Scuba Confidential – Can You Be TOO Cautious? :: Dave Clarke Portfolio

X-Ray Mag

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French Polynesia
Marquesas Islands

Polar Diving
Antarctica

Finland
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JAPAN'S
Osezaki

COVER PHOTO BY KENJI ICHIMURA

DIRECTORY

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COVER PHOTO: *Goose scorpionfish (Rhinopias frondosa), Osezaki, Japan,* by Kenji Ichimura (**dive-in-japan.com**)

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Iceberg, Antarctica. Photo by Raf Jah

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The Search for Extraterrestial Intelligence

Every time I look up into the starry night sky, I cannot help but wonder what other worlds are out there and whether there is life among all those twinkling stars. Are we alone in the universe?

I guess I am just like most people—haven't we all reflected on this most fundamental existential question at some point?

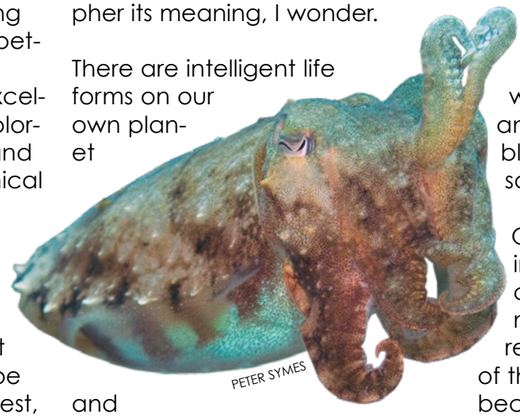
I am also a science fiction fan. Possibly in part because it sets us free from our earthly constraints and technological limitations, and lets us play around with the thought of venturing into the universe, possibly encountering other life forms. Some of the better science fiction books and movies have also done an excellent job in explaining and exploring real scientific concepts, and many have a quite philosophical edge to them too.

However, regarding descriptions of or even references to extra-terrestrial life forms, let alone intelligence, I do not find most of these movies to be very scientific or realistic. At best, they are just great entertainment with spectacular special effects, which I do, however, appreciate as such.

If we ever do find other life forms—and we might just find some in our own cosmic neighbourhood, such as on the Jovian moon Europa, which is thought to have a huge, planet-wide liquid-water ocean under its icy crust—these life forms will most likely be quite simple and not more than, say, the single-celled organisms we find on Earth—at least, not anything brainy. Even so, that would still be a very cool discovery.

Meanwhile, focused international efforts and searches for extraterrestrial intelligence (SETI) have been monitoring electromagnetic radiation for signs of transmissions from civilisations on other planets since the 1980s. If we ever picked up such a transmission, how would we know what to do with it and how to decipher its meaning, I wonder.

There are intelligent life forms on our own planet and right under our noses, with which we cannot communicate, including species with social structures and complex vocalisations that we still cannot understand. I am thinking, of course, of the great apes, marine mammals, cephalopods and birds.


PETER SYMES

What makes us think we will be able to communicate with extraterrestrials, should there ever be contact, when we cannot even understand our closest biological relatives, that is, beyond the simple sign language some scientists appear to have been able to teach a few great apes in captivity? Or the body language we seem to understand in our pets and some wildlife?

But perhaps we will soon.

Recently, **we posted an article** about an effort to use artificial intelligence to decipher and understand whale song. Now, *that* is very exciting! We already know that they sing in dialects, and there are signs that they have a culture. Next, I would like to know what goes on in the mind of an octopus—a mollusc capable of quite some problem solving and the use of tools.

Outer space is exciting, intriguing and fascinating—certainly good for a movie night. But inner space, the realm below the surface of the sea, is more enticing because it is so full of intriguing life forms that we have gradually come to understand better and to which we now feel even more related.

And it is right here. No rocket ship is required, just a ride to the beach. All we have to do is don our goggles and jump right in.

— Peter Symes
Publisher & Editor-in-Chief

Edited by
Peter Symes

from the deep

NEWS

ALEXIS ROSENFELD / UNESCO

ALEXIS ROSENFELD / UNESCO

The reef was found in November, during a diving expedition to a depth known as the ocean's "twilight zone"—part of a global seabed-mapping mission.

ALEXIS ROSENFELD / UNESCO

Pristine coral reef discovered off Tahiti

The reef, which lies at depths of more than 30m (100ft) off the coast of Tahiti, French Polynesia, is thought to be one of the largest found at such depths and seems untouched by climate change or human activities.

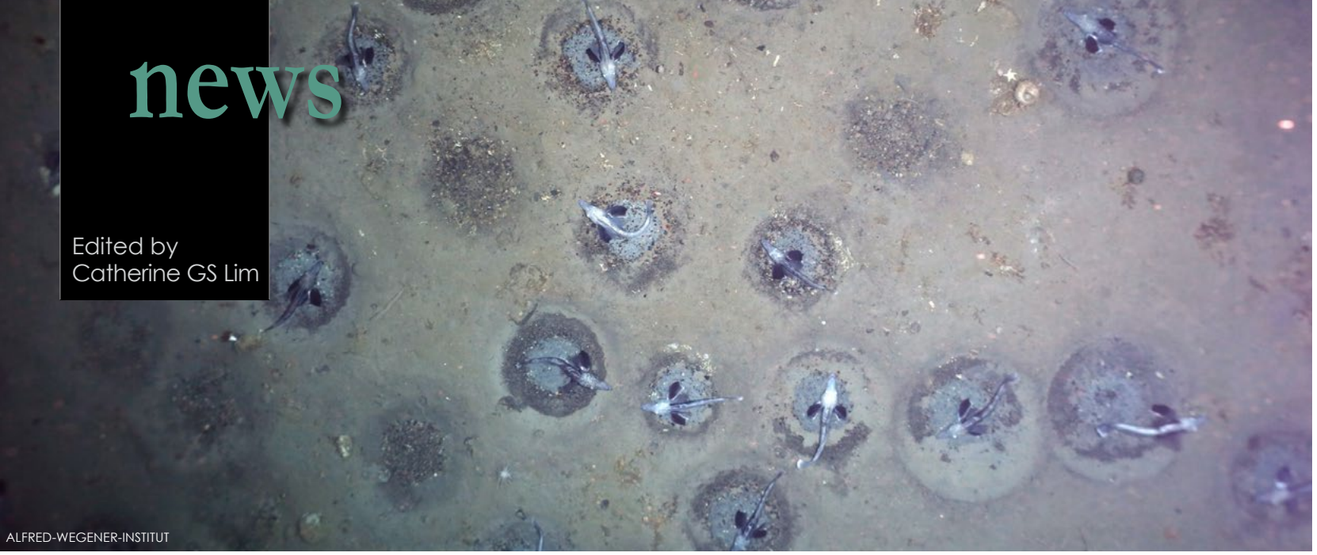
A research mission, led by UNESCO, found the reef, which stretches for nearly three kilometres and exists at depths down to 70m (230ft). This is around the ocean's "twilight zone," where there is just enough light to sustain life, and below which the ocean transitions into a dark abyss.

The reef probably took around 25 years to grow. Some of the rose-shaped corals measure more than two metres in diameter. This is highly unusual because, up to now, the vast majority of the world's known coral reefs sit at depths of up to 25m.

"It was magical to witness giant, beautiful rose corals, which stretch for as far as the eye can see. It was like a work of art," said French photographer Alexis Rosenfeld, who led the team of international divers that made the discovery.

"For once, it's a positive story about coral reefs in the news, which is quite rare these days," Julian Barbiere, head of marine policy at UNESCO, told CNN.

Warming oceans and acidification caused by the climate crisis have led to widespread coral bleaching. Last year, scientists found the global extent of living coral has declined by half since 1950 due to climate change, overfishing, and pollution. ■ SOURCE: UNESCO



ALFRED-WEGENER-INSTITUT

Some of the Jonah's icefish (*Neopagetopsis ionah*) nests that were discovered

Largest fish breeding area on earth discovered in Antarctica

Researchers on board the research vessel estimated that the area contained 60 million nests of the Jonah's icefish—likely the most spatially extensive contiguous fish breeding colony discovered to date.

Using a towed camera system, researchers discovered the world's largest fish breeding area near the Filchner Ice Shelf, south of the Antarctic Weddell Sea.

The nests belonged to the Jonah's icefish (*Neopagetopsis ionah*). Mapping the area suggested a total extent of 240 square kilometres. Based on the density of the nests and the size of the breeding area, it was estimated that there were about 60 million nests.

This was an astonishing number, considering that ever since the Alfred Wegener Institute (AWI) started exploring the area with the icebreaker Polarstern (in the early 1980s), only individual or small clusters of Jonah's icefish nests have been found there.

After combining their results with oceanographic and biological data, the researchers discovered that the breeding area corresponded spatially with the inflow of warmer deep water from the Weddell Sea onto the higher shelf. The area was also a popular destination for Weddell seals, with more than 90 percent of their diving activities taking place in the vicinity of the active fish nests.

Reporting their findings in the journal Current Biology, the team said that this was likely the most spatially extensive contiguous fish breeding colony discovered to date.

AWI Director and deep-sea biologist Prof. Antje Boetius said that the study showed how urgent it was to establish marine protected areas in Antarctica.

"This great discovery [...] shows how important it is to be able to investigate unknown ecosystems before we disturb them. Considering how little known the Antarctic Weddell Sea is, this underlines all the more the need of international efforts to establish a Marine Protected Area," she said. ■

SOURCE: ALFRED-WEGENER-INSTITUT

The idea that such a huge breeding area of icefish in the Weddell Sea was previously undiscovered is totally fascinating.

— Autun Purser, deep-sea biologist at the Alfred Wegener Institute, Helmholtz Centre for Polar and Marine Research (AWI)

ALFRED-WEGENER-INSTITUT

Close-up of one of the Jonah's icefish nests

Edited by
Catherine GS Lim

Can seaweed replace plastic?

A London-based startup is designing a seaweed-based replacement for single-use plastic packaging.

More and more alternatives to plastics are being proposed these days, as the world wakes up to the immense "longevity" of single-use plastics. One of these alternatives—seaweed—is the focus of Notpla, a London-based startup that has developed packaging that is designed to be composted, dissolved or consumed after use.

Benefits of seaweed

The decision to use seaweed was made after considering that it was abundant, grew fast, sequestered carbon from the air and did not require pesticides.

"It [seaweed] can grow into the ocean and the sea, where it actually has a lot of positive benefits so it can create new ecosystems for other organisms to thrive in," said design director Karlijn Sibbel. Satchets and film wrap

Products

Notpla is currently used as sachets for condiments, water and alcohol, takeaway boxes and as a film wrap. One of its offerings, the Ooho sachet, holds single servings of liquids. In 2019, 36,000 Oohos containing the energy drink Lucozade Sport were distributed during the London Marathon.

The company has also experimented with adding flavours into the packaging, so users can simply dissolve the packaging to add flavouring to the dish.

"You can cook with it. And you can really start to rethink what we can do with these materials," she added.

Referring to its film wrap, Sibbel said that it can replace most of the flexible packaging currently available. Besides containing dry goods or wet goods with low water content, it can potentially hold coffee grounds, toilet paper or screws.

In addition, the fibres that are left over from creating Notpla products are made into paper that is used to make gift wraps and clothes tags.

Innovations

The company has been awarded grants from the British government agency Innovate UK as well as the Ellen MacArthur Foundation. It continues to experiment and look for new products and designs. As it continues to scale up, it acknowledges the enormity of the plastics problem.

> *"I don't think one material (or) one solution is going to solve everything, but we think that seaweed really ticks the right boxes."*
>
> — Karlijn Sibbel
> Notpla's design director

Why use plastic?

Sibbel hoped that manufacturers would start to question examine why they used plastics in the first place, citing the example of food companies having to punch holes in the plastic packaging used to package perishables like tomatoes.

"Plastic can do a lot of things. But it's about asking, "Is it really necessary for this application?" she said.

■ SOURCE: NOTPLA

PHYCOLOGIA BRITANNICA

Saccharina latissima, also known by the common name sugar kelp

Edited
by G Symes

COURTESY OF MIDE

Exhibitor registration for MIDE 2022 is already open, and all diving, boating and water-sports business entrepreneurs are warmly welcomed to take part in the expo.

Malaysia International Dive Expo to return in May 2022

Sporting the theme, "Let's Keep Diving," the Malaysia International Dive Expo (MIDE) has announced that the expo will be back this year, taking place from 27 to 29 May 2022 at the World Trade Centre in Kuala Lumpur.

It will be the 16th year in running for MIDE, billed as the "hottest and coolest dive show in Malaysia," bringing together dive enthusiasts to explore the underwater world and participate in the business of diving as well. Aiming to be a one-stop-hub for all things diving, including dive equipment, courses, travel, and underwater conservation, as well as boating and water sports, MIDE promises to showcase all kinds of products and services over the three-day event.

Recovery plan

After over two years of difficult and challenging times for the dive industry during the coronovirus pandemic, MIDE is working hard to help implement a global travel recovery plan, encouraging renewed confidence in members of the dive industry by promoting both local and international dive destinations and helping divers feel safe and inspired to travel again.

New addition: Boating & water-sports

To the delight of water-lovers of all types, MIDE is expanding the show to feature more boating and water sports, bringing to visitors the best of the water world.

Attendees in the thousands

MIDE has averaged around 12,000 visitors each year, which totals roughly 200,000 visitors over the last 15 years. In 2022, MIDE is ready to welcome even more dive enthusiasts, business entrepreneurs, tourism boards, dive agencies, brand manufacturers and distributors to make use of the networking platform. While 90 percent of attendees are divers, inclusion of the new boating and water-sports area at the expo will undoubtably see even more water-lovers coming to the show this year.

Register today!

All diving, boating and water-sport business entrepreneurs are warmly welcomed to be part of MIDE 2022, which is now open for registration. Touted as Asia's "Hottest & Coolest Dive Expo," exhibitors' are encouraged to registration today and get in early to avoid disappointment.

Contact MIDE

Email MIDE at: **info@mide.com.my**
For more information and updates, visit: **mide.com.my**. Follow MIDE on social media for news and updates. Go to **Facebook**, **Instagram** and **Twitter** at hashtag of MIDEEXPO. ■

Edited by
Catherine GS Lim
and G Symes

UK monument honoring mine warfare and diving personnel to be dedicated

Text by Rosemary E. Lunn

A date has been set to dedicate a monument that honours mine warfare and diving personnel, and immortalises the memory of HMS *Vernon*, a former naval base in Portsmouth, England.

At present, the dedication event at Gunwharf Quay is provisionally pencilled for Friday, 15 July 2022. The summer date has been chosen, because it is anticipated that Covid-19 will be less of an issue by then. It is hoped that current and former Royal Navy Clearance Divers will be allowed to take part in this important occasion.

HMS Vernon

Today, most visitors to the waterfront outlet shopping destination Gunwharf Quays in Hampshire do not realise the site has a long naval history. Gunwharf was built on reclaimed land in Portsmouth in approximately 1706. The wharf acted as a main repository for the Royal Navy—supplying and maintaining guns, small arms, cannonballs and other ordnance—hence, it gained the name "Gunwharf."

Jump forward two centuries, and Gunwharf was still dealing with ordnance, this time in the shape of mines and torpedoes. The Mine School had taken over the southern end of Gunwharf in 1919, followed later by the Torpedo School in the northern end. By 1923, the whole of Gunwharf was known as the Vernon Shore Establishment.

HMS *Vernon*/Gunwharf became synonymous with torpedoes and mines. This is because in 1867, the torpedo was considered a type of mine; therefore, the two weapons were developed alongside each other.

Former Royal Navy Mine Warfare and Clearance Diving Officer Rob Hoole stated that "during WWII, HMS *Vernon* became responsible for mine disposal and mine countermeasures. However, it was not until 1 October 1944 that mine warfare (mining and mine countermeasures) and naval diving were brought under the same organisation."

US NAVY / WIKIMEDIA COMMONS / PUBLIC DOMAN

Clearance diver in training exercise

HMS *Vernon* was the spiritual home for the Royal Navy Clearance Divers from 7 March 1952, when the Branch was officially formed under Admiralty Fleet Order (AFO) 857/52. Former Royal Navy Clearance Diver Ginge Fullen told me that prior to the official launch, at least 60 to 70 clearance divers had trained and been qualified at HMS Lochinvar, on the Firth of Forth. Fullen believes that to date, approximately 3,000 clearance divers have been trained.

Training in diving, demolitions and mine warfare continued at HMS *Vernon* until the mid-90s. On 1 September 1995, diver training, along with the clearance diving teams, moved to Horsea Island, located at the north of Portsmouth. Two months later, in November 1995, mine warfare was moved, and eventually ended up at HMS *Collingwood*. The Royal Naval site formerly known as HMS *Vernon* closed its doors for the last time on 1 April 1996.

Unveiling cancelled by Covid-19

It was hoped that Prince Harry would unveil the monument in a special dedication ceremony in 2020. Eight hundred guests, including several veteran mine warfare and diving personnel, had been invited to attend Gunwharf for the commemoration on Wednesday, 25 March 2020. Sadly, this event was cancelled because of the coronavirus pandemic. A quick decision was made for the monument to be unveiled in a low-key scaled-down service led by Commodore Jeremy Bailey, commander of Portsmouth Naval Base on Tuesday, 17 March 2020, which was informally streamed on social media.

Funding the project

An idea was floated several years ago that HMS *Vernon* and the people who served, trained and were based there ought to be acknowledged. Fundraising commenced in 2008 to turn this dream into reality. Contributions towards the monument came from several organisations. In addition, thousands of individual donors sponsored events, attended dinners and talks, dropped money into collection boxes and buckets at open days, purchased merchandise and bought raffle tickets or bid at auctions. It took 12 years to raise more than GB£250,000 to pay towards designing, building and fitting the installation.

Monument design

In March 2019, sculptor Mark Richards FRSS was awarded the commission to design, create and install the Vernon Mine Warfare & Diving monument. Mark Richards specialises in figurative work, having been trained in architectural sculpture. The one-and-a-quarter life-size bronze sculpture features two clearance divers wearing the iconic CDBA (Clearance Diving Breathing Apparatus) equipment. This is a closed and semi-closed rebreather mix set that could be rigged to deliver oxygen at a constant flow for covert work. The two Royal Navy divers are attaching an explosive pack to a moored British MK 17 contact mine. Respectively, these elements represent members of the mine warfare and diving community and celebrate their work—past, present and future.

The Vernon Monument honours all involved in mine warfare, diving, bomb and bomb disposal - past, present and future (right)

ROSEMARY E. LUNN / THE UNDERWATER MARKETING COMPANY

Not just service divers

It is important to note that whilst this is a statue of two divers, the monument acknowledges many personnel. It honours those involved in naval mine warfare, service diving, and bomb and mine disposal—past, present and future. On the diving front, it celebrates the work of search and rescue divers, experimental deep divers, royal engineer divers, ship's divers, and, of course, clearance divers. Read the full-length article at: **xray-mag.com/content/monument-all-involved-mine-warfare-be-officially-dedicated** ■

REFERENCES: HISTORIC ENGLAND, VERNON MONUMENT, RNCDA, ROYAL NAVY, HISTORICAL DIVING SOCIETY

wreck rap

ANDREA MURDOCK ALPINI

Diver Flavio Cavalli with the captain's compass on the wreck of the *Plus*, located off the Åland Islands in the Baltic Sea

The Plus Wreck

— A Baltic Elegy

Text by Andrea Murdock Alpini
Photos by Andrea Murdock Alpini and Ville Lundqvist
Translation by Marianna Morè
Edited by Catherine GS Lim & G. Symes

Located in the Åland Archipelago of the Baltic Sea is the wreck of the late 19th-century, German-made, three-masted, iron-hulled barque named *Plus*, which was lost on a stormy night in 1933. Andrea Murdock Alpini describes his journey there and his dives on this wreck.

Today, I head to Stockholm. There, a ship is waiting, which will carry me to Mariehamn, the largest town in the Åland Islands. Once I arrive in this autonomous region of Finland, my return to the Baltic Sea will finally be accomplished. The last time I was here was 15 years ago, and since then, I have never forgotten it.

I return to the Baltic Sea, no longer a student studying architecture, but rather one who studies wrecks, with a passion for rust and mist. I knew that I would return here. After all, wrecks not only mark the graves of crew members, but also encapsulate tales of the sea, engineering and naval manufacturing, which the sea has preserved over time. So, I left the fog of land, clouded by humidity, so that I could return to the wreck with new eyes.

While researching the archives, I came across some notes dating to 1918. Translating them a little from the Finnish and a little from the Swedish, I discovered that they told the story of a ship, which headed from the Baltic Sea to Argentina. And by the tradition of the port where it called before setting sail across the Atlantic Ocean, the crew had to participate in what was literally called a "rough party."

Perhaps if I was lucky, I would finally see the final resting place of this ship and its crew, wrapped in the eternal embrace of silence that only the cold and dark waters of the Baltic know how to give.

Two and a half hours after the dive boat cast off its moorings, we arrived at the point where Lake Mälaren meets Salt Bay, an arm of the Baltic Sea. The view finally opened up, as the horizon widened, and with it, the silver surface of the sea, which each people in the region call by a different name.

View of Stockholm, Sweden, from the Viking Line ferry, heading towards the fjords and Åland Island, Finland (above); Aerial view of the ferry approach to Mariehamn, the capital of Åland (right); Location of Åland on map of Scandinavia (lower right inset)

A sea of many cultures

Among us Mediterranean folk, the Baltic Sea is called the Eastern Sea, bearing the Greek name of *Βαλτική Θάλασσα* or *Baltiké Thálassa*; but by its ancestral peoples, it is called *Ostsee* in German, *Östersjön* in Swedish, *Østersjøen* by the royals of Oslo, *Itämeri* in the language of Alvar Aalto, *Østersøen* by the Danes, and *Morze Bałtyckie* by the Poles.

To all these peoples, the Baltic is the Sea of the East, except for the Estonians to whom it represents the Western Sea, and they call it *Läänemeri*, as well as the Russians, who call it *Балтийское море*, while to the Lithuanians, it is *Baltijos Jūra*, and finally to the Latvians, who define it similarly to their neighbours, calling it *Baltijas Jūra*. As Shakespeare wrote: "A rose by any other name would smell as sweet," and this is true for the Baltic Sea as well.

This slightly salty sea, which is black as tar, shallow and inhabited by bony fishes (or osteichthyes), has hidden stories of great trade and shipwrecks, which were caused by storms or difficulties in navigation due to thousands of emerging islands and islets posing obstacles along shipping routes. The Baltic Sea preserves the memory of long battles, bloody revolution against tsars, independence of republics, as well as stories of Russian submarines. The Baltic is a book with endless pages yet to be written. Its depths conceal wrecks and preserve the remains of civilian or military sailors and passengers, cultures that have vanished, and vessels that were the pride of a nation.

A First Officer's grandson

"Hi, Andrea," said Ville Lundqvist in greeting, as we met each other's glance on the pier in Åland.

Who was Ville? Well, he was the grandson of the First Officer of the Finnish cargo ship, SS *Argo*, which was sunk during WWII by a Russian submarine that threatened the defensive network created by the Finns, between their land of birch trees and the coast of Estonia. According to Lundqvist, 12 of the crew members died, but Ville's grandfather was saved.

Ville had an old fishing boat adapted for dive excursions, where cylinders were kept along its sides. The line hauler was now used to retrieve the downlines of safety buoys near dive sites or attached to shipwrecks. On board, Ville showed me some archive photos—some of them I knew, others I did not. Then, he took out an old nautical map, with notes and coordinates, distance, and direction to be taken. Sometimes, he was amazed by the fact that I recognised the position of some wrecks or lighthouses. I think I made a good impression on him. So, a bit later, he invited my assistant, Flavio Cavalli, and I to his house for dinner.

It was now my second day waking up on the island. Here, in the morning, it got light around 7:40 a.m. The sky cautiously became clearer, with the mists of the night dispersing, allowing the blue sky to appear among the thinning clouds. The air was pleasantly fresh. On board, we prepared our equipment, as the dive boat headed towards the *Plus* wreck, from the western port of Mariehamn.

History of the wreck

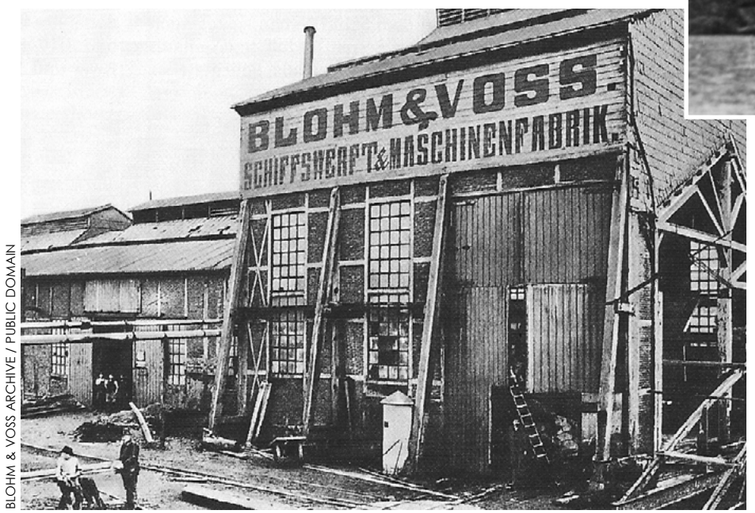
The *Plus* was a three-masted sailing vessel of 1,268 gross tons, which was built in 1885 near Hamburg


ÅLAND MARITIME MUSEUM

ÅLAND MARITIME MUSEUM

Plus

The deck of the *Pommern* (above), known as the sister ship of the three-masted sailing ship *Plus*; The shipyard Blohm & Voss 1877 in Germany where the *Plus* was built (right)



BLOHM & VOSS ARCHIVE / PUBLIC DOMAIN

in Germany, in the dry docks on the Elbe at the Hermann Blohm and Ernst Voss shipyards. The Laeisz shipping company was the first shipowner. Its maiden voyage was made from Hamburg to Valparaiso in Chile, under the command of Captain Carl J. Steincke, who, in just 61 days, reached the Spanish-speaking lands.

In 1908, the sailing ship *Plus* was sold to Henrich Hansen in Lillesand, Norway. Eight years later in 1916, the vessel was sold to Lauritz Schübeler, who registered the ship in Fredrikstad. But the story of the *Plus* does not end here.

From Norway, it was subsequently sold to the main Finnish trading company in the Baltic, Aktieselskapet Spes, which was based in the Åland Islands. This time, the new owner loaded the ship in Söderhamn, as it was bound for London in Great Britain. The purchase of the vessel, which took place in 1927, was to help implement trade with the English crown and South America.

Newspapers in Mariehamn, the capital of Åland, reported that on the night of 14 December 1933, a terrible snowstorm raged over the Baltic's Archipelago Sea. Chronicles stated that night came earlier that day; so dense was the darkness that it enveloped the coniferous forests, which clung heroically to the rocky slopes of granite and gneiss that descended into the sea.

The previous reports become diluted like aquatints, when they describe the true story of the sinking of the *Plus*, which left London on the day the patron saint of Scotland, Saint Andrew, was celebrated—November 30th.

Tragedy strikes

Back from the island of Kobbaklintar, Captain Eriksson decided to steer the ship into the dock himself. The blistering snow pierced faces and obscured the view for the whole crew, who were returning to Åland to celebrate Christmas, bringing with them exotic gifts, perhaps obtained while trading with sailors of other ships during stops at ports of call where the *Plus* had landed to load or deliver goods.

At full steam ahead, the ship left its shelter, after the sailors had laboriously turned the bow winch to retrieve the heavy anchor. Then, the ship's hull, tossed around by the wind and the current, soon became unmanageable. A quarter of a mile farther, the ship went adrift near the island of Korsölandet, where her keel hit the rocks. The iron of which the hull was built proved to be useless.

The lifeboats were launched, but the leak in the hull was so great that in just a short while, the ship sank. Ten crew members died on board, according to some sources. To this day, their remains rest among the planks of the *Plus*, which had become the shroud that enveloped them for their journey to the Beyond. Those who find


ÅLAND MARITIME MUSEUM

The captain of the *Plus*, Karl Emanuel Eriksson (above); A rare photo of the sailing ship *Plus* at anchor in a harbour (top right)

ANDREA MURDOCK ALPINI

Found on the wreck was a shoe of one of the officers on board the sailing ship *Plus*.

burial at sea rarely find their bodies surrounded by wood; very often, water and sheet metal become their only shrouds. The *Plus* crew had an earthly burial, with their hopes encapsulated in a shipwreck.

It is said that Captain Eriksson tried to swim to Korsö Island, less than 50m away, but the cold and heartbreak from the loss of men and the ship caused his death before he touched the shore. His remains today lie alongside those of his crew.

Only four men, wet and semi-frozen, reached the island. Later, they said that they were so dazed and disoriented that they did not know exactly on which island they were, a confusion no doubt made worse by the wind and snowstorm that raged. One of the survivors remembered having seen a glow of light; he thought it was a house, but his companions did not believe him, thinking the island was uninhabited.

The following day, someone indeed emerged from that glow of light—the only fisherman and inhabitant of the island of Korsö. After a night out in the open, the four sailors were finally rescued.

Memorial

Today, I found myself facing the island that revealed the point where the *Plus* sank. Here, reddish-grey rock emerged from the waters for approximately 15 to 20m. On top of this rock, one could see a small block of granite that was topped with a bell. It was the memorial dedicated to the local community of the *Plus* crew members. Carved into the block of granite were the names of the ones that today lie on the seabed of the Baltic:

- Captain Karl Emanuel Eriksson of Vårdö
- First Official J. Törntoth of Brändö
- Boatswain Stanley Työrä of Torneå
- Seaman Karl Palmén of Godby
- Seaman Johan Andersson of Jomala
- Ordinary Seaman Levi Ahlström of Hammarland
- Ordinary Seaman Bernhard Karlin of St. Marie
- Ordinary Seaman Armas Altonen of St. Karins
- Ordinary Seaman S. Wernow of Malmö
- Ordinary Seaman Claes Häggblom of Eckerö
- Ordinary Seaman Martin Lingren of Hammarland
- Cabin Boy Gösta Mattsson of Mariehamn


ANDREA MURDOCK ALPINI


ANDREA MURDOCK ALPINI

Plus

The captain's ladder on the wreck of the *Plus* (left); The sailors' toilet (above); Artifacts from the *Plus* wreck, on display at Åland Maritime Museum (right)


ANDREA MURDOCK ALPINI

Diving the wreck

I found myself at the surface, ready to dive, wrapped in a cloud of a million moon jellies. The water was green and cloudy. In front of me was the point of land that was the salvation of some of the crew. Below me, not far away, was the wreck of the *Plus*.

At 12m, the colour of the water changed drastically. The green colour disappeared in favour of darkness. It was just a matter of time—about an hour—when I would return to this point, and the dark would only be a memory of what I saw at the bow of the wreck.

I started swimming in the direction of the wreck, which, a couple of minutes later, appeared like a solid black mass. The stern was huge, massive. It towered over me. Below was the large rudder blade, which was no longer in its natural vertical position; the blade had come off its hinges due to the impact with the seabed.

Planktonic algae enveloped the wreck. The wood of the main deck appeared in perfect condition; indeed, one could see all the veins of the wood.

Visibility at this time of year was limited, often due to surface winds that raged every day. I followed the starboard side. Along my path, objects and shapes appeared, which took time to be recognised for what they were.

The ship was large, and it was hard to get an overall view. A rather thick layer of light-coloured sediment covered some parts of the ship. Features of the ship appeared in sequence, including some portholes, the glass of the sloping skylights that were placed on the deck, and finally, the silent cranes that lowered the lifeboats.

At the stern, along the centreline of the ship, there was a large skylight that led to the first of the decks below. Here, the remains of the captain's cabin were found. The space was divided into several rooms of various sizes and shapes. I moved with extreme care, both in order not to alter the state of conservation of the wood, and because in some spaces, the structures were very precarious. Hitting them would mean destroying history more so than the wreck.

I found myself facing an old piece of furniture with drawers. If it were not for the fact that the distance between its headboard and footboard seemed too short to me, I would have said that it could have been Captain Eriksson's bed. To its right, there was a metal tube that ended with an opening suitable to accommodate a person's mouth or the shape of a person's lips. In 19th-century ships, these artifacts were positioned by the captain's bed so that he could

A coco-de-mer from the Seychelles found in the captain's room on the wreck of the *Plus* (right); Carpenter's tools found at the stern of the wreck (below)

At the entrance of a corridor in the floor plan, there were two perfectly preserved coconuts. They were coco de mer, an endemic species of the Seychelles Islands. I had seen them many years ago in the rainforests on islands in the Pacific and had not seen them since. Now, finding them on the bottom of the Baltic Sea, at tens of different degrees in latitude, gave me a very special feeling. It was like being back on that hot and humid journey I took among palm trees with primitive leaves and tough bark trunks rising towards the light.

Instead, today I was here, immersed in the green waters that surrounded and protected me. I remained motionless for a few minutes contemplating this memory. Then, I got out and headed back to the main deck. The external darkness now appeared less intense to me, because of the even more harsh one in which I was wrapped just moments before. As always, it's all relative; reality is never unequivocal.

On the main deck, as I moved forward towards the bow, a second hatch led me back below deck. A shoe lay on the silt that had accumulated on the wooden planks. My thought was that this shoe had belonged to a man who had not left the ship.

A little farther on, a few metres away, there was a room with shelves.

There, between the shelves, which had collapsed with the effects of time, rested a pair of shoes waiting to be resoled. They still had the shape of the foot that had moulded them. Who knows how many miles they had travelled from bow to stern, as the vessel crossed the seas and oceans of the world.

I moved forward more with my sight than with my fins. I often moved my torchlight with my arms, stretching as far as I could, so that I could collect visual references but also information about the environment that surrounded me, before choosing whether or not to continue in that direction.

Artifacts

A metal circle attracted my attention. It was barely visible, sticking out of the mud just a couple of millimetres, perhaps less. I left my dive lamps behind me at the entry point because they were too bulky, and the space was tight.

I gently placed my hand in the silt, under the circular shape that seemed finally to be what I was searching for since the previous day. In the half-light, my fingers slid under something concave, and a cloud of silt arose. Finally, I saw that I was now indeed holding Captain Karl Emanuel Eriksson's compass in my right hand. The ceramic dial was intact. The geographical directions and wind angles could still be read perfectly.

I deposited the compass on what was left of the hatch through which I had entered the small space. I wanted to photograph it with better light than what I had inside the space, but above all, I want to show the photo to my dive partner who, until now, had been waiting for me in open water. We could not both go down to this spot together. After shooting, I paused, cherishing this small piece of *Plus* history. Then, I gently picked up the compass again with my fingers.

This time, I left my torchlights off. I entered the semi-darkness to see the wreck as it appeared in natural light. The main bridge, broken in some places, and a dorm window let in some greenish light. The show was truly incredible, unique, unrepeatable.

I hid the compass between the silt and the boards to return it to its wreck, or rather to its ship. I passed through the narrow corridor that led from the cobbler's room to the captain's cabin. I found the coconuts again, retracing each space as I passed. I went out of the stern hatch and back to retrieve my dive lamps at the entry point.

Structural features

Entering the *Plus* wreck means understanding how the ship was built. The structure determined its shape. A net of beams and pillars divided the space into three levels. The first two could be seen distinctly, the third level disappeared in the silt that had

The captain's compass on the wreck of *Plus*

permeated the wreck for almost a hundred years.

