



GLOBAL EDITION
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Red Sea

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COVER PHOTO: *Coral Grouper and Anthias on Reef at Shaab Maksour, Egyptian Red Sea*
by Scott Bennett

Emperor angelfish, Zabargad, Red Sea, Egypt. Photo by Scott Bennett



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Attention to Detail

Coronavirus pandemic, climate crisis and coral bleaching. I do not know about you, but I could do with a break from it all.

When I need to feel grounded and get away from all of it for a while, I go to my happy place: the sea.

A walk along the beach, watching the waves and the gulls gracefully gliding on the wafting wind as they have for millions of years prior to my lifetime and continuing to do so long time after I am gone, helps put matters into a wider perspective and reset my priorities. When the wind caresses my cheeks and plays with my hair, it feels like Mother Earth is reminding me that we are one with this planet.

Better still, I like to go for a swim, if it is summer—to feel the freshness of the ocean, its saltiness, which is similar to our tears, and the soft sand under my bare feet; to have waves break over me, which was always great fun when I was a kid, and still is. Swimming underwater, feeling the cool water flowing around my skin, while spotting the occasional skittish flounder or shrimp scurrying across the white sand,

makes me feel one with the ocean—that I belong.

I have often been asked which is my favourite dive site or destination. Given that I have been a dive media professional for a quarter of a century, many presume that I must have constantly gone diving in all sorts of exciting and exotic locations. Well, I have not, but I have seen a fair few.

My usual response often comes as a surprise to many. It is not lush coral reefs in Southeast Asia, or the majestic kelp forests in temperate waters, or the encounters with big marine life such as orcas in northern Norway. I would be happy to pay any of these magnificent places another visit on any given day, but my favourite dive is a simple beach dive off the local coast.

It is not spectacular—at least, not at a first glance. It has a sandy bottom and is not very deep, with patches of marine grass and kelp, and nothing much seems to be going on here.

But there is. Once you settle down and start paying atten-

tion, you will begin noticing all the small critters and growth—small organisms you would not otherwise see if you were in a hurry to get to somewhere else. Slow down, and you will catch small movements, discover how organisms eke out a living, or how they feed and breed. You will see who chases whom, or how animals compete for resources. You will see the fishes that you have known since childhood but perhaps not seen in the wild, and you can catch or collect your food.

By going back to the same spot, I see how it changes with the seasons, how things grow and wither and undergo all sorts of cycles and metamorphoses, and I watch migratory species come and go. I get to know it and understand it.

Every time I go back, I reconnect. As I settle down and I start looking around, I become one with nature again and all the stresses begin to evaporate.

You should try it too if you have not done so already.

— Peter Symes
 Publisher & Editor-in-Chief



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Edited by
Peter Symes

NEWS *from the deep*

Recovery of coral reefs

Damaged coral reefs show slower than expected recovery for up to six years before switching to a faster phase of regrowth, according to new research.

Understanding the recovery dynamics of corals is paramount to enabling the effective management of coral reefs. While detailed mechanistic models provide insight into reef recovery patterns, colony scale monitoring is not viable for reefs over a large geographical extent, such as the Great Barrier Reef (GBR).

But by modifying data analysis methods used in cancer cell biology on long-term monitoring data, researchers were able to pinpoint patterns of reef recovery amid disturbances including storms, marine heatwaves, and crown-of-thorns starfish.

Two-phase recovery pattern

The researchers found that a two-phase recovery pattern was present in 50 to 60 per cent of the monitored sites on

the GBR that had experienced at least one major disturbance over the past 30 years.

It has been assumed that the main driver of reef recovery was competition for space, but these results suggest that coral colonies may be growing at lower rates for three to four years after major disturbances before normal growth rates set in again.

Consequently, if there are less than five years between major disturbances, reefs exhibiting two-phase growth are never likely to

reach 15 percent cover. This has serious implications for recovery potential, as major disturbances are bound to occur more frequently due to climate change.

This analysis has provided critical information for the management of the GBR as it identified reefs in need of help, in the same way doctors triage patients to prioritise treatment.

■ SOURCES: QUEENSLAND UNIVERSITY OF TECHNOLOGY, AUSTRALIAN INSTITUTE OF MARINE SCIENCE, JOURNAL OF APPLIED ECOLOGY



Young coral colony (*Acropora recruit*) on the surface of a reef at the Great Barrier Reef

Local Dive Shops are the backbone of our sport. They are the gateway to training, the place where you meet dive buddies, get your tanks filled, book dive vacations, and of course purchase new dive gear. Being a small family run business ourselves, we understand that dive shops need your support now more than ever. We encourage you to support them any way you can to help keep our beloved sport growing.

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Edited by Peter Symes



Soft coral, cup coral, sponges and ascidians in Komodo National Park

Coral reef biodiversity predicted to shuffle, not decline

New research reveals that the species which dominate experimental coral reef communities shift due to climate change, but the total biodiversity does not decline.

Rather than causing a collapse of biodiversity, the dual stressors of ocean warming and acidification could instead lead to significant changes in the relative abundance of species, resulting in a shuffling of coral reef community structure, according to a new study by researchers from University of Hawaii.

Sprawling coral reefs are complex ecosystems that are teeming with life and most of this biodiversity consists of tiny organisms living deep within the three-dimensional reef matrix.

Cryptobiota

"The tiny organisms living in the reef structure are known as the cryptobiota, which is analogous to the insects in a rainforest," said Molly Timmers, lead author of the study. "They play essential roles in reef processes such as nutrient cycling, cementation, and food web dynamics—they are an important diet of many of the fishes and invertebrates that make coral reef ecosystems so dynamic."

Despite their critical importance, cryptobiota are often overlooked in climate change research as they are challenging to study in situ over longer time spans. To assess the responses of cryptobiota to future ocean warming and acidification, Timmers and colleagues came up with setting up some mesocosms (outdoor experimental systems that examines the natural envi-

ronment under controlled conditions—ed.).

Settlement plates were placed in experimental flow-through tanks, which received unfiltered seawater from a nearby reef slope and were treated to simulate predicted end-of-the-century conditions. Then they were left for two years, after which the team examined the organisms that had developed.

Composition differed

While the total number of species did not change between the present-day and the combined future ocean-conditioned treatments, the study results revealed that the composition of the coral reef community differed substantially between the treatments. ■

SOURCE: PNAS

Restoring coral to health

Restoration approaches to increase the resilience of corals are necessary to counter environmental pressures relevant to climate change projections. To that end, tools exist to maintain or even rebuild and rehabilitate reefs, enhance recovery rates and promote resistance to environmental pressures.

Corals are able to respond to changes in their environment through acclimation (the physiological process of becoming accustomed to a new condition) and adaptation. Researchers believe natural populations may already be adapting to increasing sea surface temperatures.

A deeper understanding of how coral holobionts (the coral animal together with its associated algae, bacteria and viruses) respond or adapt to stress provides opportunities to modify these responses, using the same mechanisms that corals have naturally evolved to survive stress.

The ability of at least some coral species to adapt to changing environmental conditions presents the possibility to use this capacity through a process known as environmental hardening, where young corals are pre-conditioned by gradually exposing them to higher temperatures, as a way to increase tolerance to future heat stress events. Researchers are also investigating

the use of selective breeding, using corals from the hottest reefs in the world to transfer heat tolerance to other populations.

