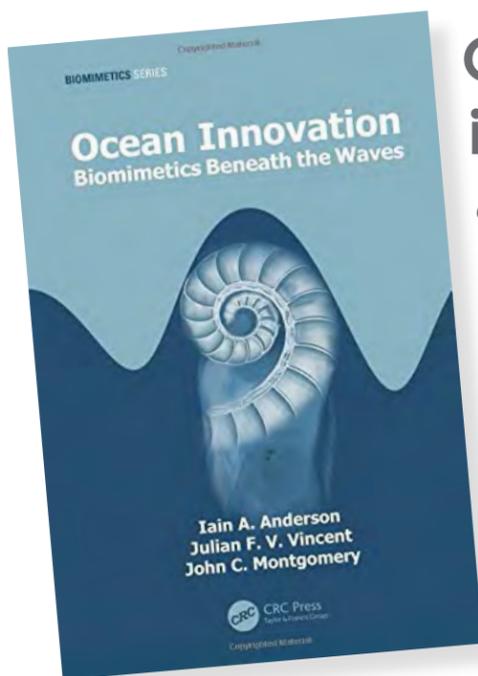
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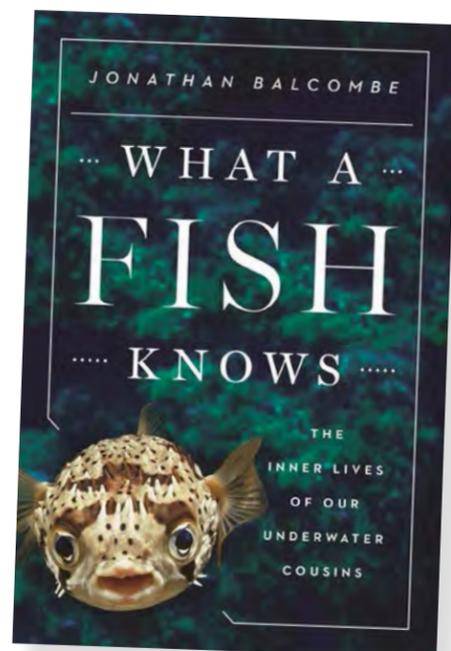
Ocean-inspired

Ocean Innovation: Biomimetics Beneath the Waves, by Iain A. Anderson, Julian Vincent, John Montgomery.

Biomimetics involves designing new technologies derived from models and systems found in biology. This book draws inspiration from the biodiversity found in the marine world, bringing

a biological and engineering perspective to this subject. Questions like how we can mimic the sensory system of sea animals to improve the way we navigate underwater, and how we can diffuse oxygen from water to enable deep diving are examined. Each chapter contains case studies that show how natural solutions can be applied to solve our own engineering challenges.

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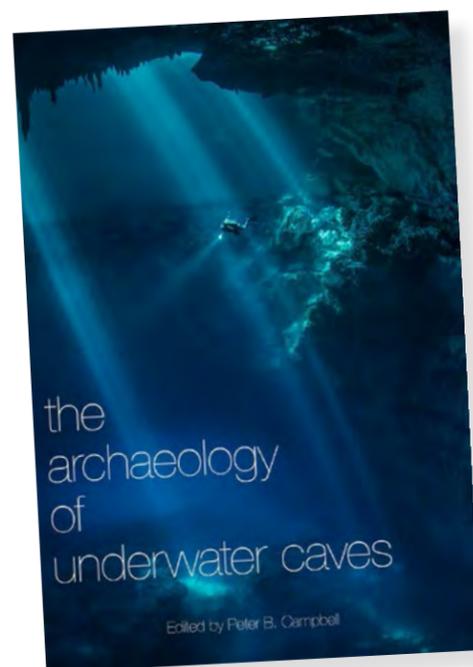
Do Fish Think?

What a Fish Knows: The Inner Lives of Our Underwater Cousins, by Jonathan Balcombe.

There are more fish species in the world than all the mammals, birds, reptiles and amphibians combined. Admittedly, most of us tend to perceive them as feeding machines that spawn on cue and do lots of aimless swimming. Yet, nothing is further from the truth. In this book, their diversity and characteristics are revealed to be as varied as their individual capabilities and personalities. They are sentient, aware and social; they also make plans, hunt coopera-

tively, use tools, curry favour, deceive one another, and punish wrongdoers—much like any other social animal. So, are you prepared to take your relationship with your pet goldfish to the next level?

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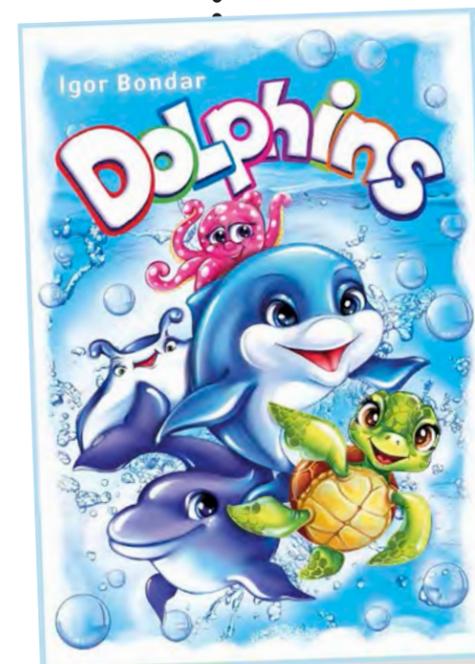
Underwater Caves

The Archaeology of Underwater Caves, by Peter B. Campbell.

Underwater caves hold much interest for archaeologists due to the superb preservation of the organic artifacts found inside them. This book focusses on the last 60 years of underwater cave research, much of which has remained unpublished till now. Topics in the book include human origins, sea level and climate change, ritual and religion, and subsistence in international cultures, covering the Paleolithic to the modern era.

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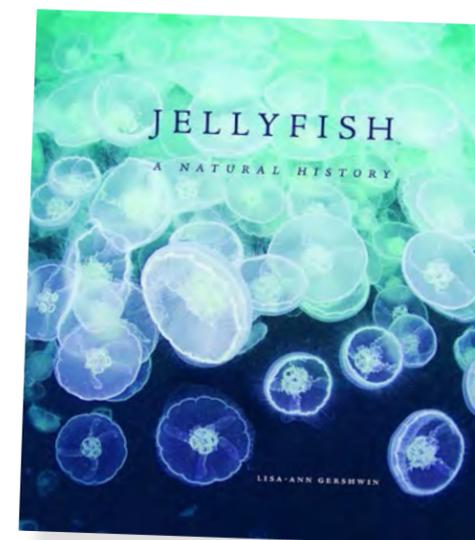
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Written by Russian children's author, Igor Bondar, translated by George Czaus, with illustrations by Alyona Garbuz, *Dolphins* is a fairy tale about a cheerful dolphin called Bin and a girl with romantic dreams named Karen. Who says these two unassuming characters could never have anything in common? Fanciful whims could have much to say about it. That's why there are fairy tales. To get your free pdf download, go to:

www.dolphinsdivingdreams.com



Jellyfish

Jellyfish: A Natural History, by Lisa-ann Gershwin.

Jellyfish are the oldest multi-organised organisms found in all of the world's oceans, having been in existence for more than 500 million years. Their populations are increasing, due to the rising temperatures and toxicity of our oceans. Incorporating the latest science and ecology, this book presents 50 jellyfish species, together with their photographs and information about their anatomy, history, distribution, environmental status, etc.

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marine mammals



Less than 60 vaquitas left in the world!

In July 2016, the United States and Mexico renewed their commitment to saving the vaquita porpoise, the smallest and most endangered cetacean on Earth.

The Mexican government has now permanently banned gillnets and night fishing in the upper Gulf of California, which is the only place in the world where the critically

endangered porpoise is found. Illegal gillnet fishing for totoaba fish, another endangered species, has been the main threat to the vaquita. Fishers with small boats have used the cover of night to hide their nets and illegal fishing activities. Totoaba swim bladders, infamously known as "aquatic cocaine", are prized as a soup delicacy (believed to enhance one's complexion) in China and Hong Kong, where they are sold on the black market for upwards of US\$10,000 per bladder. The rest

of the fish is discarded. The vaquita porpoises, which are about the same size as the totoaba fish, get entangled in the gillnets and drown.

Last-minute measures

In the July 22 statement from the US Whitehouse, both US President Barack Obama and Mexican President Enrique Pena Nieto pledged to intensify bilateral cooperation in the protection of the critically endangered vaquita marina porpoise. In addition to

the gillnet and night fishing bans in the Gulf of California, both countries will increase enforcement efforts to stop illegal fishing and trade of totoaba bladders, develop alternatives to gillnets and establish "vaquita-safe" fisheries, and initiate a long-term program to remove ghost nets (nets dumped on the seafloor) in the region, which also kill vaquita.