I tried to move in different directions, looking less for images to be filmed and more for engineering aspects to better understand the ship. Among the various notes that I brought to the surface, one certainly fascinated me more than the others: the mainmast that fit into the keel. It was made from a solid tree trunk, a single piece. I knew it had to be like this to be a load-bearing structure, but seeing it inserted into the planking was quite another thing. The reality, in comparison to the idea, was overwhelming. The veins of the wood seemed as if they were still alive. Their lines slid and circled along the circumference of the tree trunk, appearing like wrinkles of time, subtracted from natural aging.

A square metal profile of a structure stood up from the wooden deck, about a metre high. There were no impediments of any kind in the descent inside the wreck. My dive buddy, Flavio Cavalli, waited for me, leaning against the square structure like a good family man, with his light on for my return. I started to descend.

A ladder, located under a skylight, connected all the ship's levels up to the rib of the keel. The holds were completely empty, but I already knew that they would be. The *Plus* had left its last cargo load in London and was returning to Mariehamn for the winter. There, it would have stayed in the harbour, protected from the winds, together with other sailing ships like the *Prompt*, *Avenir*, *Regina*, *Baltic*, *Viking* or *Pestalozzi*. Instead, that cursed night of 14 December 1933 saw the *Plus* dragged to the bottom of the sea, transforming it forever into a mystical place.

A few minutes later, I exited from the holds in the middle of the ship and headed to the bow. After a last glance at the bowsprit and its bobstays, I turned my fins again and headed off beyond the starboard side. There, I had seen in previous days some partially visible remains of cookware from the ship's galley. They were almost buried in silt. Touching them would mean raising a cloud of silt that would prevent the photography of them.

A "rough party"

My thoughts fled to that anecdote I read in the weeks before my departure—the note dated to 1918, transcribed in the mid-1960s, in which a crew member remembered a dinner that took

A rare painting in the Åland Maritime Museum's collection, which shows the sailing ships docked in the main harbour of Mariehamn, by Gordon Macfie, 1935 (right); A very rare photo from 1885 of the "rough party" dinner on board the three-masted sailing ship *Plus* (below). This was a traditional custom for the crew when they were docked in the harbour of La Boca, Argentina.

ÅLAND MARITIME MUSEUM

place in the river port of La Boca, an Argentine barrio in Buenos Aires. Below, I relay in its entirety what I translated from a modern transcription of the old Scandinavian:

> "On the last night before the ship left the port, Pastor Johan Nielsen invited all the crew to a 'rough party.' The mass had been reserved for the officers. Immediately after the ceremony, the shepherd boarded the *Plus* with a portion of shortcrust pastry. The cook had already prepared some good coffee; the crew boys instead began to decorate the dish with flags and with what they had at hand. The 'rough party' was prepared to be in good company, singing, playing and telling stories of the sea and of the ports where each sailor had a 'family.' Towards the end of the evening, the pastor read some passages from the Bible and gave them the blessing for a safe trip."

No Scandinavian boat has ever left the port of La Boca without having experienced this centuries-old tradition.

Afterthoughts

Almost nothing remained of the galley on the *Plus* sailing ship, except for some pots, now overboard. The silt was too thick to be moved by hand; one had to be patient for the sea to do its job, covering and uncovering parts of the ship as it pleased. Its waves write the history of this sailing ship.

As for me, from this first trip to the Åland Islands, I tried to relay the best of the *Plus*—not the wreck, but the sailing ship. I spent nearly 300 minutes diving on what remained of it under the sea and visited the Maritime Museum to see its memorabilia as well. After having done all this, I once again looked for myself in a cup of black coffee, which I drank while sailing the waves of the petrol-green sea on our return to shore. Below the waters, I had explored a ship that was no longer able to sail, but whose history deserved to be passed down to future generations. ■


NORSK MARITIME MUSEUM

SOURCES: ÅLAND MARITIME MUSEUM, BLOHM & VOSS ARCHIVE, NORSK MARITIME MUSEUM, WIKIPEDIA.ORG

Based in Italy, author Andrea Murdock Alpini is a technical diving instructor for TDI, CMAS and PSAI. Diving since 1997, he is a professional diver focused on advanced trimix deep diving, log dives with open circuit, decompression studies, and research on wrecks, mines and caves. Diving uncommon spots and arranging dive expeditions, he shoots footage of wrecks and writes presentations for conferences and articles for dive publications and websites such as ScubaPortal, Relitti in Liguria, Nautica Report, ScubaZone, Ocean4Future *and* InDepth. *He is a member of the Historical Diving Society Italy, and holds a master's degree in architecture and an MBA in economics of arts. He is the founder of PHY Diving Equipment (**phidiving.com**), which specialises in undergarments for diving, as well as drysuits, hoods and tools for cave and wreck diving. Among other wrecks, he has dived the Scapa Flow wrecks heritage, Malin Head's wrecks and the HMHS Britannic (-118m), Fw58C (-110m), SS Nina (-115m), Motonave Viminale (-108m), SS Marsala (-105m), UJ-2208 (-108m) and the submarine U-455 (-119m)—always on an open circuit system. His first book (in Italian), Deep Blue, about scuba diving exploration was released in January 2020 (see **amazon.it**). For more information on courses, expeditions and wrecks dived, please visit: **wreckdiving.it**.*


VILLE LUNDQVIST

Flavio Cavalli (left) and Andrea Murdock Alpini (right) on the dive boat, a renovated fishing boat owned by Ville Lundqvist, after a dive on the *Plus* wreck

A model of the Bremer cog, which is the most well-known cog in existence today, dating from the 1380s. It was discovered in 1962. Cogs were a type of round ship primarily made of oak and clinker-built.

800-year-old shipwreck found off Sweden's western coast

A wreck discovered outside of Fjällbacka on Sweden's western coast is the oldest shipwreck ever found in the province of Bohuslän. This is also one of the oldest cogs ever found in Europe.

"The wreck is made from oak, cut between 1233 and 1240, so nearly 800 years ago," said Staffan von Arbin, a maritime archaeologist at the University of Gothenburg.

Dyngökoggen

Last autumn, the University of Gothenburg conducted archaeological diving inspections along the coast of Bohuslän to find out more about known wrecks on the seafloor. It was during this work that the maritime archaeologists came upon the wreck outside of Fjällbacka, which has been given the name "Dyngökoggen."

The limited survey of the wreck showed that it is a cog, a type of ship that first appeared in the 10th century, and was widely used from around the 12th century on.

Cogs were a type of round ship, typically constructed largely of oak and clinker-built. The most famous cog in existence today is the Bremen cog. It dates from the 1380s and was found in 1962; until then, cogs had only been known from medieval documents and seals.

The wreck has a bottom planking that is flush-laid (carvel-built), while the side planks are overlapping (clinker-built). Seams between planks are also sealed with moss, which is typical for cogs. The surviving hull section is about 10 metres long and five metres wide. Von Arbin believes, however, that the ship would originally have been up to 20 metres long.

Analysis of the wood samples showed that the ship was built of oak from northwestern Germany. How did it end up outside of Fjällbacka?

While cogs are mostly associated with the medieval Hanseatic League, ships of this type were common throughout the Middle Ages in northern Europe and Bohuslän, which was part of an important transit route for international maritime trade during this period.

Why did it sink?

It is not yet known why the ship sank but that would likely be an exciting story. The survey of the ship clearly showed indications of an intense fire.

Perhaps the ship was attacked by pirates. The first decades of the 12th century were a turbulent time in Norway, which Bohuslän was a part of at the time, with intense internal struggles for the Norwegian crown, and the coast was plagued by periods of intense pirate activity during the Middle Ages. ■ SOURCE: UNIVERSITY OF GOTHENBURG

(File photo) The Swedish Coast Guard apprehended divers in the process of plundering protected shipwrecks.

Four divers charged with systematic plunder of protected wrecks in the Baltic

The accused individuals appear to have engaged in large-scale systematic looting and disturbance of several wrecks and protected sites, including wrecks of older warships in the Baltic Sea, according to a spokesperson from the Public Prosecutor's Office in Kalmar.

The Swedish Coast Guard apprehended the divers in July 2020, as they were found retrieving artifacts from a wreck off the Baltic island of Öland. A subsequent house search uncovered a large number of objects, which were suspected to originate from wrecks classified as protected. Among the objects was an iron cannon dated to the 17th century.

The indictment includes 10 charges for incidents during a number of dives that took place from 2013 to 2020. Two of the men stand charged on all counts.

"My assessment is that the crimes should be assessed as serious, partly because they led to extensive destruction of protected sites," said prosecutor Magnus Ling with the Public Prosecutor's Office in Kalmar.

The Swedish Antiquities legislation states that it is forbidden to intentionally or negligently disturb, remove, dig out, cover, or by means of construction, plunder or otherwise alter or damage, historic sites. Offences can result in imprisonment for up to four years. ■ SOURCE: SWEDISH PROSECUTION AUTHORITY

The Tren Maya railway project is a new railway that will connect the Yucatán Peninsula's major cities and tourist areas.

Running the Tren Maya railway project through the jungle will impact the wildlife.

Dive community up in arms over Tren Maya railway project

The planned intercity railway, which will traverse the Yucatán Peninsula, is being routed through protected wildlife habitat and cave-diving country, threatening to cause permanent damage to the environment, Mayan villages, and archaeological sites, as well as the caves.

Text and photos by Larry Cohen

The first time I went cave diving in Mexico's Yucatán was over 22 years ago. I will never forget how excited I got, swimming through these spectacular passages. I remember thinking this was as close to being on another planet as I would ever get.

These caves are unique since they were dry caves before the Ice Age. This allowed stalagmites, stalactites and columns to form. After the Ice Age, these caves filled up with water, preventing this environment from changing. Over the years, I have traveled back to the area to observe and photograph what I consider to be one of the wonders of the world.

The underground water is the Yucatan's only source of fresh water

Unfortunately, all of this might change in the name of progress. The US$9.8-billion railway project will transport 40,000 passengers a day into the Yucatán Peninsula. The train will start at the airport in Cancun and run 1,500km (932mi) south. The train is supposed to move tourism to remote areas of Yucatán and create jobs. However, unless properly planned, the construction could cause permanent damage to the environment, Mayan villages, and archaeological sites, as well as the caves we love to explore.

Track through jungle

The train route has been changed several times after construction had already started. The train was supposed to run along Highway 307. This road begins in Cancun and is the primary route to travel south. The train's construction caused massive traffic delays, so this route was abandoned, but there is still damage to the highway and surrounding land that has not been repaired.

Jungle

Running the Tren Maya railway through the jungle will impact the wildlife. Now, the plan is for the

The train could damage archaeological sites.

train to run 4km (2.5mi) from the road into the jungle. This will destroy habitat where endangered and protected species, including jaguars, monkeys, wild boar and deer, live. The geology of this area is limestone, and the flooded caves we love to dive are underneath.

The water in these caves is the area's only source of fresh water and flows into the ocean. Unfortunately, to finish the railway project by the end of 2023, studies to determine how this will affect the area have been rushed and not done thoroughly.

Could caves collapse?

Besides the environmental damage, many locals question whether a high-speed railway built over limestone is safe for the passengers. There have not been studies conducted to confirm that the geology can support the weight of a train.

The underground water is the Yucatán's only source of fresh water..

Many residents of the Yucatán feel a well-planned railway project would benefit the area, but the way the project is now planned will do more harm than good. So what is a well-planned alternative?

Move the track inland

Peter Sprouse from the Association for Mexican Cave Studies says that running the railway 11 to 12km (7 to 8mi) away from the coast will minimize the number of caves collapsing since most cave systems are located no more than 10km (6mi) from the coast. However, this will still impact the environment.

Sprouse believes that if the railway is to be built, going back to the original plan of building the railway along the highway will have less impact on the cave systems. The area is already developed, and there are not many caves that cross under the highway.

Petition

The question is, what could we do to protest the building of this railway? At the time of this op-ed, 45,620 people have signed the Change.org petition at: **https://bit.ly/3uN3ex4**. If we can get the number of signatures up to 50,000, this would be one of the most-signed petitions on Change.org. So hopefully, the petition will not fall on deaf ears. ■

SOURCES: WIKIPEDIA – TREN MAYA, TREN MAYA PROJECT WEBSITE

Japan's Osezaki

— Biodiversity Hot Spot of Tokyo

Text and photos by Kenji Ichimura

Osezaki

The majestic Mount Fuji graces the scenic landscape around Ozezaki dive site in Numazu, Shizuoka Prefecture, Japan (above); A pair of bicolor anthias (top left), scleractinian corals (left) and a harlequin ghost pipefish (previous page) found at Osezaki

As a divemaster in Japan, I have enjoyed diving all around the world, and I will admit that there are many places on earth I would love to revisit soon. But for today, I would like to introduce my home country, Japan, as your next possible dive destination.

Before the pandemic, Japan put great effort into inviting tourists from around the world to visit our country. Inbound tourism was treated as a growing industry, which is now an extremely important part of the Japanese economy. Presently, many resources and a lot of money are being poured into "Visit Japan" promotions all around the world by Japan National Tourism Organization (JNTO), and as a result, tourist sites all around Japan have become packed with international travelers.

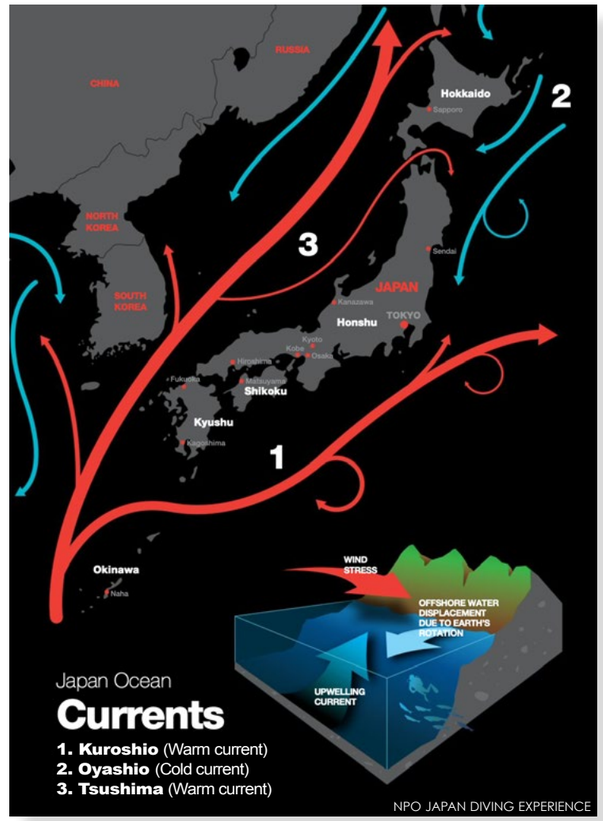
But this has not been the case for the dive industry in Japan. Happy and content with business from local Japanese divers, the dive industry was not interested in expanding its market to international divers. As an avid diver in Japan, this was a good thing. While the whole of Japan faced issues of overtourism, the dive sites all around Japan were not affected.

But as a country with its diving population growing older and smaller, I asked myself, "Is this a good thing?" My answer was very simple, "I believe not." I think Japan should get the recognition it deserves as a top, world-class dive destination, and welcome more divers from around the world—and if I can help, I will do my best to share what I know and love about diving in Japan.

Today, I would like to introduce Osezaki to you. Located in Numazu, Shizuoka Prefecture, it is a popular destination for local divers in both the Tokyo and Nagoya regions. As a resident divemaster of Yokohama, Kanagawa Prefecture, it is my home base—a weekend dive destination, where I log more than 200 tank dives per year. But before I explain how great Osezaki is, let me explain why diving in Japan is so special and unique to begin with.

Japan, as a tourist destination, was booming up until the pandemic. I believe Japan still has the potential to recover as a travel destination as soon as travelers around the world feel safe enough to travel again and visit our country. You never need to wonder what you can

Scenic landscape at Osezaki, with Mount Fuji in the distance (above); Air tanks at local dive shop Osekan Marine Service (left); Ose Shrine is a symbol of faith for the fishers of Suruga Bay (right); Map of Japan's ocean currents (far right)



do besides diving, as your "aprés-dive" activities and experiences probably will not be an issue. You can enjoy our unique traditions, culture and delicacies.

Diving in Japan

Now, for diving in Japan. Japan has four unique features that I believe are important to mention. Firstly, Japan has four distinct seasons both on land and underwater, and within the same season, you can do cold-water to tropical-water diving, depending on your diving preferences—all within a two- to three-hour domestic-flight range.

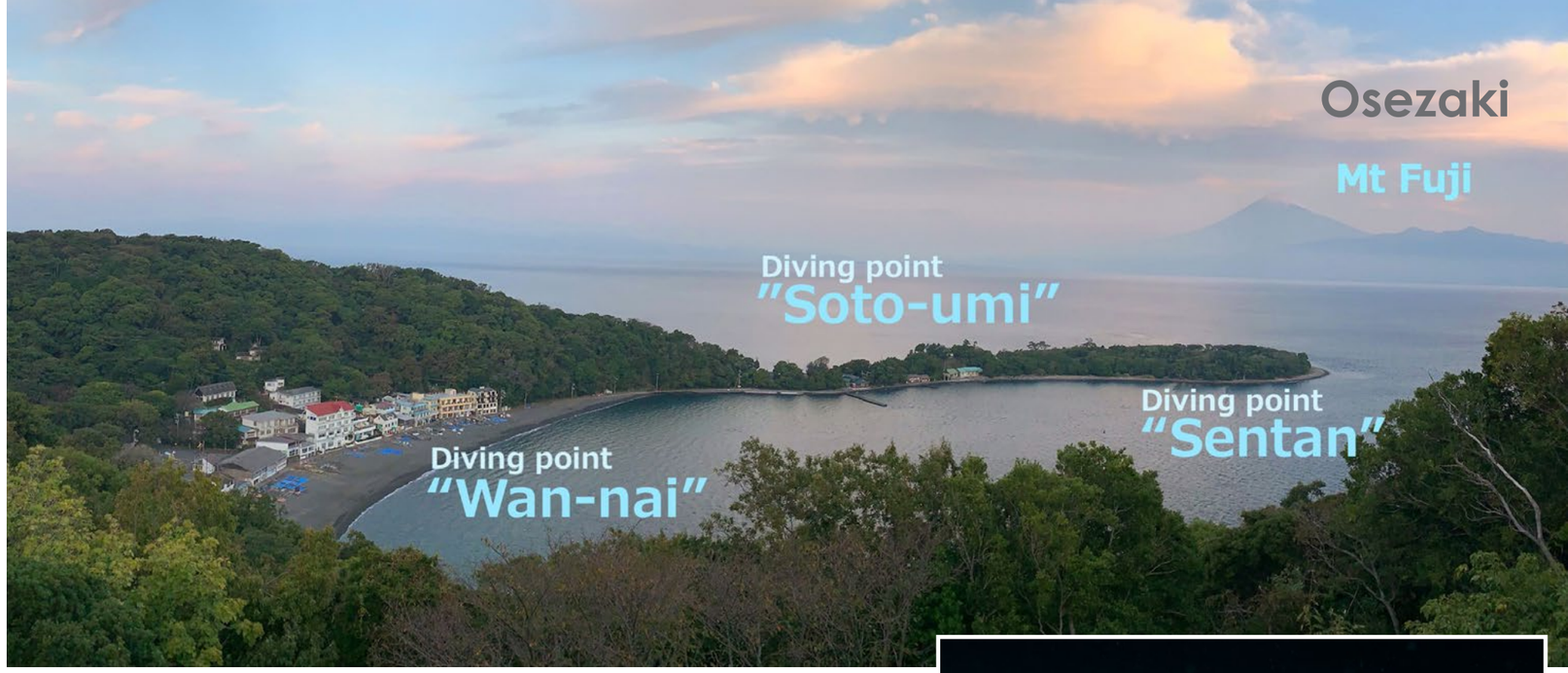
When you choose your dive destination, you do not have to choose a country according to your diving preferences, you only need to choose Japan. You can dive nutrient-filled kelp forests and see giant octopus at Hokkaido, which is a cold-water dive location; or you can dive with large schools of sharks, such as Japanese hound shark and hammerhead sharks near Tokyo, which is a subtropical dive location; or you can choose a tropical beach resort in Okinawa and dive with manta rays. You can probably find almost every type of marine creature in Japan.

Secondly, Japan has 6,852 islands, and our coastline is 33,889km long (which is about 85 percent of Earth's diameter), with many parts forming a jagged saw-shaped coastline, which is ideal for marine life to flourish. Due to this very reason, the fishing industry in Japan is old but small, mostly occurring off the coastline, thus continuing to protect the environment for marine life near our shores.

Thirdly, Japan is fortunate in that both warm currents from the south and cold currents from the north mix off its coasts. The strength of currents changes with the seasons, thus dramatically changing the underwater scenery and the marine life one can see at the same dive site. This is especially true for dive areas near Tokyo. Here, you get to see both cold-water and warm-water creatures thriving in the same area. If you are lucky, you may see tropical marine life carried up on the currents from the south as well.

Lastly, Japan is surrounded by deep-water trenches reaching down to more than 2,000m in depth, just a few kilometers off the coast. The winds and Earth's rotation cause the upwelling current, rich in nutrients from the deep, to bring with it rare deep-water creatures up to recreational diving depths. You need to be selective in choosing the right dive location to really see the deep-water creatures, but if you do, and you get the timing right, you may be in for a big surprise.

With all these factors combined, Japan hosts 14.6 percent of the 230,000 marine species that can be found around the world—a dream dive destination for any avid diver for sure.



Japanese dragon moray

Pair of blue-tailed shrimp goby (above); Harlequin ghost pipefish (top left); Dive sites at Osezaki (top right); Yellownose prawn-goby with shrimp (center)

Osezaki

Now, let's talk about Osezaki—my home diving spot. Osezaki is a dive location situated on the western shore of the Izu peninsula, facing the 2,000m deep Sagami Bay. A two- to three-hour drive from downtown Tokyo, it is a popular dive destination for many divers in Tokyo and Nagoya.

So, why is Osezaki so popular? Personally, I like the magnificent view of Mt Fuji, which you can see from the dive sites. I also like the fact that Osezaki is one of the oldest dive locations in Japan, has well-established dive site rules, and one can easily buddy dive without a guide there. Of course, you need to show the dive center that you are not a "blank" diver and have extensive buddy-diving experience. Even if you are not used to buddy diving, you can ask for a guide service at one of the many dive shops situated in the area.

I also love Osezaki for the diversity of marine life that one can encounter here, making this site very popular among divers with a passion for underwater photography and observing marine life behaviors.

At Wan-nai dive site: Pair of yellow pygmy gobies in a bottle (above); Pair of monster shrimp-gobies (top right); Pair of blue hana gobies (right); A zebra-patterned scripted frogfish, *Antennarius scriptissimus,* photographed on a day dive (far right)

Dive sites

Osezaki has three distinctive beach entry points, offering divers different types of underwater terrain and endemic marine life.

Wan-nai. *Wan-nai* translates to "inside bay." This location sits in front of the many dive centers located in Osezaki. The bay is well protected from wind and waves, and is rarely closed for weather-related reasons. Even when all the other dive sites in the area may be closed due to a hurricane, and if the hurricane does not directly hit Osezaki, there is a big chance that Wan-nai will remain open.

In the summertime, the average visibility is around five to eight meters inside the bay. In the wintertime, the visibility may improve up to 20m.

The entry point is a 20 to 30m walk down the black sandy beach, which stretches across the bay. After entry, you need to swim 20 to 30m across a shallow, rocky, two-meter area before dropping down to the sandy floor at 8m. Depending on the direction you head out from here, the sea floor changes from sand to mud, with many man-made underwater sanctuaries providing a home to a variety of marine life.

If you want to look for gobies, this is the site to dive. The idol of the bay is the tiny photogenic yellow pygmy goby (*Lubricogobius exiguus*). A pair of rare monster shrimpgoby (*Tomiyamichthys oni sp.*) have been residents here for a year now. They are very shy, but you may be lucky to see them together. Among the common gobies, one can find the

Peregrin dealfish in "light-trap dive" (left); John dory on night dive (far left); Monkfish resting in the sand (bottom center)

Osezaki

Ribbonfish (above) and oarfish (right) in "light-trap dive," where underwater lamps are set up at night, attracting species from the deep and the open sea

blue hana goby (*Ptereleotris hanae*), yellownose prawn-goby (*Stonogobiops xanthorhinica*) and filament-finned prawn-goby (*Stonogobiops nematodes*), which are popular species. Last but not least, is the very rare blue-tailed shrimpgoby (*Cryptocentrus pavonioides*). This is a seasonal species found only during a short period between summer and autumn. Its beautiful color attracts many underwater photographers from all over Japan.

The Wan-nai dive site is also the only place where night dives are allowed at Osezaki. Here, you can dive at night on Wednesday, Saturday and Sunday.

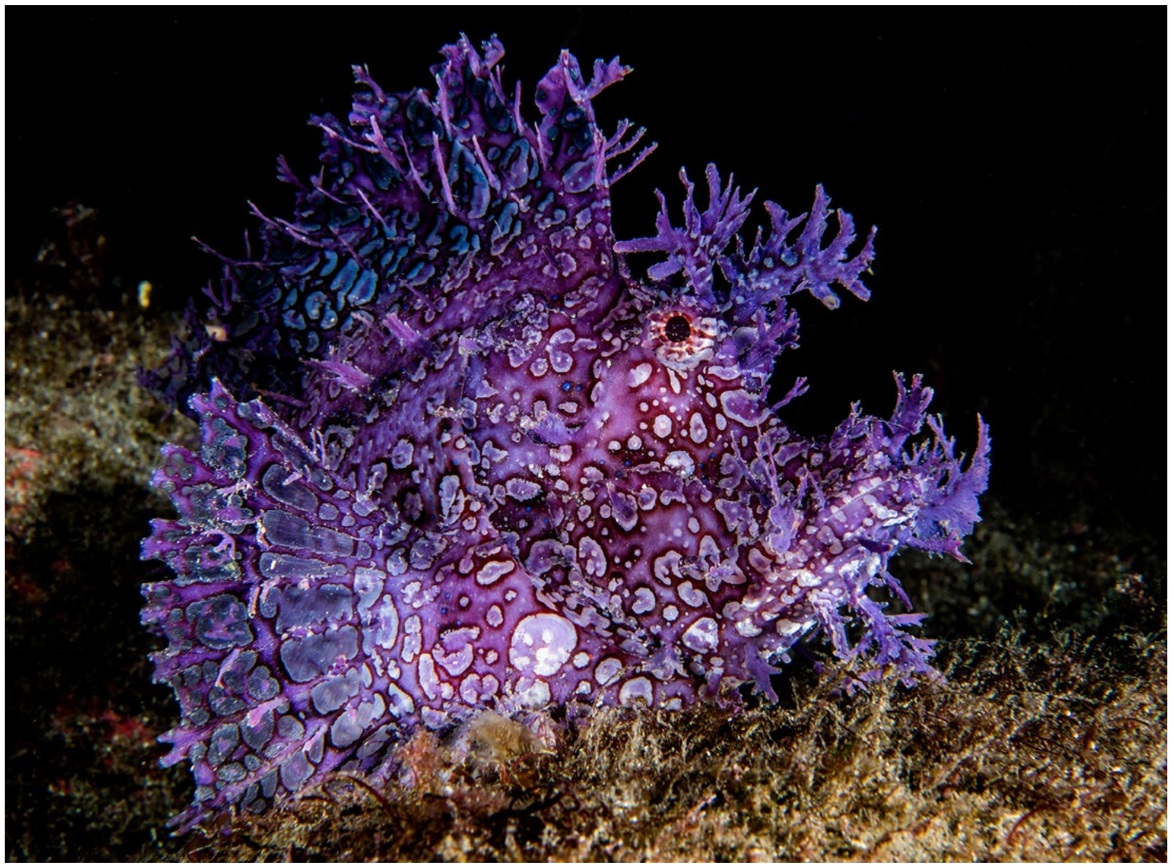
From November until March, many local dive shops host "light trap dives," where one can observe creatures coming up from the deep and in from the open sea. Here, you may get to see many rare creatures, rarely seen elsewhere around the world. If you are lucky, you may see a juvenile oarfish during your dive.

What you can see (all year-round):

- Many types of seasonal nudibranchs
- Many types of shrimp and crab
- Many types of gobies
- Many types of frogfish
- Many types of squid and octopus

If you are lucky:

- Harlequin ghost pipefish (*Solenostomus paradoxus*) in autumn
- Feeding John Dory (*Zeus faber*) in winter
- Monkfish (*Lophidae*) in winter
- Oarfish young (*Regalecus*) in winter
- Peregrin dealfish (*Trachipterus trachypterus*)



Soto-umi dive site, with Mount Fuji in the distance (above); Thread-tail basslets, *Pseudanthias rubrolineatus*—a very rare, deep-water (over 50m) species of anthias (top right), which has a shorter stripe than the one-stripe anthias

Soto-umi. *Soto-umi* translates to "outside ocean." This location is situated on the other side of the cape of Osezaki, facing the open waters of Sagami Bay. Due to its location, the visibility is often better than at the Wan-nai dive site, and the underwater terrain is more dramatic.

There are three entry points here, all with concrete paving for divers, covering the 200m rocky beachfront. After entry and heading straight out to the open sea, you can dive down to 20 to 30m. The underwater terrain is mainly composed of large rocks and sand.

Depending on the season, you may be lucky enough to see the resident purple goose scorpionfish (*Rhinopias frondosa*), which shows itself to divers from time to time. Also, there is a large Asian sheepshead wrasse (*Semicossyphus reticulatus*), which can be seen swimming around the area from time to time. Sunfish (*Mola mola*) have often been sighted in the past, but not so often recently, maybe due to climate change.

What you can see (all year-round):
- Many types of seasonal nudibranchs
- Many types of shrimp and crab
- Many types of frogfish
- Many types of squid and octopus

If you are lucky:
- Sunfish (*Mola mola*) in winter
- Goose scorpionfish (*Rhinopias frondosa*)
- Asian sheepshead wrasse (*Semicossyphus reticulatus*)

Sentan. *Sentan* translates into "tip (of the cape)." It is only open to divers on weekends and public holidays. The cape of Osezaki and the Ose Shrine are popular tourist attractions for non-divers as well. The shrine was founded in 684 AD and has long been known to house the guardian deity of the sea. If you are a diver, I do recommend you say hello to the local deity of the sea.

Goose scorpionfish (*Rhinopias frondosa*) at Soto-umi dive site on the cape of Osezaki

Osezaki

Cherry anthias (left); One-stripe anthias and nagahanadai (far left); Red-bar anthias (center); Pink basslet (below); Sea goldie fish (bottom center)

Red-belted anthias

To reach the dive entry point, you need to pay a fee of 100 yen (per person) at the entry gate, so please do not forget to bring coins with you. The entry point is at a 15m rocky slope, descending to the ocean. After entry, there is a steep slope descending to 50 to 60m, so it is very important to control your decent. You also need to check the tides as sometimes the currents may be challenging.

The location is famous for the variety of anthias you can see on one dive. Common anthias found here include the sea goldie (*Pseudanthias squamipinnis*), red-belted anthias (*Pseudanthias rubrizonatus*) and cherry anthias (*Sacura margaritacea*). If you dive deeper, you may be able to see nagahanadai (*Pseudanthias elongatus*), sea goldie fish (*Pseudanthias sp.*) and one-stripe anthias (*Pseudanthias fasciatus*).

What you can see (all year-round):

- Many types of seasonal nudibranchs
- Many types of shrimp and crab
- Many types of tropical water creatures
- Many types of anthias

If you are lucky:

- John Dory (*Zeus faber*) in winter
- Sea goldie fish (*Pseudanthias sp.*) in deeper waters
- Bicolor anthias (*Pseudanthias bicolor*)
- Pink basslet (*Pseudanthias hypselosoma*)

I hope you are now interested in considering diving in Japan, and especially Osezaki, in the future. If you want more information about diving in Japan, please visit my site, DIVE IN JAPAN, at: **dive-in-japan.com**. ■

*Kenji Ichimura is a PADI Divemaster and an underwater photographer, who loves the seas around Japan and is dedicated to introducing the wonderful world of diving in Japan. He is the founder of "NPO Japan Diving Experience" (**dive-in-japan.com**), which promotes diving in Japan to the international community. His career with Japan National Tourism Organization, which spans from 2018 to 2020, includes his initiative for "dive tourism" in Japan. His underwater photography has won awards in The Blue Earth Underwater Photo Contest 2018, 2019 and 2020.*

Marquesas Islands

— *Nuku Hiva & Beyond*

Text and photos by Pierre Constant

Jungle creek, Fatu Hiva (below); The endemic Marquesan flower sea urchin, *Toxopneustes sp.*, La Sentinelle aux Marteaux (previous page)

Crowned tiki of "Moeone" in Hanapaoa village on the northern coast of Hiva Oa

Marquesas

Haaume Bay, seen from Hatiheu viewpoint, northeastern coast of Nuku Hiva, Marquesas Islands (above); The endemic Marquesan fruit dove, Fatu Hiva (right)

For the bona fide traveller, or should I say, the thrill-seeker, the thought of heading off to the far side of the world is enticing. Ponder this for a moment: Have you ever heard of the Marquesas Islands?

Located between 7°50 S and 10°35 South latitude, and 139°23 W and 140°50 West longitude, this archipelago is home to the most distant specks of land, far from anywhere on the planet: approximately 4,700km to the tip of Baja California, 6,300km to Peru, 7,300km to Australia and 88,00km to Kamtchatka in the Russian Far East. Hawaii lies about 3,400km to the northeast, Galapagos about 5,300km to the east, Rapa Nui (Pascua Island) about 3,500km to the southeast, and Tahiti around 1,400km to the southwest.

The 12 main islands of the Marquesas Archipelago represent a land surface of 1,052 sq km, aligned on a southeast-northwest axis of 350km. Ranging from 1.1 to 5.5 million years old, the oldest islands such as Eiao and Hatu Tu are found in the northwestern part of the archipelago, and the youngest islands such as Hiva Oa and Fatu Hiva are found in the southeastern part.

A northern group of six islands cluster around Nuku Hiva (including Eiao, Hatutu, Ua Huka, Ua Pou and Motu Iti), while a southern group of islands surrounds Hiva Oa (including Tahuata, Motane, Fatu Huku and Fatu Hiva). Nuku Hiva, the biggest island, measures 340 sq km, with a summit at 1,224m above sea level.

Geology

The Marquesas Islands are an atypical geological hotspot, with islands moving from the southeast to the northwest. This matches the movement of the Pacific Plate of 10.5cm to 11cm per year. This group of volcanic islands rises 4,000m above the seafloor, with an ocean crust aged 59 to 49 million years (in the

Hakaui Bay below the rim of Nuku Hiva's caldera, southwestern point (above); Upe, the Marquesan imperial pigeon, *Ducula galeata*, in the highlands (right)

Paleocene-Eocene epoch). The latter, which is 800km wide, is limited by two major fracture zones oriented at N100°W with the Galapagos Fracture Zone (GFZ) in the north and the Marquesas Fracture Zone (MFZ) in the south. Drifting away from a fixed hotspot, the islands sink slowly by thermic subsidence, to eventually become atolls.

A number of submarine mounts have been identified in the southern part of the archipelago. Submarine reef flats have been located between the depths of 40m to 130m around Hiva Oa. The petrographic diversity of the islands is due to the Marquesan magmatic plume, which is made up of two distinct filaments of different isotopic composition: tholeiitic basalts, which are saturated or oversaturated in silica (peridotites); and alkaline basalts, which are undersaturated in silica (pyroxenites) or very undersaturated (basanites).