Another strategy is the use of beneficial microorganisms for corals (BMCs) to improve coral health by potentially increasing nutrient input to mitigate stress and toxic compounds, or controlling pathogens. ■ SOURCES: NATURE: REVIEWS EARTH & ENVIRONMENT



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The well-preserved paddle-box of the paddle wheel of the 20th-century steamer *Vera Figner*, a wreck recently discovered in Russia's Silva River, was marked by a star, which was clearly visible (right); Historical photo of the *Vera Figner* paddle steamer (below)

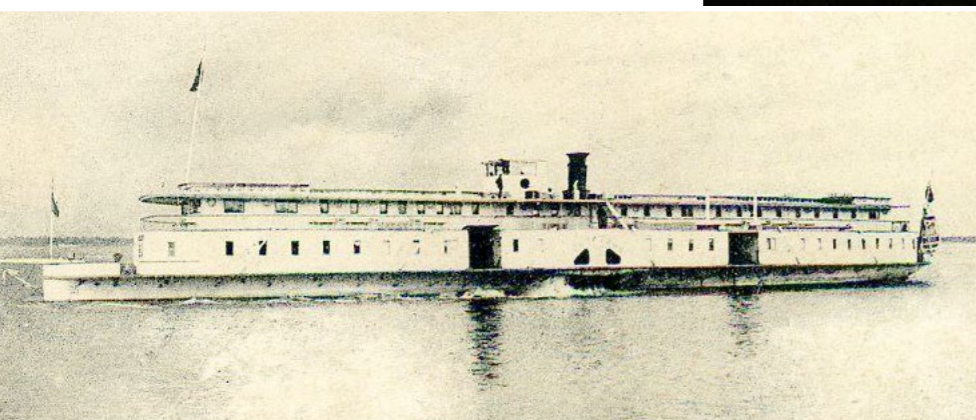
Text and photos by Pavel Lapshin

Scuba diving is a diverse and breathtaking activity where, upon submerging, one can find oneself drifting along the waves of history. Such an opportunity presented itself to me during my recent visit with fellow divers in Perm, who discovered an interesting object under the ice in the Sylva River.

Diving the Recently Discovered

Vera Figner Wreck

20th-Century Paddle Steamer in Russia's Silva River



The Sylva River flows through the territories of the Sverdlovsk and Perm regions in Russia, passing near the well-known "Perm Anomalous Zone." It has magnificent shores and is very popular among tourists and water sports enthusiasts.

Even though navigation on the river is not treacherous, it was in this place that an actual paddle steamer shipwreck was recently discovered on the bottom of the river. The fact that there was an object lying on the riverbed had been well

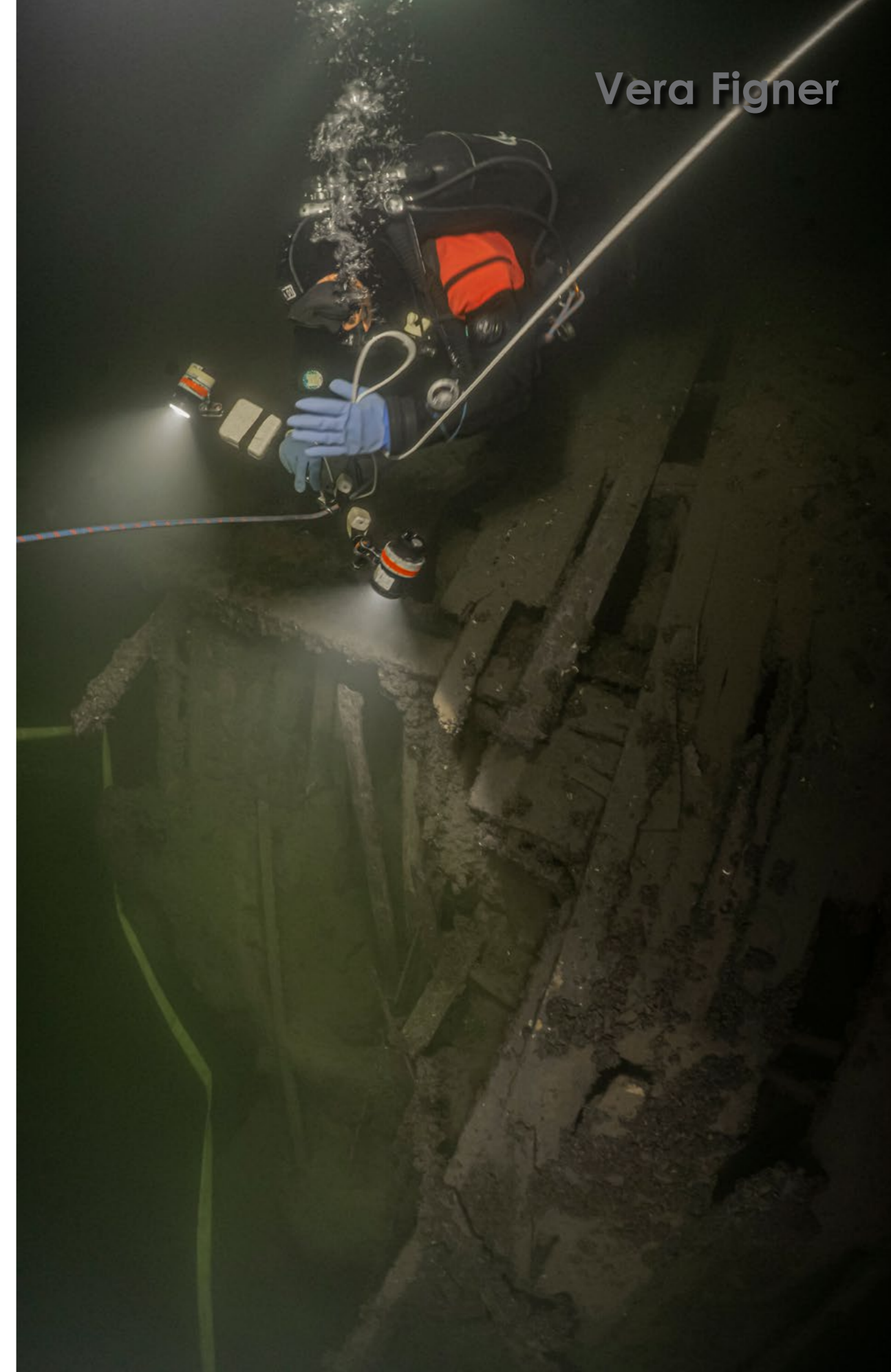
known to locals for a long time. But, until last year, nobody knew exactly what this object was.

This is when divers from Safety Stop Club, a Perm scuba facility, got down to business. They scanned the supposed coordinates of the

object, located it, made several dives, found the remains of the ship, and later identified it to be the paddle steamer *Vera Figner*.

Historical background

The history of the ship is rich and



Diver inspects the wreck of the *Vera Figner* wreck

diverse. The steamer was originally built in the city of Murom in 1904. Named after the Russian empress Catherine the Great, it made its maiden voyage as *Ekaterina*, and was built to be luxurious. With exquisite wood decor, carpets and chandeliers, it looked in the beginning like a floating palace.

But after a change in ship owners, it was renamed *Kharitina* and became a cargo ship. All the excesses and luxury were removed. Then, after the Revolution of 1917, the steamer was renamed again, now after the revolutionary figure, Vera Figner. It was redesigned to carry Soviet citizens along the vast Russian rivers.

During World War II, it was a supply vessel, participating in cargo shipments and evacuations of refugees from war zones, including Leningrad. Finally, 15 years after the end of the war, it was anchored permanently on the Sylva River, and sank in 1966, unable to withstand the pressure of the ice in winter.