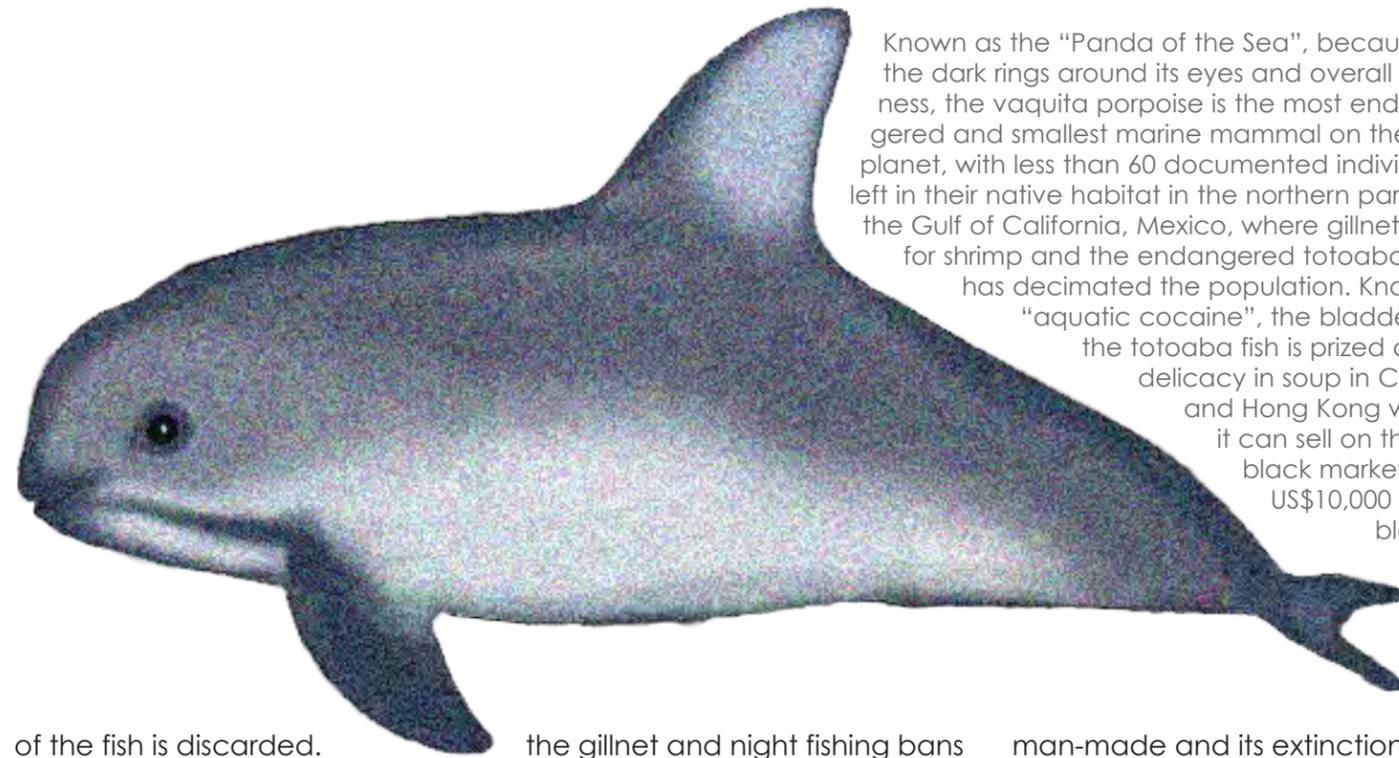
Conservationists welcomed the moves by the two governments, many declaring that the decline of the vaquita population was

man-made and its extinction is preventable.

What you can do

Want to help? Stop the demand for totoaba bladders. Stop eating the soup and encourage others to stop consuming it, as well. Share the slogan on social media. Education is key. Pass the word.

For more actions you can take to help, go to Viva Vaquita: <http://www.vivavaquita.org/act-now-to-save-the-vaquita.html>. ■



Known as the "Panda of the Sea", because of the dark rings around its eyes and overall cuteness, the vaquita porpoise is the most endangered and smallest marine mammal on the planet, with less than 60 documented individuals left in their native habitat in the northern part of the Gulf of California, Mexico, where gillnet fishing for shrimp and the endangered totoaba fish has decimated the population. Known as "aquatic cocaine", the bladder of the totoaba fish is prized as a delicacy in soup in China and Hong Kong where it can sell on the black market for US\$10,000 per bladder.

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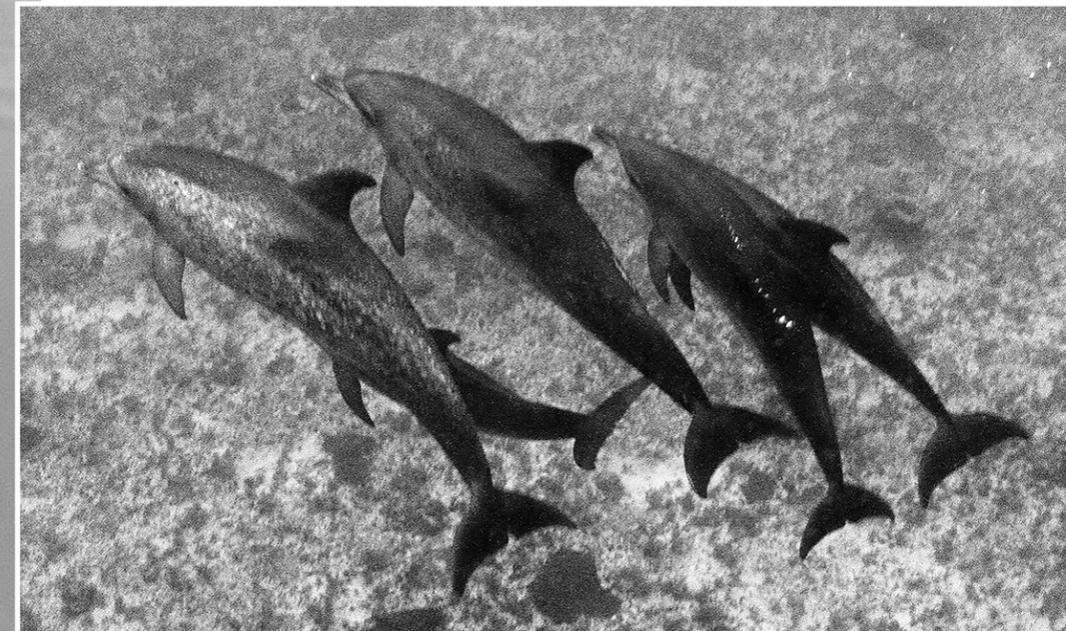
Pair of vaquita porpoises (*Phocoena sinus*) in the Gulf of California (or Sea of Cortez), Mexico

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Researchers have traditionally been apprehensive about attributing emotions to other animals for fear of being anthropomorphic. But observations of animal behavior over the last few decades have made the attribution of deep emotions to some animals difficult to deny.

Observations made in 2006 and 2007 suggest that dolphins and whales may experience complex emotions once believed to be reserved for human beings, such as deep grief at the death of a loved one.

Are whales and dolphins grieving their dead?

More than six species of marine mammals have been observed clinging to the body of a deceased conspecific, probably a podmate or relative, and kept vigil over a dead companion.

A study by researchers from University of Milano-Bicocca describes observations of adults carrying dead calves and juveniles in seven-toothed cetaceans (odontocetes). The observation

was based on 14 events from three oceans. The seven species studied were Indo-Pacific bottlenose dolphins, killer whales, Australian humpback dolphins, sperm whales, Risso's dolphins, short-finned pilot whales and spinner dolphins.

All species showed the same gesture toward a deceased companion. Although they cannot determine for sure the cause behind this behavior, study co-author Melissa Reggente told *National Geographic* that the only possible explanation for such behavior is "grief."

Mourning

Mourning a dead companion is a time-intensive and costly action, which takes away from animals finding food, mating and creating interactions with other live animals—so it does not make much sense from an evolutionary perspective. Which is why the researchers concluded that the animals are likely to be genuinely grieving.

Interpreting animal behavior after the death of a companion is fraught with difficulty. Any inferences are necessarily speculative.

The study also identified several ways whales mourn for their dead ones. For example, some touch their dead companions using their fins, while some circle around their dead as if guarding them so other species would not feed on their dead body.

In 2011, *New Scientist* reported Ingrid Visser of the Orca Research Trust in Tutukaka, New Zealand, had seen bottlenose dolphins and orcas

carrying dead infants in what she too interpreted as grief. She acknowledged that the activity may simply be misdirected behavior, and that the animals do not know that the calf is dead. "But we do know that cetaceans have von Economo neurons, which have been associated with grief in humans," she said. As a result, she speculated that the behaviors are a form of grief.

Whales are highly sociable species. Studies showed that they form actual friendships, even life-long bonds, with their companions. Some researchers have observed that whales, even after years of migrating and breeding, return to meet their companions each year. These studies corroborate that adults mourning their dead young is a common and globally widespread behavior in long-lived and highly sociable and cohesive species of mammals. ■



PETER SYMES



Divers and cloud sponge on deep wall, Sunshine Coast, British Columbia, Canada

Text by Matt Jevon
Photos by Barb Roy

In this essay, sports psychologist and technical diver Matt Jevon draws some parallels between the sport of technical diving and the sport of motorcycle racing, including attitudes and behaviors in regards to the inherent dangers and risks, sharing insights into our own natures as divers and adventurers.

A good few years ago now, I was a newly minted sports psychologist. I had done three years of supervised experience, after getting my graduate degree, and was looking to get involved in a practice as soon as possible, applying all that knowledge and theory I had been studying. One of my first roles was working with a motorcycle racing team, a very interesting set-up. I was working with youngsters, from 13 and 14 years of age, up to senior riders, all of whom were connected through the manufacturer's team. The youngsters raced on single-make series 125cc and 250cc motorcycles, depending on age; they then moved on to Supersport World Championship races; and finally, for the talented few—Grand Prix motorcycle racing.



Why Go Tech?

— *The Motivations Behind Technical Diving*

False assumptions

So, in the first meeting with the team, I mistakenly went in with a few assumptions—classically making a fool of myself. One assumption I had was that I would have to deal with issues about the dangers, the speed and the risks of motorcycle racing—perhaps having to develop

strategies to manage concentration blips caused by threats (or “cognitive intrusions” in psychology parlance) after a moment of control loss, or a competitor running them wide, etc. Nothing could have been further from reality.

The same false assumptions are often made when people find out that I cave

dive or engage in deep mixed-gas closed circuit (CCR) diving. I am looked upon as an adrenaline junky or thrill seeker. When I tell people that I love diving with sharks, they start looking around for nurses and straitjackets. At that point, even though I try to explain how much care I take to be safe, it often merely

looks like I am either a fool who does not understand the risks—which, of course, the uninitiated clearly understand better than I do—or I am a hero in rubber and latex, which is, needless to say, rather unlikely.