Volcanoes

Most of the islands are shield volcanoes. These have evolved into huge calderas, which in turn have been destroyed into halves by the action of marine currents. Once 20km in diameter, the Eiao and Nuku Hiva calderas have collapsed in their southern and southeastern parts. Exposed to a different current, Fatu Hiva has collapsed in its western part, showing a concave side to the west.

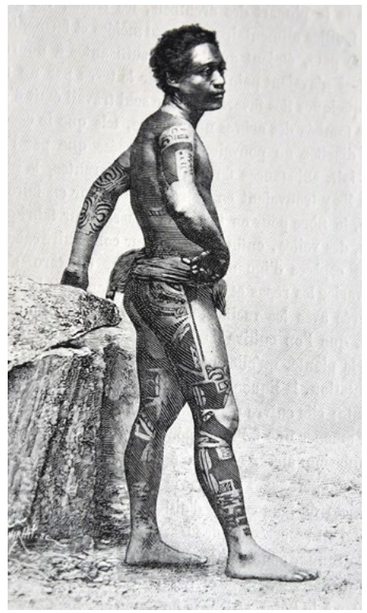
Marine climate

The Marquesas Islands are bathed by the east-to-west-flowing South Equatorial Current (SEC) in the north, and by the west-to-east-flowing South Equatorial Counter Current (SECC) in the south.

However, the archipelago is mostly under the influence of the SEC, which is helped by the easterly trade winds.

Located in the subtropical zone, the waters of the Marquesas Islands are rich in nutrients. The southern frontier of the archipelago's waters is deeply subjected to the equatorial, upwelling, deep-ocean waters coming to the surface, which favour the development of phytoplankton. This means that there is intense biological activity here, in comparison to the surrounding oceanic waters.

The elevated phytoplanktonic biomass has a seasonal cycle marked by the El Nino–La Nina



TOP LEFT TO RIGHT: Lone tiki of "Te Fiifii," in the jungle behind Puamau village, northeastern coast of Hiva Oa; Marquesan archeological site of Kamuihei, near Hatiheu; Stone carvings, Kamuihei archeological site; Paul Gauguin's grave in Atuona on Hiva Oa (far right); Jacques Brel's grave in Atuona (right); Historical illustration showing tattoed Marquesan warrior (left). Engraving by H. Thiriat, from *The Universal Geography* by Élisée Reclus (ca. 1876); Petroglyph of a dolphin on basalt rock, Fatu Hiva (bottom left)

phenomenon. Average seawater temperatures range from 27°C to 28°C. With a not-so-humid tropical climate, the rainy season takes place from July to August.

History

Although archaeological research suggests that the islands were colonised between 150 B.C. and 100 A.D. by voyagers from West Polynesia, it turns out, around 1500 B.C., the presence of populations of the Lapita ceramic culture was already evident in the region of Fiji, Samoa and Tonga.

An oasis of life in the middle of an oceanic desert, the Marquesas are dispersed over a marine surface of 100,000 sq km.

There is no doubt that the islands' ancestors were of Melanesian origin, even beyond Southeast Asia and Taiwan. The cultivation of breadfruit as well as irrigated terraces of taro plants are predominant. The word *kaikai*, which means "food" in Marquesas, is the same word used in Papua New Guinea and Melanesia.

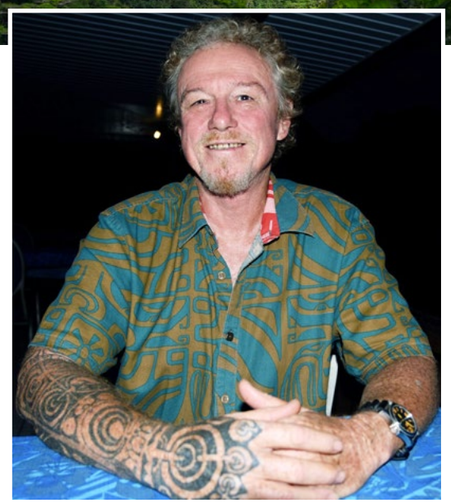
For the Europeans though, the official discovery of the islands was made by Spanish navigator Álvaro de Mendaña, who sailed by them on 21 July 1595. Landing in Fatu Hiva, he named them the Marquesas Islands in the honour of Marquis de Cañete, the then Spanish viceroy of Peru.

American whalers visited in the 18th and 19th centuries. Among them was Herman Melville on the whaleboat *Acushnet*, who deserted the ship at Nuku Hiva on 9 July 1842. After a memorable escape with his friend "Toby" (Richard Tobias Greene), he took refuge in the valley of Taipivai, where he lived with the cannibals for three weeks. His adventures were relayed in his book, *Typee (Taïpi): A Peep at Polynesian Life* (published in 1846), which ended in a thrilling escape.

More recently, Robert Louis Stevenson, the Scottish novelist who wrote the book, *In the South Seas* (published posthumously in 1896), left tracks as well. The French post-impressionist artist Paul Gauguin lived and died in Hiva Oa in 1903. Later on, talented Belgian singer Jacques Brel, remembered for his song "Les Marquises," also lived on the island for three years and died in Atuona in 1978.

Dive operator

Looking for adventure and a new life, as Norwegian adventurer Thor Heyerdahl did before him in 1937, Xavier Curvat (also known as "Pipapo") left France in 1980 at the age of 20. With a work certificate as a cook, he booked a flight to Tahiti, where he soon met Marquesan people. He boarded a cargo-passenger



The beach and bay of Atuona on Hiva Oa (above); Taiohae Bay, Nuku Hiva (top left); Xavier Curvat tells his story in the Marquesas (far left); A cove on the seashore near Puamau, eastern coast of Hiva Oa (left)

boat for a memorable four-day journey on deck. Disembarking at Atuona, Hiva Oa, he crossed the island on foot to reach the valley of Puamau.

A spearfishing enthusiast, he dedicated himself to fishing and hunting, catching turtles as well. He planted an orchard, purchased a horse, and sold his products around the village. Building a dugout canoe, he ventured into lobster fishing. Three years later, a friend invited him to take a sailboat from Tahiti to the Tuamotu and the Marquesas. This would be his first encounter with sperm whales in the open ocean. He ended up marrying a Marquesan woman.

In 1990, he was initiated into scuba diving, with tanks and an old compressor. Based in Nuku Hiva, together with a young divemaster, he discovered an islet at the exit of Taiohae Bay, which turned out to be a haven for hammerhead sharks. The idea of a dive centre emerged slowly, but he needed to get certified and pass all the levels first. In 1993, he opened Centre de Plongée Marquises (dive centre) and refitted the hull of an old wreck, which he transformed into a dive boat.

He then organised interisland transport for the locals, attracting Nicolas Hulot of the French TV programme *Ushuaia* (1994), which propelled him to national fame. Later on, he operated dive charters in the northern islands, opening a new dive centre on Hiva Oa. When his wife left him after 11 years, he closed his operations in Atuona and concentrated on Nuku Hiva. He now specialises in scientific research, millionaires' boats, shoots for television, American groups, and sometimes works as a consultant.

Biodiversity

A hotspot with high biodiversity underwater, the Marquesas Islands are a centre of endemism. In 1973, Mission IX of the National Museum of Natural History in Paris established a list of 391 species of fish in the archipelago. In 1978, the American ichthyologist John Randall evaluated the endemism to be 10%.

In their expedition of 1998-99, Randall and Earle published a list of 415 coastal fishes (2000). Following the Expedition Pakaihi I Te Moana, which was conducted in 2011 in the Marquesas Islands, the latest research of Frenchman Delrieu-Trottin (2015), brought the number to 495 species, with 68 endemic species (or 13,7%), which is more than the other archipelagos of French Polynesia, but less than Hawaii (20%), Galapagos (17%) or Pascua Island (22%).

The fish community in the Marquesas Islands is different from those at other archipelagos in French Polynesia and the South Pacific. The presence of strong upwellings around the islands triggers an important primary production and may explain the absence of constructed coral reefs. Nevertheless, marine life includes 24 species of hard corals, 38 species of sponges, 70 species of echinoderms and 629 species of molluscs (61 species being endemic to the Marquesas).

Marine mammals are also well represented in the Marquesas, with 16 species having been identified. The four coastal species include the spinner dolphin

Underwater scene (left) and large school of bluestripe snappers (above) at Cap Martin, also known as Cape Tikapo; Dive boat in the fishermen's harbour at Taiohae on Nuku Hiva (top left)

(*Stenella longirostris*), pantropical spotted dolphin (*Stenella attenuata*), common bottlenose dolphin (*Tursiops truncatus*), and melon-headed whale (*Peponocephala electra*). Pelagic dolphins include the Risso's dolphin (*Grampus griseus*), Cuvier's beaked whale (*Ziphius cavirostris*), sperm whale (*Physeter macrocephalus*), pygmy or dwarf sperm whale (*Kogia sima*), humpback whale (*Megaptera novaeangliae*), false killer whale (*Pseudorca crassidens*), orca (*Orcinus orca*), and pygmy killer whale (*Feresa attenuata*).

Twenty species of sharks are also noted in the Marquesan waters, including the classic reef sharks: grey, whitetip, blacktip reef and blacktip (*Carcharhinus limbatus*), but also the silvertip shark (*Carcharhinus albimarginatus*), silky shark (*Carcharhinus falciformis*), sicklefin lemon shark (*Negaprion acutidens*), oceanic whitetip shark (*Carcharhinus longimanus*), tiger shark (*Galeocerdo cuvier*), blue shark (*Prionace glauca*), shortfin mako shark (*Isurus oxyrhinchus*), scalloped hammerhead shark (*Sphyrna lewini*), great hammerhead shark (*Sphyrna mokarran*), tawny nurse shark (*Nebrius ferrugineus*), whale shark (*Rhincodon typus*), and two species of thresher shark (*Alopias pelagicus* and *Alopias vulpinus*).

The two species of manta rays that are currently seen include the giant oceanic manta ray (*Mobula birostris*) and the reef manta ray (*Mobula alfredi*). The smaller sea devil or sicklefin devil ray (*Mobula tarapacana*) is also found. Manta rays were traditionally speared with a harpoon by Marquesas fishermen in Nuku Hiva and Tahuata, during village festivals, until the year 2000.

Diving

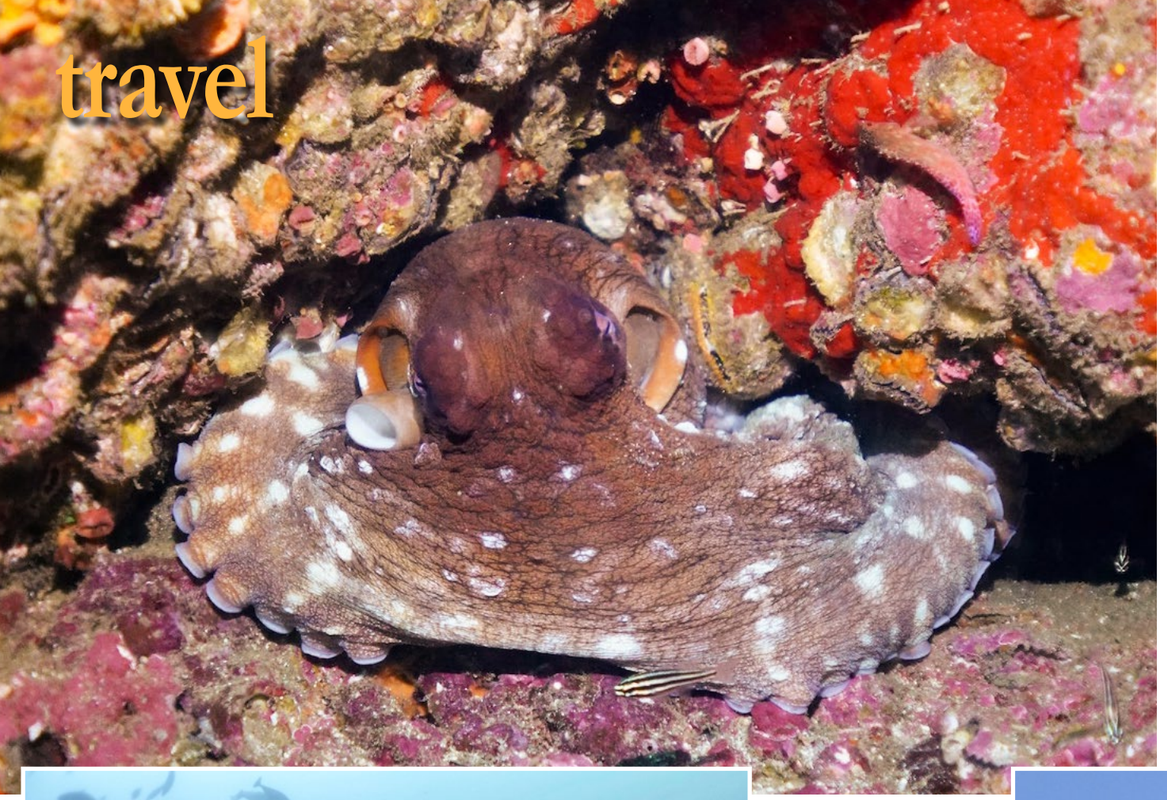
Inconspicuously, the Centre de Plongée Marquises was hidden behind the flamboyant clothing and souvenir shop of Marie, right beside the fisherman's harbour. The red and ochre-coloured dive boat *Makuita* was moored at the dock, where I met Jules, a 20-year-old with big curly hair. "I am the deckhand and son of Xavier," he said, reaching out his fist in a fashionable Covid-19 salute.

Dive centre owner Pipapo showed up a little bit later, a weathered 61-year-old mariner with spotted skin and tattoos on his leg and arms, Marquesan-style. Four other divers joined us on this dive trip.

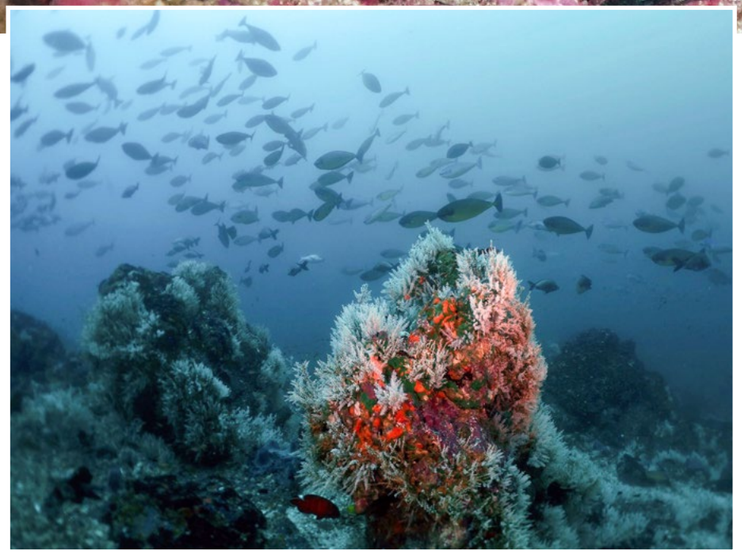
Cap Martin

We then headed out to Cap Martin (also known as Cape Tikapo), which was located on the south-eastern tip of Nuku Hiva's caldera.

Half an hour into the trip, the boat ride was rough, the sea foaming around us with lots of waves. The island's rugged coast was carved



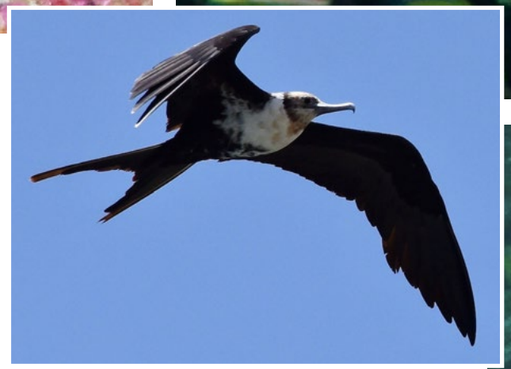
Marquesas



by basaltic points and coves, with its interior covered in jungle, rising steeply behind them.

"The plan is to dive the protected side of the cape—although the swell is conspicuous underwater," said Pipapo in his briefing on deck, but he would not be diving with us. We divers were on our own. Three of the divers would team together, and I would dive with a diver named Alexandra. "I'll follow you," she warned.

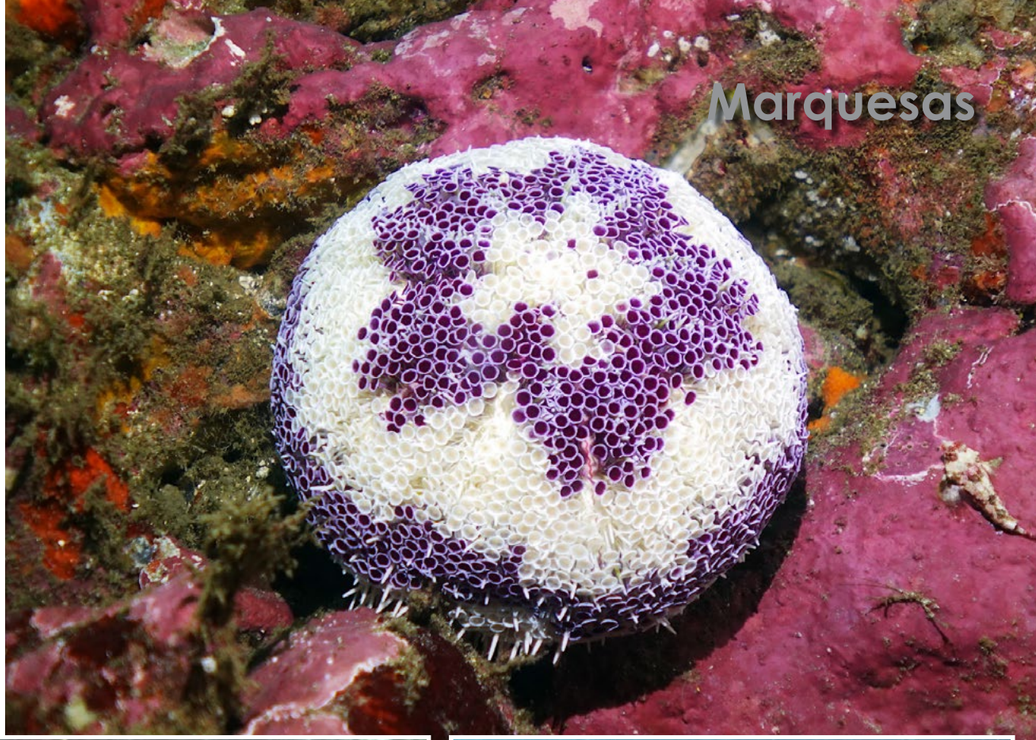
The visibility struck me as being rather misty, but fish life was plentiful. There were large schools of paddletail snappers (*Lutjanus gibbus*) and sleek unicornfish (*Naso hexacanthus*). Compact shoals of bluefin jacks (*Caranx melampygus*) mixed with giant jacks (*Caranx ignobilis*) and rainbow runners (*Elagatis bipinnulata*). I saw moving clouds of bluestripe snapper (*Lutjanus kasmira*), with the occasional red snapper (*Lutjanus bohar*). A squad of oriental bonitos (*Euthynnus affinis*) zoomed past, and a silver doublespotted queenfish (*Scomberoides lysan*) followed suit. This

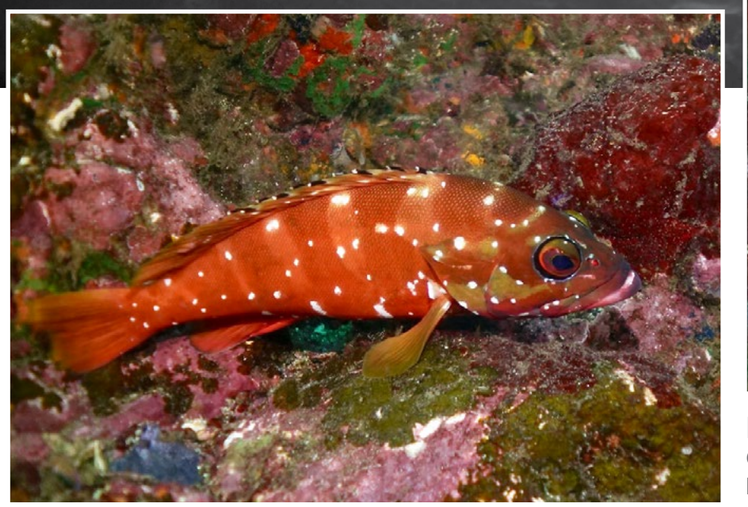


was a fountain of life indeed!

As we neared the point, at a depth of 35m, I felt the current dragging us to the other side. A big octopus stared at me from the comfort of its hole. I gave the signal for a turnaround. The visibility was really affected by lots of plankton, an effect of the upwelling. The water temperature was a balmy 27°C, and a wetsuit was not even necessary. Lesser frigate birds (*Fregata ariel*) hovered above, as we surfaced. "At the right time, early in the year in January to February, one may witness an important gathering of melon-headed whales at Cap Martin," said Pipapo

CLOCKWISE: Common octopus, school of bluestripe snapper with squirrelfish, peacock grouper, lesser frigatebird, and school of sleek unicornfish on rocky reef at Cape Tikapo, Nuku Hiva





CLOCKWISE: Scalloped hammerhead shark, endemic Marquesan flower sea urchin, Tahiti butterflyfish, tarry hogfish, fire surgeonfish, and blacktip grouper at La Sentinelle aux Marteaux dive site, Nuku Hiva

with a smile.

The *Makuita* headed back to the caldera of Taiohae. Our interval time would be spent on the protected side of Matauapuna Island. Homemade banana cake was served with tea.

La Sentinelle aux Marteaux

La Sentinelle aux Marteaux was our next dive site. The name referred to a small island that stood like a sentinel at the eastern entrance of the bay. Another sentinel stood to the west, which was Motu Nui.

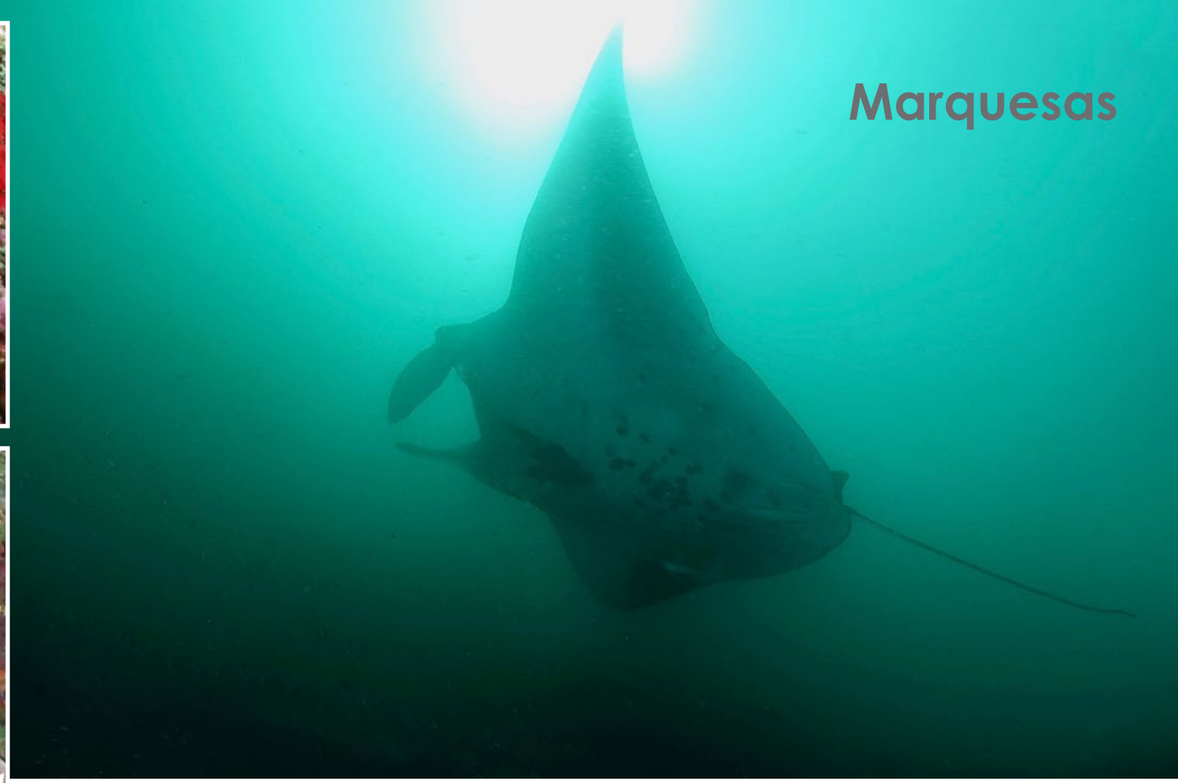
Visibility did not improve on the second dive, with a sulfur-yellow layer in the water at 25m. Alexandra joined the others this time, and I was on my own, happy as can be with my camera buddy!

I chose to stay above in the 15m zone, where the clarity of the water was better. A good decision, for I met four scalloped hammerhead sharks (*Sphyrna lewini*), with two approaching close enough for decent shots. One of them was a pregnant female, which had bite marks on the left pectoral fin—the work of an aggressive male. This was what the dive site was famous for: the presence of hammerhead sharks, with a 70 percent chance of an encounter.

Other species seen here included convict tangs (*Acanthurus triostegus*); whitecheek surgeonfish (*Acanthurus nigricans*); Tahiti butterflyfish (*Chaetodon trichrous*), which is endemic to French Polynesia; tarry hogfish (*Bodianus bilunulatus*); and large peacock groupers (*Cephalopholis argus*). Cute, blacktip groupers (*Epinephelus fasciatus*), red in colour, were seen everywhere. An inquisitive masked moray eel (*Gymnothorax breedeni*), which was brown with a black stripe across its face, peeked out of its hole with a cool glance. A school of barracudas swirled by, and imposing great barracudas showed up during the dive.

Absolutely stunning was the Marquesan flower sea urchin (*Toxopneustes maculatus*), which was spherical in

Manybar goatfish (top center) and orange band surgeonfish (above) at La Sentinelle aux Marteaux, Nuku Hiva



Marquesas

Endemic Marquesan parrotfish (above) and yellow margin moray (top left) at La Sentinelle aux Marteaux, Nuku Hiva

shape and white all over, with concentric purple rings, sometimes forming a star pattern. It was "non-venomous and endemic to the Marquesas," confirmed Pipapo. Anywhere else, the genus was highly toxic.

Sea caves

A number of sea caves could be found in Nuku Hiva. These could be pretty hectic due to swell and strong currents. Ekamako Cave was 7m wide, 3m high and 8m deep. It used to be the hiding place of warriors. Nowadays, it was better known for stingrays (*Himantura fei*), whitetip reef sharks (*Triaenodon obesus*), three species of spiny lobsters (*Panulirus femoristriga, Panulirus homarus* and *Panulirus penicillatus*), and slipper lobsters (*Parribacus scarlatinus* or *Scyllarides haanii*). A system of four caves was located on Nuku Hiva's southern coast. At a depth of 22m to 24m, these were the refuge for marbled rays (*Taeniura meyeni*), grey reef sharks (*Carcharhinus amblyrhynchos*), and blacktip reef sharks (*Carcharhinus melanopterus*).

Topside excursions

Due to the lack or scarcity of customers during these days of the coronavirus pandemic, non-diving days were used for local topside excursions. A short distance from Taiohae town, one could take an excursion to the Tehaatiki viewpoint, which overlooked Matauapuna Island,

Yellowsaddled goatfish (above) and giant manta ray (top right) at La Sentinelle aux Marteaux, Nuku Hiva

Taiohae Bay (above), white and sooty terns (center) seen from the Tehaatiki viewpoint, Nuku Hiva; The tiki of Upeke, with giant banyan behind, Hiva Oa (top left); Sentinelle de l'Est, Matauapuna Island, Taiohae Bay, Nuku Hiva (left)

known as "Sentinelle de l'Est," with commanding views over the entrance of the bay of Taiohae. It was an opportunity to observe seabirds such as the white tern (*Gygis alba*) and sooty tern (*Onychoprion fuscatus*), or the white-tailed tropicbird (*Phaethon lepturus*), flying above.

Other excursions required transport (hire a car, unless you want to walk or hitchhike), such as Hatiheu Bay on the northeastern coast, past Taïpivai where Melville lived. From Hatiheu, a nice trail led eastward over a pass, to Anaho Beach and Haatuatua Beach, which was well worth doing for the panoramic views. Before you reach Hatiheu, you can stop by the archaeological sites of Kamuihei and Tahakia, where you can marvel at ancient "tohua" (stone platforms for festivities) such as "me'ae," a religious sanctuary; "paepae," a dwelling of terraces and gardens for the cultivation of taro plants; as well as petroglyphs on boulders and "tikis." Let me explain what a tiki is…

A tiki is an anthropomorphic figure carved in stone that depicts a mythical supernatural being, often a high-ranking warrior or chief, elevated to deity status. In Taaoa (Hiva Oa), a one-metre-tall tiki with huge globe-like eyes and a wide, grinning mouth was offered human sacrifices during religious rituals, which took place on a dedicated stone platform or "me'ae." Ritual cannibalism followed in order to absorb the "mana," or life force, of the deceased. Among the animals carved into the stone, the sea turtle was deeply venerated.

More diving

Another dive day brought me back to La Sentinelle aux Marteaux dive site, with

Tiki of a warrior with prisoners, Hikokua archaeological site, Nuku Hiva

Lemonpeel angelfish at Motu Nui, Nuku Hiva

Marquesan surgeonfish (above) at Motu Nui, Nuku Hiva; Mound of fire coral at La Sentinelle aux Marteaux, Nuku Hiva (top left); Largescale mullet at Anakee Islet, Hiva Oa (top center)

better visibility and a chance of close encounters with various species of fish, including the orange-band surgeonfish (*Acanthurus olivaceus*), fire surgeonfish (*Acanthus pyroferus*), manybar goatfish (*Parupeneus multifasciatus*), blacktail snapper (*Lutjanus fulvus*), and Marquesan parrotfish (*Scarus koputea*), which is endemic.

At the dive site of Motu Nui, or La Sentinelle de l'Ouest, the waters were very full of plankton, and I felt as if I was swimming through fog. Nonetheless, I came across two species of surgeonfish, the Marquesan surgeonfish (*Acanthurus reversus*), which is endemic; and the very pretty bluespotted or striped-fin surgeonfish (*Ctenochaetus marginatus*).

Freshwater streams

One local curiosity drew my attention to the freshwater streams of Taïpivai, Hatiheu and Aakapa Bay on Nuku Hiva Island: the presence of two freshwater eel species, *Anguilla obscurus* and *Anguilla marmorata*. I have seen these eels much farther south on Fatu Hiva Island. It seemed that the origin of these eels was in Vanuatu in the western Pacific, from where they migrated most likely with the South Equatorial Counter Current.

Coral bommie (above) and endemic Marquesan damsel or Strasburg's dascyllus (top right) at Anakee Islet, Hiva Oa; Bluespotted surgeonfish at Motu Nui, Nuku Hiva (center)

Cobblestone beach in Taaoa (above) and chestnut-breasted mannikin (left) on Hiva Oa

Afterthoughts

If the Marquesas Archipelago is indeed a "booby trap" for tourists searching for a lost Eden or an ancestral culture that values ruthless warriors with cannibalistic rituals, it may also be a potentially enormous one for divers, with its rich and unique marine biodiversity. Far from the postcards of Tahiti or the idyllic lagoons of Tuamotu, with its crystal-clear waters, the Marquesas Islands require an ability to adapt to the circumstances—from various sea conditions to underwater visibility affected by equatorial upwelling. Just remember Jacques Brel's song, "Gémir n'est point de mise aux Marquises." There is no point to moaning in the Marquesas. ■

With a background in biology and geology, French author, cave diver, naturalist guide and tour operator Pierre Constant is a widely published photojournalist and underwater photographer. For more information, please visit: ***calaolifestyle.com****.*

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Anaho Bay, near Hatiheu, Nuku Hiva (above); Freshwater eel in a creek, Aakapa, Nuku Hiva (top right)

Expedition to Antarctica

Falkland Islands & South Georgia

Text and photos by Farhat "Raf" Jah

Antarctica

View from the ship, steaming south from Coronation Island in the South Orkney Islands (above); Adélie penguin on floating iceberg, Coronation Island, South Orkney Islands (top right); View of iceberg, upon entering Antarctica proper (previous page)

Text and photos by Farhat "Raf" Jah

Travelling to the Antarctic to dive gin-clear polar waters is a dream topping many an adventurous diver's bucket list. Farhat "Raf" Jah shares his impressions and experiences from a dive expedition to Antarctica, the Falkland Islands and South Georgia.

Just getting to the start of an Antarctic dive expedition is a journey in itself. It took my wife, Francesca, and I 15 to 18 hours on a Boeing 777 to get to Buenos Aires. Then, after a night in the city, a 3.5-hour flight on a Boeing 737 brought us to the southern tip of South America and the town of Ushuaia. Here, we made a mandatory two-night halt in case our baggage had chosen a different route. We were now within 100 miles of Cape Horn and the southernmost tip of South America.

Ushuaia was pretty, but it consisted of a series of overpriced, odd-looking hotels and restaurants set on the side of a hill. We wandered around the streets trying to make sure that our legs worked, stopping in cafes to drink real coffee while looking out at the Beagle Channel, with Chile as the backdrop.

En route on the expedition ship

Boarding the MV *Plancius* did not go quite as planned. A crew member had been sick, and the Argentine authorities wanted to quarantine the ship. So, we hung around Ushuaia, drinking coffee and waiting for news. Thankfully, the ship's agent managed to negotiate mass inoculation

Antarctic fur seal, South Georgia Island

The expedition ship MV *Plancius* (above); Zodiac dive boats, South Orkney Islands, Antarctic Peninsula (left); Adélie penguin sunning itself on an iceberg, South Orkney Islands (bottom left)

instead. We met up to hear the expedition leader and her deputy explain that all was well, and we could now be bussed to the ship.

With no idea about what really went on, we felt slightly uneasy, but were soon steaming out of Ushuaia while we attended safety briefings and had dinner on board. I later went out on deck and stared at Argentina to the north and Chile to the south; the excitement was palpable, as skuas and other seabirds circled the ship in the endless twilight.

Preparations and safety

Morning unveiled an unbelievably calm south Atlantic Ocean. We prepared our kit and listened to interminable briefings on everything from how to get boots on to boarding a zodiac. As divers, most of this was old hat, but briefings are vital and compulsory, so we listened closely.

More important were the repeated briefings on dive safety procedures. There is so much that can go wrong, so nothing can be left to chance—or worse, assumption. We assembled on the ship's bow and thoroughly tested our kit. Check, check, check and check again—then take it apart. While kitting up, we saw a fin whale breach near the ship, followed by a pod of orcas ambling alongside our vessel.After lunch, we had a series of lectures of varying quality on the Falkland Islands and geology.

Falkland Islands

A good cruising pace brought us into the following morning, and we steamed around the outer edges of the Falkland Islands. We passed through a gap called Wooley Gut at 6:45 a.m., and I stood on the bow and peered down at penguins and dolphins on either side of the vessel.

Our first dives were check-out dives. Using a procedure that was to become a habit, we loaded our zodiac with dive gear. It was then craned over the side, with our dive guide aboard, by a trio of competent and friendly Filipino crewmen. We embarked via the gangway, and within 30 minutes, there were fat, black-and-white Comerson's dolphins swimming around our zodiac.