Superstructures on the wreck were damaged and there was a lot of silt (above and left)



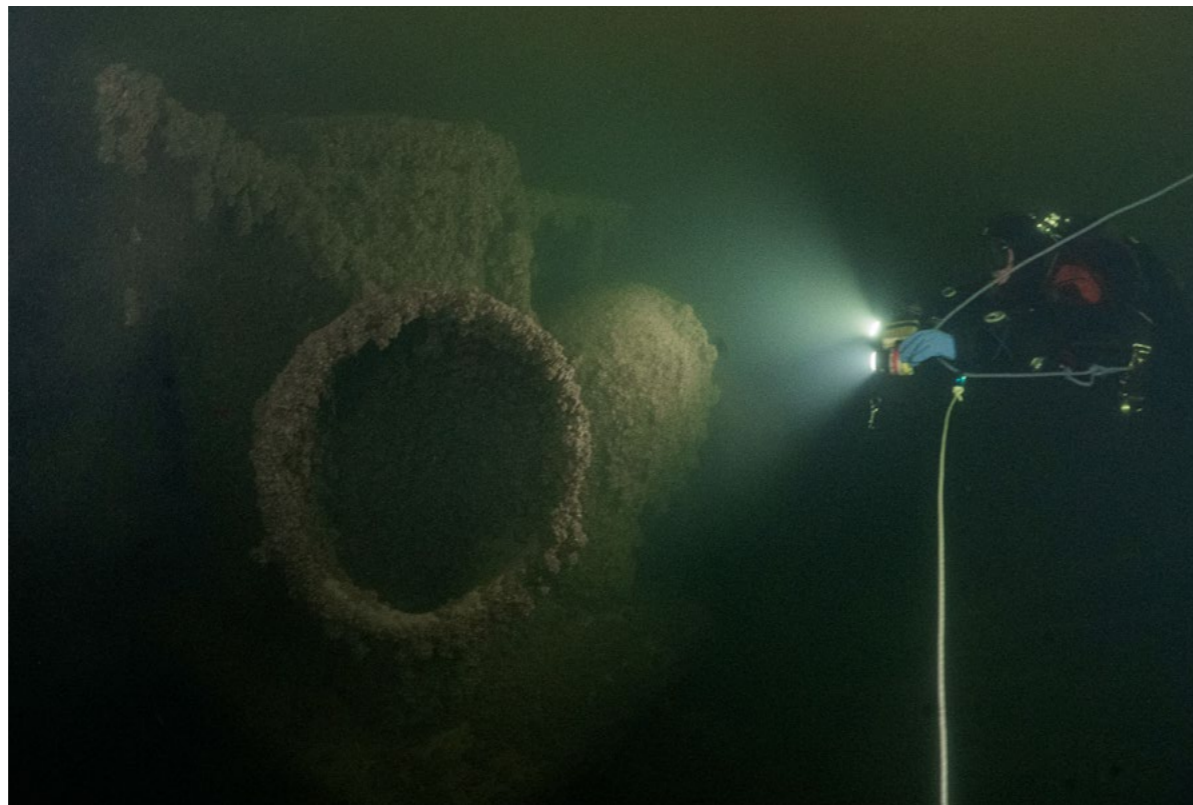


Diving the wreck

Speaking about the dive itself, visibility in Russian rivers is much better during the winter season, but because of the freezing cold, my friends from Perm had to set up a whole research camp on the ice of the Sylva, cutting several entry holes into the ice above the steamer and setting up warm shelters for people and gear nearby.

I had only one day to photograph the wreck, and it was just on the day when the air temperature dropped below -20°C. But, of course, there was no chance this fact would stop us!

The village of Sylva lies 30km from the city of Perm. The ice was thick enough to carry a car, so after arriving in the village, we drove straight to the



Diver at air vent (above) and cabin window on the deck of the Vera Figner



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View of a cabin on the main deck (right); Silt on the wreck stirred at the slightest touch (below); A star marked the paddlebox of the paddle wheel (center)



Vera Figner



steamer's location, which was very convenient. After the dive briefing and planning the dive, we jumped into the freezing waters.

The water was cold—almost zero degrees Celsius—but visibility was very good, about seven to eight meters. The steamer rested at a depth of 12 to 18m.

Approaching the wreck, it looked as if it had been torn apart. It was said that there had been an attempt to pull her out to the shore at one point. The superstructures were destroyed and

at the slightest touch.

We moved along the starboard side of the wreck, examining the stern. We then moved on to the well-preserved casing of the paddle wheel, marked with a large star, which was clearly visible. There were fragments of the cabins on the first deck, which partially remained. The pipes of the steam engine looked surreal.

Unfortunately, we did not have enough time to fully explore the ship during our two short dives, leaving

there was a lot of silt, which turned the water into a dense murky curtain

further exploration for future expeditions. But what we did manage to see and photograph made an indelible impression.

The chance to see history hidden deep below the ice as well as the chance to show images of the wreck and share admiration for the new findings—these opportunities are exactly what maintain the spirit of exploration and constantly inspire us to pursue new adventures. Keep traveling and explore! ■

Pavel Lapshin is a diver, photographer and explorer based in Russia. For more information, visit: [instagram.com/pavellapshin_deepravel](https://www.instagram.com/pavellapshin_deepravel)



Molluscs cover the wreck's rails and ropes (above); Diver inspects the casing of the paddle wheel (top).



Museum of Wrecks opens in Stockholm

Vrak – Museum of Wrecks is a new maritime archaeological museum in the middle of Stockholm. It opened on Thursday, 23 Sept 2021.

Vrak – Museum of Wrecks is a new museum about the Baltic Sea's unique wrecks and cultural heritage, and is the sister museum to the Vasa Museum in Stockholm. Nowhere else in the world are there as many well-preserved shipwrecks as in the Baltic Sea.

Vrak brings their stories to the surface while leaving the wrecks themselves and their artefacts on the seafloor where they are best preserved. The new museum serves as a hub for wrecks, new discoveries and research throughout the Baltic Sea region.

The new museum allows visitors to dive into the past with the help of various digital solutions. On

the seafloor of the Baltic Sea, there is a unique cultural heritage, featuring wrecks and other historical relics from the Stone Age to the present time. Vrak is part of the government agency, the Swedish National Maritime and Transport Museums.

In the first exhibition, the visitor is brought to the bottom of the Baltic Sea with the help of an immersive film experience. The mythical wreck "Resande Man" is shown in scale 1:1 and presented using a hologram and the visitor experiences the feeling of moving through an old shipwreck.

The museum is housed in an old boat hangar designed by architect Paul Hedqvist in 1941. The architectural firm Fahlander Arkitekter have carefully redeveloped the building with sustainable materials like concrete, oak, steel and glass, which have associations with the sea, ships and the seafloor.

The museum is located at: Djurgårdsstrand 17, Djurgården, Stockholm. See, visit: vrak.se ■



In the museum exhibition "Resande Man," visitors walk on a carpet with a reproduction of the wreck in 1:1 scale.

WISCONSIN HISTORICAL SOCIETY



Wisconsin Historical Society archaeologists, assisted by divers from the Dane County Sheriff's Office, recovered the historic canoe from Lake Mendota on 2 November 2021.

1,200-year-old canoe found in Wisconsin lake

Carbon dating places the vessel in use around A.D. 800, centuries before European arrival.

Wisconsin Historical Society maritime archaeologists recovered a historic dugout wood canoe from the bottom of Lake Mendota in the US state of Wisconsin yesterday, just a few months after learning of its existence in June 2021. The canoe is a remarkable artifact made from a single tree.

Tamara Thomsen, a maritime archaeologist with the Wisconsin Historical Society and owner of Diversions Scuba, first came across what she thought was a log sticking out of the bottom of the lake while riding an underwater scooter in June, alongside co-worker Mallory Dragt, CNN reports. After investigating the find, Thomsen determined the log was actually a dugout canoe.

Excavation of the area around the canoe began in late October 2021, and maritime archaeologists recovered artifacts from the site early on in their process. Net sinkers, rocks that were flattened by hand tooling, were recovered from within the canoe, indicating the vessel may have been used for fishing.