At any rate, my experience to date in training and diving with some of the





Divers in training doing their safety stop

of exploring a virgin cave and laying new line, can't be beat. Hardships will be suffered; the edge of acceptable risk will be pushed and sometimes exceeded; but the experience of being the first human to set foot on a ship since it sank over 100 years ago, or to see a new cave passage or connect a system, will be the reward that pays back again and again.

first and foremost—a vindication of the training, the preparation and the hard work. After that, was the celebration. I feel the same coming out of a deep dive or a cave—a complete satisfaction at having managed the odds. I need to review and embed this reaction before I can enjoy the “success” of the dive.

Stressors

Conversely, the things that cause the greatest stresses in motor sports include dealing with sponsors, discomforts of travel and strange hotel rooms, legal and insurance issues, not to mention,

Achievement.

It's not a question of whether or not the experience

rewards or satisfies the ego. For some, it's all about the task and the process to reach the outcome. Both ego and task work well as positive drivers. A person who is both highly ego-driven and highly task-driven is the most likely to succeed. In fact, these characteristics are key predictors of talent in high performance sport and business as well as in diving.

Beating the odds. There is also a huge satisfaction to be gained in simply beating the odds. For some, this is exultation, for others, relief. It depends on whether or not the major part of your motivational make-up is linked to a need to achieve or avoiding a fear of failure.

For me, when I played rugby, winning was a relief,

world's pre-eminent cave and technical divers has shown me huge parallels with the motorcycle and rally drivers, with whom I have worked. None of them are thrill seekers. In fact, they are the opposite. This does not mean they ignore or blank out the risks entirely. They coldly and calmly assess the risks, and formulate strategies and responses to deal with these risks. Once satisfied, they have been managed the risks, their conscious and subconscious minds are free to focus on the objective... winning. Accomplishing a successful dive mission or winning a race are indeed similar. Interestingly, motorcycle rally as a sport has a great saying: “To finish first, first finish!” The same is true in diving: To have a successful dive, finish alive!

Motivation

So what does drive technical and cave divers to set and pursue their goals?

Challenge. Well, for some it is clearly the challenge of exploring their personal limits. In any field of human endeavor,

this is a great driver and motivator. I see these guys as students and for a while as peers, working their way up through the levels until they hit the outer edges of certification programs. But then after a couple of years or less, they drop out, or fall back. Job done, goal achieved.

Self identity. For others, it's about the love of what they get to be, the sense of self and identity—the element of both uniqueness and individuality involved in being at the highest level of a sport. In short, it's about the passion to be different, to be excellent, in a society that all too often seems to pander to the average or worse, the lowest common denominator. So, I can empathize with the drive for excellence; it is a boost to one's self-esteem to be a little bit different, to be unique, to be part of a small and select group.

Because it's there. For many, it's the Everest story: They dive a wreck or a cave “because it's there”. For some, that feeling of discovering a new wreck,



Diver explores a wreck at Porteau Cove on Howe Sound, British Columbia, Canada

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Diver explores deep wreck, off Nanaimo, British Columbia, Canada



family and friends. It's not too different from diving. That is where the real psychological work is done: making sure that none of these issues interfere with concentrating on the objectives.

Risk-takers and thrill-seekers

So, do people dive for the thrill, for the element of risk? I am certain there are some who do. I have met a few, not always with big egos either. They just have a need to go beyond their comfort zones in order to feel alive.

Some cultures seem more prone to excessive risk-taking and thrill-seeking than others. The strange thing is this: The thrill-seekers will probably take risks on dives which could be properly managed with the

right training, kit and preparation.

I cannot say I have come across these traits in the divers I have met who have truly achieved feats of exploration and are still here to share those experiences with us. These pioneers take a more thorough approach to often much bigger risks, building in safety and maximizing performance by knowing how to manage and mitigate those risks.

Whatever the reason you dive, whether it's because the wreck or cave "is there", or because you like to be an individual, or because you like to coldly and calculatedly beat the odds—good on you, dive safe. Stay away from the thrill-seekers. Stay safe, stay focused. □

A native of the Republic of Ireland, Matt Jevon, MSc., is an experienced and passionate open and closed circuit 100m trimix diver and full cave diver. Whether using back-mount, sidemount or his favorite JJ-CCR rebreather, Jevon believes technical diving is all about being safe, having an awesome dive and enjoying experiences few people share. Jevon holds instructor qualifications from TDI, PADI TECREC and IANTD, and partly owns South West Tech—a TDI dive centre in Ireland. Jevon is also an approved JJ-CCR instructor and dealer. In addition, he is a sports psychologist, senior rugby coach and works in strategy and private equity. For more information, please visit: Swf.ie and MattJevon.com.

Technical divers at down line on wreck, British Columbia, Canada




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Rebreather Sorb Research Unveiled

Text by Rosemary E. Lunn

Until today there has been no published data that compares the carbon dioxide (CO₂) absorption of Spherasorb and Sofnolime 797 when dived in an AP Diving “Inspiration” rebreather.

This information is needed because a number of divers use Spherasorb in their APD units. Ambient Pressure Diving (APD) recommend that divers should use Sofnolime 797 in their unit—the APD units are designed and tested using this sorb. However, there are times when divers will use an alternative sorb due to cost, availability and/or because of perceived advantages in work of breathing or endurance.

Just under a year ago, in July 2015, Martin Parker of AP Diving issued a warning on the Inspiration Owners list, about the use of alternative (non-manufacturer recommended) CO₂ absorbents.

“We have all used other limes, particularly when we travel but you MUST reduce your usage times compared to 797. In some cases it should be reduced to less than 1/3rd of the 797 time!” Parker wrote.

Now new research regarding CO₂ absorption has been published in the South Pacific Medicine Underwater Society (SPUMS) and the European Underwater and Baromedical Society (EUBS) journal.

Safety information

Thanks to the intervention of Associate Professor Simon J Mitchell, the recreational, technical and rebreather diving communities have free, immediate access to this key safety information! (Normally the community has to wait one—two years before they can gain access to the paper).

The paper is entitled, “The duration of two carbon dioxide absorbents in a closed-circuit rebreather diving system,” and is published in the current edition of the quarterly publication, *Diving and Hyperbaric Medicine* (Vol. 45 No. 2, June 2016).

The research was conducted in the Exercise Physiology Laboratory at the Auckland University and funded by Shearwater Research. The team included Dr Simon Mitchell, Head of Anaesthesiology at the School of Medicine of Auckland University; Dr Nick Gant, Head of the Exercise Laboratory where the work took place; and Dr Neal W Pollock, Research Associate



UNDERWATER MARKETING COMPANY

at the Center for Hyperbaric Medicine and Environmental Physiology of Duke University.

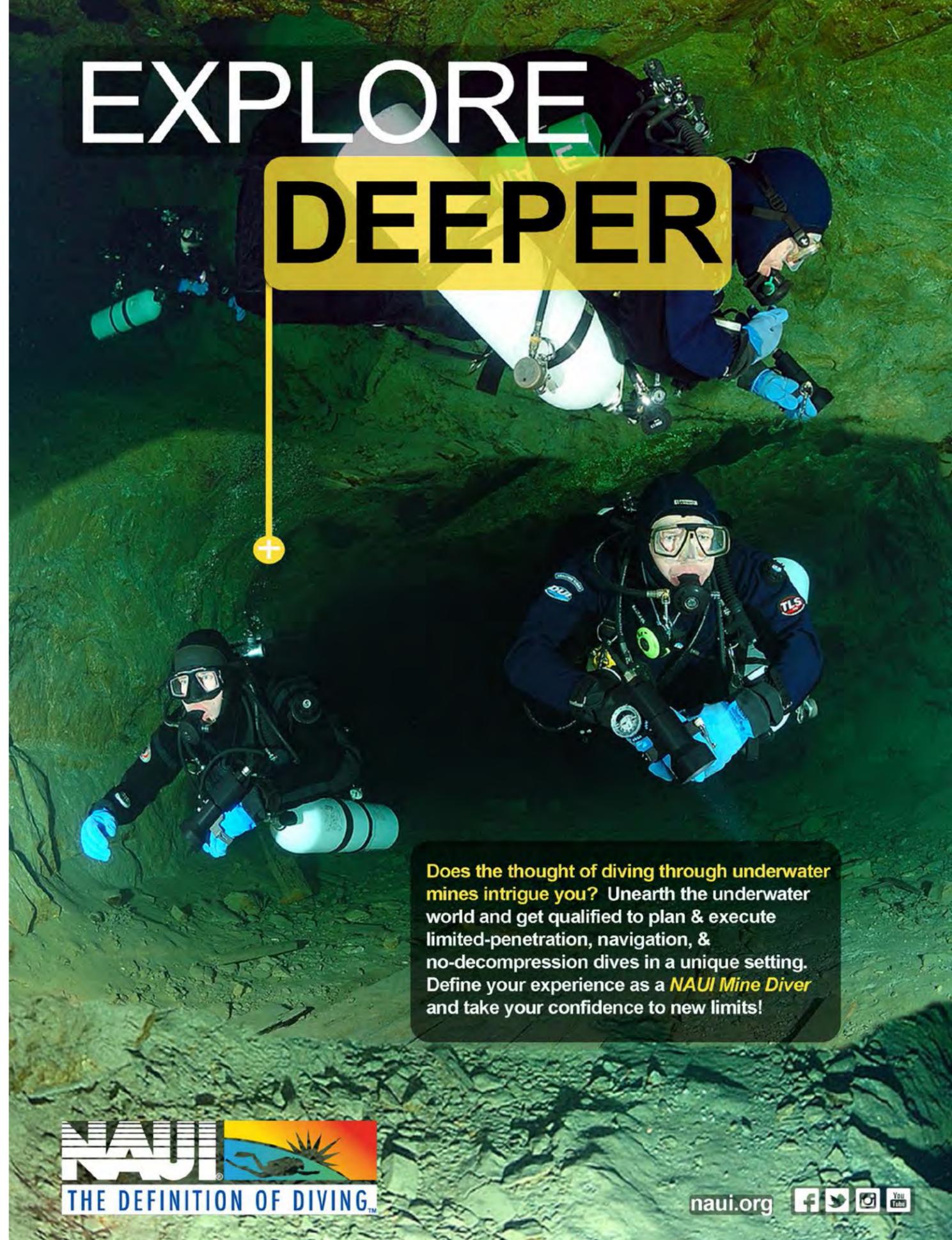
Take-home message

In summary, rebreather divers: You need to check and understand what sorb you are diving. You cannot expect different kinds of sorb materials to have the same CO₂ absorbing performances. You should also remember that all sorb preparations are less efficient when conditions are cold. If this is not understood and applied, it can (and may have had) fatal consequences.