Excited to get wet, we struggled into our kit and rolled into the waters with a depth of about 10 metres. Francisca was

Map of Falkland Islands

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Colony of gentoo penguins in the Falkland Islands (above); Two-toned orca spotted en route to the Falkland Islands (right); Magellanic penguin, Saunders Island (below)

my dive buddy, and we checked buoyancy, cameras and general movement before winding our way through the kelp and bearing right, seeing crabs, fish and an octopus along the way. The water was a pleasant 10°C, and I was able to dive with 3mm neoprene gloves.

What amazed me about the Falkland Islands was the sheer amount of sea life down amongst the kelp. Everywhere I looked, I saw a crab or a nudibranch or a small fish. We descended to 16m, played with some seals, and kept looking around, because there was something to see everywhere. As is often the case, our allotted 45 minutes of time were suddenly up. We surfaced, and Jerry, the *Plancius* dive team leader, picked us up.

Carcass Island. With time to spare, we landed on a slipway at Carcass Island, and walked, still donned in our drysuits, to a small settlement, which, to my surprise, was operated by friendly Chileans. While I sipped on a welcome mug of tea, I was entertained by gentoo penguins, plus a vulture flying overhead. But sitting there created an unusual problem: We started to overheat in the sun! Our drysuits and Weezle undersuits coped well with the South Atlantic Ocean's frigid waters but posed a problem on land. It was easily fixed by jumping into the nearby bay to shed some heat.

Saunders Island. Reboarding the *Plancius*, we lunched before arriving at the "neck" of Saunders Island where we were soon back in the water. We had done our check dives. We had ironed out any kinks. This now was real expedition diving. No one had been here before, and every buddy team had to make their own decisions.

We reached the rocky bottom

Rockhopper penguins on Saunders Island in the Falkland Islands

Francisca in kelp forest (top left and right) and fur seal (top centre) at Tern Island, Bay of Isles, South Georgia; King penguins and Antarctic fur seals on a beach in South Georgia (above)

at 15m and found our way through even thicker, but more bunchy kelp. The visibility was four to six metres, and wherever I looked, I saw life. Lobster krill, fish, starfish and multiple nudibranchs, made for an excellent dive.

Port Stanley

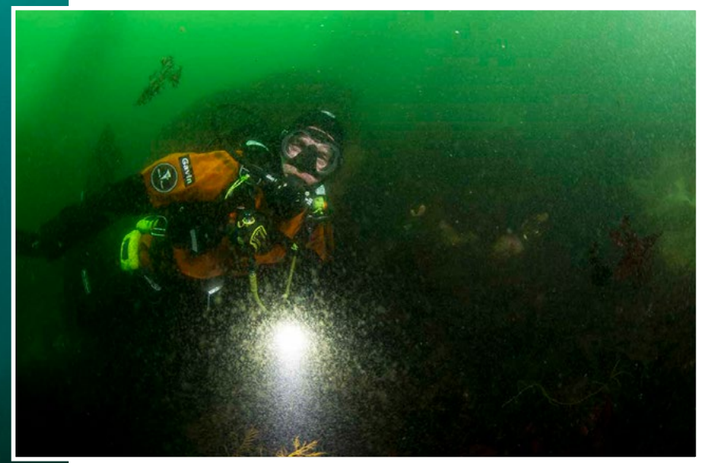
That night, we steamed to Port Stanley—capital of the Falkland Islands and a charming small town populated by people from around the world—before departing for South Georgia. We broke down our scuba kit to make sure that it would not be damaged if we hit rough weather.

With 20-, then 30- and finally 40-knot winds, I thought the sea swell was under two metres—but the third officer said it was a 4m swell, causing rougher seas. As the *Plancius* rode the swells, there were yet more lectures, but the weather held as we made good time at a steady 12 knots.

South Georgia

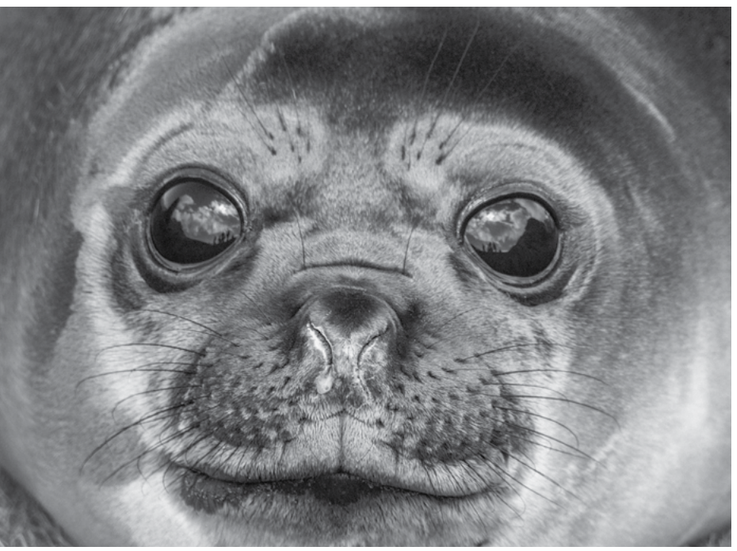
Tern Island. Nearly three days later, we were diving off Tern Island in South Georgia. We had passed the convergence and the water temperature was down to 2°C. Our thermal layers were fine, but some of the group started to suffer cold hands. However, with fur seals swirling all around us and coming up close to say hello, freezing hands were soon forgotten and we had a magical dive.

South Georgia had us alternating diving and landing. Some of the dives were less spectacular than others. Francisca and I went down to enjoy the 10 to 30cm visibility. We held hands and felt our way along



Antarctica

Elmar Schanz with kelp at Quarry Wall in Cook Bay, South Georgia (top left); Antarctica fur seals at Tern Island, South Georgia (left and below); Gavin Walker at Coopers Bay at Grytviken, South Georgia (centre)



Weddell seal, South Georgia

the side of the wall for ten minutes before binning the dive. The experience was not lost, however, as we spent the rest of the time snorkelling with the seals.

Following this dive site, we landed at coves named Salisbury Plain, Prince Olav Harbour, and St Andrews Bay. These were packed with penguins and breeding male fur seals, the latter being rather snarly and snappy if anyone ventured too close.

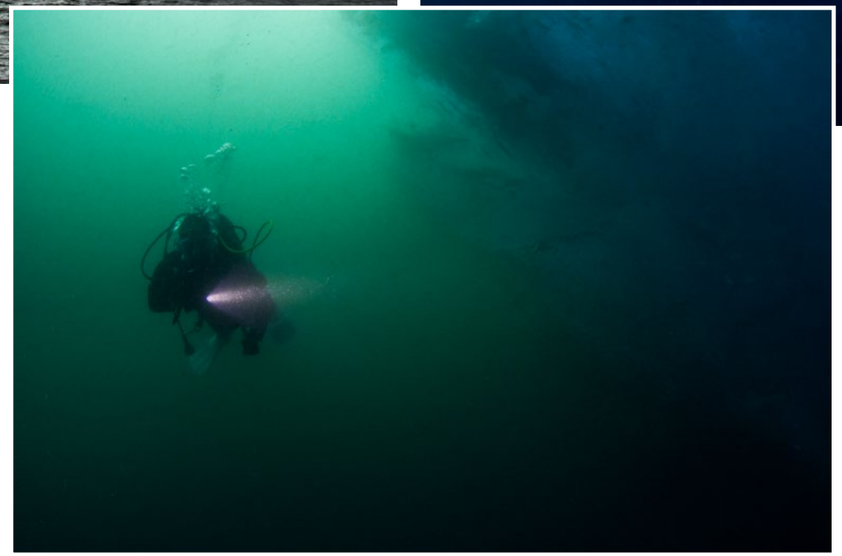
Quarry Wall. Later in the trip, we dived in the afternoon at a site called Quarry Wall. I was without a buddy and so joined my friends Elmar Schanz and Stevie Macleod. Stevie was one of Dubai's veteran and most experienced dive technicians, and the only person carrying more spare parts than me. On the dive deck, he had blown a wrist seal and replaced it quickly. We thought that all was well until we rolled off the zodiac. Stevie surfaced suddenly and shouted: "I've got water in my suit!" He swam quickly back to the zodiac and said, "You two dive together." There was no time to debate the matter. With 2°C water in his suit, he had to get out of the water immediately.

Elmar and I had never dived together before, but "needs must," I suppose. So, we dropped down to 20m and moved along the rock wall. We wound our way through the kelp with an occasional communicative nod and were treated to a plethora of sea stars and small molluscs. We ended the dive after 31 minutes, with seals playing around us in 7m of water—all very nice, but my video was annoyingly out of focus.

Coopers Bay. After an evening halt in Grytviken, our last day in South Georgia loomed. The non-divers were offered a zodiac cruise, but I opted for a gamble dive. If the dive was rubbish, I would snorkel; if it was good, it would be worth it. Francisca decided she just wanted to snorkel, so I ended up diving with Gavin Walker in Coopers Bay.

We descended off a small, unknown islet and hit the bottom at 12m. I had not tied my ankle velcro straps tight enough, so I was legbuoyant, and scrabbled around, trying to take photos, stay warm, and maintain some form of level. It was a lot of work, but it was enormous fun, as we enjoyed a whole three metres of clear visibility!

After 24 minutes, I suggested we end the dive, since my fingers hurt with the cold. Gavin kindly agreed, and we ascended to three metres, where we dutifully did a three-minute safety stop. I cursed in my regulator as my painful fingers screamed at me, and a swell meant we had to hang on to some kelp to stabilise ourselves. We had descended to 13m and lasted for an impressive 27 minutes. Gavin had used 60 bar, and I, some 120.



Sculptural iceberg photographed while leaving South Georgia (above); Underwater view of an iceberg (top right); Random jagged iceberg spotted at sea (bottom right); Francisca diving along the edge of an iceberg (right)

South Orkney Islands

As soon as we were done, we had lunch on the ship, which navigated through a series of icebergs. South Georgia disappeared as we turned southwest towards the South Orkney Islands. After taking some photos on deck, I was soon asleep in my cabin.

We generally had two days at sea between every set of islands we visited. This was time spent writing up our experiences, cleaning our land kit for biosecurity reasons, and double-checking our dive kit. While on deck, we watched numerous whales blow on either side of the *Plancius* while the sun set, albeit slowly, and more icebergs became visible.

As we travelled southwest, the atmosphere on board changed from trepidation to excitement—we had made it out of South Georgia without a single injury. The weather held, and the Southern Ocean was flat-calm, which meant we could maintain a speed of 12 knots with all three diesel generators running. The phrase we heard from the bridge was, "All's well—3DG full ahead."

Coronation Island. One morning, we steamed through fields of thick ice and arrived at Coronation Island in the South Orkneys. We were inside Antarctica and yet still so far from the actual continent. Our soft-spoken Russian captain wove his way between the icebergs with supreme skill. Penguins sat on the ice, seals sunned themselves, and we marvelled at the weather.

The ice was so thick that we could not land on the shingle beach, so our dive team leader decided to dive an iceberg instead. We dropped in and circled a medium-sized iceberg; the depth was well over 100m, and so we had to maintain perfect buoyancy.

Gavin and his wife, Petra, disappeared first, followed by Francisca and me. The water was green and murky, yet the iceberg was melting and creating a layer of clear water next to it. The water temperature was between 0°C and 2°C. I tried to photograph some ice with a stone suspended in it, but with a strange current running, I found myself finning like mad to travel around the iceberg. After 15 minutes, we had seen enough and surfaced calmly.

Once we had clambered back into the zodiacs, we cruised around in the stunning sunlight before alighting on another smaller

The captain weaved the ship through these icebergs as we entered Antarctica proper (top left); Cape Wild (above), chinstrap penguins (left), napping Weddell seal (centre), and humpback whale fluke (far lower left) at Elephant Island, where Antarctic explorer Sir Ernest Shackleton in 1915 had to abandon his crew members while he sailed to South Georgia to find rescue

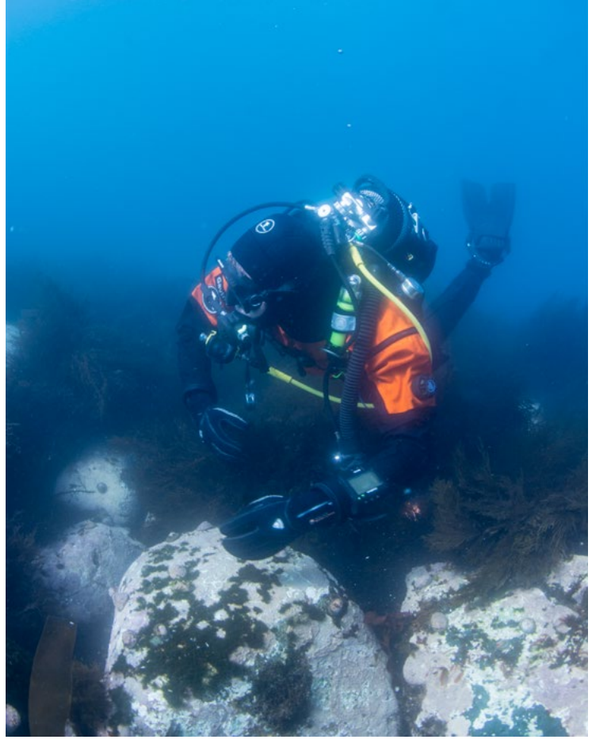
iceberg for a team photo. Standing there, I literally felt as though I had made it to the highest passes of Nepal again, before we headed back to the *Plancius* for lunch and coffee.

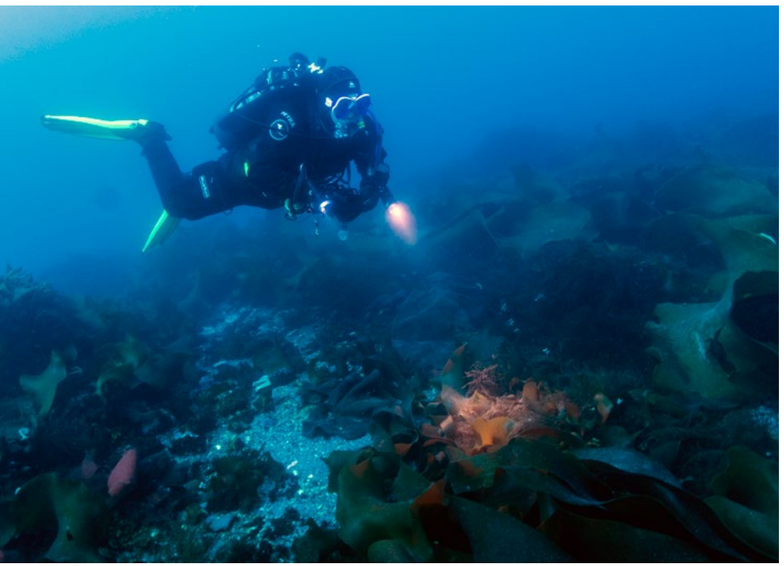
Elephant Island. We were told that there was a slight possibility of making it to Elephant Island, depending on sea conditions and time. If the sea stayed calm and we could set off by 3 p.m., we had a chance of making it. The atmosphere on the *Plancius* become electric. The idea of seeing the beach where in 1915 Sir Ernest Shackleton was forced to leave his men while he sailed to South Georgia to find rescue was beyond belief.

The view from the porthole showed an apparently calm sea (you never can really tell in the Southern Ocean), and the *Plancius* maintained its sedate 12 knots all morning. We were getting closer and closer.

Then, just as we approached Elephant Island, the sea started boiling with humpback and fin whales as they surfaced, blew, and dived again and again in front of us. I lost count of how many there were. In the foreground, hundreds of chinstrap penguins filled the sea, while Antarctic terns and prions filled the sky as they dived for food. I had never seen such a proliferation of marine life. The captain decided that we could stop, and turning the *Plancius* in slow circles, played with the big mammals for an hour.

It was time to head on to Elephant Island, and we headed into the bay opposite Cape Wild and dropped anchor, so the crew could launch all ten zodiacs. Motoring slowly, we viewed Point Wild from both sides, then closed in to see the tiny beach where Shackleton's men had spent 16 weeks. They lived under two boats for four months, eating seal and penguin and drinking Bovril. With steep cliffs and a glacier behind, and caves and a spit of land in front, their





Sea star (top left), and worms with sea urchins, isopods and limpets (left) at Devil Island; Gavin Walker on the rocks (above), salp on kelp (top right), sea stars (right) at Half Moon Island; Petra Walker explores the clear waters of the South Shetland Islands (far left).

camp would have been exposed and tiny. It was an incredibly emotive place.

On the far side, we found a leopard seal playing with the zodiacs. It swam from inflatable to inflatable until, bored, he bit into a zodiac full of Germans. There was mild consternation as the boat deflated and some passengers had to be transferred to other boats!

Paulet Island. We left Elephant Island, and a day later, were at Paulet Island. Francisca was not feeling great, so I joined Gavin and Petra once again. But once on the boat, Petra realised she had no air, so I dived with Gavin. I was getting used to Gavin's completely unruffled style.

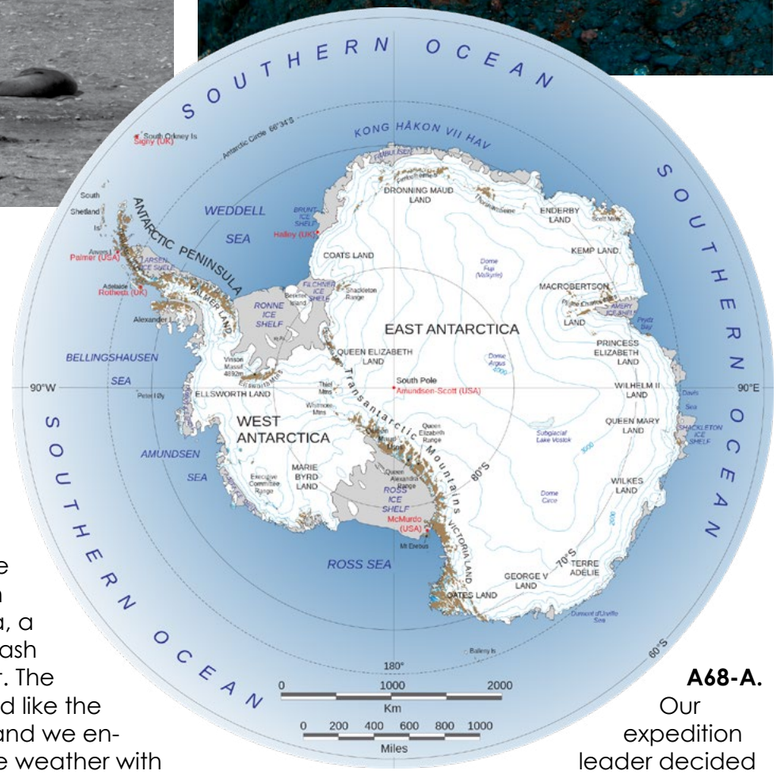
We were advised to use a surface marker buoy (SMB) if the current was running. We rolled in, as the current was streaming along at three knots. Paulet Island was a place in which I had no desire to get lost at the surface, so I deployed my SMB immediately. We dived along on a steep slope, with rounded rocks, limpets, pale lobster krill, isopods, sea squirts, sea spiders and sea cucumbers, as well as numerous orange spongy things, a large white nudibranch, some small worms, a few entry holes, loads of urchins and some small fish.

My regulator started to become hard to breathe through, so I pulled in a hefty breath and a bunch of ice shot into my mouth, making the regulator a lot easier to breathe through. Too easy, and in fact, it was starting to free flow, so I took out the regulator and switched to the second one. Gavin turned the air off to the free-flowing regulator, but with poor buoyancy, I ended up on the surface. I ducked down to find Gavin, and we continued on the dive.

After a while, Gavin turned my valve back on again, so that I could at least see, rather than guess, my contents gauge, and we dived on calmly. By the time we finished, we had moved over half a kilometre. I ran low on air, signalled to go up, and ascended. Gavin did not follow, so I went down to get him. He then followed; in the confusion, however, I dropped my GoPro camera and Francisca's torch. Apart from these losses, the dive had been a great success.

Zodiac driver and commercial diver Chris had to help me de-kit. My fingers were so painful that I had to put them into my Arctic warfare mittens and massage them, and it was a full five minutes before they were of any use.

Antarctica



LANDSAT IMAGE MOSAIC OF ANTARCTICA TEAM / NASA / PUBLIC DOMAIN

Fur seals and large colony of king penguins, South Georgia (above); Zodiac pick-up boat (left) and Gavin Walker at Brown Bluff (top right); Map of Antarctica (right)

Continuing on, we landed at rocky Paulet Island and saw a massive Adélie penguin colony near the ruins of an old stone hut, with an incredible frozen lake on the far side. We watched the penguins slither over the ice and waddle around in their comical penguin manner. Someone spotted what looked like a man-made path leading up a hill, reminding us that this was the island that Shackleton wanted to reach. Apart from having supplies, the landscape would have been sensational for a camp—much better than the tiny, horrid space on Elephant Island.

Brown Bluff. In the afternoon, we headed to Brown Bluff in Antarctica, a pillar of volcanic ash mixed with basalt. The cliff behind looked like the Grand Canyon, and we enjoyed summer-like weather with brilliant sunshine. We dived on an underwater ridge off Brown Bluff, with two icebergs, one grounded and one floating. We swam along the ridge and down to 14m, spotting life everywhere: seaweed, red algae, amphipods, brittle stars, limpets and more. There were penguins on top of the ice, but not under, and we were excited to be diving on the Antarctic continent itself. Soon after we ascended, we were on the continent!

A68-A. Our expedition leader decided that we should try and get to A68-A—which was, at the time, the world's largest iceberg and a section of the Larsen Ice Shelf that had broken off. Our skipper found it, and the weather held perfectly. We cruised for about 90 minutes along A68-A, before coming into fast and brash ice. The ship circled the bigger of the ice floes, and bashed its way through the smaller ones, the hull clanging against larger lumps.

TIPS & INFORMATION

HOW TO GET THERE
Divers and non-divers can fly to Buenos Aires from major hubs all around the world. From there, they join the African & Oriental Travel Company (A&OTC) team, who arrange the mid-summer Antarctic dive expedition. Based in the United Kingdom, the A&OTC specialises in dive trips to remote and lesser-known locations, and is also an African safari specialist. The next escorted Antarctic dive expedition takes place in December 2022. Prices start at US$8,500 per person, including flights inside Argentina. Contact the A&OTC at: **info@orientafrica.com**, call +44 1291 570953, or visit: **orientafricatravel.com**

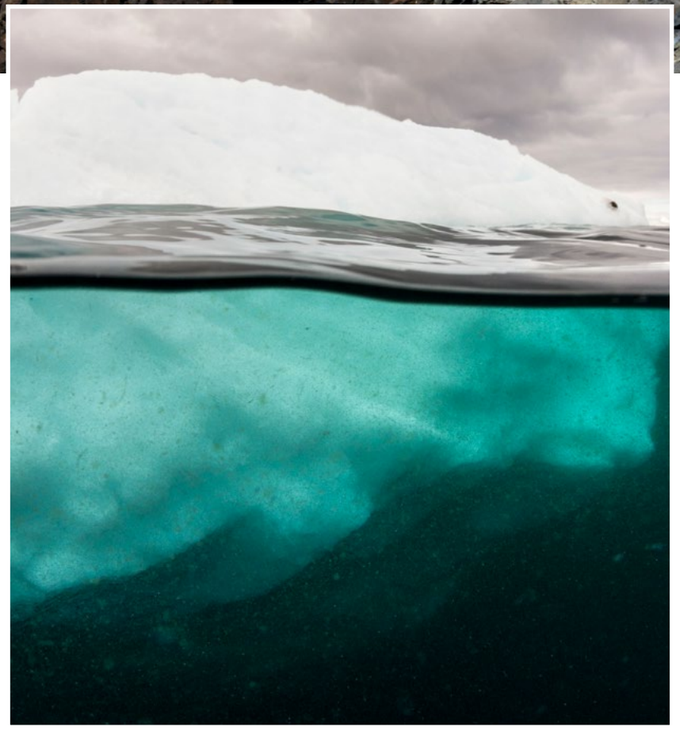
WHEN TO GO
Most Antarctic dive trips take place in the late season, when the whales are out, but this is not always the best time for land-based expedition-goers. The A&OTC runs dive trips every two years in December. The next is in 2022.

Non-divers are more than welcome, which is why the trips are run in December during the penguin season.

WHAT YOU NEED
You need to be an autonomous diver who is competent underwater. You need have 30 drysuit dives, but more importantly, you need to be comfortable diving in a drysuit. More than any qualification, you need to be happy in a drysuit, able to solve small problems and fiddle with your kit underwater. The diving is not deep and not technical.

The best dive gear to take is a simple BCD and two basic cold-water regulators. We bought a lot of gear from Mike's Dive Store, and used Aqualung Core regulators. For the Antarctic, 7mm mittens seemed to be best, while 5mm gloves are good enough for South Georgia, and 3mm gloves for the Falkland Islands. ■

Rocky landscape (left), gentoo penguins (above) and chinstrap penguins (right) at Yankee Harbour on Greenwich Island in the South Shetland Islands, Antarctic Peninsula



Over-under shot of floating iceberg, Antarctic Peninsula

We pushed ever southwards, and the ice thickened, with Adélie penguins scrabbling out of our way onto the pack ice. Eventually, we saw a single emperor penguin, then a second. I took several photos, knowing that my chances of making it this far south again were slim, and I would probably never see one of these magnificent birds in its natural habitat again.

It was time to enter the green water and savour its great visibility. Petra had a cold, so I dived with Gavin again. We had around three metres of visibility, but plankton was found everywhere. Visibility improved at depth, and there was more life on this dive than on any other dive we had done since the Falklands.

Yankee Harbour. The morning saw us arrive at Yankee Harbour, a name whose provenance stumped us all. I decided to dive with the Walkers. We had crystal-clear blue water with five metres of visibility and 1°C water temperature. This does not sound like much, but 5m of clear and sun-illuminated waters made the dive seem like paradise. The two-degree warmer water made such a difference. I photographed fish again, krill, and more fish.

This was the best of Antarctic diving. With that, I was done. This dive would be too hard to beat. I washed my kit and later that day, went ashore with the non-divers. I sat on a stone in Horseshoe Bay, watching whales breach and penguins natter. The expedition was over.

There remained the small matter of writing reports, editing photos, and sailing for two days through the Drake Passage to start the journey home—"small beer" compared to what we had done and seen. ■

Expedition leader and underwater photographer Farhat "Raf" Jah runs the African & Oriental Travel company in the United Kingdom, with his wife, Francisca, who is a marine anthropologist. For more information, visit: ***orientafricatravel.com***

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KATE JONKER

My Favorite Black & White

— Contributors' Picks from Around the World

Text and photos by John A. Ares, Scott Bennett, Rico Besserdich, Larry Cohen, Anita George-Ares, Jennifer Idol, Kate Jonker, Matthew Meier, Brandi Mueller, Gary Rose, Mike Rothschild, Peter Symes & Olga Torrey

We asked our contributors what their favorite black-and-white underwater photographs were, and they came back with diverse and dramatic images and stories captured under the waves. From haunting wrecks to patrolling sharks, from delicate macro marine life to giant majestic whales, from sea turtles to manta rays, from recreational and technical divers to hard-hat divers, *X-Ray Mag* contributors share their favorite images from locations near and far from home.

Zanzibar shrimp, Anilao, Philippines (right). Gear: Canon EOS 7D Mark II camera, 60mm macro lens with +15 diopter, Sea&Sea housing, two Inon Z240 strobes. Exposure: ISO 100, f/2.8, 1/250s

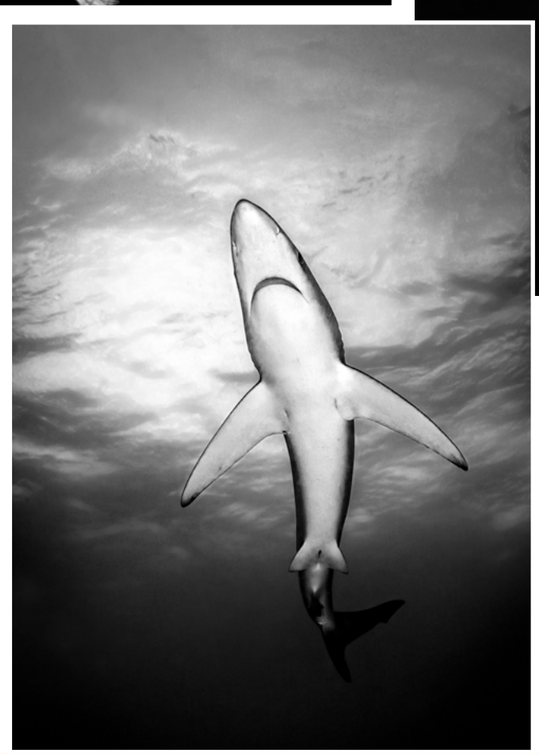
Textures, Shadows & Contrasts

Text and photos by Kate Jonker

The textures, shadows and contrasts in black-and-white photos are what first drew me to photography as a child. I spent hours using my father's Canon film camera trying to capture the textures in nature. As an underwater photographer, I love capturing colour contrasts and have had to train my eye to look for black-and-white photo opportunities.

Nowadays, when I see extreme light and texture contrasts in my subjects, I like to capture these for black-and-white conversions. I picture the image in my mind and how it would render with light and texture contrasts. I will then take the raw file into Lightroom where I will convert it to black and white as a starting point and then adjust the sliders just enough to create an image with impact.

The incredible detail in wrecks can be emphasized by converting the image to black and white, but I like to look for contrast in other subjects too, such as schools of fish, sharks and macro subjects. Visit: **katejonker.com**



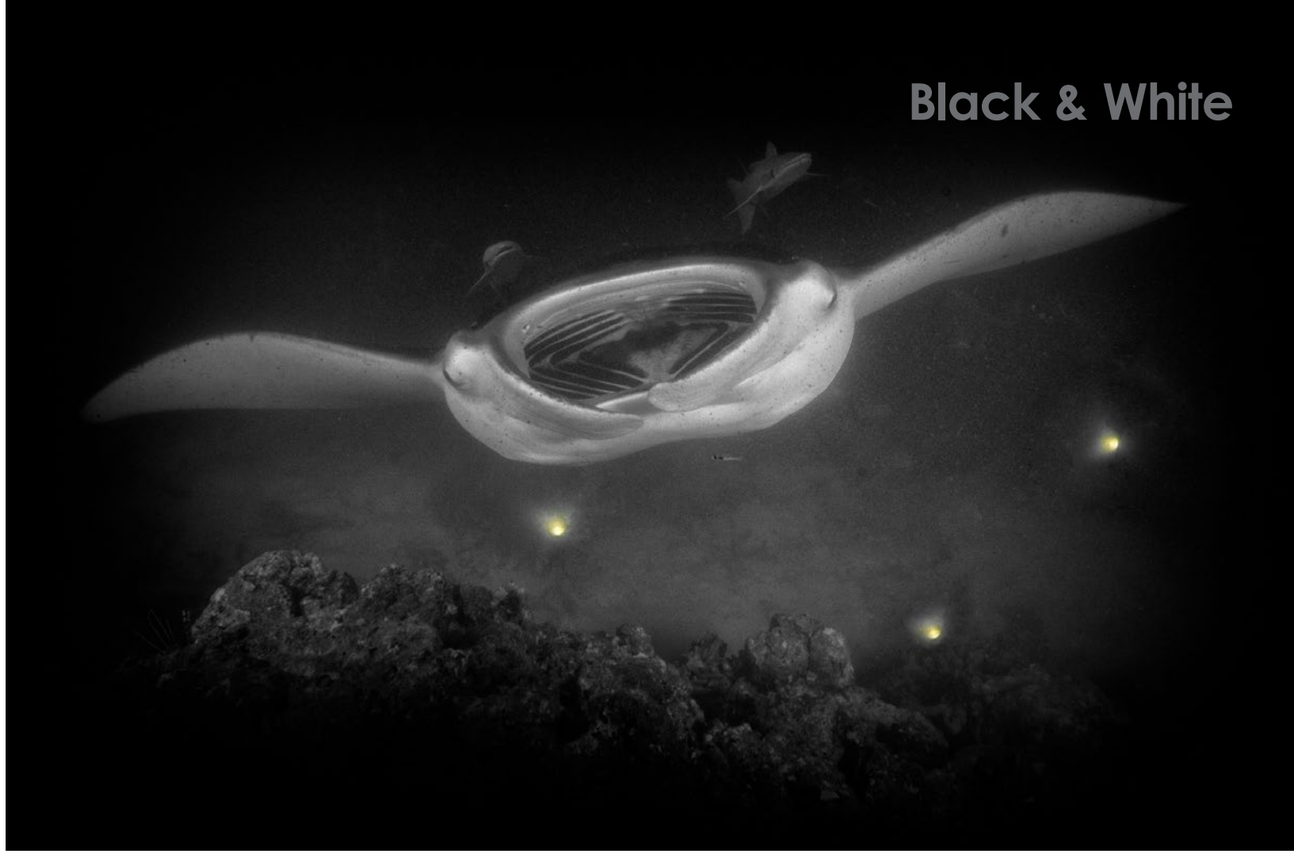
Powder blue surgeonfish, Sodwana Bay, South Africa (above). Gear: Canon EOS 7D Mark II camera, Sigma 17-70mm macro lens, Sea&Sea housing, two Inon Z240 strobes. Exposure: ISO 160, f/8, 1/125s

Blue shark, Cape Town, South Africa (left). Gear: Canon EOS 7D Mark II camera, Tokina 10-17mm fisheye lens, Sea&Sea housing, two Inon Z240 strobes. Exposure: ISO 320, f/8, 1/200s

Salem Express, Southern Red Sea, Egypt (far left). Gear: Canon EOS 7D Mark II camera, Tokina 10-17mm fisheye lens, Sea&Sea housing, two Inon Z240 strobes. Exposure: ISO 100, f/5.6, 1/60s

SS *Dunraven*, Northern Red Sea, Egypt (previous page). Gear: Canon EOS 7D Mark II camera, Tokina 10-17mm fisheye lens, Sea&Sea housing, two Inon Z240 strobes. Exposure: ISO 320, f/9, 1/200s

Night manta, Maldives (right). Gear: Canon SL1 camera, EF-S 10-18mm f/4.5-5.6 IS STM lens, Ikelite housing, twin Ikelite 161 strobes. Exposure: ISO 400, f/16, 1/80s; Damselfish, Apo Island, Philippines (bottom right). Gear: Canon Rebel T1i camera, Canon 100mm f/2.8 macro lens, Ikelite housing, twin Ikelite DS-161 strobes. Exposure: ISO 400, f/16, 1/60s



Orangutan crab and flatworms on bubble coral, Bunaken, North Sulawesi, Indonesia (above). Gear: Canon 10D camera, Sigma 50mm f/2.5 macro lens, Ikelite housing, twin Ikelite DS-125 strobes. Exposure: ISO 100, f/16, 1/160s; Porcupinefish, Bonaire, Netherlands Antilles (right). Gear: Canon 10D camera, Sigma 50mm f/2.5 macro lens, Ikelite housing, twin Ikelite 125 strobes. Exposure: ISO 400, f/16, 1/160s

Black and White with Selective Color

Text and photos by John A. Ares

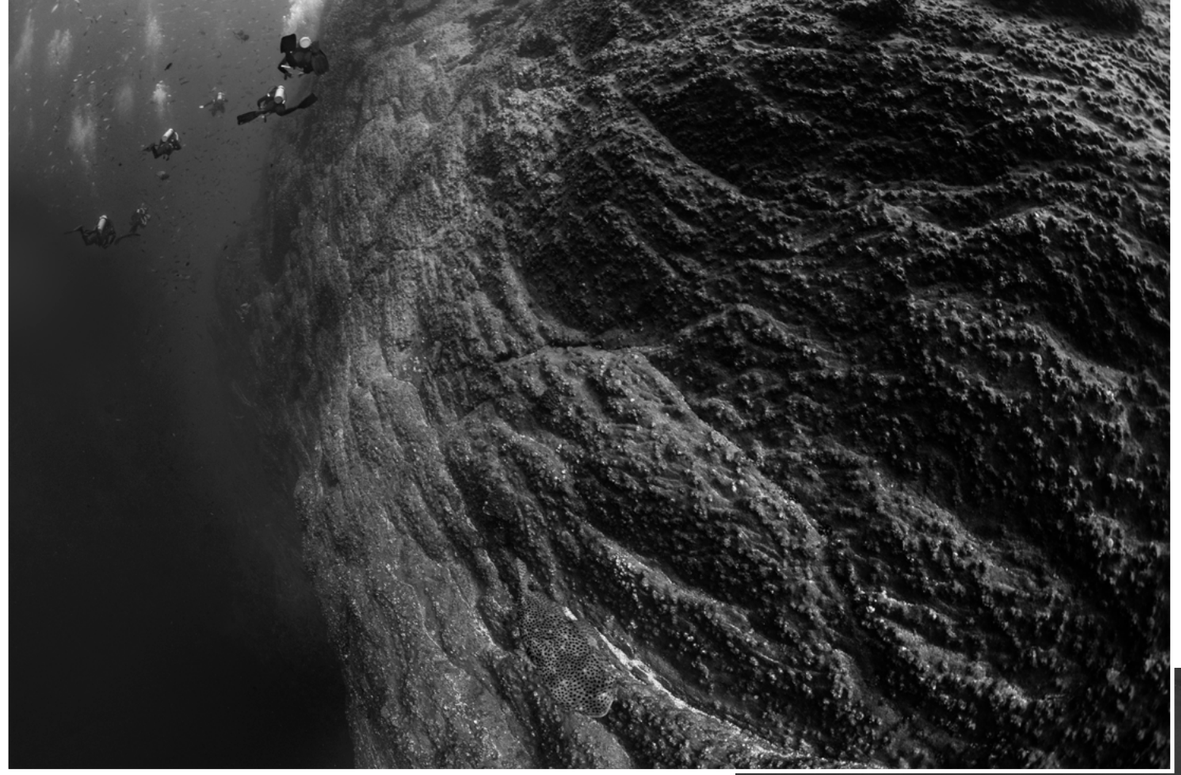
Bubble coral is inherently plain and is an ideal candidate for black-and-white (B&W) photography. Bubble coral routinely hosts colorful creatures like the orange orangutan crab and yellow flatworms, which makes it a prime candidate for the technique of B&W with selective color. I decided to leave several flatworms in B&W to add some interest to the background.