The canoe was raised from a depth of about 30ft with the assistance of the Dane County Sheriff's dive team. The canoe was transported to Wisconsin's State Archive Preservation Facility and placed into a custom-built storage vat containing water and a bio-deterrent to protect the canoe from physical deterioration. Over time, a chemical solution will be added to the vat, which will eventually replace the water in the cellular structure of the wood. The preservation process is estimated to take approximately three years. ■ SOURCES: WISCONSIN HISTORICAL SOCIETY



New book on Britannic

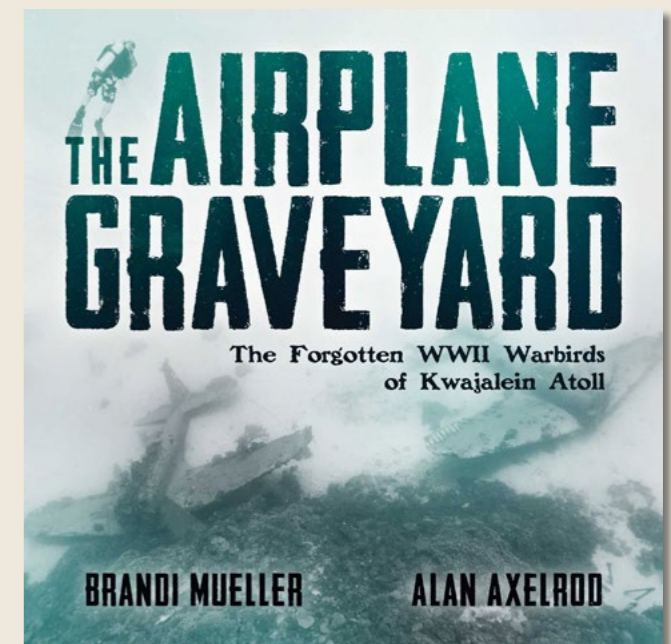
Welcome to the Britannic, the Titanic's sister ship. At over 100 metres below the surface, diving this wreck requires meticulous planning, precise execution and good conditions—and a high level of technical-diving proficiency. This book tells the story of Rick Ayrton's expedition to dive this wreck, from the planning, logistics and preparation, to a dive-by-dive exploration of it. Features original photographs of the ocean liner.

Publisher: Dived Up Publications

Date: 5 October 2021

Paperback: 176 pages

ISBN-10: 1909455415



Never before published in book form, see extraordinary images of the forgotten American WWII airplanes resting on the bottom of the Kwajalein Atoll lagoon, from award-winning underwater photographer Brandi Mueller. Available on: [Amazon.com](https://www.amazon.com)

Somebody has to fill those tanks.

Edited by Scott Bennett



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Dive operators hit by a shortage of staff

Australia's situation is but a microcosm of trends facing the worldwide diving industry. It will take some time for the industry to return to pre-pandemic levels. Although many challenges remain, tenacity will hopefully pave the way for a brighter future.

There are several possible reasons for this. To get an idea why, we can look to Australia, where the dive industry is still reeling.

In Queensland, the impact of the Covid-19 pandemic has been catastrophic. Before the pandemic, the industry depended highly on backpacker instructors and those with short-term work visas. Australia's high cost of living and low

wages discourages many locals from careers as dive instructors.

For the backpackers, however, living costs are high, with Australia ranking ninth out of 68 countries. An instructor with 12 months of experience would earn approximately AUD30 per hour; at this amount, it would be difficult to sustain a proper lifestyle for Australian residents. Unlike many parts of the world, tipping is not a widespread practice in Australia.

Regardless of Covid-19, work permits are both difficult and expensive to obtain. Those wishing to remain for extended periods (e.g. three years) can pay a fee as high as AU\$14,000 to an immigration agent to prepare their paperwork. And prior to that, they must find a dive operator to hire them.

Borders shut

When Covid-19 hit, the country closed en-

tirely to international tourism. As a result, many backpackers returned home, with a substantial number pushed out of the dive industry entirely. Like countless people worldwide, sudden unemployment provided an opportunity for soul searching, along with the realization that the dive lifestyle was not going to support long-term prospects, such as purchasing a home.

With their borders closed to other states, Queenslanders themselves kept the Cairns operators' businesses alive, although social distancing protocols capped numbers on boats. Already lacking its international backpacker workforce, the arrival of a second wave and the Delta variant prompted lockdowns. Restrictions on regional and local travel during school holiday periods triggered continuous uncertainty for businesses, workers and domestic holidaymakers.

Australia's international borders are set to open without quarantine requirements on November 1st, but only for fully vaccinated Australian citizens and residents. When they will open for international working holidaymakers and tourists remains uncertain.



Service with a smile (above); Dive staff member assists a guest getting all set to dive (left). In a number of regions worldwide, operators now face shortages of staff following the pandemic

Advertising for staff

In the meantime, dive operators are advertising for workers, but with overseas backpackers still barred from entry, where they will come

from is debatable. Many former instructors have since moved on to new jobs and careers. ■