The team is now expanding its sorb studies. The reserachers will be revealing the performance of solid sorb versus granular sorb, evaluation of storage strategies for partly used scrubber canisters, and an evaluation of the accuracy of temp sticks in predicting CO₂ breakthrough at the European advanced diving conference, EUROTEK, 8-9 October 2016, in Birmingham, England. ■

To read more about the test protocol, read the full article on our website at: <http://www.xray-mag.com/content/rebreather-sorb-research-unveiled>.

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Submerged Machines of
Moregallo
in the Italian Alps

Text and photos by Marco Daturi

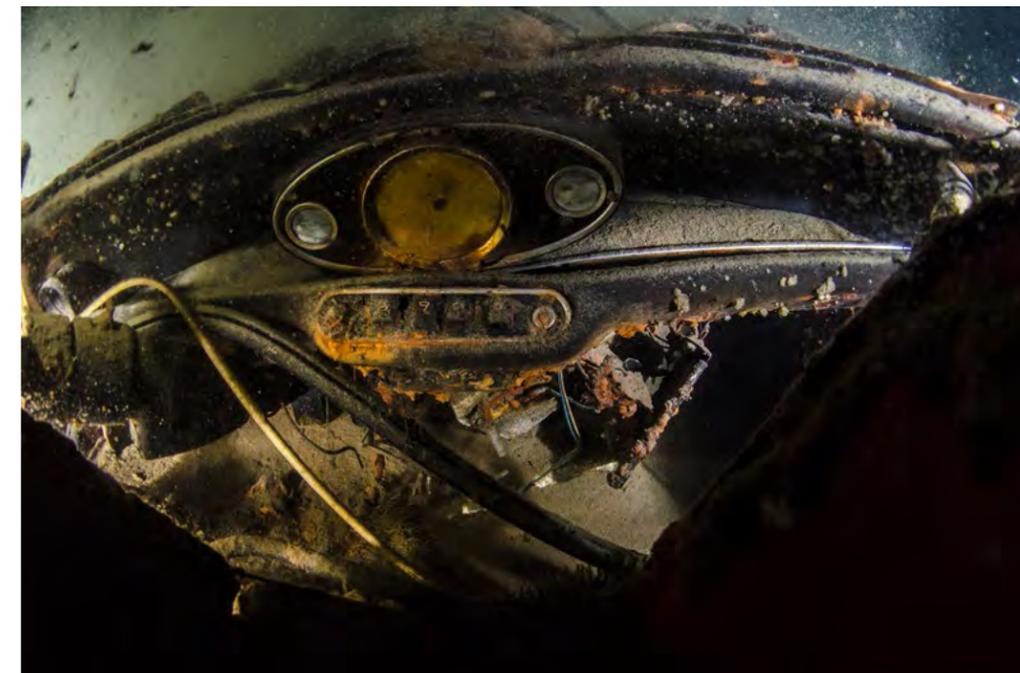
unique dive



Moregallo

Moregallo is one of the most beautiful and well-known sites on Lake Como, located in the Italian province of Lecco, within walking distance of the community of Valmadrera. Surrounded by the majestic Italian Alps, this mountainous region is often used by athletes to boost their abilities at high altitude, and tourists come here to enjoy hiking, biking and of course, scuba diving, as well as the great cuisine of the fine restaurants that can be found here.

Moregallo, however, is also the location of one of those dive sites that is unfortunately often mentioned in unpleasant news stories. Recently, some dive accidents have captured the attention of the media. Just google



THIS PAGE: Moregallo's mysterious machines are cars that have been dumped into Lake Como by thieves and robbers in the past. PREVIOUS PAGE: A diver with an underwater scooter visits a memorial laid by friends of the deceased who perished in accidents at this location.

unique dive



Diver prepares for a dive in Lake Como to see the mysterious machines of Moregallo—submerged car wrecks

Moregallo



“Moregallo sub” to see some of the news headlines, which are, to say the least, disturbing. It is often the case that the headline makes waves, but some journalists unfortunately don’t elicit an effective impact on the public, often at the expense of the facts of the case and respect for the people involved.

Mysterious machines

I went back a couple of times to the site, accompanied by a very knowledgeable friend of mine, so we could dive the mysterious machines of Moregallo—the submerged car wrecks. We had already done a lot of diving at this location. The convenient access and the peculiarity of the car wrecks underwater make it more special and interesting to dive.

The lake bottom is littered with car

wrecks, more or less preserved. Dozens of cars were thrown into the lake by thieves and robbers. The dumped cars now lie between 15 and 60m deep, to the delight of thousands of divers who have found in these weird wrecks, something special to explore. Dives here can be performed by both new divers making their first dives with an experienced guide, to technical divers using technical gear configurations at depth.

Diving

The surrounding landscape is always exciting. The lake reflects nearly tropical colors, and despite the little sun that reaches the seabed below the banks of the lake, it is the emerald green of the water that invites you to dive.

The clouds above provided a theatrical atmosphere and a bit of breeze

helped me cope with the heat and warmth of wearing 200g undergarments.

All was quiet at 8:00 a.m. as we prepared for the dive, and we took all the time we needed to bring heavier equipment closer to our entry point at the water’s edge.

We entered the water close to the wall at the lake’s edge, so that we could follow it on the way down. A car wreck was right under our feet, at just 30m. From here, we decided to continue to descend to see the other car wrecks. Visibility was fair, not the best ever, but it allowed us to see and photograph what we wanted to, without too much trouble.

After a few minutes, my manometer alerted us, so we ascended to 20m. Then we used an underwater scooter to drag us to the wreck of a jeep rest-

THIS PAGE: Wrecked cars make eerie underwater scenes in Lake Como at Moregallo



unique dive

Moregallo

THIS PAGE: Divers explore the submerged car wrecks in Lake Como at Moregallo in northern Italy



ing on the lake bottom at around 15m. Here, we saw some fish. But at this depth, I could not see anything, so I calmly approached the location where we would exit the dive and visited the memorials friends of the deceased had placed.

The Moregallo machines make a nice dive for all who come here. The site attracts hundreds of divers, especially during the

weekends, who are looking for a different underwater experience in a picturesque setting—a place that is also much loved by many celebrities and well-known personalities throughout history, including Alessandro Manzoni, Napoleon, Giuseppe Verdi, Leonardo da Vinci and many others. ■

Marco Daturi, who emerged

from the warm waters of a nursery in 1972—a restriction prescribed by an inclement, authoritarian doctor—was always very close to the sea and the underwater world, which he continues to explore with a passion whenever he can. Having survived the attack of a Ligurian porter crab, the false attentions of Indonesian nudibranchs, an underwater wedding, and insist-

ent invitations to get into technical diving, Daturi continues to enjoy the passion that is diving, which culminated in 2003 with the creation of ScubaPortal.it. A certified divemaster, Daturi also holds a doctorate in economics, and two masters in marketing and sports management. For more information, visit Scubaportal.it or email: info@scubaportal.it.





photo & video

Red and orange color tones always work well when combined with blue. The composition concept here: colors.

Text and photos by Rico Besserdich
Edited by Scott Bennett

There are plenty of books, magazine articles and blogposts about underwater photography, each providing the keen underwater photographer with valuable knowledge, leaving almost no question unanswered. However, there might be one remaining question: How many of these tips, tricks and techniques can we remember when diving with our cameras? The requirements of scuba diving itself, combined with the basics of underwater photography (we all, of course, want to shoot really cool images), can fill our heads easily and make it difficult to remember the right thing at the right moment.

For this reason, let's keep things simple. Utilizing composition as the key element of underwater photography, I would like to take you through a couple of dives, sharing some ideas of composition styles



A Practical Guide to **Composing Images** *Underwater*

that could be used in specific situations. This will round up my series in X-RAY MAG, and things I have talked about before will now be put to use in a practical way.

First things first, when I am about to enter the water, my camera is already switched on. As for settings (at the begin-

ning and very end of dives), I always rely on the setting recommended by grand master Martin Edge: "F/8, 1/125s, 1 meter and be there!" It really works. Set ISO to 100-200, depending on the ambient light.

The thought behind the phrase is to be ready in case there is something awe-

some to see in the first seconds of a dive. There is no time to fiddle with your camera in such instances. Dolphins, turtles and sharks will not wait until you are ready, so it is better to be prepared in advance. Remember the "Edge setting" (above)!

When diving from a boat, several compositional opportunities can appear upon entering the water. If equipped with a wide-angle set-up, you can start shooting (with image composition in mind) even before the guide leads you to the dive site's main attraction.





photo &
video



Shapes and colors: Look up! (At the beginning or at the end of a dive, or at both times, if you wish). Silhouettes of boats provide interesting shapes, and the gradient of the blue in the water has photographic potential too. (right)

At the surface

For example, shots of the dive boat and divers entering the water are ideal for using contrast and shapes as compositional concepts. Think of a split shot with the boat in the upper half and the water (with a diver jumping into it, if you are fast and lucky) in the lower half. The boat provides an interesting shape, and the sun will add strong contrast.