Manta rays are ideal subjects for B&W conversion since they have no other coloration. The night shot was perfect for B&W, except that the lights on the bottom were inherently warm and begged for a selective color treatment, providing a nice, subtle contrast.

The damselfish was colorless except for the stunning metallic eyes. A pure B&W conversion was a "nice" low-key picture, but using selective color made it compelling.

A fish's eyes can be quite dazzling. This high-key image of a porcupinefish was enhanced by using selective color. To do selective color, one must master two techniques: first, B&W conversion (of which there are several methods); and second, Photoshop layer masking.

I use Nik Silver Efex software on all B&W conversions because of the unique "structure" slider that adds mid-tone contrast. For a step-by-step walkthrough of how to do selective color, please see my article in this issue entitled, "Selective Color." Visit: **JohnAres.com**



Roca Partida wall, Socorro Islands, Mexico (left). Gear: Nikon D850 camera, Sigma 15mm lens, Seacam housing, two Z-330 strobes with Strobe Dome Filter. Exposure: ISO 320, f/10, 1/60s

Whale shark, St. Helena, South Atlantic (below). Gear: Nikon D810 camera, Nikon 10.5mm DX lens, Seacam housing, ambient light. Exposure: ISO 200, f/11, 1/125s

Dakota C-47 wreck, Bodrum, Turkey (above). Gear: Nikon D850 camera, Sigma 15mm lens, Seacam housing, two Z-330 strobes with Strobe Dome Filter. Exposure: ISO 200, f/10, 1/160s; Chevron manta, Roca O'Neil, Socorro Islands, Mexico (top left). Gear: Nikon D850 camera, Sigma 15mm lens, Seacam housing, two Z-330 strobes with Strobe Dome Filter. Exposure: ISO 320, f/8, 1/125s

Form, Texture & Tone

Text and photos by Scott Bennett

For me, photography is usually all about colour, with coral reefs and reef fish being one of my favourite subjects. Sometimes, however, an image can be more successful in black and white. Without colour to rely on, an image is reduced to the basics: form, texture and tone. Combined with a strong composition, these factors can create a powerful image not readily apparent in colour.

On a recent liveaboard trip to Mexico's Socorro Islands, manta rays were the main attraction. A 15mm fisheye lens worked well, but the subject had to be very close. A 16-35mm lens provided more versatility, but the mantas were usually photographed in open water. Even with strobes, images were predominantly blue. Black and white made the subject pop, with background divers creating depth and their bubbles adding contrast.

One of Socorro's signature sites is Roca Partida, a remote seamount that is usually a magnet for huge numbers of fish. During our visit, things were quiet. Using a 15mm lens, I decided to focus on the seamount itself. Filling the foreground with the wall, patterns and textures lead the eye to the divers in the distance, creating a sense of scale.

Featuring all sorts of shapes and textures, wrecks are another prime candidate for black and white. Situated off Bodrum in Turkey, a Dakota C-47 aircraft provided numerous photography options. Due to the plane's size, twin strobes can only brighten the foreground, but with colour lacking, this is not an issue.

During summer, whale sharks congregate around the island of St. Helena in substantial numbers. However, guidelines are strict; snorkellers must remain 3m away from the sharks, and strobes are not allowed. A fisheye lens captures the entire subject, while the white spots and rough skin textures contrast sharply with the radiating sunbeams in the water. Visit: **xray-mag.com/Contributors/Scott-Bennett**

Dunraven. Gear: Canon 7D camera, Tokina 10-17mm lens, Easydive housing, ambient light only

Capturing Aesthetic Aspects

Text and photos
by Rico Besserdich

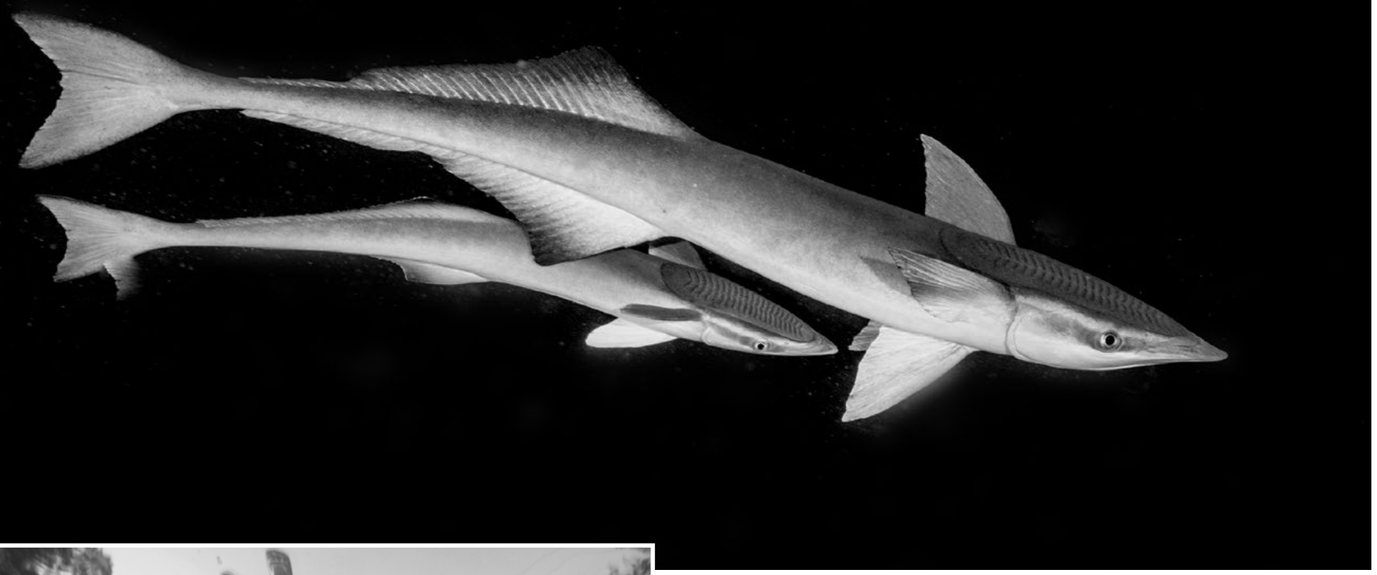
During my first visit to Sharm El-Sheikh, Egypt, to dive the Red Sea, the dive guide pointed to a very tiny spot at the dive centre's house reef. Folks used to call this spot "Little Ras Mohammed," a small reef structure of around 5m by 2m, which was stuffed with life. I fell in love with the pulsating xenia soft corals here. I could watch them forever. Their simple beauty and detailed structure inspired me to take a black-and-white shot of them, which, despite being 12 years old, still remains one of my favourite black-and-white shots.

Compared to the *Thistlegorm* wreck in the Red Sea, the *Dunraven* (also in the Red Sea) is not a super-great wreck to dive. But it is huge (81.6m)! The image of this wreck is special to me because it is an underwater panorama that consists of four images stitched together. It was a bit tricky to do while hovering freely underwater, so I was happy to carry that shot back home with me.

The model in the image on the right is Olivia. She was a divemaster trainee at a dive centre where I conducted a photography workshop. She was very keen to model for me, so one early evening after my daily classes, we entered the shallow waters of the bay and did a 20-minute shoot. Olivia was a natural. Doing this shot in black and white nicely draws attention to the tiny details and aesthetic aspects of this image and the model. Please visit: **maviphoto.com**

Sleeping Mermaid. Canon 7D camera, Canon 10-20mm lens, Easydive housing, two Sea&Sea YS-110 strobes. Exposure: ISO 200, f/11, 1/125s

Xenia. Gear: Canon 40D camera, Canon 60mm macro lens, Ikelite housing, two Sea&Sea YS-110 strobes. Exposure: ISO 100, f/16, 1/100s



Olga Torrey freediving at Dutch Springs, Pennsylvania, USA. Gear: Olympus E-620 camera, Olympus 7-14mm lens, Olympus housing, Sea&Sea YS-01 strobes. Exposure: ISO 200, f/5.6, 1/180s

Free-swimming remoras in Cuba (above). Gear: Olympus OM-D E-M1 camera, Olympus 9-18mm lens, Aquatica housing, Sea&Sea YS-D1 strobes. Exposure: ISO 200, f/16, 1/250s; Hawksbill sea turtle in Cozumel, Mexico (right). Gear: Olympus OM-D E-M1 camera, Panasonic 8mm fisheye lens, Aquatica housing, Sea&Sea YS-D1 strobes. Exposure: ISO 200, f/10, 1/100s

Silhouette of shark and boat (right). Gear: Olympus OM-D E-M1 Mark II camera, Olympus 9-18mm lens, Aquatica housing. Exposure: ISO 200, f/6.3, 1/250s

Shades of Gray

Text and photos by Larry Cohen

Most people are used to viewing underwater images with vibrant colors. However, at times, converting the images to shades of gray can produce a striking photograph. If you cannot get close enough to your subject for the strobes to bring out the color, it might also be better to create the image in black and white (B&W).

The silhouette image of the shark and boat captured in Cuba looked flat with a blue background. I did turn off my strobes for this image. Converting the image to B&W added drama to the picture.

To create the photograph of my dive buddy, Olga Torrey, freediving at Dutch Springs in Pennsylvania, USA, I had to balance the strobe light with the ambient light. Capturing in the background the leftover smokestacks from when the site was a working limestone quarry on the surface added interest to the image. Converting the image to B&W gives the image a vintage feel.

When I captured the image of the hawksbill sea turtle in Cozumel, Mexico, I used an 8mm fisheye lens on an Olympus Micro Four-Thirds format camera. I was so close to the turtle that my dome almost touched its nose. I used a 1/100s shutter speed and an f/10 aperture to darken the background. Converting the photo to B&W brought out the texture in the image.

When diving in Cuba, I saw free-swimming remoras for the first time. The image was captured during the day, but I used a fast 1/250s shutter and closed the aperture down to f/16 to create a black background. The original image lacked color, so I converted it to B&W. Visit: **liquidimagesuw.com**

Humpback whale and calf, Moorea, French Polynesia. Gear: Canon EOS Rebel SL1 camera, Canon EF-S10-18mm f/4.5-5.6 IS STM lens, Ikelite housing, available light. Exposure: ISO 1600, f/18, 1/200s

Humpback, Shark, Sea Turtle & Whipray Encounters

Text and photos by Anita George-Ares

The light rays penetrating the water column were not obvious in my original blue water image of the humpback whales. As if swimming with whales was not magical enough, the conversion of the image to black and white gave the appearance of the mother and calf floating above a sunburst.

I shot the image of the shark from another shark cage. The videographer was stepping back as if he wanted to put as much distance as he could between himself and the approaching shark. I like the size comparison between man and shark. The shark was missing the tip of a pectoral fin, which made it easy to identify her during several encounters.

The layers in the image of a hawksbill sea turtle make it one of my favorites. In the background, ripples on the water surface resemble clouds behind the turtle. Chromis and damselfish form the middle layer. The hawksbill sea turtle is featured prominently in the foreground.

Abundant and diverse fish species converge upon the Fish Factory dive site in the Maldives, following the daily dumping of fish waste. I like the Jenkins' whiprays present in the foreground and background with the school of red-toothed triggerfish in the middle ground. Jenkins' whiprays repeatedly crashed into me during the feeding frenzy.

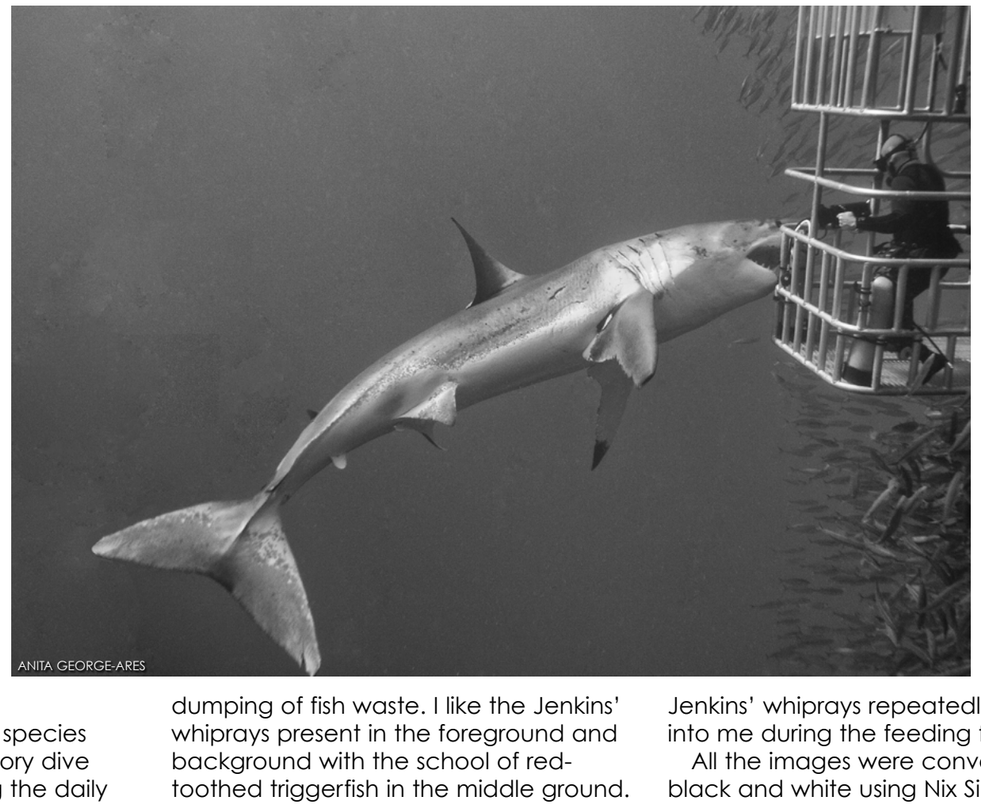
All the images were converted to black and white using Nix Silver Efex Pro 2 and Adobe Photoshop CC 2018 software. Please visit my Facebook page at: **facebook.com/profile.php?id=100016947967639**

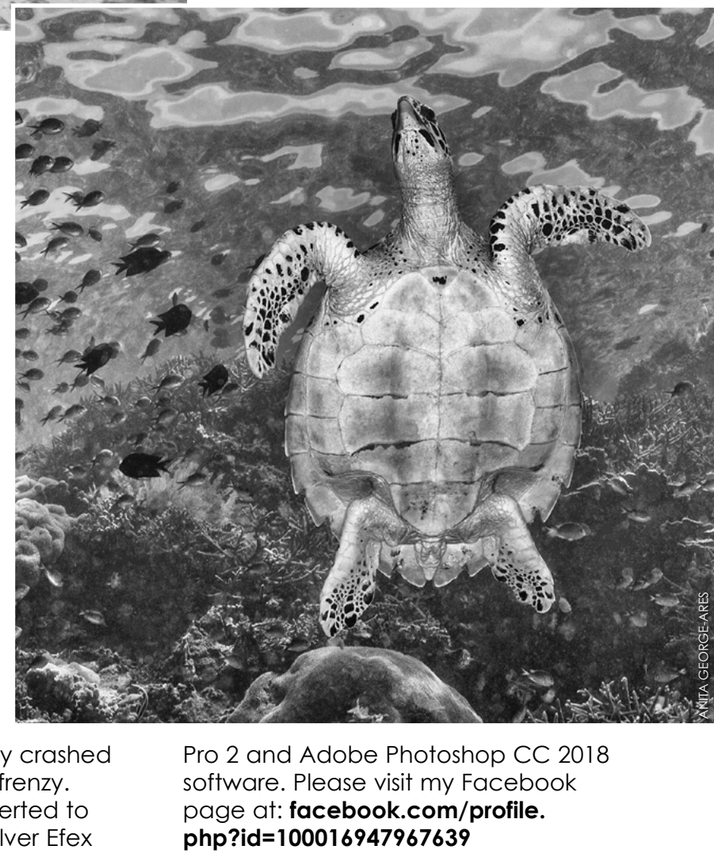
Black & White

Jenkins' whipray, Fish Factory dive site, North Male Atoll, Maldives (left). Gear: Canon EOS Rebel SL1 camera, Canon EF-S18-55mm f/3.5-5.6 IS STM lens, Ikelite housing, two Ikelite DS161 strobes. Exposure: ISO 200, f/11, 1/100s

Great white shark, Guadalupe Island, Mexico (center). Gear: Canon EOS Digital Rebel XTi camera, Canon EF-S10-22mm f/3.5-4.5 USM lens, Ikelite housing, available light. Exposure: ISO 400, f/8, 1/80s

Hawksbill sea turtle, Bunaken Marine Park, North Sulawesi, Indonesia (below). Gear: Canon EOS Rebel SL1 camera, Canon EF-S18-55mm f/3.5-5.6 IS STM lens, Ikelite housing, two Ikelite DS161 strobes. Exposure: ISO 200, f/8, 1/200s





Visitors gaze through glass-bottom boats to view the reef (above). Gear: Nikon D5 camera, Nikkor 8-15mm lens, Nauticam housing. Exposure: ISO 640, 11mm, f/11, 1/125s

The unique shape of a paddlefish in Tennessee makes a compelling sunburst silhouette (above). Gear: Nikon D5 camera, Nikkor 16-35mm lens, Nauticam housing. Exposure: ISO 100, 17mm, f/18, 1/160s

A Monochromatic Art Form

Text and photos by Jennifer Idol

Silhouettes and monochrome images are obvious candidates for black-and-white photography, but it takes more than redefining color photography to create a black-and-white image. The best photos not only master composition, but they also transform light into an array of contrasts.

In the digital realm, I am primarily a color photographer but recall my roots in school where black-and-white processing provided parameters for my first photos. They were terrible photos, ruined by pattern, with no discernible subject.

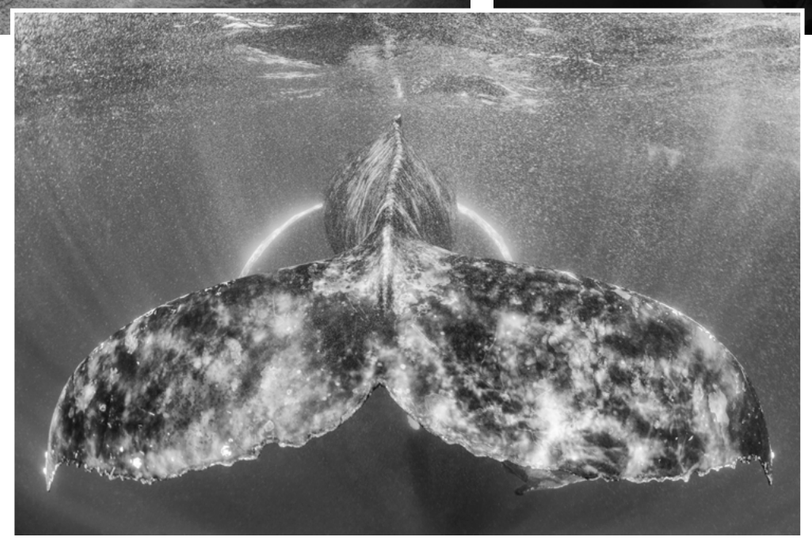
Later, I was fortunate enough to meet one of the greatest champions of underwater black-and-white photography—Ernie Brooks. He built a career on nuances in his images, and supported and educated photographers through his institute of photography. He generously supported my work through his encouragement and was a legend with tremendous depth of character and insight, often remarking on the beauty of 1/125s at f/11.

In honor of Ernie, I share these treasured black-and-white moments. I first share an image of another underwater photography giant, David Doubilet, as he looked up at the sun while demonstrating framing in a silent and treasured moment.

Another is of one of my favorite subjects, the paddlefish, which I photographed in the US state of Tennessee. I timed my dive beneath the fish to capture this silhouette shot. On open circuit, this also meant holding my breath repeatedly.

Lastly, I share a Snell's-window look at a Texas spring near home, shot in 1/125s at f/11. In the spirit of Ernie Brooks, keep sharing stories from the heart. Visit: **uwDesigner.com**

Renowned underwater photographer David Doubilet demonstrates the importance of framing on the USS *Kittiwake* in Grand Cayman (below). Gear: Nikon D610 camera, Nikkor 14-24mm lens, Nauticam housing. Exposure: ISO 640, 14mm, f/5, 1/60s



Chevron manta ray in front of the massive rock formation that is the Boiler dive site, San Benedicto Island, Revillagigedo Islands, Mexico (above). Gear: Nikon D810 camera, Sigma 15mm fisheye lens, Subal housing. Exposure: ISO 200, f/8, 1/125s; Beams of sunlight shine through the canopy of giant kelp (*Macrocystis pyrifera*) covering the water's surface, Catalina Island, Channel Islands, California, USA (top right). Gear: Nikon D3 camera, Nikon 24mm lens, Subal housing. Exposure: ISO 200, f/7.1, 1/125s; Fluke of a mother humpback whale swimming past, just below the surface, Sea of Cortez, Cabo San Lucas, Mexico (right). Gear: Nikon D810 camera, Sigma 15mm fisheye lens, Subal housing. Exposure: ISO 400, f/8, 1/200s

Full Tonal Range

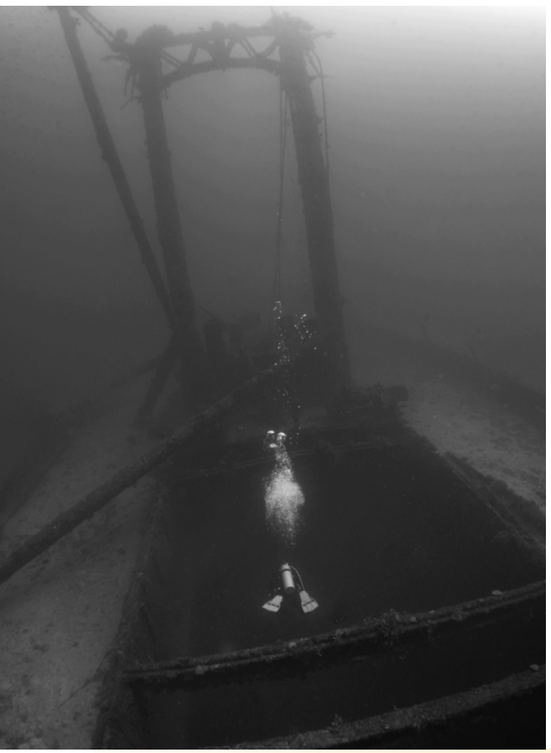
Text and photos by Matthew Meier

My favorite black-and-white photographs include the full tonal range, from bright whites to deep blacks, which helps to create an impactful image, bursting with contrast. While going through my photo library, I was particularly drawn to images with sun rays and one or two strong subjects. The elimination of color simplifies the composition so that the success of the image is defined by its shape, texture, light and shadow detail.

All of my recent photos were originally shot in color and later converted to black and white in postproduction. The conversion process provides an extra bump of contrast, which can elevate a good image to a truly stunning work of art.

While my underwater photography journey began with film, I never mastered shooting and processing black-and-white film to achieve the results I can now produce with Lightroom and Photoshop. I stand in awe of one of my mentors, Ernie Brooks, who created most of his spectacular underwater image collection from rolls of medium format, black-and-white film and just 12 exposures per dive! That said, I will continue to strive to create images that may one day be worthy of being hung alongside the masters. Visit: **MatthewMeierPhoto.com**

Large, pregnant female tiger shark swimming over the shallow, sandy bottom with sun rays above, Tiger Beach, Bahamas. Gear: Nikon D810 camera, Sigma 15mm fisheye lens, Subal housing, Sea&Sea YS-250 strobes. Exposure: ISO 200, f/8, 1/160s



Divers circle the *Doc De Milly* at 150ft (45m), a ship sunk as an artificial reef in 1986, Florida, USA (top left). Exposure: ISO 400, f/8, 1/100s; A diver photographs the USS *Anderson*, which was used as a target ship in the "Operation Crossroads" nuclear weapons tests. Lights were set up inside the ship, and the diver is at around 165ft (50m), Bikini Atoll, Marshall Islands (top right). Exposure: ISO 500, f/5, 1/100s; A diver swims above a cargo hold toward a king post on the *Asakaze Maru*, a Japanese ship sunk during WWII at 110ft (33m), Kwajalein Atoll, Marshall Islands (left). Exposure: ISO 500, f/10, 1/125s. Gear used for all images: Nikon D850 camera, 8-15mm lens, Ikelite housing, no strobes

Deep Shipwrecks

Text and photos by Brandi Mueller

I love taking black-and-white images of shipwrecks, especially wide-angle shots. Seeing a ship underwater is like a glimpse into the past—be it a moment frozen in time due to the untimely sinking of the ship, or if the ship was sunk on purpose for an artificial reef, a monument that was otherwise going to be disposed of in disrepair.

I like how black and white can help portray a feeling of time passing, especially in the case of WWII wrecks. Most of the images we see of WWII are black and white, so it seems appropriate to show them in their underwater resting places in the same manner we picture them here.

While the images are taken in the present day, they represent something many years old, and I like the way black and white helps to capture this sense of age. Many shipwrecks are deep, and light is lost, so black-and-white photography can also help show detail and contrast in low-light situations. Please visit: **brandiunderwater.com**

A diver photographs a tank on the *San Francisco Maru*, a wreck resting at a depth of 165ft (50m) in Truk Lagoon (Chuuk), which was sunk during WWII. Exposure: ISO 320, f/6.3, 1/80s

Gray Scale, great hammerhead shark (above). Exposure: ISO 200, f/14, 1/200s; Exposure: ISO 100, f/22, 1/60s; *Face to Face,* sandbar shark (right). Exposure: ISO 200, f/11, 1/125s; *Hitchcock,* lemon sharks (left). Gear for these images: Nikon D500 camera, Tokina 10-17mm lens, Nauticam housing, Inon Z330 strobes

Why Black and White?

Text and photos by Gary Rose, MD

Early pioneers of photography were limited to black and white, or sepia, as they attempted to record people, places, events and emotions. To this day, black-and-white photography is still superior in its ability to evoke visceral emotion.

The photo entitled *Gray Scale* inspires awe and reverence. The cathedral lighting and broad utilization of grayscale emphasize the beauty and majesty of this regal great hammerhead shark.

The photo which I have titled *Hitchcock* draws us to the confusion and plight of the diver in this dark and sinister "sharknado," reminiscent of Hitchcock's film, "The Birds."

I particularly like the lighting of the photo that I titled *Face to Face*. It is the emphasis of the sunburst, and the corona of light reflected from this sandbar shark, that has produced the most "oohs" and "ahs" from viewers, when I have exhibited this photo with other black-and-white photographs.

The photo, *Heavy Metal*, speaks for itself. Appearing right out of the heart of darkness, this 14ft tiger shark graphically displays its power. As a black-and-white photo, the beauty of the shark's reflective metallic skin is totally captured.

All divers are enamored with the cacophony of color witnessed on almost every dive. Our left brain works hard to take it all in, analyze it, and then process what we are seeing. It appeals to our objective consciousness. At times, it can be overwhelming. By using black and white, we permit the right brain to absorb and feel emotions contained within a photograph. It appeals to our subjective subconsciousness and evokes a strong emotional response. Visit: **garyrosephotos.com**

Heavy Metal (tiger shark). Gear: Canon G16 camera, Fantasea housing, Sea&Sea YS-D2J strobes. Exposure: ISO 500, f/8, 1/160s

Diver on the *Lady Luck* wreck, Florida, USA (above). Gear: Canon EOS 7D Mark II camera, Tokina 10-17mm fisheye lens (10mm), Nauticam housing, dual Inon Z-240 strobes. Exposure: ISO 500, f/5.6, 1/80s; Freediver, Florida Keys, USA (right). Gear: Canon EOS 7D, Tokina 12-24mm lens (12 mm), Nauticam housing, dual Inon Z-240 strobes. Exposure: ISO 200, f/8, 1/80s

Engaging Tension & Dynamics

Text and photos by Michael Rothschild, MD

Underwater photography is often about the brilliant colors of marine life. But I am drawn to the incredible power of black-and-white images, and for some subjects, this is a far better way of engaging the viewer.

Strobe-lit macro shots show rich, vibrant hues, but the water column between the photographer and larger subjects mutes the contrast of the scene. It washes out details, and beyond usable strobe range, results in muddy ambient-light scenes. By using black and white, contrast and punch are restored. Composition and framing once again take precedence. I find these photographs far more rewarding than the lucky discovery of a flashy nudibranch, where evolution did all the design work for me.

The photo of the freediver is one of my favorite portraits. The black-and-white image accentuates the angles of the freediver, the tension of the breath hold, and the path to the surface.

The photo of the sand tiger sharks is a distance shot with a macro lens. I was planning on shooting little critters when these sand tiger sharks cruised by. I love the way the lens compression makes the sharks look so stocky and powerful.

The *Lady Luck* wreck photo uses black and white to draw attention to the diver cruising over the wreck, adding a 3D effect to the shot. And in the *Stolt Dagali* wreck photo, monochrome highlights the diver over the wreck's rich marine life cover. The taut anchor line keeping the dive boat above firmly in place describes tension and power, like in the image of the freediver, adding dynamics to a still photo. Visit: **dive.rothschilddesign.com**

Diver on the *Stolt Dagali* wreck, New Jersey, USA (above). Gear: Canon EOS 7D Mark II camera, Tokina 10-17mm fisheye lens (10mm), Nauticam housing, dual Inon Z-330 strobes. Exposure: ISO 800, f/11, 1/50s; Sand tiger shark on the SS *Atlas* wreck, North Carolina, USA (top right). Gear: Canon EOS 7D camera, Tamron 60mm macro lens, Nauticam housing, dual Inon Z-240 strobes. Exposure: ISO 400, f/9, 1/250s

Gorgonian, Sipadan, Malaysia. Gear: Minolta X-700 35mm film camera, 16mm lens, Seacam housing, Subtronic main stobe, Nikonos SB-105 fill strobe. Exposure: ISO 1600, f/11, 1/60s. Film: Agfa Scala 200X

Shooting with Black-and-White Film

Text and photos by Peter Symes

Often a black-and-white image is a converted colour image that is lacking in colour or got it wrong. In some cases, such as in images of wrecks where it is impossible to light up the whole subject, resorting to black-and-white conversion often works quite well and can add an old-school press photo, documentary-quality to the image—if done right.

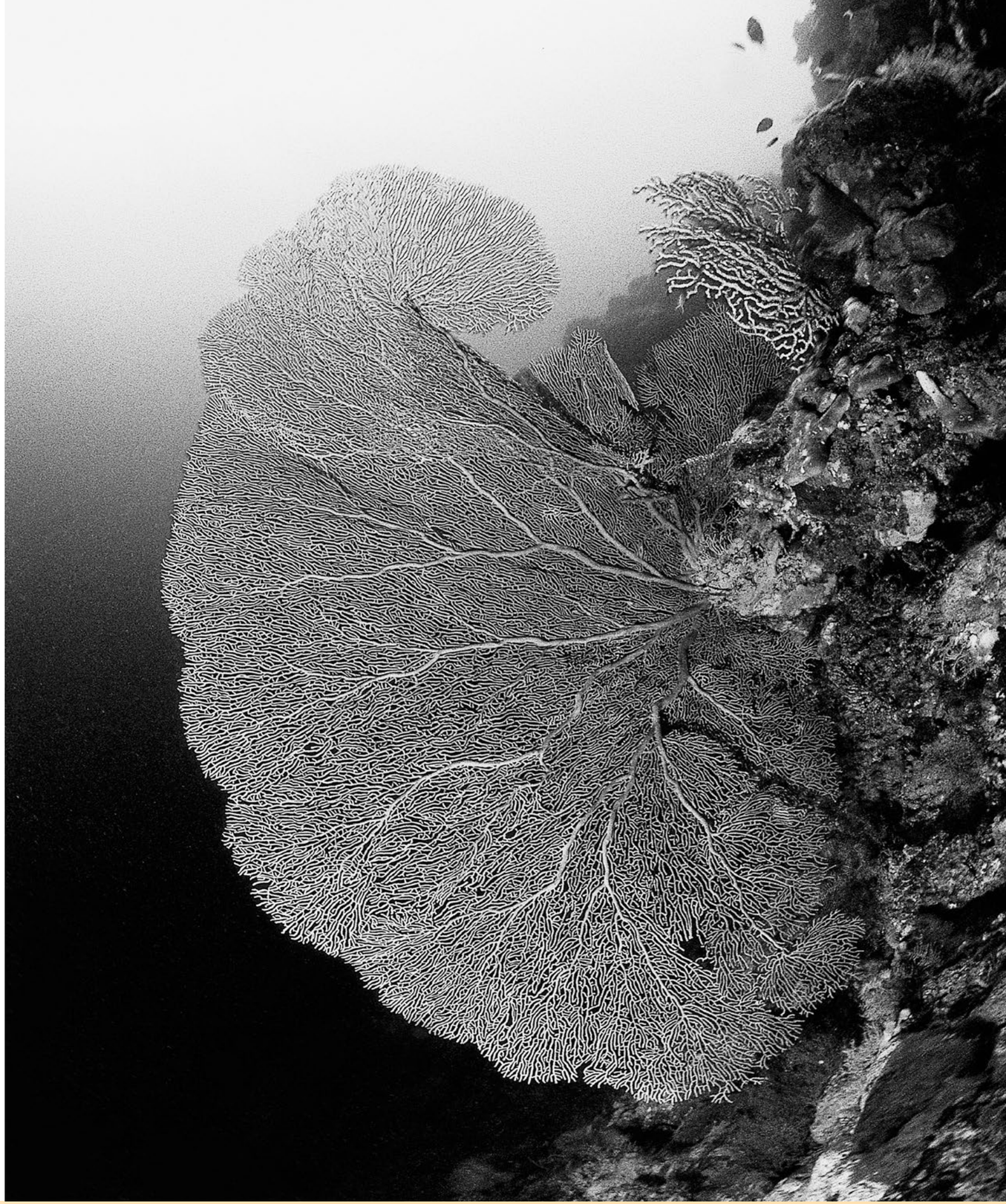
The image of the gorgonian, however, was taken on black-and-white slide film (Agfa Scala), which I really fancied, until I switched to digital. It was also one of those rare instances in which I just instantly saw the resulting image before my inner eye. I was swimming along the reef, scanning for subjects to photograph when, suddenly, I came across this majestic gorgonian with its delicate structure.