PETER SYMES

PETER SYMES

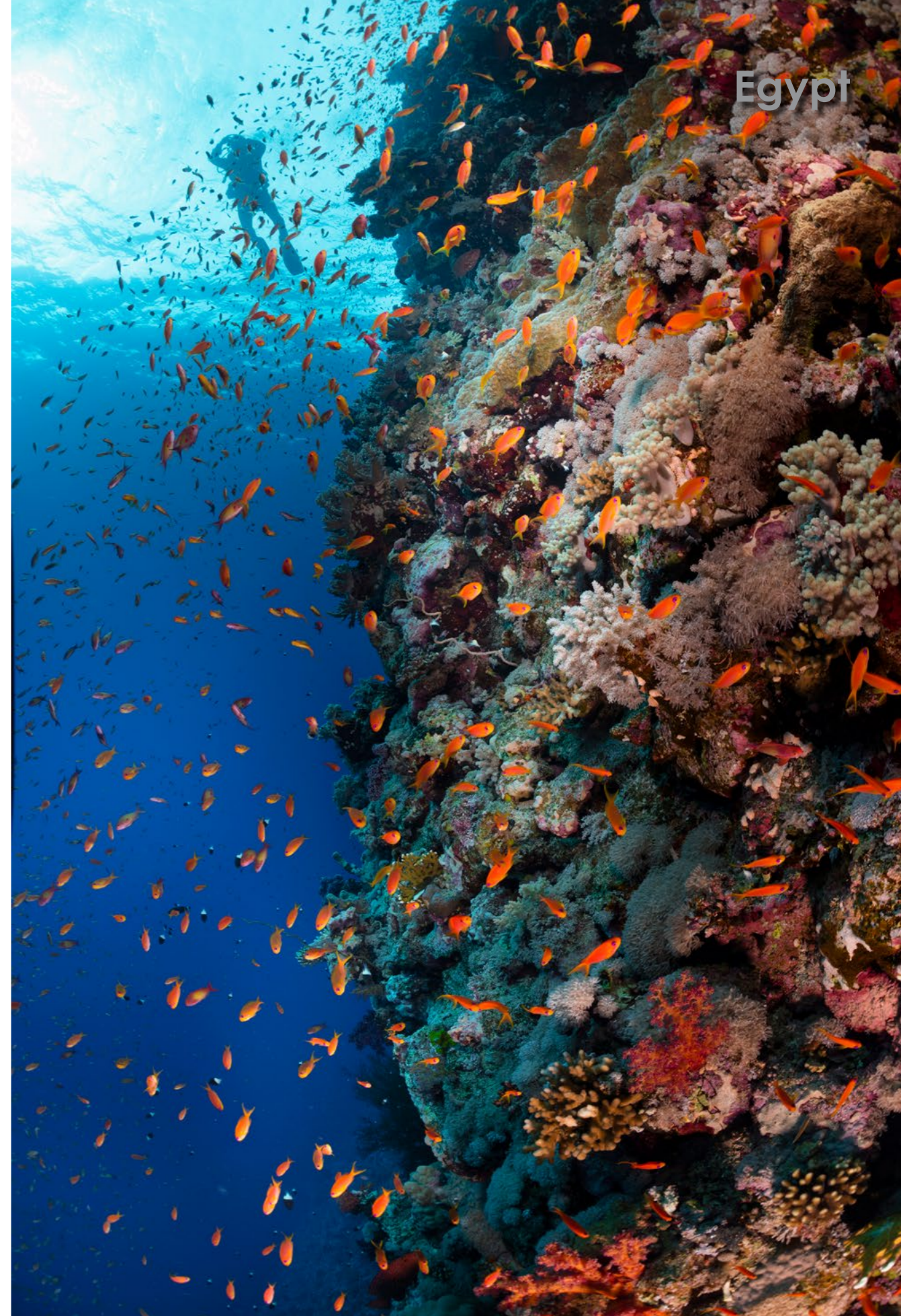




Southern
Egyptian Red Sea

— *Safari to the Deep South & Remote Islands*

Text and photos by Scott Bennett



Brilliantly coloured soft corals hang from a reef wall at Rocky Island dive site in the deep south of the Egyptian Red Sea

“WHAT TOOK ME SO LONG?” I repeatedly asked myself during a recent trip to the Red Sea. One of the globe’s most iconic dive destinations, its spectacular coral gardens, prolific fish life and legendary visibility is beloved by divers the world over. Yet, despite nearly 30 years of diving experience, I somehow had not gotten around to it—definitely on my radar, but inexplicably regulated to the “someday” file.

Every year, my friends Raf and Cisca Jah, who run the African and Oriental Travel

Company, charter the MV *Nouran* from Red Sea Explorers to dive the less-visited parts of the Egyptian Red Sea. The global pandemic halted the 2020 expedition, but this year, they were fortunate enough to be able to lay on the charter—this time to the southernmost point of the Egyptian coast and the deserted islands of Rocky and Zabargad—and they invited me to join them.

I was keen, but as a Canadian, there was a deal-breaker: the Canadian government’s mandatory hotel quarantine for returning travellers. However, when the government announced the lifting of quarantine for vaccinated travellers from mid-July, I immediately sent Raf a two-word text: “I’m in!”

As the world’s northernmost tropical sea, the Red Sea is also one of the saltiest bodies of water on earth, due to scant rainfall

and high evaporation rates. An extension of the Indian Ocean, it shares many of the same habitats and marine life but is home to numerous endemic species.

In addition to the liveaboard, an eight-day land extension was also on offer. With the combination of the Covid-19 pandemic and the off-season summer heat, tourist numbers would be significantly lower. The idea of visiting Egypt and not seeing the pyramids was tantamount to sacrilege. How could I refuse?

Departing from Hurghada, our week-long itinerary would encompass some of the south’s most renowned dive locations, well out of the reach of day-trippers. Remote sites meant fewer boats, reducing the likelihood of diver logjams. The south also maintained the most pristine coral reefs, with a greater abundance of species resilient to climate

Diver and cloud of anthias on reef wall richly decorated with hard and soft corals (above) and gorgonian sea fans (previous page) at Elphinstone Reef in the Red Sea off Marsa Alam in Egypt





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View of the Nile at Luxor (above); The Sphinx and the Great Pyramid at Giza Plateau (right); Felucca sailboat on the Nile at sunset (far right)

change. Add sharks and pelagics to the mix, and it was the perfect antidote to Covid blues!

Getting there

My flight route would take me from Toronto to Hurghada, via Istanbul. With flights booked, all that remained was travel insurance and a PCR test. To be safe, I purchased extra Covid insurance, which was not cheap. As a negative PCR test was required 96 hours before flights from Canada to Egypt, I made my appointment 72 hours prior to departure, at a cost of CA\$185.00! A pain to be sure, but I was actually going to travel again.

With my flight imminent, I began to ponder possible scenarios. What would travel be like? Would security be extra strict? Would the flight be full? Would wearing a mask for nine hours prove unbearable? Fortunately, all concerns proved unjustified. With Toronto's airport

quieter than usual, check in and security were a breeze. The flight was also full, which was something of a surprise. Even wearing the mask was no big deal, and I slept for most of the flight.

Egyptian contrasts

Istanbul Airport was bustling, a far cry from Toronto's emptiness. Everything seemed, well, normal. After a bite to eat and a snooze, I headed to the departure gate, where I met up with four other members of our expedition. Along with Raf and Cisca was Paul, a UK expat living in Turkey, and Mike from the United States, who I had travelled with previously. We would meet the rest of the group—four Belgians and another American—in Egypt. After showing our negative test results, we were good to board.

The flight to Hurghada was a brief two hours. After getting through customs and stopping at the duty-free for additional

"beverages," we boarded our shuttle for the Marriot Beach Resort. Despite the long trip, I could not sleep—my mind racing about the adventures to come.

I awoke to a glorious Red Sea sunrise, scarcely believing I was actually here. Then came something unexpected: a hotel breakfast buffet—a downright surreal experience after endless months of Covid protocols back home. Raf had suggested arriving a full day early to rest—just the ticket after the long trip getting here.

Originally, we were set to leave from Port Ghalib, a four-hour drive south, but as the liveboard boat was already in port, we could leave directly from Hurghada. Meanwhile, Belgians Fien, Wannas, Rutger and Niels had arrived, along with the remaining American Neil. By mid-afternoon, we

headed for the marina and were surprised by just how big Hurghada really was. Encompassing a 40km swathe of coastline, it is the second biggest resort area in Egypt after Sharm el Sheikh.



Khan el-Khalili bazaar in Cairo



View of landscape at Ras Torombi (above); Masked butterflyfish (right) and Eritrian butterflyfish (top right) at Ras Torombi

The liveaboard

Waiting for us was the MV *Nouran*, our home for the next six days. A 36m mahogany-hulled vessel, she catered to 24 guests with 12 cabins and en-suite bathrooms. An air-conditioned lounge and separate dining area offered plenty of outlets for charging, while several outdoor decks offered ample room for post-dive relaxation. No social distancing issues here! The fully equipped dive deck catered to both recreational and technical divers, offering underwater scooters for hire along with an unlimited selection of tanks.

With our departure set for 6:00pm, we had plenty of time to settle in and meet the crew and other guests. On hand were dive guides Le'reyce Josephs from the United Kingdom and Maysara Sayed from Aswan, who gave a briefing before showing us to our cabins. Along with our international group, we had Danish, German and Kuwaiti divers, creating a mini-United Nations. Also joining us were Red Sea Explorers owner

Faisal Khaled, his wife Tanya, and two golden retrievers Antar and Batta—all keen divers.

Still in jet-lag's grasp, I awoke early and grabbed a coffee in the dining room. Stepping outside, it was already hot, with Hurghada's bustle replaced with silence. On the nearby shore, a cluster of buildings along the coast marked civilization's boundary, while beyond, ochre mountains faded into the distant haze. The Red Sea certainly was not named for the colours of its waters; all around, the sea was an astonishing azure, contrasting sharply with the stark coastline. Gazing below, I could discern the bottom. Just how deep was it? Five metres? Twenty metres? I could not wait to find out!