Anchor chains and ropes are ideal for shots using lines as compositional elements, creating tension in the image, if the ground is visible.

Just centimeters beneath the surface, the colors of the water, plus reflections on the surface, provide nice photo opportunities (preferably on sunny days with lots of ambient light and no strobes). Work with colors and contrast as elements of



Composition

composition.

Noticed something? Yes, we have not even commenced the dive yet but have already taken some pretty nice shots. Okay, now let's descend!

During descent

Usually, everyone wants to descend quickly. Be it a reef, a wreck or whatever the main attraction might be, I have seen plenty of divers descend like stones and swim like torpedoes to be the first at a dive spot, in search of something fancy to shoot. Just a suggestion, but let's slow down a bit and let's stop somewhere at 6-10m during our descent. Now, let's look up.

If the sun shines and the visibility of the water is good (+20 metres), the dive boat itself works well as a subject. Think of a silhouette (the boat itself) and there you have a nice shape for composing an interesting shot. Now add the sun, placing it behind the boat, so it is not visible in frame. The sun's rays will add pleasing lines to your image. Shapes, contrast and lines. That's it. No strobe needed.



Shapes: Being on the way to the main attraction or returning to the boat (or land) does not mean you can't and shouldn't take photos.

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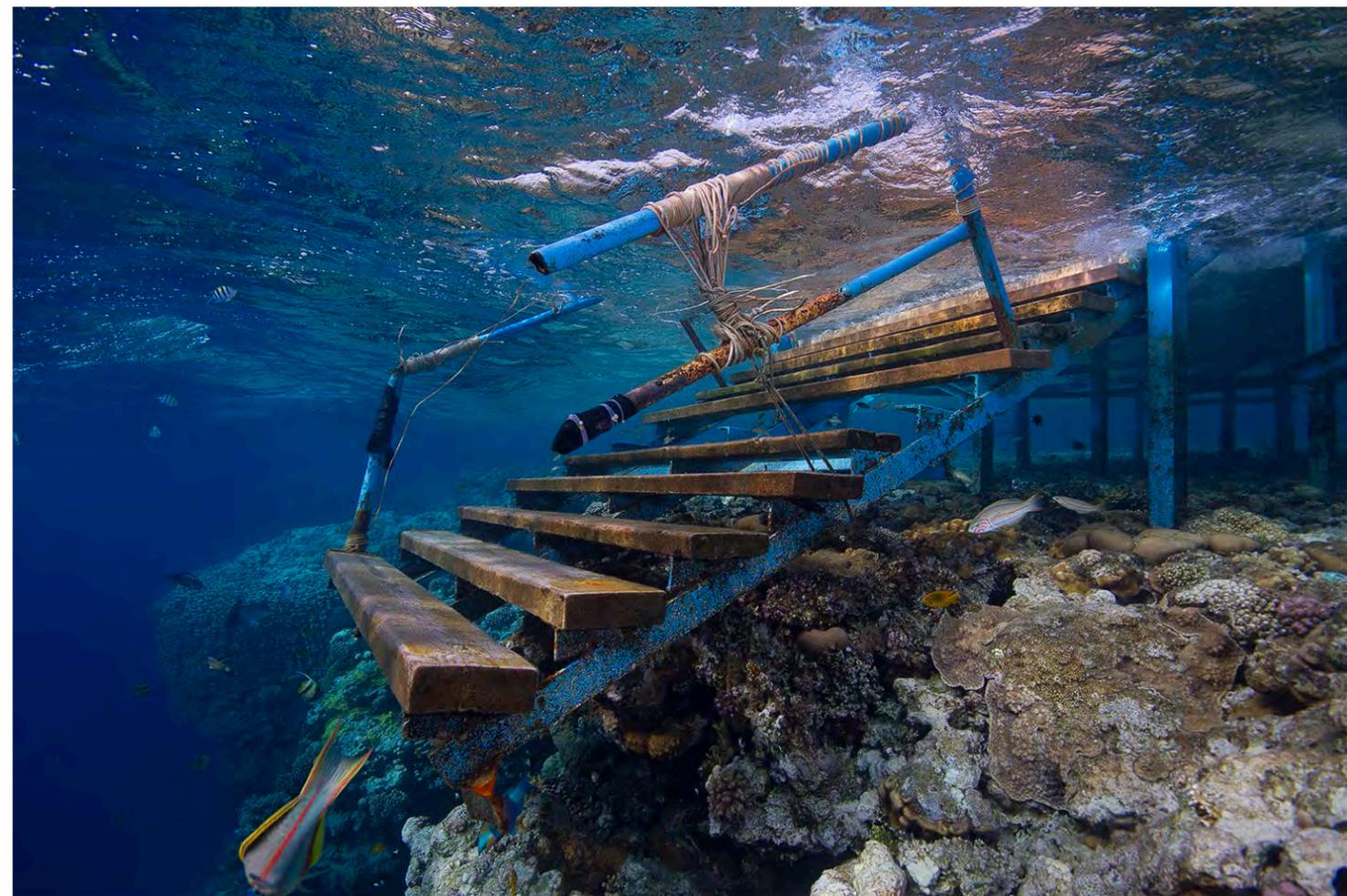
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Color, contrast and shapes: Even before descending, photographic opportunities might occur. Sadly, the diver who jumped in the water was obscured by a mass of bubbles.



Colors and contrast: Look up! Before descending to the deep (or returning from it and are about to enter the boat), it always pays to look up. (left)

Composition



Snell's window

Alternate subjects are other divers or larger sea animals. Shooting upwards at an extreme angle reveals the effect of "Snell's Window", another useful geometric shape that benefits image composition.

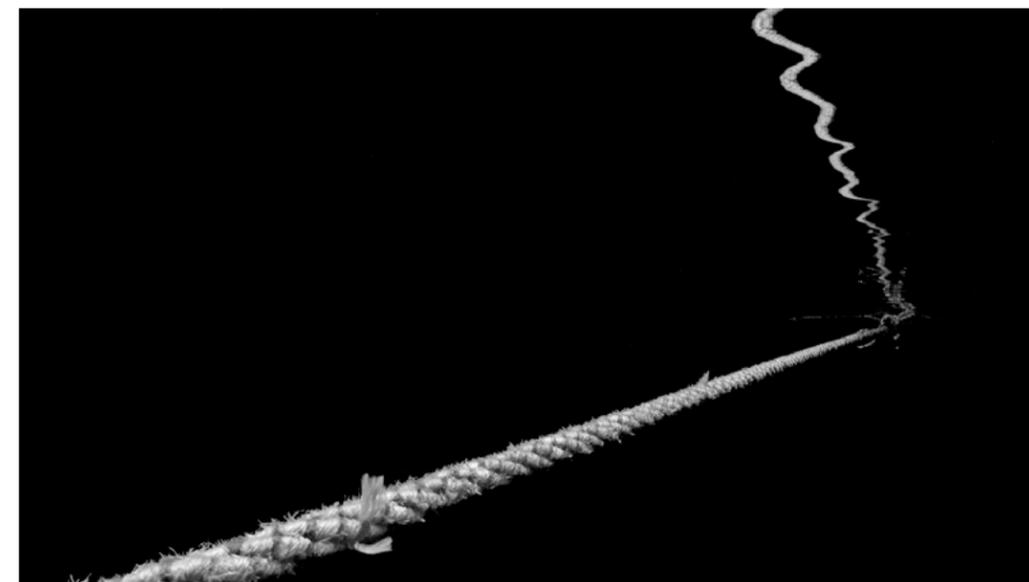
Even if the underwater visibility is not so bright, such a compositional concept is still worth a try. Just add a bit "mystic fog" to your image (caused by low visibility). Not every good photograph must be tack-sharp with endless depth of field.

At depth

Now we have reached our final depth. Be it a coral or rocky stone reef, wreck or just some muck where you hope to find small macro subjects, if we slow down a bit and think about composition, there are plenty of opportunities.