I immediately slammed on the brakes, hovered, eyeballed the distance, and manually adjusted the output of my two flash strobes. It was all just second nature and muscle memory in those days. It came out exactly as I wanted.

The image of the barracuda swirls, on the other hand, is an example of a subject for which strobes were of little use. By composing vertically and tilting upwards, I strived to create an image akin to a walk in a forest with an overhanging canopy. The light filters through the schools of fish as if through foliage and one has to look up, above one's head, to follow the action.

Because of the rather old technology used, the dynamic range was challenging to get right. It is not quite there, and a modern top-end camera would surely have produced better results—but you get the idea.

Barracuda swirls, Sipadan, Malaysia. Gear: Minolta X-700 film camera, 16mm lens, Seacam housing, ambient light. Exposure: ISO 400, f/8, 1/30s. Film: Kodak Ektachrome 400, scanned on a Plustek slide scanner and converted to black and white in postproduction



Rebreather divers Larry Cohen and Gregory Borodiansky descending to the Challenger 600 at Dutch Springs, Pennsylvania, USA (above). Exposure: ISO 250, f/5, 1/50s

Mark V helmet diver at Dutch Springs. Exposure: ISO 250, f/9, 1/160s

Creating More Drama

Text and photos by Olga Torrey

As much as I enjoy showing the colorful underwater world, sometimes converting an image to black and white (B&W) creates more drama. Usually, I capture images while scuba diving, but I was snorkeling when I took the photo of the blue shark off Montauk, New York. Working in shallow water, the picture looked good in color. However, converting it to B&W created more emphasis on the shark's white underside.

The image of my dive buddy, Larry Cohen, was captured at Dutch Springs, Pennsylvania. At this dive site, there are platforms set up for training. So, I set up Larry under the platform to get the streaming sunray effect. I then balanced out the ambient light with my strobes. Converting the image to B&W added more drama.

The Challenger 600 airplane is one of the main attractions at Dutch Springs. So, I decided to break the "always-shoot-up" rule and shoot straight down on the plane while Larry and Gregory Borodiansky descended down to the dive site. I found the image more appealing in B&W.

Larry Cohen diving under the platform at Dutch Springs (above). Exposure: ISO 250, f/7.1, 1/125s; Gear used for all images: Olympus OM-D E-M5 camera, Lumix G Fisheye 8mm lens, Nauticam housing, Sea&Sea YS-D1 strobes

The North East Diving Equipment Group meets at Dutch Springs twice a year and allows sports divers to try surface supply diving helmets. In addition, this fun event provides many fantastic photo opportunities. Unfortunately, taking photos is not easy since the divers walk on the bottom, kicking up silt. However, I did manage to get a silt-free picture of a diver in a classic Mark V helmet rig. Converting the image to B&W made the photo look like a period piece. Visit: **fitimage.nyc**

Blue shark, Montauk, New York, USA. Exposure: ISO 400, f/5.6, 1/200s

Edited by
Rosemary E. Lunn,
Matthew Meier

POINT & CLICK ON BOLD LINKS

Equipment

Journeys Edition

"Journeys" is a watch-style, feature-rich dive computer. Shearwater said, "...the Journeys Edition is inspired by dive helmets and tools used by divers over the years, re-imagined in underwater adventure stories and movie classics." The Journeys Teric has five modes and upgradeable software. It has a full-colour AMOLED display and features a bronze-coloured bezel. **Shearwater.com**

Wearable Trshbg

Trshbg was created by a team of surfers and divers from all over the world. Now, every diver and surfer can clean the ocean, on every session. Trshbg is handmade in Bali of re-used scooter tubes and banners and is available in a 3.8L Hip Bag and a 1.2L Calf Bag. Each bag is available with either buckle clips or velcro closures for securing the bag to the user and features a patented, single-handed, one-way entry. A lockable side zipper allows the bag to be easily emptied when full. **Trshbg.com**

Fourth Element Scout Mask

Fourth Element's slogan is "Equipment for Adventure." It was therefore only a matter of time before this manufacturer looked beyond their core product range of thermal protection and swimwear, and branched out. And the catalyst? Ironically, Covid-19. Fourth Element has taken the coloured lens idea and invested research and development time into it. The result is a "lens system" that is designed to accommodate different diving conditions. Divers, therefore, have a choice of four lenses: the Contrast, Shield, Enhance, and Clarity. The idea is that you choose the right lens to suit your style of diving. The single-lens, frameless Scout comes in two skirt colours, four lens options and four strap colours. As a result, you get 32 options to choose from. Simply jump onto the mask builder to play and preview your choice of skirt, lens and strap to create the right custom solution for you. **FourthElement.com**

Keeping your car keys dry

Machined out of anodized aluminum with a dual O-ring seal and IPx8 rated to 40m (130ft), the Dryfob waterproof container allows scuba divers to safely carry their electronic car key fobs with them underwater. Small enough to be stowed in a BC pocket, the Dryfob also has multiple attachment points and can be secured with a lanyard, bungee, or clip. It is neutrally buoyant and has an interior measuring 95mm by 42mm (1.65in x 3.75in) to accommodate all standard car key fobs. **Dryfob.com**

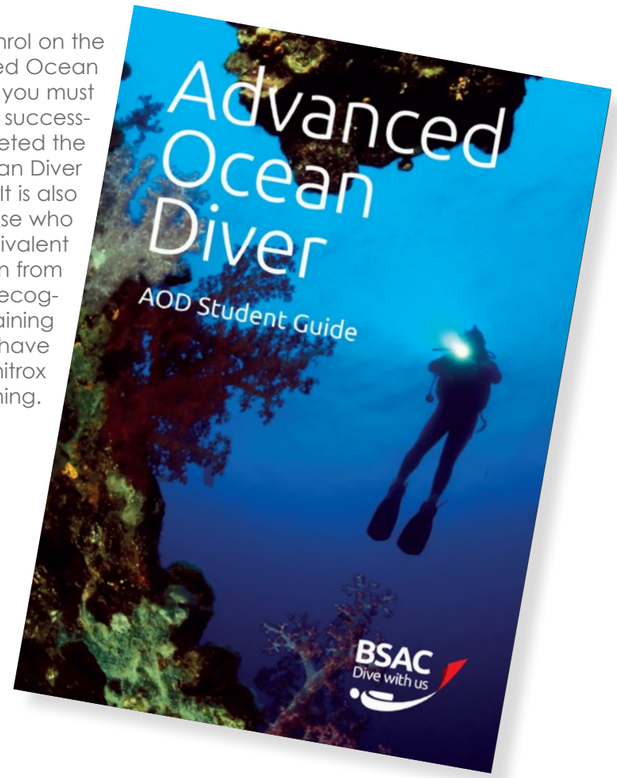
Suunto under new ownership

Amer Sports has agreed to sell Suunto to Liesheng, a Chinese technology company focusing on the smart and sport wearable electronics segment.

Founded in Guangdong, China, in 2015, Liesheng is a global consumer-electronics company with its products being sold in more than 100 countries around the world. It is top-ranked globally in the wireless audio field and has successfully developed the consumer electronics brand Haylou.

X-Ray Mag visited Suunto in 2016 and published this profile in issue #76. (Click image to view.)

BSAC launches Advanced Ocean Diver course



To enrol on the Advanced Ocean Diver, you must have successfully completed the BSAC Ocean Diver course. It is also open to those who have an equivalent certification from another recognised diver-training agency and have completed nitrox training.

BSAC has launched its "next step" entry-level course, Advanced Ocean Diver, to allow qualified Ocean Divers to extend their diving depths to 30m.

British Sub-Aqua Club's (BSAC) Advanced Ocean Diver (AOD) course is an optional course that gives new divers more choice and flexibility as they progress with their training.

The course is open to all Ocean Divers (or divers who have an equivalent certification from another recognised diver-training agency and have also completed nitrox training) aged 14 and over.

Outline

The AOD course includes four theory sessions, which can be completed either via eLearning or in person with an instructor, giving flexibility for students and instructors.

Practical sessions include two open-water lessons and two depth-progression dives. Centres can complete the AOD course in two days and make the most of BSAC's digital and eLearning resources. There is no time limit for clubs delivering AOD.

On completion, Advanced Ocean Divers can conduct no-decompression dives to 30m accompanied by a Sports Diver, or above, certification (or an equivalent certification from another training agency).

Gaining the AOD qualification can also be used to support more divers to progress to Sports Diver and beyond. Meanwhile, existing Sports Diver trainees can apply for the AOD qualification card part-way through their training, once they have completed the required theory and practical elements.

Stepping stone

"Advanced Ocean Diver does not replace Sports Diver, but can be used as a stepping stone that expands the opportunities available to divers as they progress towards this important grade," said BSAC's head of diving and training, Dom Robinson.

The Advanced Ocean Diver course is now live and ready for delivery in both BSAC clubs and centres. Full course details of the new Advanced Ocean Diver can be found on the **BSAC website**.

Can You Be Too Cautious?

— Responding to Dive Computer Nitrox Alarms

Text by Simon Pridmore

When it comes to responding to certain computer alarms, can one be too cautious? Being well informed about gas exposure limits and computer defaults can be an advantage. Simon Pridmore discusses a case in point, involving computer nitrox alarms on a routine wreck dive.

The other day, I joined a group for a dive on a small shipwreck, lying on a sandy plain just beyond a reef wall in the central Philippines. We were briefed that the site itself did not have much to recommend it. Recent coastal development had led to runoff and consequent coral destruction, and unsustainable fishing practices had taken care of most of the large schools of fish in the area.

However, from a marine life point of view, the wreck was an oasis in the desert, and that was why we were diving there. The interior was packed full of bait fish, and there were plenty of predators around—such as catfish, moray eels and leaf scorpionfish—to take advantage of the prey. We were also advised to keep our eyes peeled for a photogenic red clown frogfish, and there would be cleaner wrasse offering their services to any passing animal with an itch, as well as a small school of blue-lined snapper circling around us. So, we could expect lots of activity. It all sounded very good.

The dive

The dive guide did not lie. As we approached, even from a distance, one could see the wreck was jumping with life, as opposed to the surrounding reefscape, which was as dismal as we had been warned.

My buddy and I hung back a little from the group and watched the rest of our gang drift in to the site. Then, there was a beeping sound, swiftly followed by more beeping. Suddenly, half the group started looking at their wrists rather than the wreck, there was a general onset of anxiety, and then they were gone, swimming quickly back to the reef wall, where they spent the rest of the dive searching in vain for something interesting to photo-

PHOTO-ILLUSTRATION BY PETER SYMES

graph and ended up ascending early.

After the dive, these divers surrounded the guide, complaining that the dive had been a waste of time. Meanwhile, the few of us that had stayed on the wreck were quite happy. There had been plenty of action there to keep us entertained.

Misplaced concern

I already had a good idea of why half the group had chosen not to stay on the shipwreck and departed so quickly, but I had to ask.

"One point four," they replied. "*My computer gave me a nitrox warning*," "*I don't want to die!*" and "*We were too deep!*"

We were all using nitrox 32, and the wreck was lying at exactly 35m (115ft), sitting bolt upright on its hull, so its shallowest point was about 30m (100ft). As the divers started swimming around it, they got close to a depth of 34m, their partial pressure of oxygen (PO_2) reached 1.4, their computers' nitrox alarm went off, and their immediate reaction was: "An alarm means danger. Let's get out of here!"

They were acting out of concern for their safety, even though their retreat would cause them to miss out on the best part of the dive. This, of course, is all very admirable in terms of diving priorities in general; although, in this case, you could argue that their concern was misplaced and the degree of caution they were exhibiting was unnecessary.

NOAA Oxygen Exposure Limits

PO_2 (atm)	Maximum Single Exposure (minutes)	Maximum per 24 hr (minutes)
1.60	45	150
1.55	83	165
1.50	120	180
1.45	135	180
1.40	150	180
1.35	165	195
1.30	180	210
1.25	195	225
1.20	210	240
1.10	240	270
1.00	300	300
0.90	360	360
0.80	450	450
0.70	570	570
0.60	720	720

COURTESY OF BEST PUBLISHING (NOAA DIVING MANUAL 4TH ED.) FLAGSTAFF, AZ, USA

Chart showing NOAA oxygen exposure limits

Facts and figures

The chart illustrating this article should be familiar to all nitrox divers. If it was not shown and explained to you when you took your nitrox course, your instructor did a shoddy job.

Scientists and navy divers were diving with nitrox for decades before sport divers started using it. The science behind nitrox, including this chart, came to us via a former United States National Oceanic and Atmospheric Administration (NOAA) diving officer named Dick Rutkowski. He started teaching nitrox diving to sport divers in 1985, after he retired from government service. Nitrox 32 was originally known as NOAA 1; nitrox 36 was NOAA 2.

The NOAA chart details the level of oxygen exposure at which a diver may be at risk of an oxygen toxicity convulsion. As you can see, the limits do not derive only from the PO_2 a diver is breathing; they derive also from the length of time the diver spends exposed to that PO_2. Therefore, spending 150 minutes at a PO_2 of 1.4 carries the same risk as spending 45 minutes at 1.6. But a PO_2 of 1.6 is the absolute maximum for sport divers because, beyond this level, the permitted exposure time drops quickly to only a few short minutes. NOAA deliberately set conservative limits. After all, it did not want to lose its scientists.

When Rutkowski and others started teaching sport divers how to use nitrox, some people in the established sport-diving hierarchy feared that this was a dangerous thing to do. They prophesied that it would lead to mayhem, with nitrox divers suffering oxygen convulsions and drowning all over the place. This did not happen.

Today, millions of nitrox dives take place each year and it still does not hap-

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KLAUS STIEFEL / FLICKR / CC BY-NC 2.0

pen. Experience has shown that sport divers diving on open circuit nitrox do not come to harm when diving within no-decompression limits and the NOAA oxygen exposure limits.

In any case, as one would expect, even in the beginning, the approach of the community of sport nitrox divers was conservative and instructors taught students not to plan their dive for a maximum depth where their breathing gas PO_2 would reach 1.6, but to allow for factors such as defective gauges, defective analysers and diver inattention, and to not exceed 1.5 or so.

However, the early establishment fears did not go away completely and, as nitrox became more commonly used, the recommended maximum PO_2 level for sport diving dropped from 1.6 to 1.4.

Computer manufacturers started establishing 1.4 as the default PO_2 alarm level, and although the setting was user-changeable on many units, typically few divers ever bothered. This is still the case now and, in fact, some diver training agencies now teach 1.4 as the PO_2 level beyond which one shalt not pass.

Moreover, the computer alarm is set to go off as soon as the computer calculates that the diver's gas and depth equate to a 1.4 PO_2. The concept of a diver being able to remain safely at a certain PO_2 for a certain length of time seems to have been lost. The PO_2 level is now all that counts, not the duration or the dose.

Hence, the misguided behaviour we observed among some of our fellow divers on the shipwreck dive.

Nitrox 32 was actually the perfect mix for that wreck dive. The water was warm. The visibility was excellent. There was no current and the divers had to expend only minimal effort on the dive, so there was no reason for any unusual level of concern. The maximum depth was 35m (115ft), giving the divers a maximum PO_2 of 1.44, even if they were lying flat on the sand. Also, with nitrox 32, their computers would give them a no-decompression time on and around the wreck of 20 to 25 minutes or so—far less than the 120-minute exposure limit that the NOAA chart allows for a dive at a PO_2 of 1.5.

Sadly, it was completely unnecessary for the beeping divers to abort. They missed a great dive. What a shame that their misplaced fears got in the way of having fun!

It is good to be a conservative diver, but it is important to be well informed, so you can distinguish between being sensibly careful and excessively cautious. ■

Simon Pridmore is the author of the international bestsellers Scuba Fundamental: Start Diving the Right Way, Scuba Confidential: An Insider's Guide to Becoming a Better Diver, Scuba Exceptional: Become the Best Diver You Can Be, *and Scuba Professional: Insights into Sport Diver Training & Operations, which are now available in a compendium. He is also the co-author of the* Diving & Snorkeling Guide to Bali *and the* Diving & Snorkeling Guide to Raja Ampat & Northeast Indonesia. *His recent published books include* The Diver Who Fell From The Sky, Dive into Taiwan, Scuba Physiological: Think You Know All About Scuba Medicine? Think Again! *and the* Dining with Divers *series of cookbooks. For more information, please see his website at:* ***SimonPridmore.com***.

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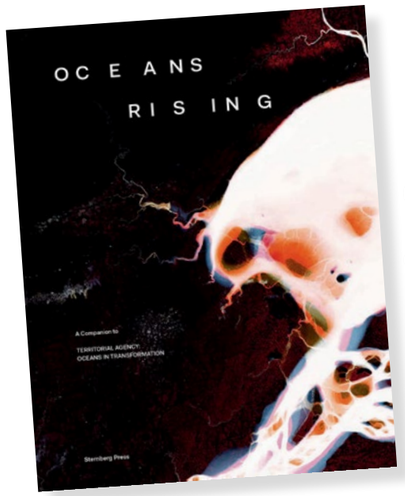

Oceans

Oceans Rising: A Companion to Territorial Agency: Oceans in Transformation, edited by Daniela Zyman and TBA21

Compiled as a companion reader to Territorial Agency: Oceans in Transformation, an independent oceanic research initiative commissioned by TBA21–Academy, this book contains 41 contributions written by artists, scholars, scientists and ocean activists, in response to the rapidly changing oceans. This collection presents alternative narratives that, while revealing the magnitude and urgency of ecological devastation, strengthen our knowledge communities and contribute to world-making practices from an oceanic perspective.

Publisher: Sternberg Press
Date: 1 February 2022
Paperback: 272 pages
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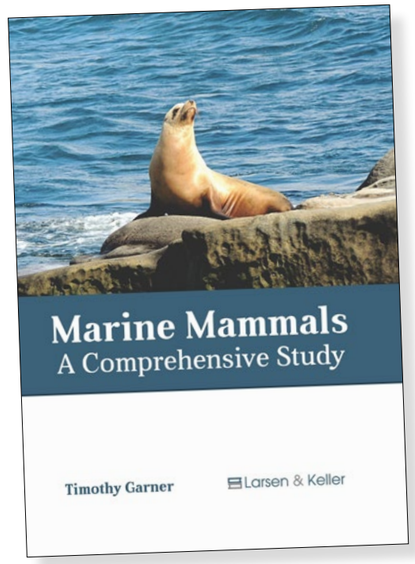
ISBN-13: 978-3956796098

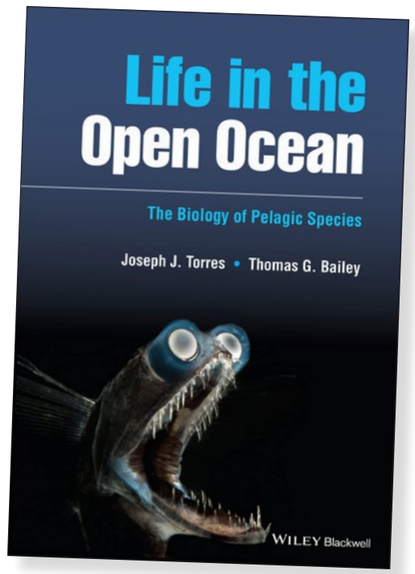


Furry Critters

Marine Mammals: A Comprehensive Study, edited by Timothy Garner

There are different categories of marine mammals. Some, like cetaceans and sirenians, are fully aquatic; some, like seals and sea lions, are semi-aquatic; and there are other marine mammals, like otters and polar bears, which are much less adapted to an aquatic lifestyle. Each species possesses specific anatomical and physiological features that enable them to overcome challenges associated with aquatic living. This textbook provides insights and detailed explanations into the various concepts and theories related to marine mammals.

Publisher: Larsen and Keller Education
Date: 8 March 2022
Hardcover: 241 pages
ISBN-10: 1641726172
ISBN-13: 978-1641726177



Pelagics

Life in the Open Ocean: The Biology of Pelagic Species, by Joseph J. Torres and Thomas G. Bailey

This book covers marine animal groups inhabiting the ocean's pelagic realm, such as cnidaria, ctenophores, pelagic nemerteans, pelagic annelids, crustaceans, cephalopods, pelagic gastropods, invertebrate chordates, as well as micronektonic and larger fishes like sharks and tuna. It explores the physical environment, foraging strategies, energetics, locomotion, sensory mechanisms, global and vertical distribution, special adaptations, etc. It examines how they have adapted to life in the open ocean, and includes an introduction to the physical oceanography and properties of water in the pelagic realm. Ideal for senior-level undergraduates and graduates in biology and biological oceanography.

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Date: 1 March 2022
Hardcover: 1,008 pages
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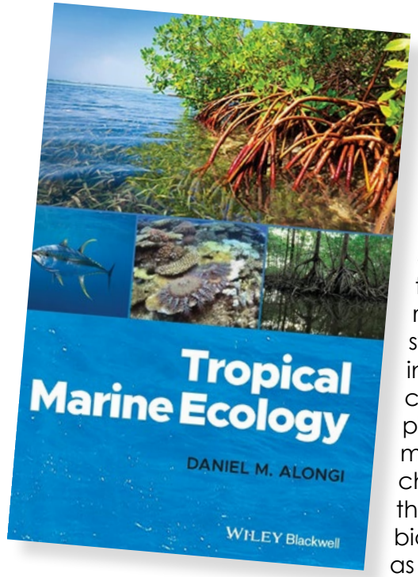
ISBN-13: 978-1405145299



Tropics

Tropical Marine Ecology, by Daniel M. Alongi

This book focuses on the estuarine, coastal, continental shelf and open ocean ecosystems in the tropics. It documents the structure and function of tropical marine populations, communities and ecosystems in relation to environmental factors including climate patterns and climate change, and patterns of oceanographic phenomena such as tides and currents and major oceanographic features, as well as chemical and geological drivers. It covers the tropical marine environment, tropical biota, and pelagic and benthic food webs as well as how human activity and pollution have altered the tropical ecosystems.

Publisher: Wiley-Blackwell
Date: 4 January 2022
Hardcover: 688 pages
ISBN-10: 1119568862
ISBN-13: 978-1119568865

National Geographic presents a gripping podcast series about slave ship wrecks and the divers documenting them

National Geographic Explorer Tara Roberts takes us on a journey through history as she covers the stories of some of the estimated 1,000 shipwrecks of slave ships in the Atlantic Ocean that took place during the transatlantic slave trade in which approximately 12.5 million Africans were forced to cross the Middle Passage.

In the new six-part podcast, *Into the Depths*, Roberts tells of her time with a group of Black divers whose mission is to locate and help document the wrecks.

Click on the image to hear the podcasts or read the transcripts.

Episode 1: Trusting

Upending her life to set off on this quest, even leaving her job, she meets legendary Black diver and International Scuba Diving Hall of Fame inductee Dr Albert José Jones, who founded Underwater Adventure Seekers and the National Association of Black Scuba Divers, and learns about his project to place a memorial on the British wreck of the *Henrietta Marie* to honor the 272 Africans trafficked to the West Indies in the vessel's cargo hold. With National Geographic Explorer and poet Alyea Pierce, who gives voice to the captive Africans and speaks their names, Roberts finds there is far more than pain and trauma alone to reckon with in the history of the slave trade.

Episode 2: Training

Roberts meets Ken Stewart, co-founder of Diving With a Purpose (DWP), who tells the tale of his nearly 20-year mission to locate the Spanish pirate ship *Guerrero*, carrying enslaved Africans and wrecking off Florida's coast in 1827. She decides to take up dive training with DWP, which includes learning how to find and map a shipwreck. Roberts tries to imagine what the enslaved Africans on the *Guerrero* experienced with the help of poet and fellow Explorer Pierce.

Episode 3: Building

In Costa Rica, Roberts meets a multigenerational community of divers documenting two Danish shipwrecks, the *Fredericus Quartus* and the *Christianus Quintus*, which carried slaves and experienced rebellions on board. Here, a new type of marine archaeology is taking shape, which is centered on the local community and driven by young people. She learns from journalist María Suárez Toro that the divers are playing a major role in reshaping a society's own history. Roberts and fellow Explorer Pierce try to draw a picture of a female-led insurrection that took place on one of the ships.

See the trailer and upcoming episodes at: **nationalgeographic.com/podcasts/into-the-depths** ■

VDI unveils a dive simulator app

Virtual Divers International (VDI) has announced that they have created a realistic diving simulator.

According to VDI "this app is as close to diving as you can get on your mobile device while playing a game at the same time. More than a game, this simulator puts you in the diver's seat!"

Target market

The platform allows divers to enjoy their sport, with the simulator integrating the most used items in diving: mobile devices, training, and a connection to others with the same lifestyle.

It is believed that the VDI app is aimed at billions of gamers either wanting to dive, or divers continuing their adventures. By introducing new ways to engage/re-engage end-users, it is hoped that VDI will encourage all levels of training, equipment sales, and travel.

Jim Holliday

The team behind VDI includes two dive professionals: Jim Holliday and Rob Partridge. Holliday has a long career in the scuba diving industry. He has distributed Sherwood, Aqualung, Suunto, Sharkskin, and Neptune wetsuits, and worked extensively with SSI in the South Pacific and throughout Asia.

In spring 2014, Holliday, along with Paul Toomer, bought shares in the dive training agency RAID in order to take it to the next level. In August 2014, he was appointed the new CEO of RAID International, a post he held until approximately two years ago.

Now, Holliday, VDI's operations officer, has confirmed that the first dive training agency to get involved with his latest project is Scuba Schools International.

VDI and SSI partner

Holliday said, "SSI is the world's largest business-based training agency for a reason. They clearly have a technology vision. Together with SSI, we will change the diving industry, both literally and figuratively, and this is only the beginning!"

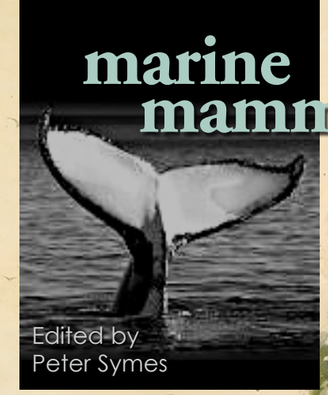
"SSI is constantly looking for new ways to acquire consumers. Whether that's through our own advances, or partnering with new and innovative companies when we see an opportunity, we act quickly," said Guido Waetzig, SSI president and CEO. "This is one of those opportunities!"

As part of the partnership, VDI will list all SSI Training Centres as partners on day one.

About the app

The VDI app allows the user to perform a number of skills including mask clearing, regulator removal and recovery, equipment assembly, descents, ascents and hand signals. VDI claim that this game "will engage new and experienced divers or anyone just wanting to learn more about our sport or even preparing for a course."

During the virtual dive, users will be able to discover marine life, explore underwater scenery or find gold coins. The team behind the VDI dive simulator think that this will help users to learn more about scuba diving and try virtual skills before taking a real scuba diving course. See the video here: **youtu.be/sgIV-f7UDPRY** ■



WIKIMEDIA COMMONS / PUBLIC DOMAIN

An era is about to come to an end. *South Sea Whale Fishery*, a lithographic print published in 1835 of a painting by Ambroise Louis Garneray, which was engraved by E. Duncan

Iceland poised to end whaling in 2024

Iceland says it will end commercial whaling from 2024 amid dwindling demand and continuing controversy.

Along with Norway and Japan, Iceland is one of only a few countries that still hunt whales commercially. However, demand for whale meat has decreased dramatically since Japan—Iceland's main market—resumed commercial whaling in 2019, after a 30-year ban. Commercial whaling was banned in a 1986 International Whaling Commission embargo, but Japan withdrew from the IWC in December 2018. The extension of a no-fishing coastal zone, requiring whalers to go even farther offshore, also made Iceland's hunt more costly.

Consequently, the Icelandic government has now arrived at the realisation that whale hunting does not make much economic sense anymore. According to Minister of Fisheries and Agriculture Svandís Svavarsdóttir, there are "few justifications to authorise whale hunting beyond 2024," when current quotas expire.

Consumer pressure mattered

Svavarsdóttir also pointed out that whale hunting has been controversial and recalled that the US retail chain Whole Foods had stopped marketing Icelandic products for a while as a result.

Iceland's annual quotas for 2019 to 2023 allowed for the hunting of 209 fin whales—the planet's second-largest species after the blue whale—and 217 minke whales, one of the smallest species.

More than 1,700 minke, fin and sei whales have been killed in Iceland since the 1986 embargo, according to data from Whale and Dolphin Conservation (WDC), a nonprofit organisation. Meanwhile, Svavarsdóttir stated the fact that only one whale had been killed in the past three years showed that the practice had little economic benefit for the country. ■ SOURCES: WHALE AND DOLPHIN CONSERVATION, MINISTRY OF FISHERIES AND AGRICULTURE ICELAND

shark tales

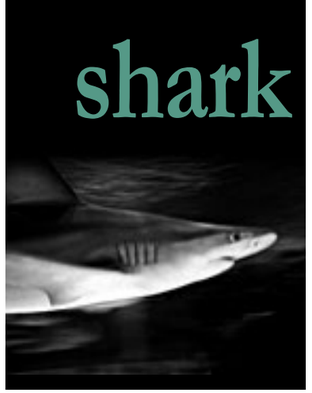


Photo 1. Divers and a bull shark at 100ft (~30m) on the deep ledge off Jupiter, Florida, USA

The Sharks of Jupiter

Text and photos by David Pearlman

So, your dive goal is to get up close and personal with several different species of shark—in one day of diving. Well, then I suggest you fly to Jupiter.

Where else in the continental United States but in Jupiter, Florida, can a shark aficionado experience the thrill of leaping into the ocean with over half a dozen different species of sharks in one day, including bull, tiger, great hammerhead, lemon, sandbar, silky and nurse sharks? And these are just the ones that I have seen! Some of the luckier and more regular divers have even been fortunate enough to catch glimpses of the great white shark migrating through the area.

We dive with sharks because we are fascinated by them. Are we all crazy? Perhaps! As one of the local shark dive boat owners put it in his daily dive briefing: "We're all here because we're not all there."

Each shark species, and individual shark, for that matter, has its own very specific look, allure and personality; and as photographers, we want to see and experience them all! It is gratifying to get into the water not knowing precisely what we are going to see that day. Every dive offers something different, and all nature lovers know and accept that there are no guarantees. Those seeking a guaranteed outcome best head to a zoo or an aquarium.

Diving

The first tank of the three 36-percent-required nitrox mix tanks is exhausted just off Jupiter's deep ledge. Whatever direction the current is moving that day dictates the drift dive that is done. This baited dive is meant to attract bull sharks and any other pelagics in the area. Bull sharks are common year-round, but the summer months are known to also attract sandbar, dusky and silky sharks. The trick to success on this dive is to not descend lower than the feeder. Sharks tend to hesitate to rise to the level of the feeding, which is around 90ft (~27m), if divers are blowing bubbles below.

Like all sharks, bull sharks are super smart and motivated by food. When they come close and eventually start to feed and realize that they are going to be successful and unmolested, they often remain throughout the entire dive—drifting along with the divers.

Photographers who want that spe-

cific image with nothing but open water behind the shark will hover farthest away from the feeder. Those who want to get more toothy shots can place themselves relatively close to the feeder. After 20 minutes or so, the feeder will slowly ascend to shallower depths. Most of the time, the bull sharks will follow the divers, giving underwater photographers a chance to capture the godlight streaming down behind them.

The second and third dives are shallower and, from my experience, yield more compelling images than the drift dive. These dives cover one to two wrecks, just over the three-mile maritime line, in about 70ft (~20m) of water. Here, one can legally participate in shark-feeding activities off the Florida coast.

It is exciting to arrive at a wreck, get in the safety formation (kneeling on the wreck and looking unappetizing in dark dive gear), and watch the lemon sharks feed. These enthusiastic, puppy-like sharks are almost always there and ready to share a bite to eat. I really do enjoy these lemon sharks because they are endlessly cute and entertaining.

One female named Snooty has a physical trait that I have not seen in any other shark. At first, I thought it must have been a wound caused by a fisher or other reckless act, but I have since learned that she has a birth defect. She is cheeky in both looks and personality. It is almost as though she knows that she is terrifyingly gorgeous, and she wants you to know it too.

Now, if a tiger shark turns up, it immediately becomes the star of the show, and the lemon sharks become little more than obstacles that occasionally get in the way of a clear shot of the tiger shark. This dynamic goes on for the entire dive, unless it is a really lucky dive, and a great hammerhead shark emerges from out of the blue. At this point, the hammerhead naturally becomes the star! But great hammerheads are far more skittish, and it is quite rare that they get close enough to feed and pose for a brilliant shot. This explains my almost complete lack of good images of a great hammerhead shark in Jupiter.

Recognizing individuals

For me, the best days are when the tiger sharks show up, as they dazzle me with their breathtaking size and striped beauty. I have learned that they have been maligned as aggressive man-eaters, while they are actually quite capable of distinguishing between humans and their food.

Photo 2 (top left). To get photos free of divers, hover at the edge of the group, away from the feeder; Photo 3 (above). Sandbar shark in summer; Photo 4 (top right). Near the feeder, lemon sharks act like hungry puppies.