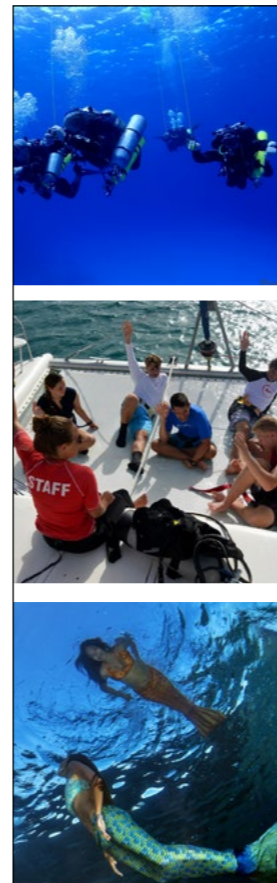
Diving

Ras Torombi. Our first dive at Ras Torombi would be a checkout dive. The 360m-wide bay featured easy conditions and was the usual

first stop for southern Red Sea live-aboards. Aside from the reef, an area of seagrass attracted turtles and dugongs, although seeing the latter required luck. As a photographer, diving without a camera on the checkout dive was sheer torment, but as I was renting gear with over two years since my last dive, it was a necessary evil. The only wetsuit in my size was a 5mm, and with the Red Sea's higher salinity, more weight would be necessary.

After a short zodiac ride, it was time to take the plunge. The water was 31°C (~88°F), and I instantly felt warm. Even despite the proximity to land, visibility was exceptional. From the reef top at 1m, the wall descended to 12m, where the sandy bottom radiated outwards, dotted with numerous coral bommies.

A green sea turtle ascended for a breath (no camera... Arrgh!)



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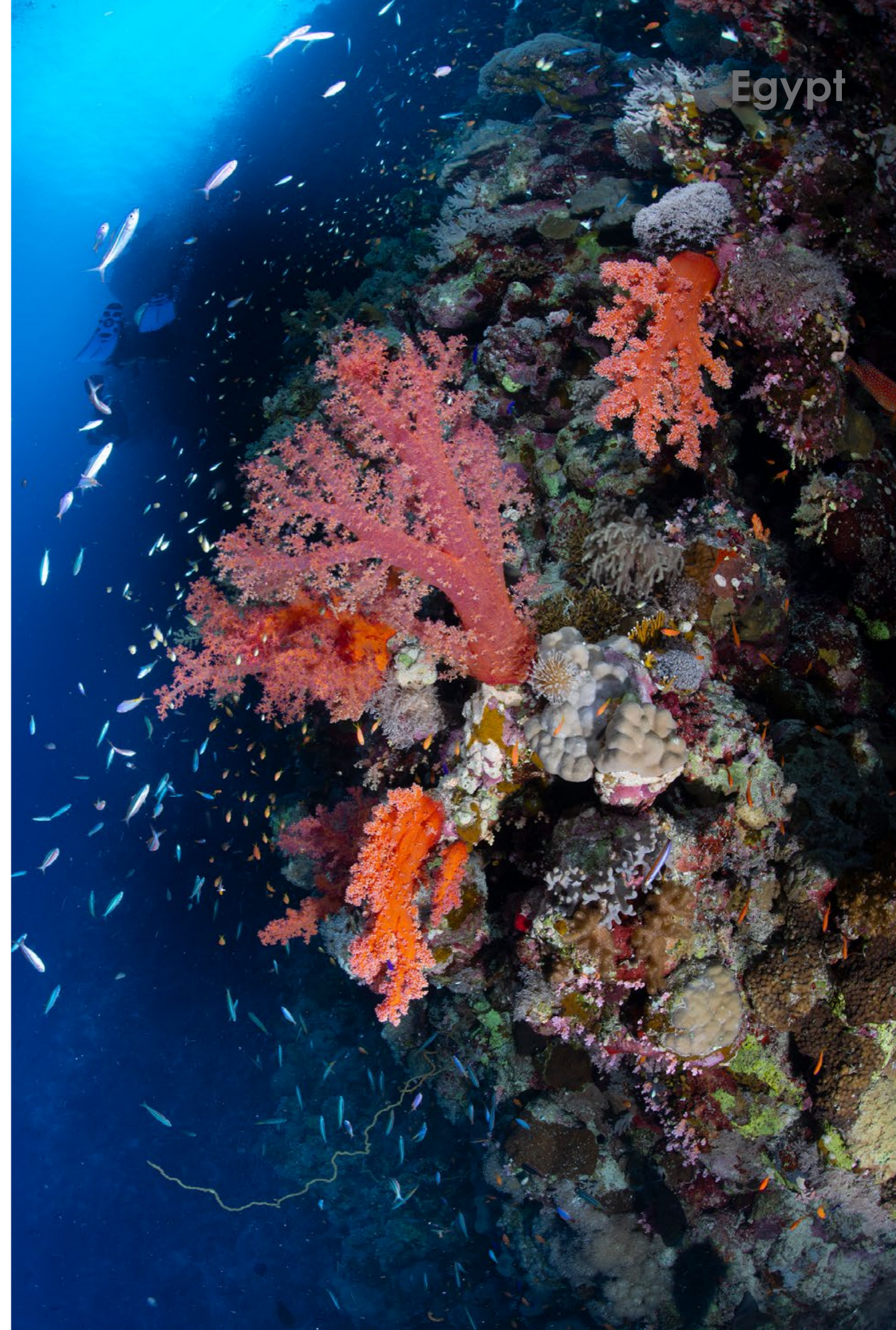
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as a multitude of reef fish swarmed amongst the corals. Along with recognizable species such as anthias, snappers and damselfish, were Red Sea endemics such as Eritrean butterflyfish and Red Sea bannerfish. Schools of goldstripe goatfish allowed a close approach, and I glimpsed my first Napoleon wrasse (arrgh again...). Despite the lack of a camera, it was a joy to be diving again, and I could not wait to see what the week had in store.

Back on the boat, I faced a dilemma. With the warm water temperature, the wetsuit and excess weights were just too uncomfortable. I wondered how I would manage the week, but it was Le'reyce to the rescue! She suggested wearing a rash guard with my swim trunks. Not only was it extremely

comfortable, but I only needed 4kg of weights. Problem solved. Over lunch, I remarked to the Danish couple how impressed I was with the visibility. They both gave me a knowing smile. "It gets better," said one. Bring it on!

Abu Dabbab. We then moved on to Abu Dabbab, 4km off the mainland and home to extensive coral gardens from 15m down to 4m. The visibility was even better, and I saw a new species that quickly became a photo favourite. Stunningly attired in yellow with a blue patch around the eyes, the masked butterflyfish was another endemic species, usually seen in pairs. At 15m lay the wreck of *Heaven*, a liveaboard that sank in 2003. Not exactly something one wishes to see on a liveaboard trip...

THIS PAGE: Reef scenes from Rocky Island in the Deep South of the Egyptian Red Sea



Common bigeyes (above) and diver dwarfed by huge gorgonian sea fan (right) at Elphinstone

Giant moray, greasy and coral groupers, blackside hawkfish, wrasse, chocolatedip chromis and anthias on coral reef at Elphinstone

Elphinstone. We finished the day at Elphinstone, regarded as one of the Red Sea's premier dive locations. At a length of 450m, it featured deeper plateaus to the north and south separated by a massive 300m plateau only 1m deep. Fuelled by nutrient-laden currents, it was also famous for its sharks, with oceanic whitetips being the star attraction.

As seeing the entire site on one dive was impossible, we would concentrate on the southern end. The *Nouran* was able to anchor to the mooring platform right alongside the reef. During pre-pandemic years, ten or more boats competed for moorings, but we had the entire place to ourselves. Sweet!

Plunging in from the dive deck, it became readily apparent how Elphinstone has earned

its renown. The Red Sea is home to more than 200 soft and hard corals, and they all seemed to be here. Acropora was the most common, growing in either plates or branches. Fungia, soft corals, organ pipe corals and black coral trees all jostled for space, but the fan corals stole the show, with some absolutely massive specimens on display. Mike posed behind one for scale, and it literally dwarfed him. Le'reyce had urged us to keep an eye out to the blue for pelagics, but the kaleidoscopic palette had me spellbound.