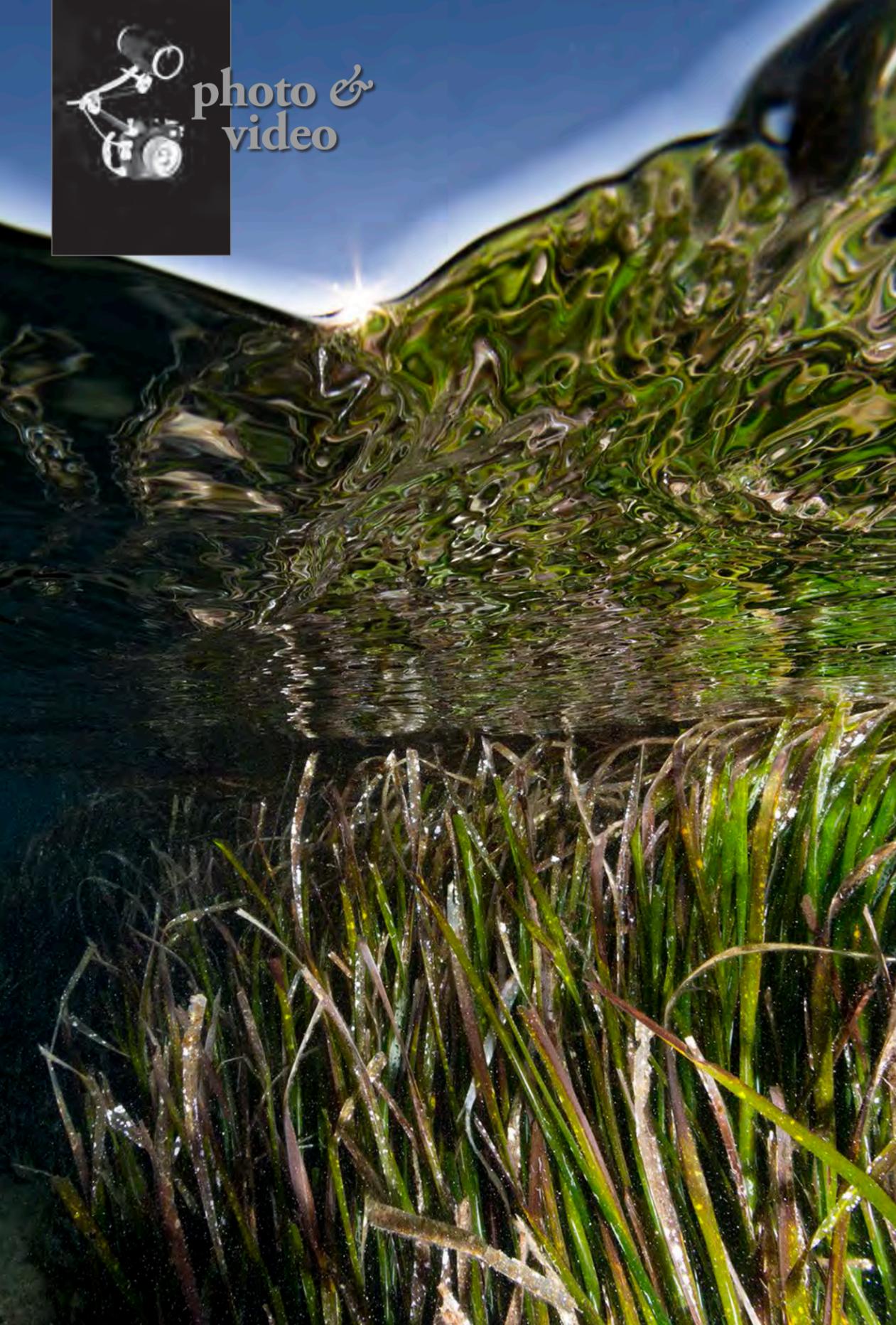
To prevent confusion when shooting underwater, it is very helpful to make a plan prior to entering the water.

With the "Edge Setting" you will be always ready (when looking in the right direction, of course) for some fast action.



Anchor chains or safety ropes (above) are good photographic subjects when utilizing lines as compositional elements; Your dive might begin or end here (top left). Don't be a "torpedo diver"; look around. Photographic opportunities are often closer than you think. The composition concepts here: shapes and colors.





Colors and contrast: No need to dive deep, as snorkeling in shallow water can provide new photographic visions. Remember to keep green colors fresh and bright.

When shooting macro (right), it always pays to concentrate on the details of things. The composition concepts here: Lines and colors.

The key to any good photograph is always the photographer's intention.

If you are photographing a very rare or unknown marine species, or are the first to shoot a newly-found shipwreck, no one cares much for composition or any trials of creative. That's



Composition



okay, because the purpose is to document the subject or scene as clearly and realistically as possible. Photojournalism demands a different approach, but the very best pieces of photojournalism often come with outstanding composition.

However, let's leave documentation photography aside for a moment. This article is about how to use composition as a creative tool

in photography, regardless of the subject. Photojournalism and proper nature and wildlife documentation = a different story.

So, let's consider for this dive that our intent is to use composition as the main element.

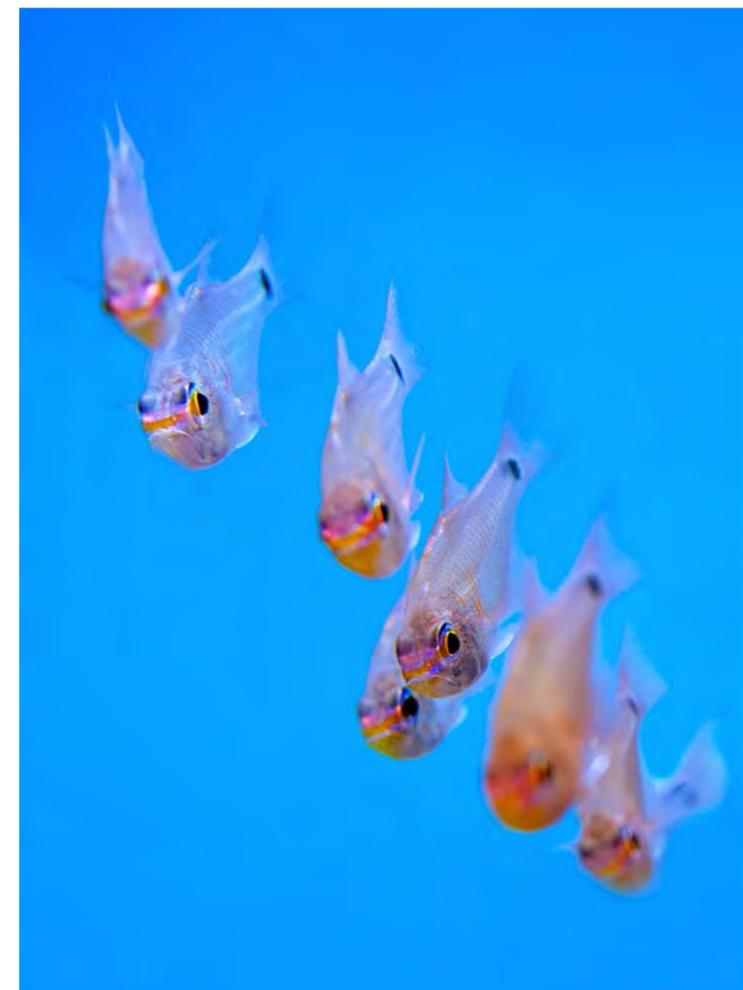
Coral reefs

If you like colors (and who doesn't?), you may want to take a moment and think about how to use the right combination of colors in your photography. Colors are a very powerful tool in image composition. It often works best to keep things simple. Less is more. Instead of looking for the most colorful things swimming around, crawling or growing somewhere, take a moment and look out for color combinations.

All red tones (which includes orange as well) do pop in the image when combined with blue, kindly provided by the water itself (in the sea).

Yellow and green can sometimes be tricky colors. They look best in an image if the color tone is a bright. Darker yellows (fire corals) and darker greens (algae) are often perceived as slightly displeasing by the viewer.

Instead of many colors, use only



Red color tones and blue: an all-time winner (above and left). Try (if you can) not to overload your images with too many colors.



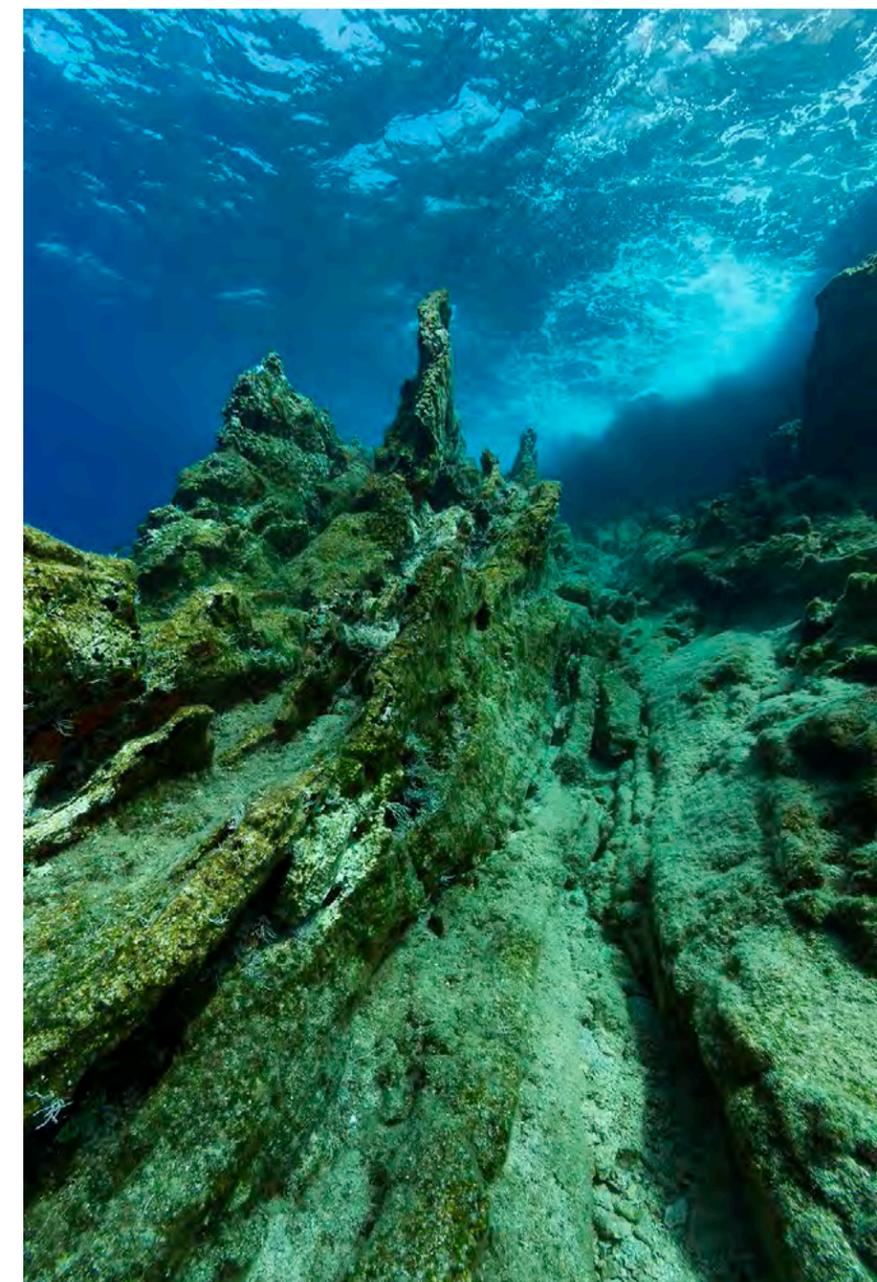
Composition

Color and contrast: When shooting colorful things (left), try to isolate them, avoiding color overload in the image.