Photo 7 (above). Female tiger shark Sophia, with remoras and the paparazzi

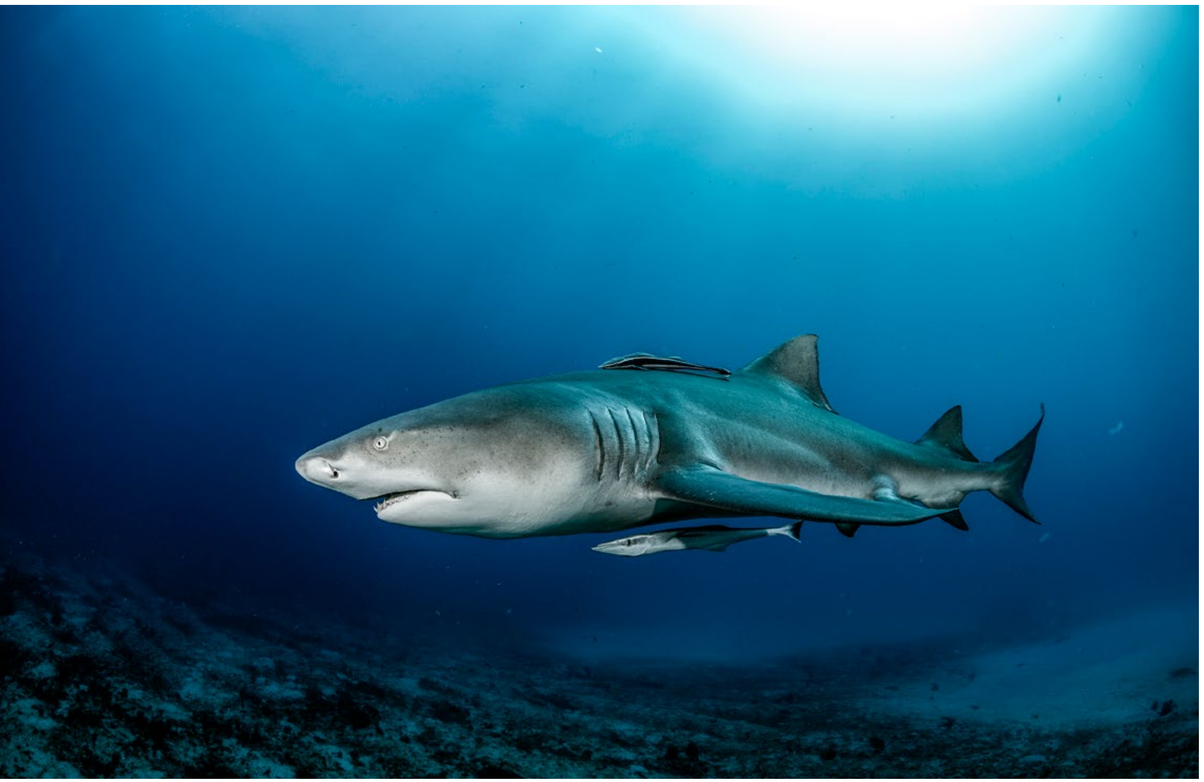


Photo 5 (top left). Close-up of Snooty, showing her birth defect; Photo 6 (above). Drift dives in which sharks follow the feeder offer opportunities to capture shark images with great backgrounds.

I have come to know and admire a few different tiger shark individuals in Jupiter. Two females, Djenny and Sophia, and one male, Patrick, often migrate through the area during the spring and summer months.

Occasionally, particularly when the same wreck is visited on two consecutive dives, one of these three tiger sharks is already there and will greet divers on the descent—escorting them to the wreck. That is one of the best times to get a stellar shot of a tiger shark in open water.

Shark-feeding controversy

Before I discuss some of my favorite shark images, I want to comment briefly on the controversial practice of shark feeding. Opponents of the practice claim that sharks are being conditioned to associate people with the smell of food, which they believe is dangerous for humans and detrimental to sharks.

Admittedly, as a professional photographer who is eager to capture compelling images of sharks, I fully recognize and admit to my own personal bias. Unfortunately, it is impractical to expect sharks to spend much time around divers without the incentive of food. Effectively everything that has been gained in the study of, and broader appreciation for, sharks has been made possible through the practice of shark feeding. However, I write this with an open mind as well as a strong understanding and respect for both sides of the issue.

Photographing sharks

Divers descend to approximately 100ft (~30m) over Jupiter's deep ledge (see Photo 1). It is crucial that the divers stay behind and at the same depth as the feeder, and that everyone glides along together in the same direction. It usually does not take very long to attract the bull sharks, which always seem to enjoy a free handout.

Your best opportunity to capture a shark portrait without any divers in the image is to hover away from the feeder towards the outskirts of the group. (See Photo 2.)

In the summer months, when divers are out over the Jupiter ledge, trying to incentivize the bull sharks to join them, you can occasionally come upon sandbar sharks (see Photo 3). From a distance, one could swear a bull shark was coming. Once they get close enough, however, their oversized dorsal fin and pointier snouts make it obvious that you can cross the sandbar shark off your bucket list.

Lemon sharks are like hungry puppy dogs. The minute they smell the bait bin, they are all over the place. There is a "no-touch" policy with these sharks because while they do not pose much of a threat to divers, there is the possibility of them confusing a

shark tales

waving hand for bait. The trick is to relax and keep your extremities close to your body. In Photo 4, Snooty and another lemon shark check me out, with the tiger shark Sophia in the background.

A close-up of Snooty shows her mouth deformity (see Photo 5). I like to think she is keenly aware of her almost cartoon-shark-like appearance and uses it to her advantage. She is, without question, a local favorite.

After about a half hour on the wrecks, divers drift along with the current, taking along whatever bait is left in the bins (see Photo 6). As long as the scent holds out, the sharks will follow. This provides another opportunity to get a beautiful shark portrait with great backgrounds of open water.

Sophia and the paparazzi (see Photo 7): She is one of two female tigers that come for a visit every so often. She is easy to identify, due to the unusual notch in her dorsal fin.

Time for your close-up, Patrick (see Photo 8). Of the three tiger sharks that visit divers in Jupiter, Patrick is the most striking. He is probably the youngest, as his tiger stripes are still dark and quite clear. As tigers get older and larger, their stripes tend to fade somewhat.

Djenny is one of my absolute favorite tiger sharks (see Photo 9). When she shows up to a dive, the water turns electric. Like any of the local tiger sharks, Djenny is not shy. She seems quite comfortable swimming right up to the divers for a game of chicken—a game we are all too happy to let her win. It is only when tiger sharks get too close that a diver should gently but firmly put a hand on the top of its snout and confidently guide it in another direction.

The crème de la crème, the great hammerhead sharks, add a totally different dynamic to a shark dive—even more so than a tiger shark. All eyes become instantly glued to these amazing-looking creatures, with their strange head shape and unusually tall dorsal fins, when they come close to investigate the scene. They maneuver their way around the outskirts of the feeding, circling and circling. I have been told that if they feel comfortable enough to feed, they will hang around and get as close as any of the other sharks. But I personally have never been so lucky as to see that happen! This big boy (Photo 10) followed me from mid-water back to the boat.

I hope that you enjoy these images and come to love these majestic creatures as I have. ■

American photographer David Pearlman specializes in underwater, wildlife, nature, people, product and food images. His work has been published in books and magazines in over a dozen countries. Having run a successful commercial photography studio since 1987, he moved to South Florida in 2000 to pursue his "true passion" of wildlife and underwater photography. For more information, visit: ***davidpearlmanphotography.com***

Photo 8 (top left). Close-up of male tiger shark Patrick; Photo 9 (above). Divers with female tiger shark Djenny; Photo 10 (top right). Great hammerhead sharks are shy, but when they get comfortable, they will hang around.

Unique antibodies present in sharks can inactivate SARS-CoV-2, its variants and other coronaviruses

Shark antibodies can fight coronaviruses

Researchers have found that shark antibodies can prevent the virus that causes Covid-19, its variants, and related coronaviruses from infecting human cells.

Small, antibody-like proteins known as VNARs (Variable New Antigen Receptors) are derived from the immune systems of sharks, and appear to be extremely potent in preventing Covid-19, as well as its variants, and related coronaviruses from infecting human cells.
Miniscule antibodies

The shark proteins are ten times smaller than human antibodies and can bind to infectious proteins in unique ways that bolster their ability to stop infection. "These small antibody-like proteins can get into nooks and crannies that human antibodies cannot access," said study co-leader Aaron LeBeau, a professor of pathology at the University of Wisconsin–Madison.

In one of the experiments, such a protein neutralized WIV1-CoV—a coronavirus present in the bodies of bats capable of infecting humans. In turn, in a pool of synthetic VNARs developed by Elasmogen, researchers found three SARS-CoV-2 neutralizing proteins. The same proteins were also effective against the virus that caused SARS in 2003.

Future outbreaks

The new VNARs will not be immediately available as a treatment in people, but they can help prepare for future coronavirus outbreaks.

"The big issue is there are a number of coronaviruses that are poised for emergence in humans," said LeBeau. "What we're doing is preparing an arsenal of shark VNAR therapeutics that could be used down the road for future SARS outbreaks. It's a kind of insurance against the future."

The shark VNARs were able to neutralize WIV1-CoV, a coronavirus that is capable of infecting human cells but currently circulates only in bats, where SARS-CoV-2, the virus that causes Covid-19, likely originated.

According to the researchers, possible future treatments are likely to take the form of a cocktail of different shark proteins, to maximize their effectiveness against a range of different and mutating viruses. Their application may be even wider. Scientists are already studying the potential of shark proteins in the diagnosis and treatment of cancer. ■

SOURCES: NATURE COMMUNCATIONS, UNIVERSITY OF WISCONSIN

Diver at the door to the small dead-end tunnel at a water depth of 50m, in the Nyköping Mine on Utö Island in Sweden.

Utö Mines

— Exploring 150-Year-Old Mines in Sweden

Text and photos by Anders Etander

The desire for adventure lies in wait and entices us… On Utö, there was an unexplored mine system. Follow Anders Etander down into the darkness, where the "In Water Under Land" exploration group had the privilege of diving in a place that has been untouched for 150 years.

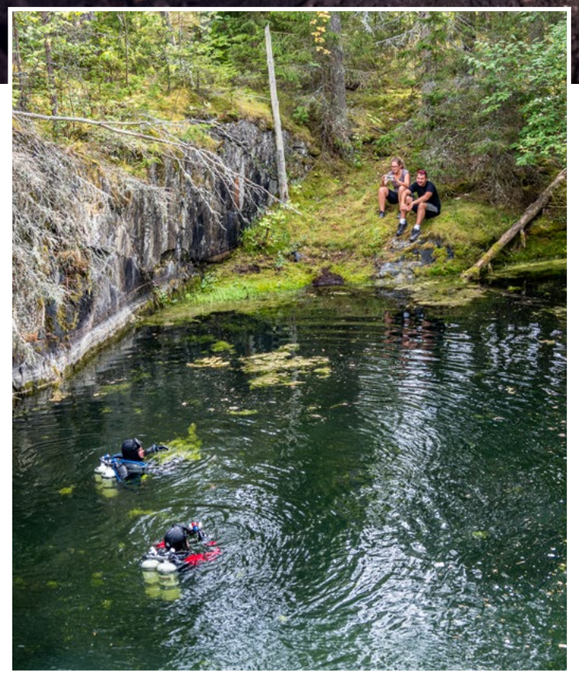
Our journey through life is amazing, and it is strange how one thing can lead to another. Ever since we got our basic certificate in mine diving, my closest dive friends and I had talked about the existence of mines on Utö Island in the Stockholm archipelago. We knew that there were some who had been there and dived the mines in the late 1990s, but not much more than that. We really wanted to go there; a mine environment like this attracted us—especially when, as was true in this case, it was also unexplored. But we did not know how we would do it, and from which end we should start.

In connection with a guided tour of Sala Silvergruva (Sala Silver Mine) in early 2019, fellow divers Martin Fregelius and Filippa Ek met a representative of the Archipelago Foundation, which owns and manages large parts of Utö, including the mines. One thing led to another, and we were commissioned by the Archipelago Foundation to carry out exploration of the Utö mines. Planning could now begin.

Unique minerals lead to mining

The bedrock on this island in the Stockholm archipelago contains a large number of different minerals. More than 70 rocks and minerals have been discovered and named after finds on the island, of which lithium is probably the most well known. Another is the very rare mineral holmquistite, which has only been found in Madagascar and on Utö. Archaeological excavations on Gotland found traces of holmquistite in slag remains dating to the 12th century. With this discovery, there are those who claim that there is evidence that mining has been conducted on Utö

Utö Mines



Divers enter the surface waters over one of the mines on Utö Island, under the watchful eye of surface-support members of the expedition.

Martin Fregelius inspects a stockpile of drilled logs, which were prepared for use in a pump pipe in the Ribbings Mine. These were located at a water depth of 57m (top left); The ladder sitting on the wall of the Nyköping Mine. The divers were at a depth of about 25m, which corresponds to 190m above the bottom of the mine when it was active (top right).

since then. Historically, mining on Utö was only first mentioned in writing in 1544.

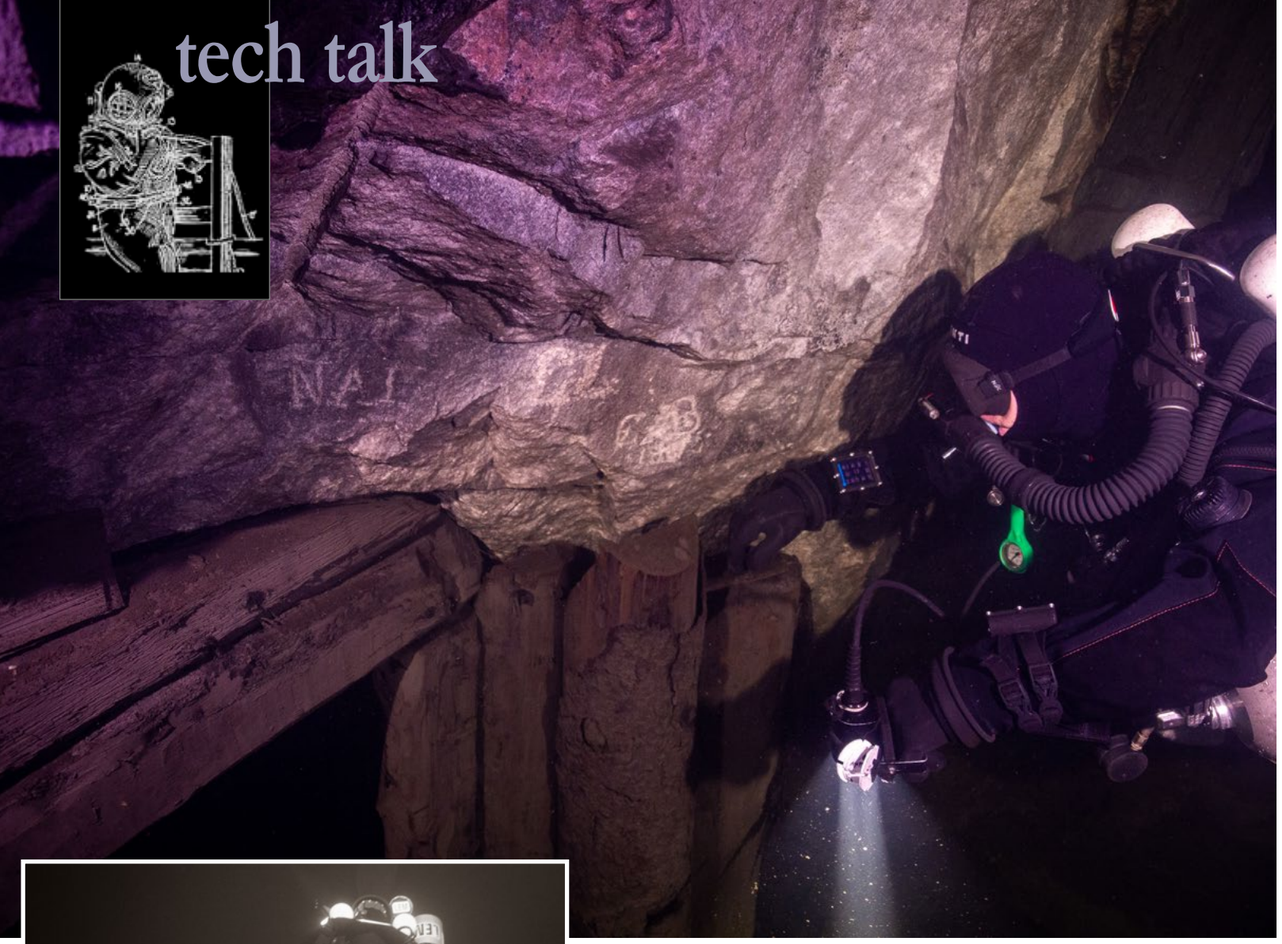
During the 17th century, mining operations were expanded considerably, and several new mining holes were opened, among them Finngruvan and Långgruvan. Mining then took place under the responsibility of various owners, until 1878, when the business was closed down. At the time, the breaking method was used to mine, which meant that one set fire to the rock and then knocked off the parts that became porous. For each load of wood, about 500 kilos of rock mass was normally released. Gunpowder had also been used in the mine, but only on a small scale. The orebody on Utö is rich in iron, with concentrations of up to 85 percent, compared to, for example, the orebody found in Kiruna, which today is around 45 percent.

The Utö mines can be considered open mine holes, dug straight into the ground, and the central area consists of ten different mines. Today, all are filled with rain and meltwater; the inflow of groundwater is and has always been small on Utö. All depth markings on the maps are based on the mine's balanced point, and the water surface today starts at about 10m below this point. The Nyköping Mine, as the name indicates, delivered its ore for enrichment to Nyköping. This mine is also called Storgruvan (Big Mine), and with its 215m, is the largest and deepest on Utö. To the north is first Långgruvan (Long Mine), which is about 60m deep and named after its appearance; then comes Finngruvan (Finn Mine), which is 150m deep, whose ore

The scenic surroundings at one of the mines on Utö Island

Utö Mines

Pipes at 74m in Stjernheim's shaft. These were probably used to purify water, which was pumped up from sedimentation.



Inscriptions over a door were made by miners in 1875. The letters "CAB" can be seen in the middle of the picture (top left); A timber prop left against the wall was found at 74m in Stjernheim's shaft, located between Nyköping Mine and Långgruvan (Long Mine) (top right).

was sent to Finland for enrichment. Under the ground between Nyköping Mine and Långgruvan is Stjernheim's shaft, which is 130m deep.

The adventure begins

In the summer of 2019, we started conducting dives through the exploration group "In Water Under Land." The group consists of Martin Fregelius, Filippa Ek, Linus Malmgren and myself—all experienced rebreather divers in a mine environment.

After a couple of trips to Utö for reconnaissance and planning, we loaded all the equipment on a pickup that, with the help of Utö Sjötransport, was driven out to the island. Safety planning was a challenge; we knew that the diving depths would be deep, with long decompression times as a result. For that reason, we conducted the dives during late summer, so that the temperature of the surface water would be as high as possible. From six metres and shallower, it was a pleasant 19°C, otherwise the temperature was a constant 5°C in all the mines.

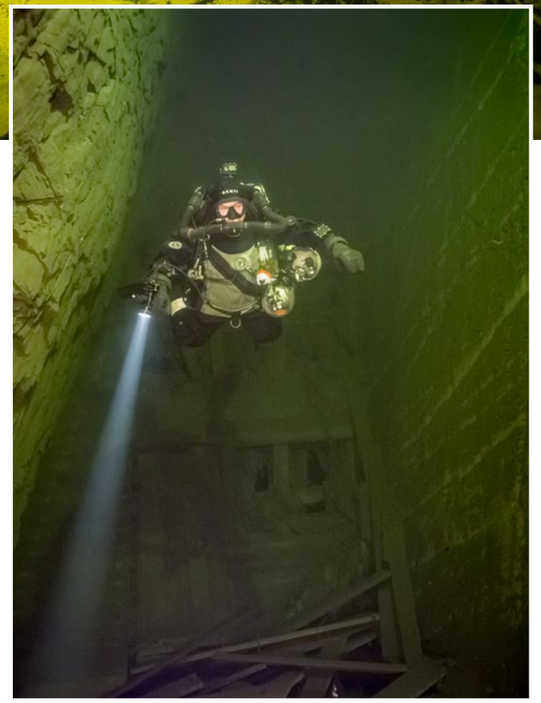
We also set up a communication system from a depth of 15m to the surface, with the help of writing boards; plus, we brought with us plenty of oxygen, to have both in the water and on land. A responsible dive leader was always on land for surface support and any contact for help.

Diving

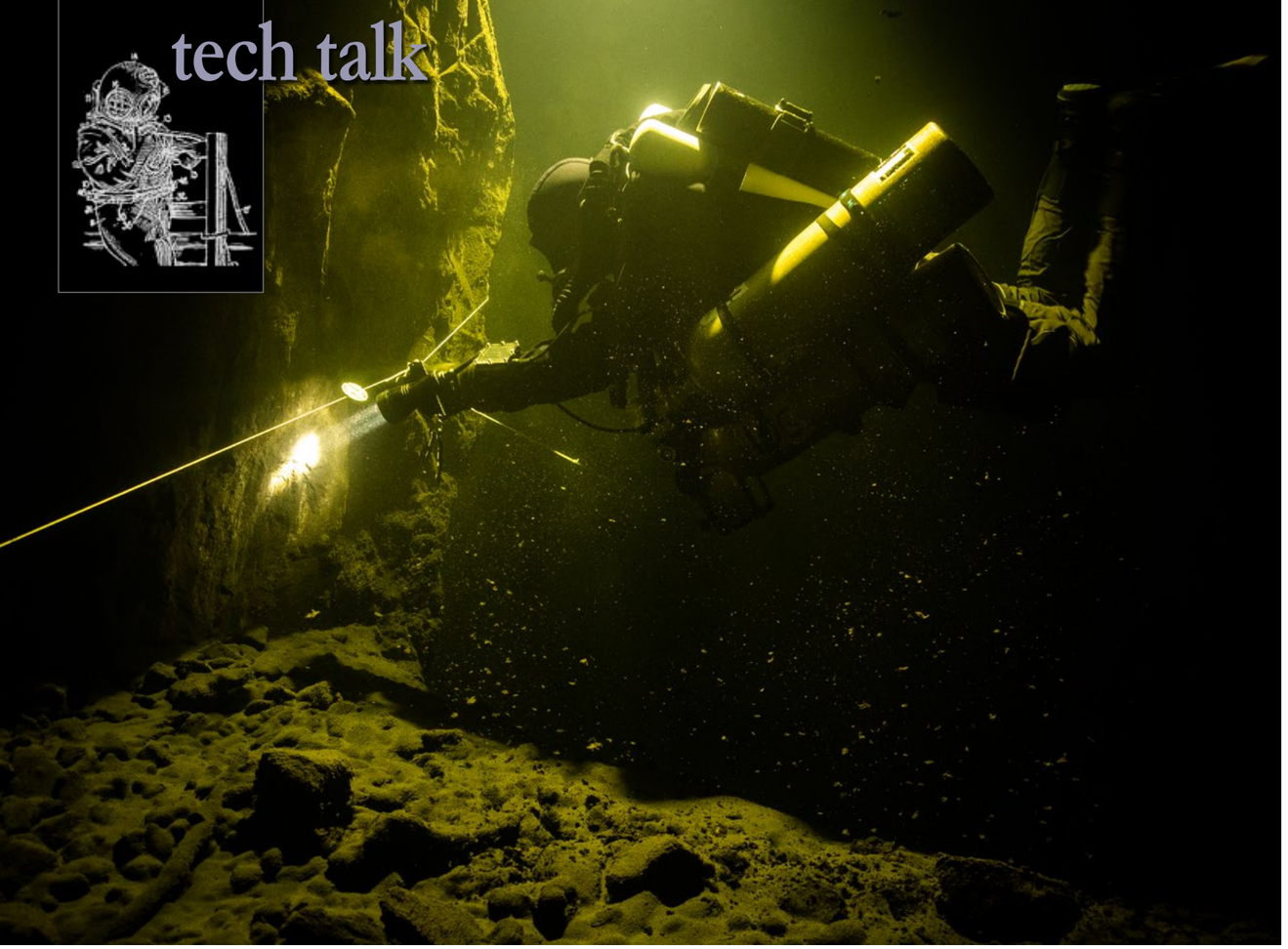
The first dive was "an experience" in many ways. Fregelius and I stepped in without knowing what awaited us. The visibility in the warm surface waters was, as expected, a bit cloudy from summer growth, but down in the depths there was about 15m of visibility. Bare walls fell into the depths below us as we followed the sides of the mine, counterclockwise, slowly heading downwards. The primary goal was to find the guide lines from the dives made in the 1990s and follow them, to see what had already been done. After that, we would swim around the perimeter of the mine, first at 40m, then at 30m, 20m, followed by a final round at 10m.

Traces of the miners

On the way down, we came across the first remains from the days of mining: a solid ladder attached to the bare



Linus Malmgren poses in front of one of the walls erected in a space with great height, probably to control the air flow in the mine, located at a water depth of 74m.



Malmgren places a cookie at an intersection to show the way out, at a water depth of 74m in Stjernheim's shaft.

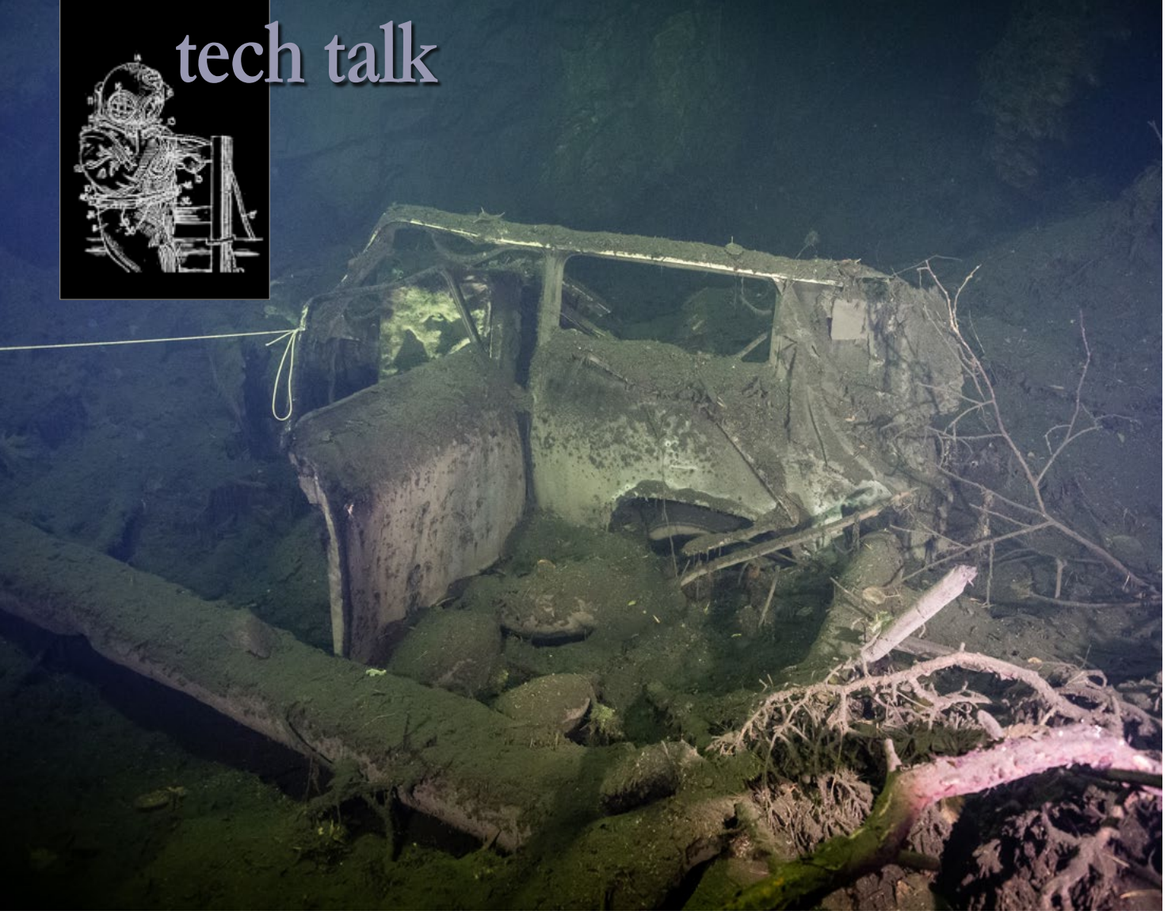
mountainside with rugged chains. The sides of the ladder were made of logs and between these were worn wooden steps, where one could clearly see how the miners' steps had worn them down over the years. The ladder was 15m long and consisted of two joined units.

At the ladder, we also found the remaining rope lines from the previous dives, and we followed them down to a plateau at 50m, where they stopped. Here, we found a small dead-end tunnel that had previously been blocked by a solid door, which now lay on the plateau. Inside the dead-end tunnel, there were remains of several barrels, which indicated that it was some kind of storage place (maybe for gunpowder?). Our tours around the mine hole at the predetermined depths did not yield much, only bare walls beyond the ladder. But visibility improved considerably; after we passed a five-metre-thick layer of white fog, there was crystal-clear water from 40m and down!

The next team in the water, Malmgren and Ek, did about the same dive profile as us, but when they broke the surface, the first thing they asked us was, "Did you see the inscriptions?" Above the door, at a depth of 50m, they had found at least three engraved initials and a year—1875. Since then, we have, together with a local community association on Utö, been able to identify one of the people behind the initials "CAB." His name was Carl August Björkman, who had worked as a miner on Utö since 1863. In 1875, he lived on Utö with his wife Emma Kristina Westerlund and their two children, Augusta Kristina and Karl Hjalmar.

To dive where time has stopped

During the next few dives, we continued past the 50m plateau, towards Stjernheim's shaft and down to the ledge where there was a water depth of 74m. This is exactly on a par with the water lowering that was done in the mine in connection with test drilling in the 1950s. This means that we were right on the borderland, where time had



One of the cars, which were notorious on the island, was found at the bottom of Spensgruvan, 85m below the surface (above); The connection between two log pipes in the steam-powered pumping plant found in Finngruvan (Finn Mine) at around 60m (right)

stood still since the end of the 19th century—an immense feeling!

We found several ladders, railings and some wooden structures. At 74m, we encountered a couple of large wooden walls that blocked two large and lofty chambers, four metres wide and almost ten metres high. During a subsequent dive, we were able to locate the other side of the walls. They had probably been designed to control airflow in the mine and prevent cold drafts during the winter months.

On the last weekend of summer 2019, we completed the deepest dive—down to the bottom of Spensgruvan. According to the maps, the bottom of the mine was at a depth of around 90m, which meant a water depth of 80m. However, when we made our turnaround in the dive, we found that we were at 94m, and the visibility there was almost zero; we were then probably close to the floor of the mine.

One might think that the bottom of these open pits would be filled with rubbish thrown down over the years, but this was not the case. Fallen trees and plant material were abundant, but there were surprisingly few remnants of human refuse. However, we did find one of the cars which are so notorious on the island, down at the bottom of Spensgruvan.

In the summer of 2020, it was time to carry out the second year of exploration. To help us, we expanded the "In Water Under Land" exploration group with four divers: Jonas and Victor Enevold, Jimmy Sandström and Christer Hesslin. During our three-week expedition, we conducted a total of 14 dives, searching all the mines in the area down to a water depth of just under 100m. We also managed to connect all the mines by water.

Finding the pumping plant

One of the major challenges with mining is getting rid of running groundwater, and for open mines like those on Utö, also precipitation. In old writings about Utö, we found notes describing how almost half the day was spent lifting out water that had flowed into the mine, before the miners could even begin mining. At the beginning of the 19th century, investments were therefore made in a pumping plant, powered by a steam engine, on Utö. It functioned in a similar way to the bilge pumps that existed on the sailing ships of the time, working with a pump rod that created negative pressure and lifted the water below it.

During one of the dives that we conducted in the first year, we found, stacked against a wall at a depth of 55m, six drilled logs, prepared for such a pumping plant. In Finngruvan, this past year, we found the pumping plant itself, still attached to the rock wall. There were pump rods still left here, mounted several in a row. Inside one of them, a pump rod was still in place.

Afterthoughts

It has been fantastic to explore these mines and to dive in places where no one has been since the mine was closed almost 150 years ago. The inscriptions and the identification of Carl August Björkman as well as the ladder along the wall, with steps worn down by miners, which sat 200m above the bottom, gave me a feeling of connection to a bygone era. It was a time of hard work and difficult conditions for the miners, but at the same time, they had, most likely with pride, carved their initials for posterity to see.

We have been very well received on Utö Island by those who live there, and we have tried to share our experiences and discoveries with others. In 2021, the mining museum on the island included some of our photos in their permanent exhibition. We also undertook another expedition that same year. There was a place down at 110m where, according to the maps, there would be a ledge. The curiosity was great about what might be found there… ■

Selective Color

— *Creative Effects in Postproduction of Underwater Images*

Photo 1 "After." *Coralscape*, by John A. Ares. Selective color has been applied in postproduction. (See the original image on the last page of this article.)

Text and photos by John A. Ares

Selective color is a multi-step procedure in post-production of images, allowing certain colors to be highlighted while removing color in the rest of the image. Underwater photographer John A. Ares gives us a step-by-step look at how one can use this unique effect to transform underwater images into artistic creations.

To do selective color, you must master two techniques: 1) black-and-white (B&W) conversion of color images (there are several methods to do this); and 2) layer masking in Photoshop.

For layer masking in Photoshop, four tools and actions are employed:

- Brush tool
- Setting default foreground and background colors
- Switching between foreground and background colors
- Layer Mask tool

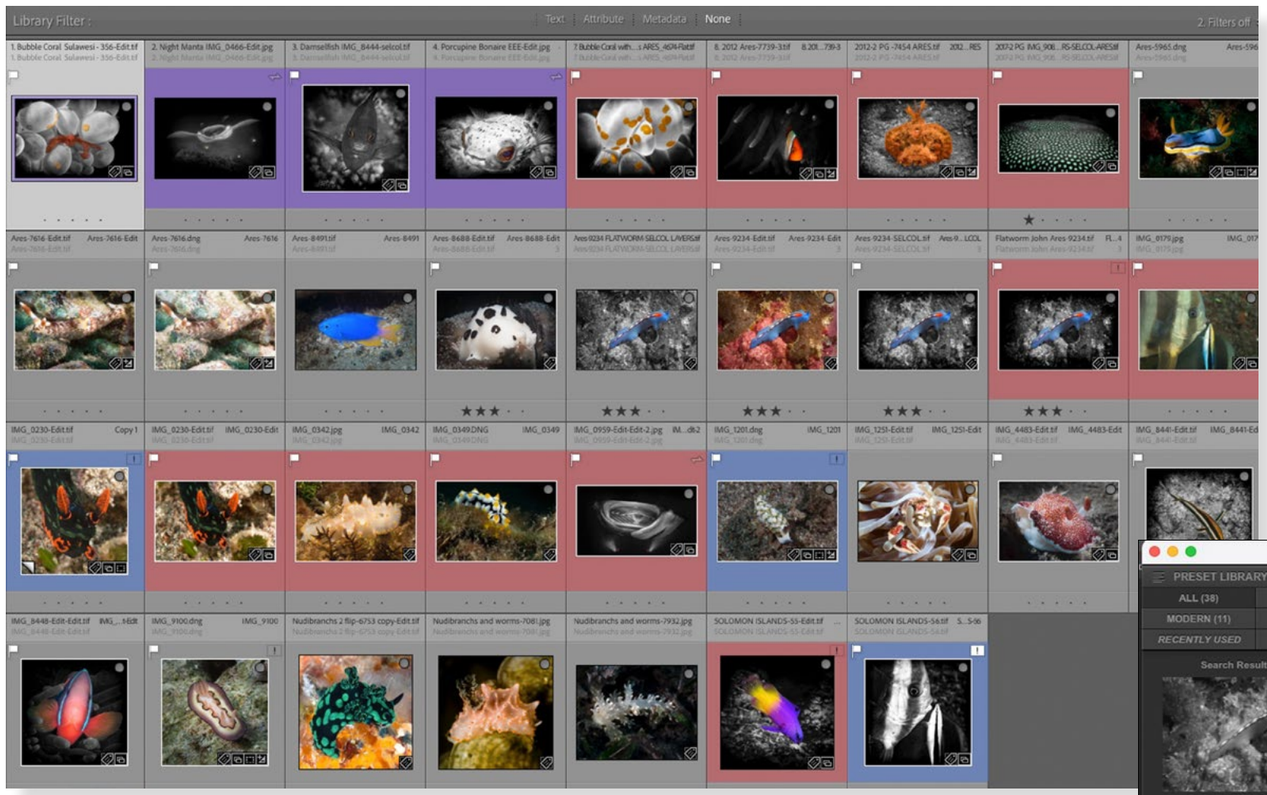
If you are not familiar with these tools and actions, search the internet or YouTube for tutorials.