Fish life proved equally prolific. Red Sea sail-

fin tang, masked puffers, emperor and queen angelfish and jewel groupers thronged the reef as anthias amassed in astounding numbers. Visibility was astonishing, easily exceeding 40m and quite possibly reaching 50m! For photographers, it was wide-angle bliss, the clarity ensuring minimal backscatter from my strobes. Sadly, the whitetip sharks remained elusive, but such is the luck of the ocean. Next stop, the Deep South!

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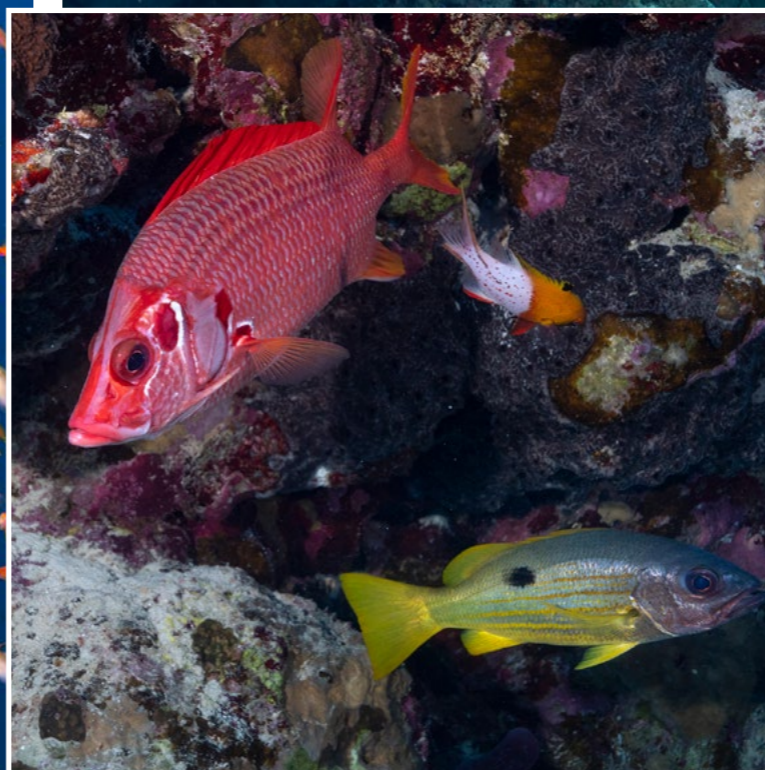
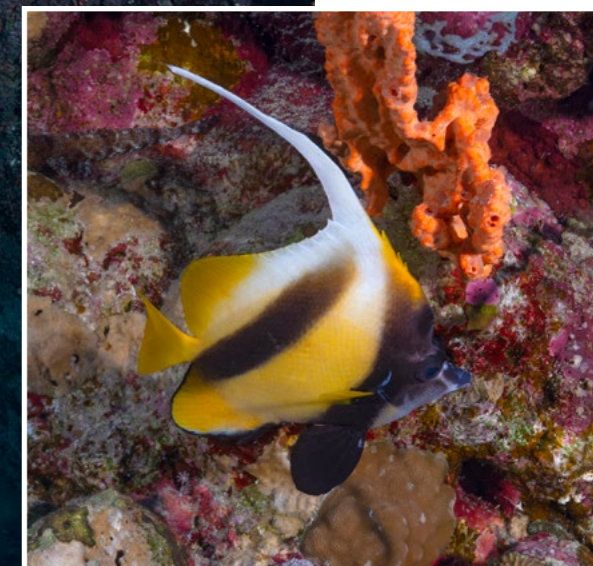
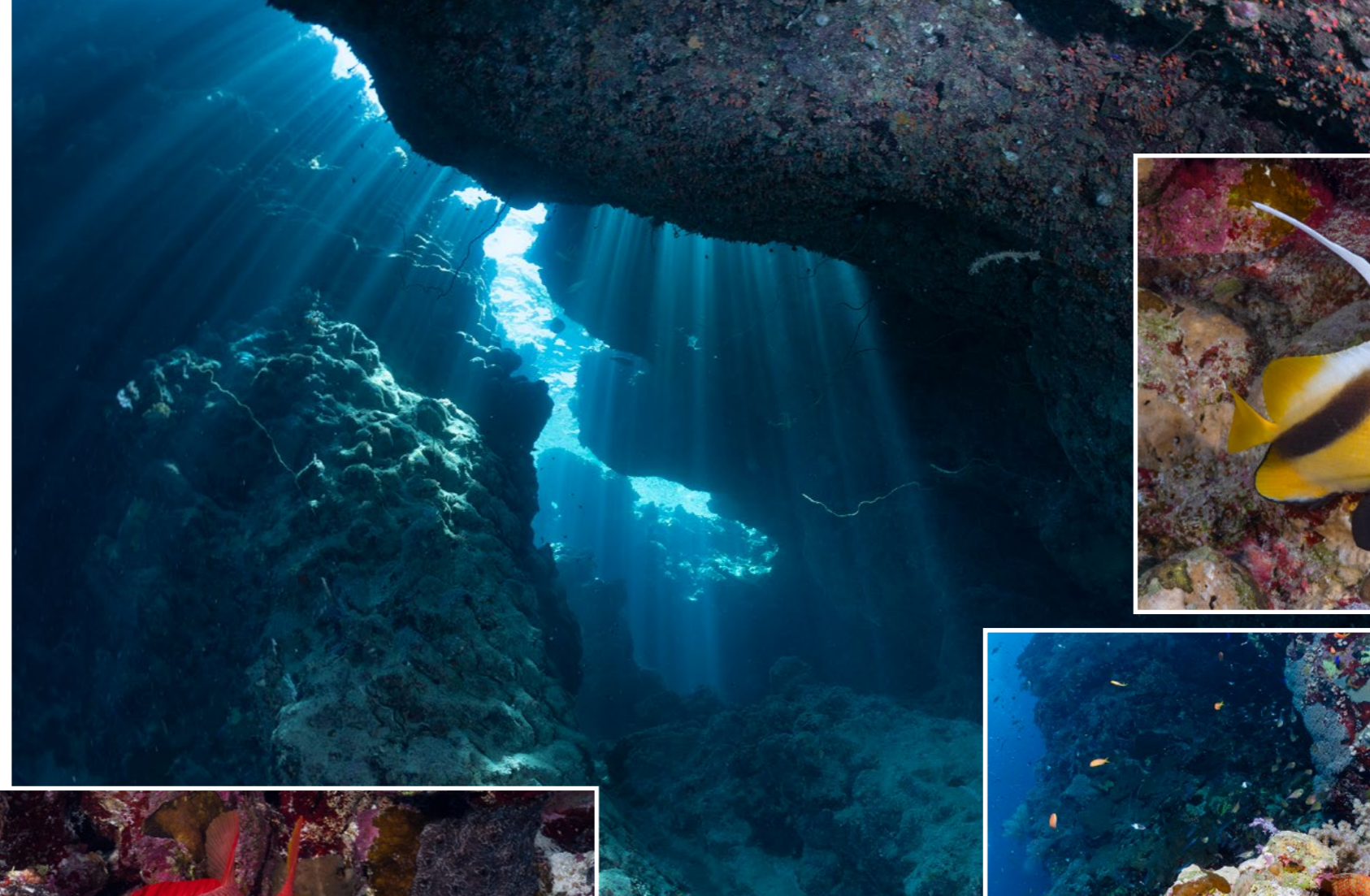
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Rocky Island. Our first stop was Rocky Island, a barren slab only 540m across. Below, the scene was a different story. Corals and sponges shrouded the walls as anthias and surgeonfish swirled in dense clouds. Soft corals were radiant, dazzling the eye with hues of violet, magenta and yellow. Far below, between 80 to 110m deep was the wreck of the *Maidan*, one of the most historic wrecks in the Red Sea, but solely in the realm of technical divers.