Structures, contrast and colors: Rocky reefs (left) are fun to shoot in shallow water using ambient light.

Rocky reefs (right) have their very own beauty. The composition concepts here: structures and lines.

When diving wrecks, it pays to focus on smaller details (below). The composition concepts here: structures and colors.



one color but with different levels of brightness. Imagine the different red tones of some corals. Some corals do have beautiful shapes and to concentrate on them (photographed as a silhouette, for example) can result in very pleasing images.

Macro fans might find it interesting to look out for patterns. Closer scrutiny of corals can reveal very interesting details. Patterns, lines and colors can make excellent abstract photographs.

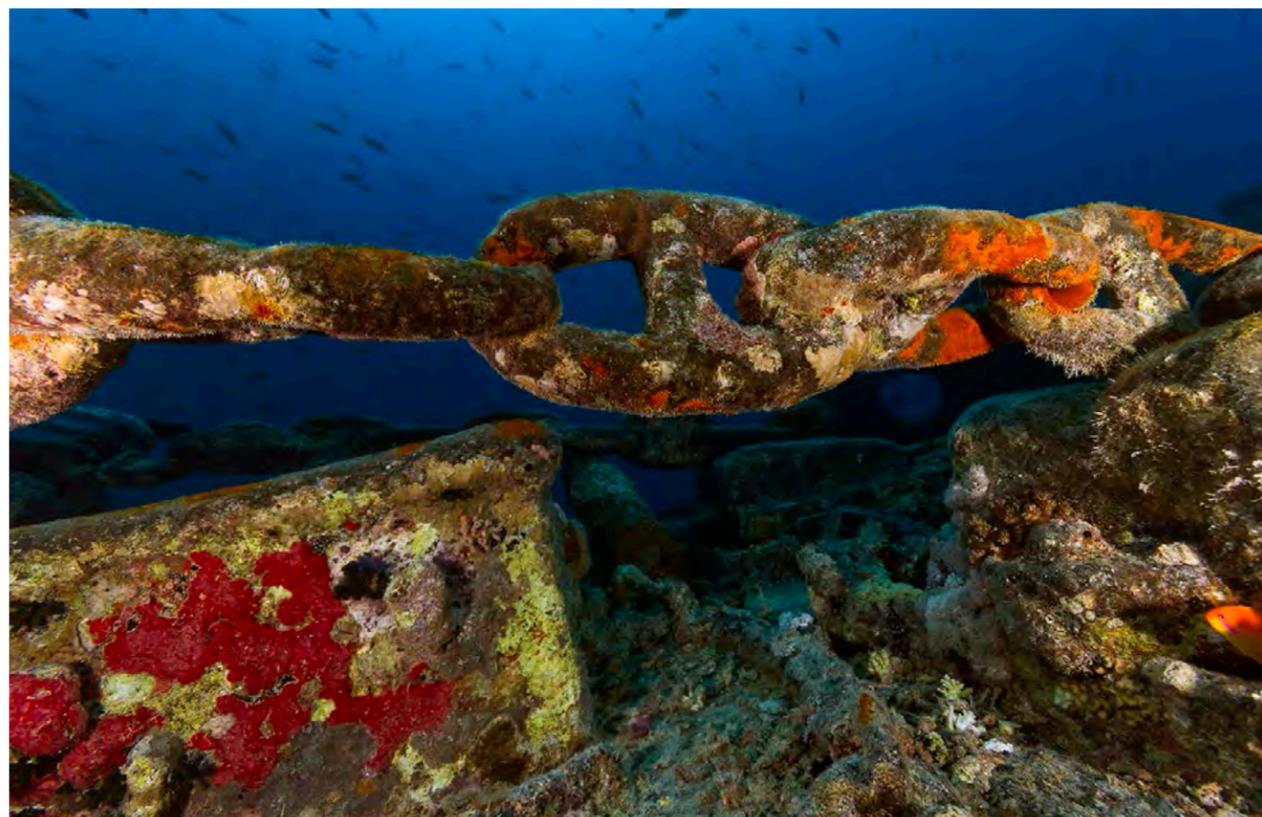
Stone reefs

Rocky reefs, very common in the Mediterranean Sea, often form fabulous underwater landscapes. Look out for nice structures and shapes; there are plenty.

The Mediterranean Sea provides variations of blue tones that you can't see anywhere else in the world. Think about using just the blue tones as elements of composition.

Remember when using colors to compose an image, you do not always need very fancy subjects.

In shallow water, the sun often draws beautiful patterns on the rocks. Remember patterns and lines as elements of composition.





Wrecks

Wrecks provide plenty of opportunities when it comes to image composition. Shapes and structures are strong elements here, and so are lines. Once you dive a wreck with the intention to realize specific composition concepts (no more trucks, motorbikes or R2D2's), you will be surprised by how many virgin photographic opportunities are awaiting your discovery. Dive a wreck with the idea of shapes in mind. Or just go for structures. Suddenly, even the most-dived wrecks in the world can transform into a photographic Garden of Eden.

Just sand or pebbles
(I want my money back!!)
There might be areas like the dive center's highly-praised



house reef, which appears to be an empty desert. No fish, no subjects—only sand or pebbles. But before you file a complaint or are about to get kicked out of the dive center because of nasty words: Look

Cars are also wrecks (above). Instead of trying to photograph the entire wreck, concentrate on details such as geometric forms. The composition concept here: shapes.



No bad words about pebbles, please. Pebbles are cool... and very photogenic! (above and top left) The composition concepts here: structures and contrast. Whether shallow or deep (top right; 65m), wrecks always provide pretty cool shapes to work with.

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Only sand, sand, sand. Sometimes it pays to go very shallow (above) and play with the reflection of sand on the water's surface. The composition concepts here: structures and contrast. Diving from shore (right). The photo dive ain't done just because you've returned to the jetty. Look up (again) and use your last bars of air for some more shots. The composition concept here: shapes and colors.

again!

Once you stop swimming around searching for things to shoot (remember the aforementioned "torpedo divers"), have a look around; you will be able to see that desert-like environment with different eyes. Don't forget, you are a photographer. You can create stunning images where there may be nothing special to see at first glance. In "desert waters" the average diver sees nothing, but the photographer (you!) is looking at the world with different eyes.

Sand forms shapes. Shapes (to stick with image composition) are always interesting and photographic aspects of value. The sun draws lines on sandy

ground. Beautiful lines.

In extremely shallow and calm water, sand might reflect on the water's surface allowing stunning "mirror style" shots. Angel Fitor, PRO photographer from Spain and former BBC Wildlife Photographer of the Year and European Wildlife Photographer of the Year (now in the panel of judges) created such shots, and they are beyond imagination. So don't complain about sand. Sand can be very attractive.

Pebbles might look boring at first glance, but if you look closer, you will see that no pebble looks the same. It's all about form, shapes and structures. Add some light (in my experience, late

afternoon light is nice), stay shallow (shoot with ambient light) and enjoy your pebbles!

In shooting environments like this, you might sometimes end up with abstract photographs. But that's okay. The power is in your hands to create beauty that no one else sees.

Ascending

I have seen many underwater shooters who have turned off their cameras and "packed" their gear at 20m because they think the dive is almost done and they must ascend for that boring safety and/or deco stop. A word of advice: Never do such a thing! You never know