In processing images, selective color is one arrow in our quiver of tools for creativity in tonality, B&W, and monochrome, such as sepia and cyanotype.

Simple selective color

1. The first step in constructing a selective color photo is finding candidate images. Personally, I use the Collections feature of Lightroom to add virtual copies of photos that have dramatic color or colors. Sometimes, the areas of color can be small or large. This is a completely subjective decision. The idea behind using Collections is to have a range of choices for your first attempt. (See Screenshot 1 on the next page.)

Photo 2 (right). For this tutorial, I chose this photo of a flatworm, taken in Dumaguete, Philippines.



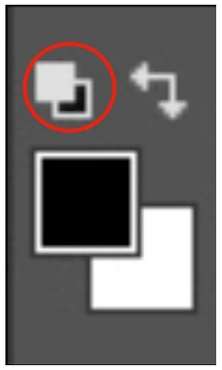
Screenshot 1 (above). Using the Collection feature in Lightroom, I select a candidate image for selective color; Screenshot 2 (right). I use Nik Silver Efex—an advanced creative black-and-white photo-editing software developed by photographers—to convert a color image into black and white, as it has a useful slider called "Structure," which increases mid-tone contrast.

2. Make a copy of the image you want to modify. In this case, I use an image of a flatworm from Dumaguete in the Philippines. (See Photo 2.)

3. The next step is to do a B&W conversion that creates a top layer over the original color layer, which is the base layer. Any photo-editing software that supports layers can be used. I have seen a plug-in from one that adds layers and layer masking to Lightroom, but I have not tried it yet.

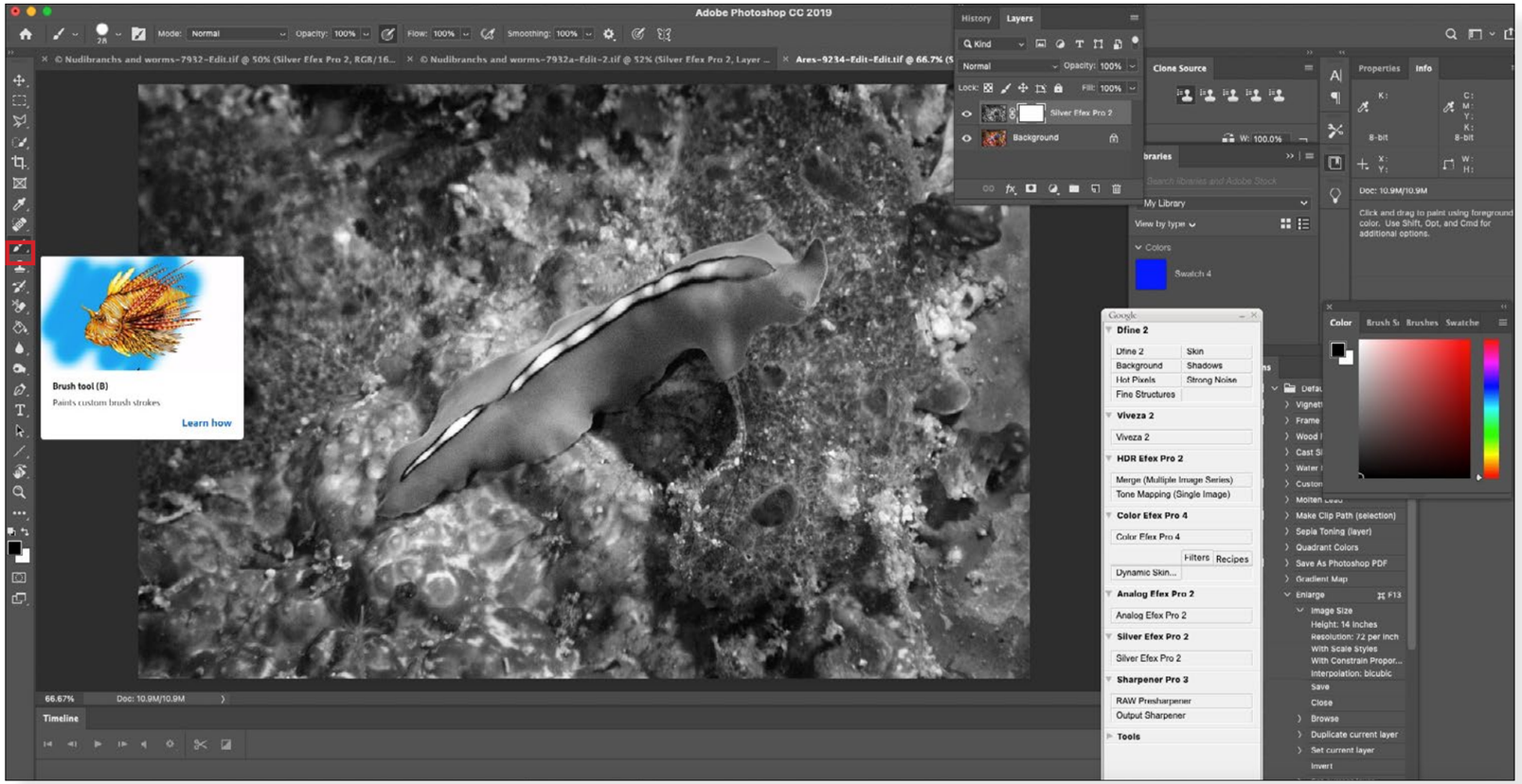
Indeed, B&W conversion is a significant topic for discussion on its own, given all the methods available.

TIP: In Photoshop, you can simply duplicate the layer. The layer on top should be the one converted to B&W. I use Nik Silver Efex because it has a slider called "Structure" that increases mid-tone contrast. There have been several versions of the Nik Collection, which are now available for purchase from DXO at: **nikcollection.dxo.com**. (See Screenshot 2.)



Screenshot 3. To select the default forground and background, click the icon in the red circle shown above.

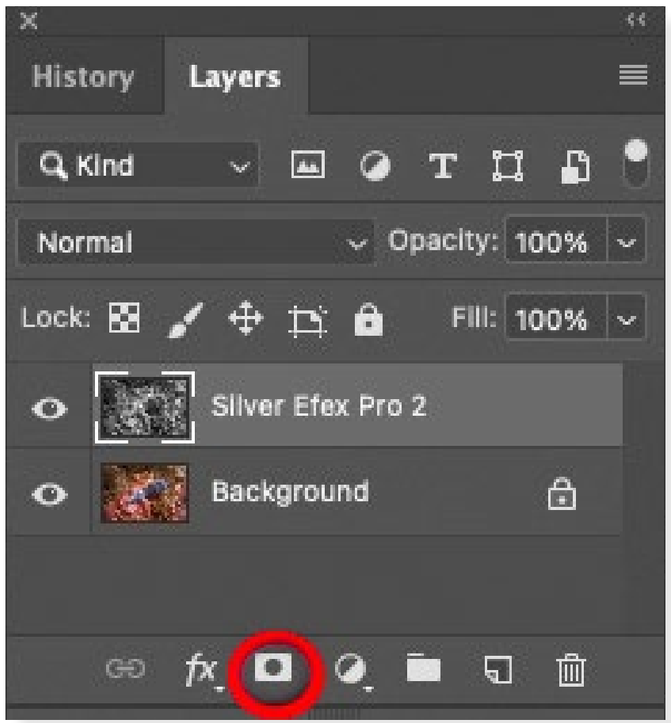
Screenshot 6. The Brush tool (framed in red) is located in the toolbar on the left side of the Photoshop workspace.



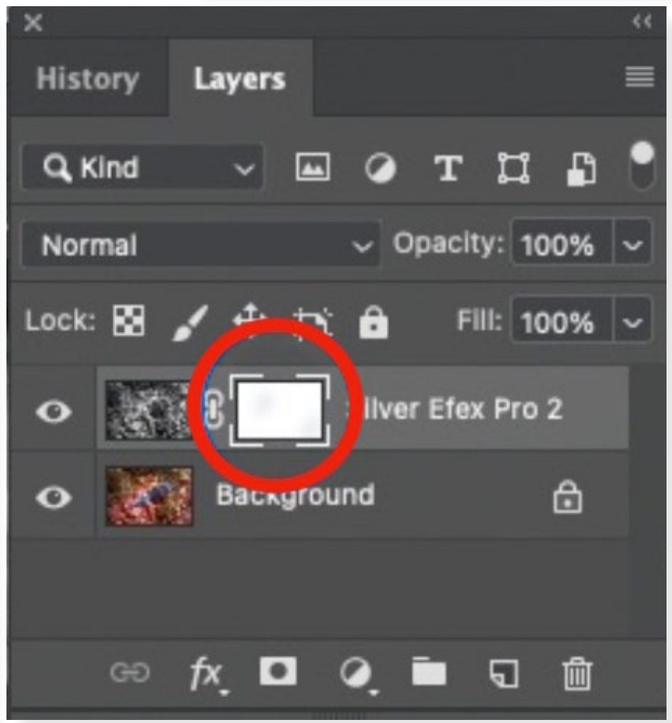
4. Select the default foreground and background color by clicking the icon in the red circle shown. (See Screenshot 3.) Black is the foreground color.

5. The next step is to apply a layer mask to the top layer. Be sure the top layer is selected.

6. Go to the Layers panel and click on the icon (circled in red) at the bottom of the panel. (See Screenshot 4.) You will see a white rectangle appear to the right of the top layer. (See Screenshot 5.)



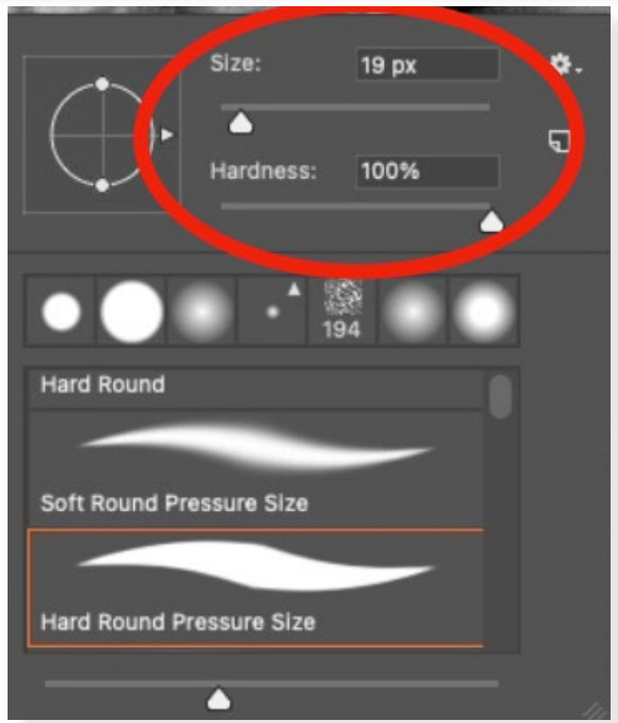
Screenshot 4. Click on the circled icon to go to the Layers panel.



Screenshot 5. A white rectangle appears in the top layer.

7. Then, activate the Brush tool to paint ON THE PHOTO where you want the color to appear. This will allow the color to bleed through the top layer, exposing the base layer color underneath. The Brush tool is in the toolbar on the left side of the Photoshop workspace. (See Screenshot 6.)

8. Go to the Brush tool, right-click on it, select a brush width and hardness (preferably 100% hardness to start), and select a brush size of perhaps 20 to 100, depending on the area you need to mask. Do not be afraid to experiment if you made a copy of your file. You can use a wide area at first and then use a smaller area when you get close to the edges of where you want the color to stop. (See Screenshot 7.)

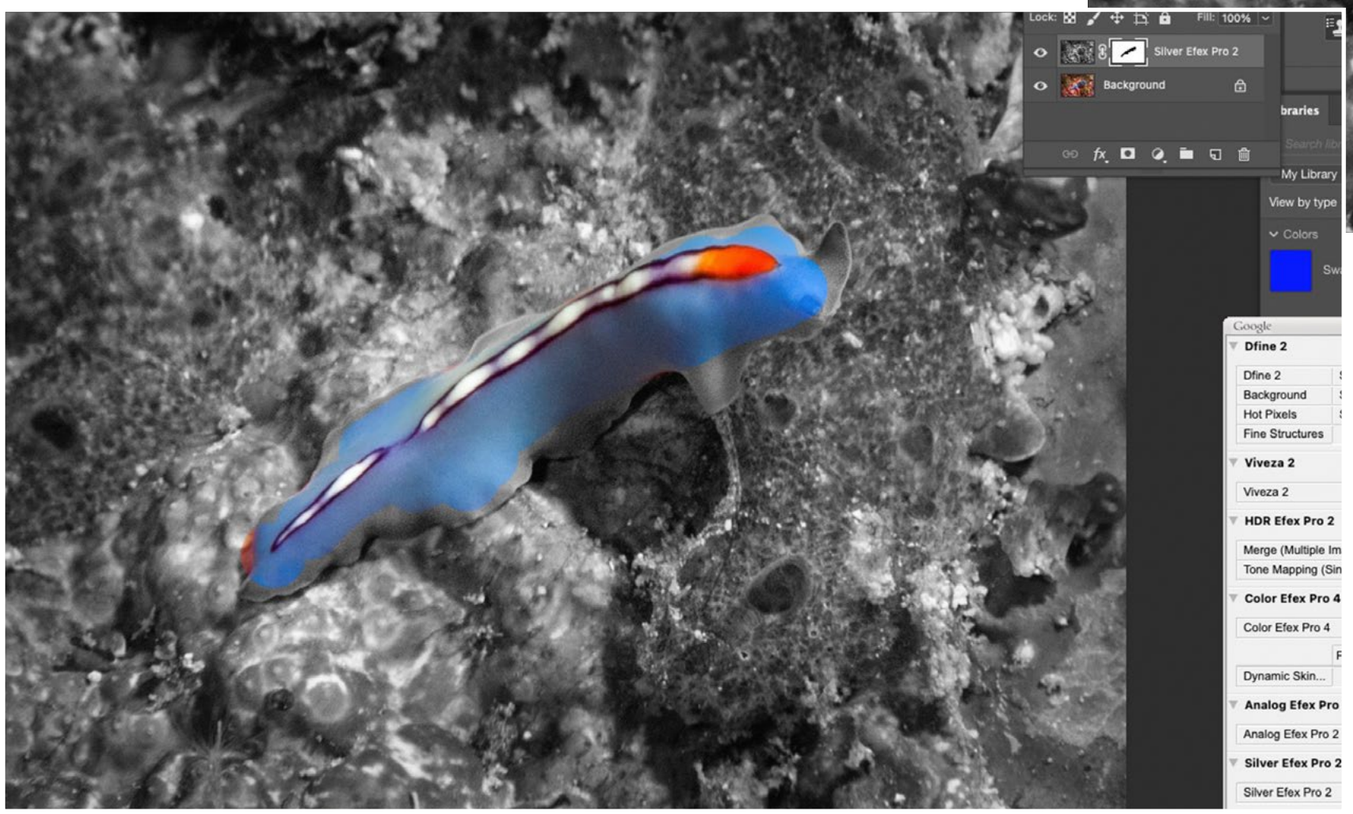


Screenshot. 7. Slider for adjusting the size of the Brush tool

Screenshot 10 shows the finished image with selective color applied.

"When we remove some of the true color from an image, we remove some of the reality. When we remove some of the reality, our images can, but not always, look more creative and artistic."

— Rick Sammon, author and award-winning photographer, named Canon Explorer of Light



Screenshot 8 shows how the image appears as one "paints" over the area to be highlighted, uncovering the color by using "black" as the foreground color in the layer mask, to reveal the color in the base layer underneath.

9. Paint over the area you want to highlight. Do not worry if you go over the border of your "color boundary." You have been uncovering the color at this point, using "black" as the foreground color to reveal color in the base layer. (See Screenshot 8.)

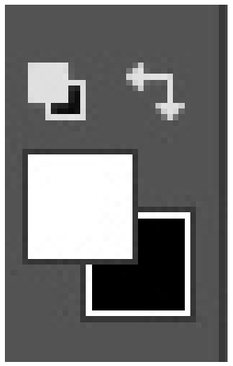
10. If you need to fix the border because you exposed too much color into the B&W area, hit the X key to switch to the background color (white) and paint over the "mistake" to restore the B&W to the masking area of the top layer. (See Screenshot 9.)

11. Hit the X key again to continue masking until you are done. (See Screenshot 10.)

12. Save your work in a TIFF format to preserve the layers if you want to make future adjustments. Layers are not supported in JPG files.

Complex selective color

Aside from dramatic color, you can take a more subtle approach. You can look for areas that may have a hint of glow. You can also look for photos that are predominantly B&W, but the subject has a good amount of tint.



Screenshot 9. If you have exposed too much color, hit the X key to switch the background color to white, or click on the icon shown in the top left corner of this screenshot.

Photo 4 “Before” (right) shows the original image of an unusual nudibranch photographed in the seagrass off North Sulawesi, Indonesia, wherein the background does not contribute much to the overall composition.

Photo 5 “After” (right) shows the nudibranch image after selective color has been applied, allowing the subject to stand out in its subtlety.

Coralscape. This photo (on the first page of this article) took days to render as selective color. By processing this image with selective color, the coral is turned into B&W, removing color that is not needed and adding an artistic look to the green polyps, so that they appear to “glow” next to the B&W background. However, producing this image tried my patience, owing to the sheer number of polyps. But the technique is the same as for simple selective color images, and I was happy with the result. It helps to do the editing a little at a time and take frequent breaks. (See Photo 3 “Before” on this page, and Photo 1 “After” on the first page of this article.)

Nudibranch. My image of an unusual nudibranch was taken in the sea grass off North Sulawesi, Indonesia. The background color did not contribute to the overall composition. The tonal range of the nudibranch was almost B&W but not quite. The image benefitted from a darkening of the background and a masking of the nudibranch, allowing it to stand out in its subtlety. Again, the techniques used were the same as the ones described at the beginning of this article. (See Photo 4 “Before,” and Photo 5 “After.”)

Afterthoughts

If you have an image that you think could be optimized with the use of creative effects, try your hand at selective color and give it a spin. You may find the results surprisingly sublime! ■

A former senior management consultant for Fortune 100 companies, studio commercial photographer and trained biologist and marine food toxicologist, John A. Ares is an assignment and stock photographer and image consultant based on Staten Island in New York City, specializing in portraits, nature, travel, underwater, food/restaurant and fine art photography. An avid diver, he has been a PADI instructor and instructor trainer, teaching underwater photography courses and traveling to many exotic dive destinations around the world. A member of the New York Underwater Photographic Society (NYUPS) and American Society of Media Photographers (ASMP), he has served as an associate editor and photographer for Seafood America magazine and his work has won competitions of American Photographer magazine. He also conducts training seminars and has been a presenter at Beneath The Sea and NYUPS. For more information, visit: ***JohnAres.com***

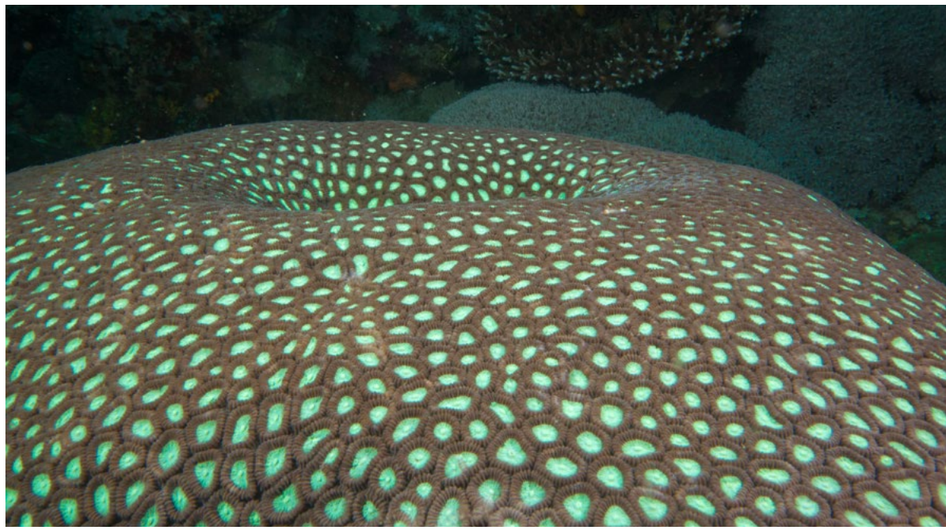


Photo 3 “Before” (above) shows the original image of *Coralscape*. See the final image with selective color applied in Photo 1 “After,” on the first page of this article.

photo & video

Edited by
Rico Besserdich

Canon EOS R5 C camera

Canon has announced the EOS R5 C, a hybrid camera with pro features from Canon's Cinema EOS line. The EOS R5 C works with Cinema RAW Light in three quality settings: HQ (high quality), RAW ST (standard quality) and RAW LT (light recording). All three modes are 12-bit. Furthermore, the R5 C can also record 8K video in MP4 format. The camera comes with a 45MP full-frame sensor and combines electronic image stabilisation with lens-based stabilisation. The Canon EOS R5 C is expected to ship in March 2022. **usa.canon.com**

Ikelite strobes

Ikelite has announced new versions of their popular DS strobe series, which are ready to order and ship in February 2022. The DS230 offers 213Ws of power and has an integrated 2500-lumen video light. The DS162 has 160W of power and includes a video light, while the DS160 II has the same strobe output (160W) but comes without a video light. The new DS51 II strobe has 50W of output. All the new strobes feature improved recycling times (0.1 to 1.2 seconds, depending on power setting) and redesigned controls. Triggering is either via the Ikelite ICS-5 electrical plug (standard) or an optional fibre optic converter. **ikelite.com**

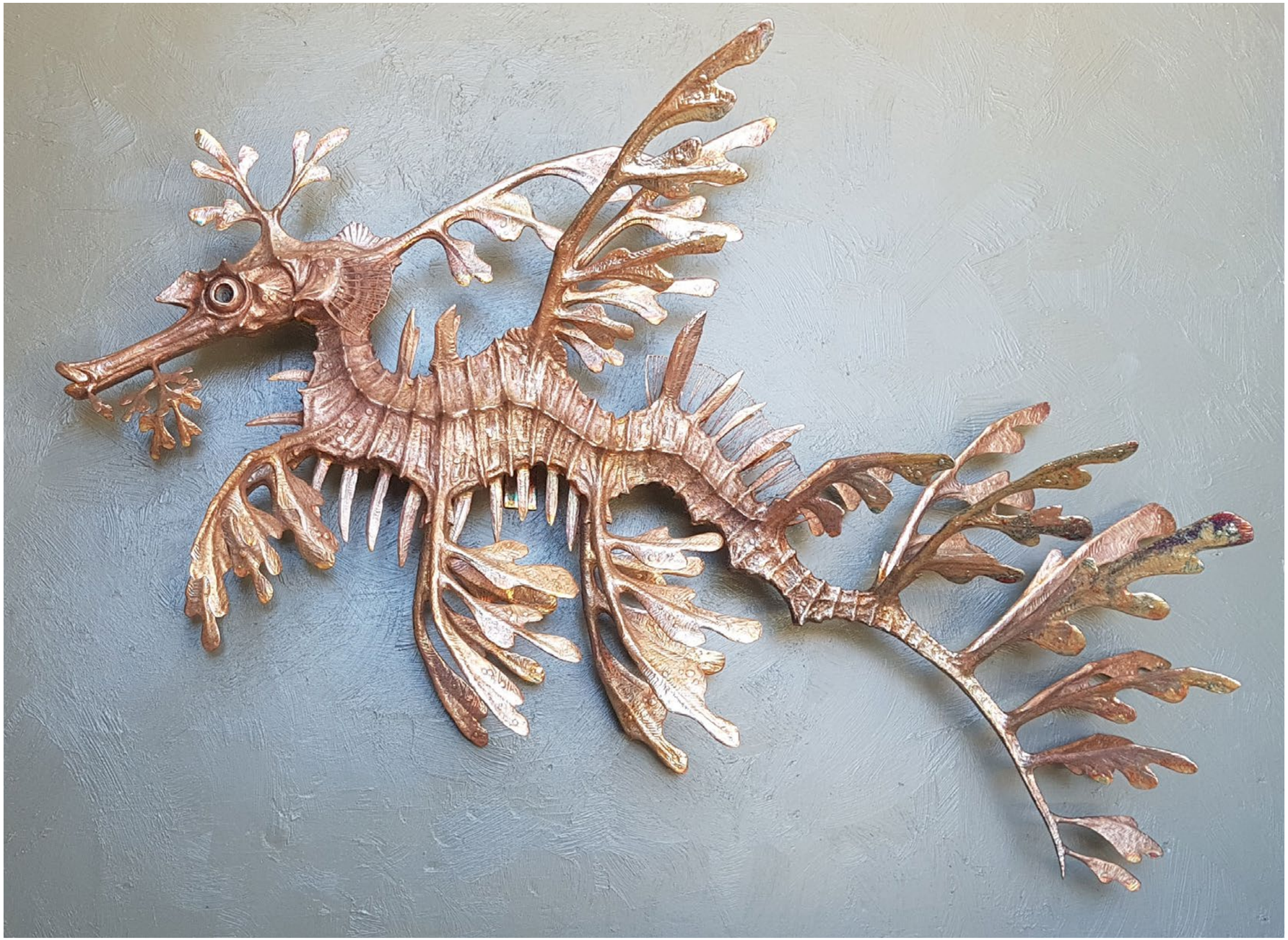
Marelux housings

Marelux, a new housing manufacturer from California, USA, is producing a series of aluminum housings and accessories especially for mirrorless cameras, including Canon EOS R5/R6, Nikon Z 6II/7II, Sony Alpha 7mk3/mk4, Sony Alpha 1, along with Sony FX3 and Arri ALEXA Mini LF video cameras. Aside from their housings, Marelux offers dome ports, macro ports, zoom and focus gears, as well as additional accessories like optical triggers, vacuum sensors and optical snoots. The housings are made of anodised aluminium, are depth-rated to 100m, feature a solid dual-locking system, and include an optical-electronic flash trigger device as standard. The housings are available in various different colours. **marelux.co**

Nauticam NA-A7IV housing

Nauticam is now shipping their NA-A7IV housing for the popular Sony A7 IV camera. The housing has a dedicated lever for switching between video, still and VFR mode. It offers the option of HDMI 2.0 output and uses Nauticam's well-known N100 port system. Strobe triggering is via fibre optics with an optional flash trigger. Technical specs: 340mm wide, 170mm high, 125mm deep; Topside weight: 2.7kg; Underwater weight: 0.3kg, including camera and battery; Depth rated to 100m. **nauticam.com**

Dave Clarke



P O R T F O L I O

Electroformed copper sculptures *Octopus*, 40 x 30 x 30cm (right), and *Leafy Seadragon*, 60 x 110 x 25cm (previous page), by Dave Clarke

Jellyfish, electroformed copper sculpture, 100 x 30cm, by Dave Clarke

British artist and avid diver Dave Clarke, currently based in South Australia, creates beautiful, detailed and dynamic patinated copper, bronze and recycled steel sculptures of marine life, which seem to flow in the liquid medium of the sea. *X-Ray Mag* interviewed the artist to find out more about his creative process and perspectives.

Text edited by G. Symes
Artwork and photos by Dave Clarke

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

DC: As a child, I was always drawing dragons and fish. You could always find me at lunchtime in the school library sketching instead of the playground. I was always trying to create something weird and wonderful. I grew up in Sussex, England, where I spent my childhood catching fish in the local ponds and lakes, especially the predators like pike and catfish.

I transitioned to sculpture while at art college, as it was somehow more real and had more life. I was a mannequin sculptor's assistant for several years in London and worked for several sculpture businesses there, from wall relief sculptures to movie props at Pinewood Studios. My practice now consists of creating my own personal work for galleries and exhibitions, as well as prop-making for movies, theatre and pageants, when it becomes available.

Kelp, electroformed copper and stone sculpture, 50 x 45 x 15cm (left); *Seahorse*, electroformed copper and granite sculpture, 30cm high (below); *Nautilus*, electroformed copper sculpture, 70 x 40 x 15cm (right); *Goose Barnacles*, electroformed copper and steel sculpture, 100 x 40 x 15cm (bottom right), by Dave Clarke

X-RAY MAG: Why marine life and themes inspired by the sea? How did you come to these themes and how did you develop your style of sculpture?

DC: I suppose my love for creating fish came from my obsession with catching them. My love for the ocean was only realised when I moved to South Australia at 25 and lived on Kangaroo Island in South Australia for over a decade. The island was a wonderland of creatures, from southern right whales to great white sharks and leafy sea dragons—you never knew what you would come across while out fishing or diving. My style of sculpture has evolved over the years to incorporate swirls, spirals and pronounced curves to enhance the aesthetics of the piece while keeping them semi-realistic.

X-RAY MAG: Who or what has inspired you and your artwork and why? For instance, what mentors, artists, art styles or movements have influenced your artistic vision, creative process and/or development of your artwork?

DC: I am inspired by many artists from different genres, including monster creators like HR Giger, Paul Komoda, Simon Lee, Aris Kolokontes and Steve Wang, to name a few. Wildlife sculptors, such as Dylan Lewis, Beth Cavener, Nick Bibby and Ellen Jewett, have been a great influence on my work.

Instagram is also a massive inspiration to me by following people like Marcelo Johan Ogata (@bugdreamer) who posts some amazing videos of sea creatures. My interests tend to

Gulper Eel, electroformed copper sculpture, 40 x 20 x 20cm (left); *Squid,* electroformed copper sculpture (above); and *Stingray,* steel sculpture (right), by Dave Clarke

lean towards the darker side of art with the choice of creatures sometimes being the uglier the better, the deep sea being the best resource for this with its myriad of ugly/beautiful creatures.

X-RAY MAG: What is your artistic method or creative process?

DC: I have several creative methods and materials from bronze, electroformed copper, steel and thermoplastics, depending on the sculpture I want to make. For most of my sculpting career, I have created multiple editions of my works by creating moulds; but nowadays, my preference is to create one-offs. I sometimes employ a lost wax electroformed copper process, whereby I will create a creature in wax, then coat it in a conductive layer, and electroplate it in a copper bath before melting the wax out. This process creates very delicate and intricate sculptures made of 99.9 percent pure copper.

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

DC: My relationship with the undersea world since being in Australia has been life-changing. When I first came to Australia, I got my PADI open water certificate and did several dives on the Great Barrier Reef, including an unforgettable night dive, going into caves, and seeing

Weedy Seadragon, bronze sculpture, 65 x 65 x 20cm (right), and *Port Jackson*, electroformed copper sculpture, 50 x 30 x 30cm (below), by Dave Clarke

Viperfish, copper and glass sculpture, 100 x 35cm, by Dave Clark

turtles resting and whitetip reef sharks feeding in packs.

The giant cuttlefish in Whyalla South Australia were an incredible experience, even though they were in very shallow water. I was glad to have a scuba tank so I could just lay on the bottom to blend in and observe their fascinating displays.

Shark cage diving at the Neptune Islands was another highlight. I have been lucky enough to have a southern right whale come right up to me while I was surfing on the southern coast of one of the islands and had a 4.5m great white shark attack my fishing boat motor several times.

I have also designed and built a shark-resistant exploration submarine to be towed behind a boat, which can be steered by the diver.

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

DC: Not all of my dives were so pleasant, as I saw firsthand the destruction caused by prawn trawlers in the Spencer Gulf near Whyalla. I had descended there for a drift dive along the bottom for a few kilometres; but where the prawn trawlers had criss-crossed the bottom, all that was left there were only small geometric shapes of pristine sea bottoms of sponges and corals.

When I was in London, I created a 6ft fibreglass silvertip reef shark to be hung by a longline hook in the London Aquarium's Atlantic tank, to draw attention to the practice of shark finning. The sculpture was towed behind a bicycle on a custom-built trailer from London to Brussels to deliver a petition with thousands of signatures to try and end the practice.

I am always trying to make my work as sustainable as possible with the materials and processes I use, but bronze tends to be very energy intensive when the foundry and freight is considered.

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

DC: Not all of my works have meaning behind them.

portfolio

Sometimes, I just tend to create them because the creatures have their own beauty, which I want to emulate with the hope of inspiring my fascination with them in others. Every now and then, I will create a piece with a message such as my lionfish, which was called ''Eat Them to Beat Them'' when it was exhibited. This slogan is used by people in the Caribbean and the Gulf of Mexico who have been trying to curb the spread of the beautiful but invasive lionfish since around 2000, which originally come from the South Pacific

Detail of *Lionfish* sculpture by Dave Clarke

and Indian oceans. Lionfish have invaded and become a major threat to native species, as they lack natural predators and can reproduce year-round, releasing 50,000 eggs every three days. It is unknown how they got there, but it is likely humans provided a helping hand.

X-RAY MAG: What are the challenges or benefits of being an artist in the world today? Any thoughts or advice for aspiring artists in ocean arts?

Lionfish, lost wax electroformed copper sculpture, 50 x 50 x 60cm (above); and
Baby Shark, electroformed copper sculpture, 80 x 20 x 10cm (top left), by Dave Clarke

Electroformed copper sculptures *Viperfish*, 80 x 50 x 10cm (left); and *Fantasy Fish*, 40 x 30 x 30cm (right), by Dave Clarke

X-RAY MAG: How do people—adults and children—respond to your works?

DC: I especially like it when people seek me out, and come and visit the studio, to see firsthand how things are created. Some of their reactions then can be great, especially if they are bringing their partner to surprise them with a gift of my work. People will often send me photographs of my artworks hanging in their home or garden, which gives me great pleasure. I recently visited one of the galleries exhibiting my sculptures to drop off a new artwork, when a customer was in there talking to the gallery owner about my work, which was lovely to overhear—and she also bought the piece.

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

DC: I enter as many competitions and exhibitions as I can each year, here in South Australia. I have several upcoming shows, for which I am trying to get enough work together. I also apply for public sculpture tenders (contract bids) when they become available—so, lots of exciting things in the pipeline at the moment.

Close-up detail of *Fantasy Fish*, by Dave Clarke

DC: I think now is a great time to be an artist, with the use of social media to get your work out there; and with YouTube, you can learn any process or technique. One of the challenges I find is how to narrow down on a medium and a style. Self-discipline and getting your head around the business side of art can be a struggle for many artists, myself included.

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

DC: If you are interested in my work and my techniques, please check out my Instagram and Facebook pages where I upload videos of works-in-progress to show some ofthe creative process. The links can be found at my website at: ***daveclarkseculpture.com***. ■