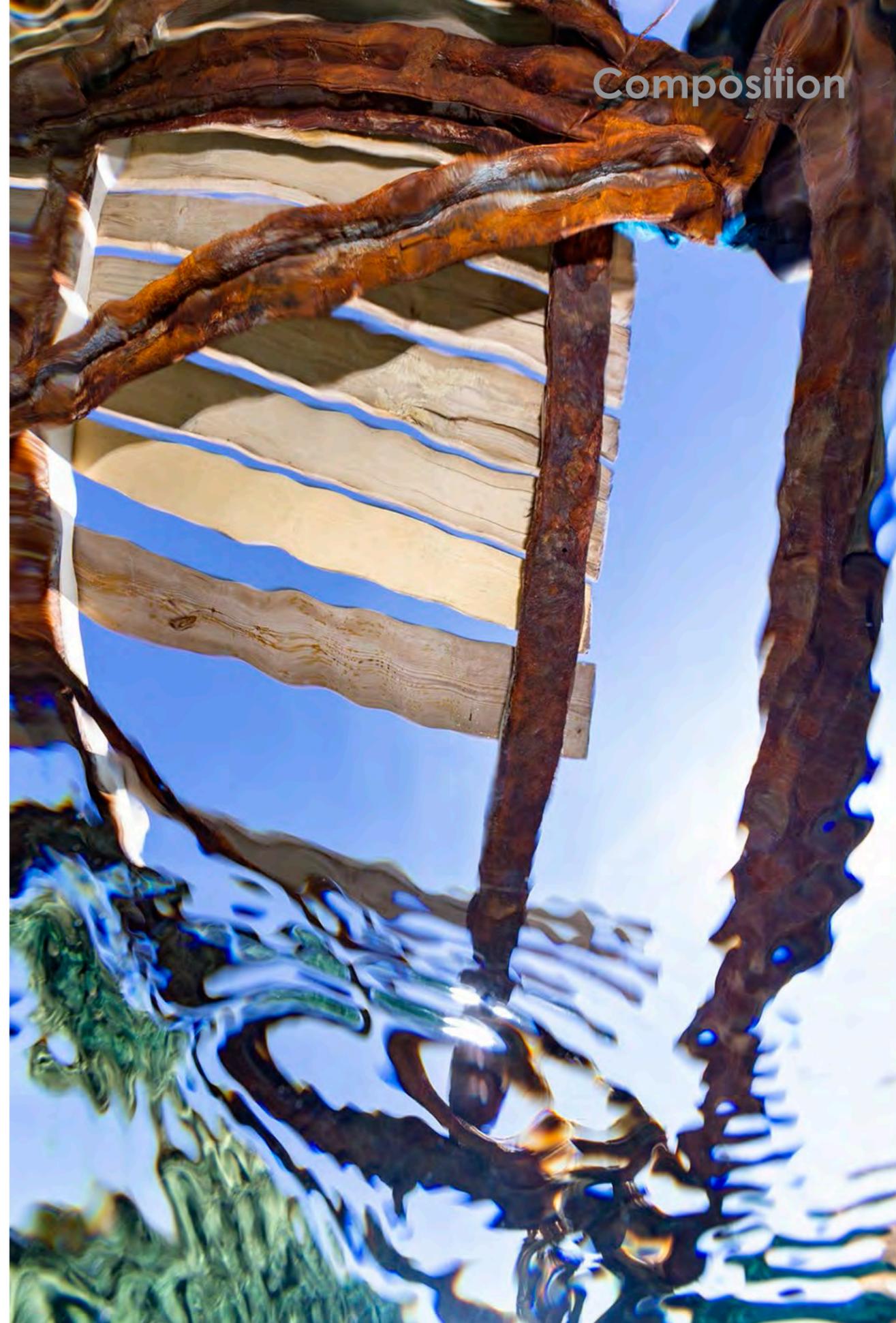




photo &
video



Contrast and shapes: The dive is done, and you are going back to the boat. If your camera is still ready, interesting shots are still possible (above). A little surprise below the boat (right). It's fun to spend time there after the dive (and if the boat captain allows), shooting "abstract macro". The compositional concepts here: structures and shapes.

what awesome photographic opportunity will appear during your ascent. My own camera stays switched on until I am back on the boat (or back on land).

If ascending on a rope or anchor chain, here is your second chance to do something with lines. In case the sun was not ideally positioned when the dive began, you now have a second chance to shoot the boat's silhouette (or anything else of interest in the blue), working with shapes as a compositional element.

If your safety stop is done but you still have some air left, you might



have a look to the dive boat's hull. Macro shooters can find nice little surprises here, and wide-angle shooters might spot barracudas right beneath the boat. Or just shoot the boat's propeller, working with

the composition concept of shapes. This subject can be very good for strong contrast images. But please check with the captain beforehand; not all of them are happy to see you swimming below their boat.

Composition

As always: Safety first.

Once you start to focus more on composition and understand some of the basics, places you have dived many times, or places that look boring at first, can suddenly present brand-new photographic opportunities. Underwater photography is, in terms of photographic concepts, still a small baby and is waiting for you to raise it!

Thank you for reading. Please follow me on Instagram (@ricobesserlich) if you like, and please feel free to email me at ricobesserlich@gmail.com with any questions you have about underwater photography. Happy bubbles, happy photos, and please stay safe! ■

Rico Besserlich is a widely published German photographer, journalist and artist based in Turkey. For more information, visit: Maviphoto.com.



If the boat is not so photogenic (or the light is simply wrong), your dive buddy can serve as a model.

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Shayne Greco



P O R T F O L I O

PREVIOUS PAGE: *Ceramic Double Lobster Platter*, by Shayne Greco. Hand-built Mediterranean glazed pottery, 22 x 15 x 7 inches

Large Ceramic Octopus Bowl, by Shayne Greco. Hand-built Mediterranean glazed pottery, 11 x 13 x 7 inches

Shayne Greco



Text edited by Gunild Symes
All artwork and photos by Shayne Greco

American artist and sculptor, Shayne Greco, creates mesmerizing sculptures of marine life forms adorning functional stone pottery built totally by hand from start to finish. X-RAY MAG interviewed the artist based in North Carolina to find out more about his creative process and inspiration from the sea.

X-RAY MAG: Tell us about yourself, your background and how you became an artist.

SG: I have always been inclined towards the arts since I was small. We had a GREAT arts program in high school, after which I attended Savannah College of Art and Design for a degree in painting. I really fell back into ceramics by chance when I needed a dinner platter for myself and couldn't really afford the one I wanted. I decided I would make one and it turned out to be a hit!



X-RAY MAG: Why marine life? How did you come to this theme in your work and how did you develop your style of sculpture?

SG: I live near the ocean. I have always been fascinated by aquatic creatures. It's like there is a whole new alien world right under the surface. The octopus was my first design. I then branched out to other designs with crabs, lobsters, seahorses, etc.

X-RAY MAG: What is your artistic method or creative process? Briefly, please describe in step-by-step terms for the layman, how you create your artworks.

SG: I always start a new design with a few sketches. It must make sense in my head before I can create it in three dimensions. Drawing it on paper always helps me work out the kinks and lets me visualize the elements coming together as a work of art.

Ceramic Seahorse Vase, by Shayne Greco Hand-built Mediterranean glazed pottery, 9 x 17 x 19 inches



The artist at work with assistant in studio

There are basically two components to my designs: the "vessel" and the creature(s). The vessel is made first using the coil technique. Then the creature (made by hand in many different pieces) is attached piece by piece onto the vessel.

X-RAY MAG: It is very special that you use the coil technique in creating your vases. Can you explain this process to our readers and why you use this technique?

SG: The coil technique has been around since pottery began. It is done with long ropes or coils of clay continuously going around and building atop each other to form whatever shape is desired. I



Giant Ceramic Octopus Vase, by Shayne Greco. Hand-built Mediterranean glazed pottery, 19 x 21 x 21 inches; *Ceramic Crab Platter*, by Shayne Greco. Hand-built Mediterranean glazed pottery, 16 x 16 x 4 inches (left)



Nautical Ceramic Octopus Candelabra, by Shayne Greco. Hand-built Mediterranean glazed pottery sculpture, 17 x 17 x 7 inches

spend all my free time diving. I have even been asked if I am a marine biologist. In fact, the first time I have ever snorkeled in clear water was last October in the Florida Keys. It was great to finally get out and swim with some of the creatures I study on a daily basis.

X-RAY MAG: What are your thoughts on reef and ocean conservation and how does your artwork relate to these issues?

SG: When I first began my ceramic line in 2012, I was largely ignorant to much of what we are doing to our oceans. Besides the occasional oil spill on the news, I had no idea of the damage we are causing, spe-

cifically with trash being dumped in the water. I was appalled to discover there are floating masses of trash, the size of small islands, killing off marine species. Focusing on marine life in my pottery has enlightened me to some of the irreversible damage we have done and are still doing. Plastics in particular are a serious problem for our entire ecosystem.

X-RAY MAG: What is the message or experience you want viewers of your artwork to have or understand?

SG: My goal is very simple, that is to create beautiful, elegant works of art. If a piece of mine attracts your

Nautical Ceramic Sea Turtle Dinner Plate, by Shayne Greco. Hand-built Mediterranean pottery, 11-inch diameter



love this technique. I am a sculptor at heart. When I am coiling a vessel I feel as though I am able to gain complete control over the shape of the vessel by layering the clay coil by coil.

X-RAY MAG: Do you use photography in the creation of your sculptures?

SG: I do use photography, just not my own. Whenever I am sculpting something new I study the animal by watching videos, looking at still photos and observing the creature in real life.

I can usually find images I need by searching the Internet.

X-RAY MAG: What is your relationship to the underwater world and marine life? Are you a scuba diver or snorkeler and how has this influenced your art? In your relationship with the sea, where have you had your favorite experiences?

SG: Many people have asked this question. It would be natural to assume I'm an avid scuba diver and



Dining table spread using a variety of dish service designs by Shayne Greco

eyes and allows them to move seamlessly over the shape of the vessel and its different elements, then I have succeeded.

X-RAY MAG: What are the challenges and/or benefits of being an artist in the world today?

SG: Challenges—a steady and reliable income is one of the biggest hurdles to any artist. At one point in my young career, I wasn't very far away from the term "starving artist". I am so thankful now to be in a position where I don't have to worry about where my next meal is coming from.

Benefits—being self-employed, writing my own schedule, and doing what I love to do on a daily basis are the perks of being an artist. I literally have the Dream Job!



Large Handmade Ceramic Sea Turtle Vessel Sink, by Shayne Greco Hand-built Mediterranean glazed pottery, 15-inch diameter



Large Handmade Ceramic Splash Vessel Sink, by Shayne Greco. Hand-built Mediterranean glazed pottery, 15-inch diameter

only one incident where someone emailed me in a negative connotation. The email was written in outrage regarding my pricing. They wrote asking how I could charge such ridiculous prices for pottery! And how could it be so expensive!? There were a couple curse words in there as well.

I responded by telling them they were absolutely right. I mean, it is only mud after all.

X-RAY MAG: What are your upcoming projects, art courses or events?

SG: We always have new designs coming out. This season, I think we will be debuting a piece or two featuring moray eels. I am really excited about these! For events, we attend

wholesale trade shows in Atlanta and New York twice a year.

X-RAY MAG: Lastly, is there anything else you would like to tell our readers about yourself and your artwork?

SG: Yes, I would not be here if it wasn't for my studio assistants! Janell is my glaze technician and Carolynn and Lindsay work with me in clay creation. They all help me keep up with demand. I literally could not do it without them! ■

*For more information and to buy ceramics, visit the Shayne Greco Ceramics website at: **ShayneGreco.com**. "Like" the artist on Facebook to see what's new and exiting!*



Large Handmade Ceramic Octopus Vessel Sink, by Shayne Greco. Hand-built Mediterranean glazed pottery, 15 x 18 x 9 inches (left)

X-RAY MAG: How do people/children respond to your works? What feedback or insights have you gained from the process of showing your work to various audiences?

SG: I am constantly overwhelmed by the positive feedback. I am always humbled when I received random praise from people I don't even know.

Negative feedback is very rare; I can think of