Deep South

Situated south of the Tropic of Cancer, Zabargad and Rocky are the southernmost dived islands in the Egyptian Red Sea. Another 90 miles farther south and we would hit Sudan.

A second dive proved even more exhilarating. Red Sea bannerfish, giant squirrelfish, lyretail hogfish and blackspot snapper posed for my camera. Amid walls and overhangs, sunbeams radiated from above, creating a vision of ethereal beauty. The only thing missing was a heavenly choir.



Coral grouper rests on lush coral reef wall (above) and Red Sea bannerfish (top right) at Rocky Island

Anthias swirl on a wall laden with brilliantly coloured corals and sponges (above) and sunbeams radiate through the depths between walls and overhangs at Rocky Island (top centre); Giant squirrelfish, lyretail hogfish and blackspot snapper (centre) at Rocky Island



Sea fans (above), sling-jaw wrasse with moon grouper (top left), and clouds of anthias on reef (top right) at Zabargad Island

Zabargad Island (above); Bluespotted ribbontail ray at Shaab Sataya (right)

Zabargad Island. After lunch, we finished at Zabargad Island, just 5km to the northwest. Zabargad was the largest island in the Red Sea; its highest point was 800m above sea level. Due to its strategic location, it also served as a base for the Egyptian Armed Forces.

Another superb location, Zabargad offered both wall and shallow diving. Tightly packed

hard corals and sponges vied for space as anthias pulsed in staggering numbers. Off the wall, huge tuna patrolled, hoping to snap up unsuspecting prey.

After the final dive, an array of snacks appeared on the outdoor deck, from fresh fruit and cake to kibbeh, a Middle Eastern delicacy with a mixture of bulgur wheat,

onions and ground beef. Meals were served buffet style and were some of the best I had ever had on a liveaboard—so much so that my belt would likely need an additional notch at the trip's conclusion. After dinner, it was sundowner time with gin and topics, as we steamed north to the Fury Shoals.

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Whitetip reef shark shelters under an enormous overhang in the cavern system at Shaab Claudio (right)



Red Sea Explorers owner Faisal Khaled and his two golden retrievers Antar and Batta enjoy a dip at Daedalus.



School of bluestripe snapper at Shaab Sataya (above); Divers on wall at Shaab Claudio (right); Diver explores the cavern system at Shab Claudio (top left).

Fury Shoals

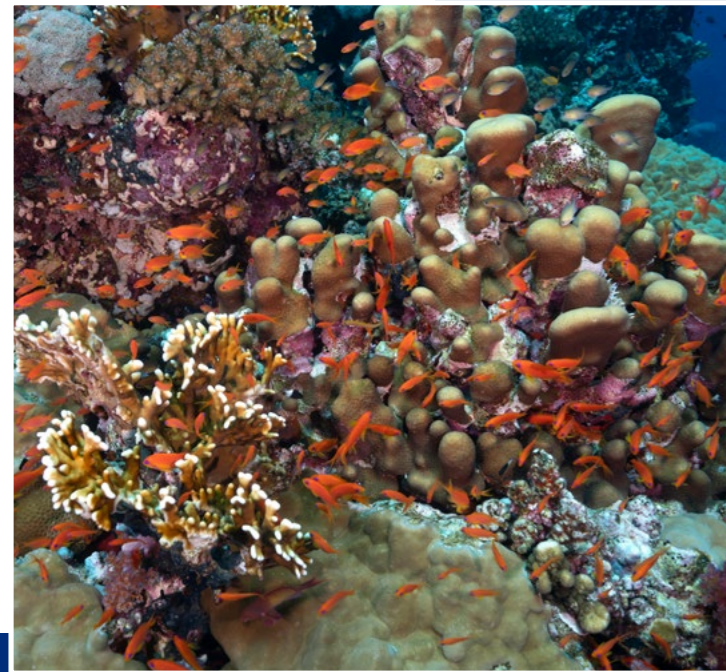
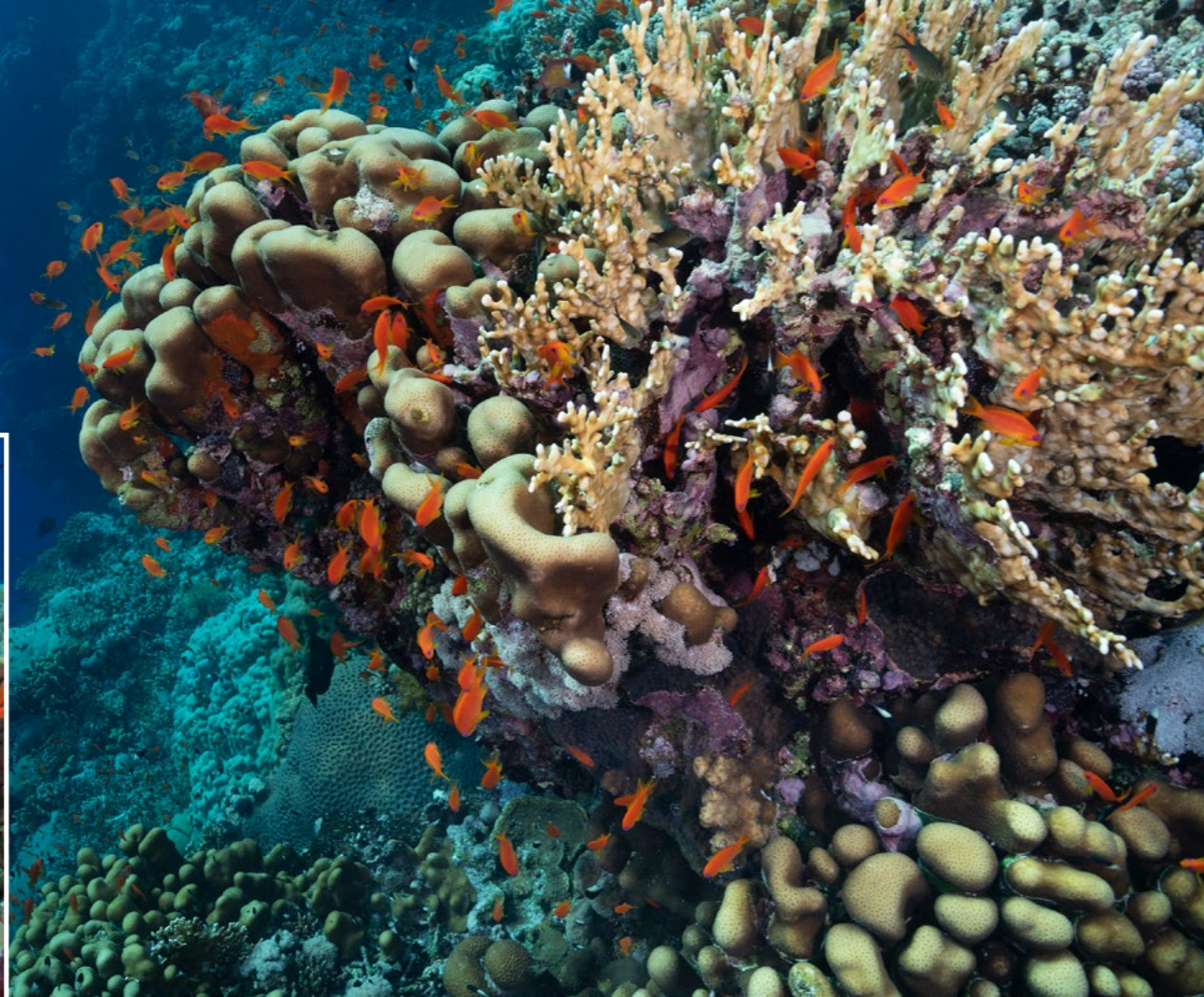
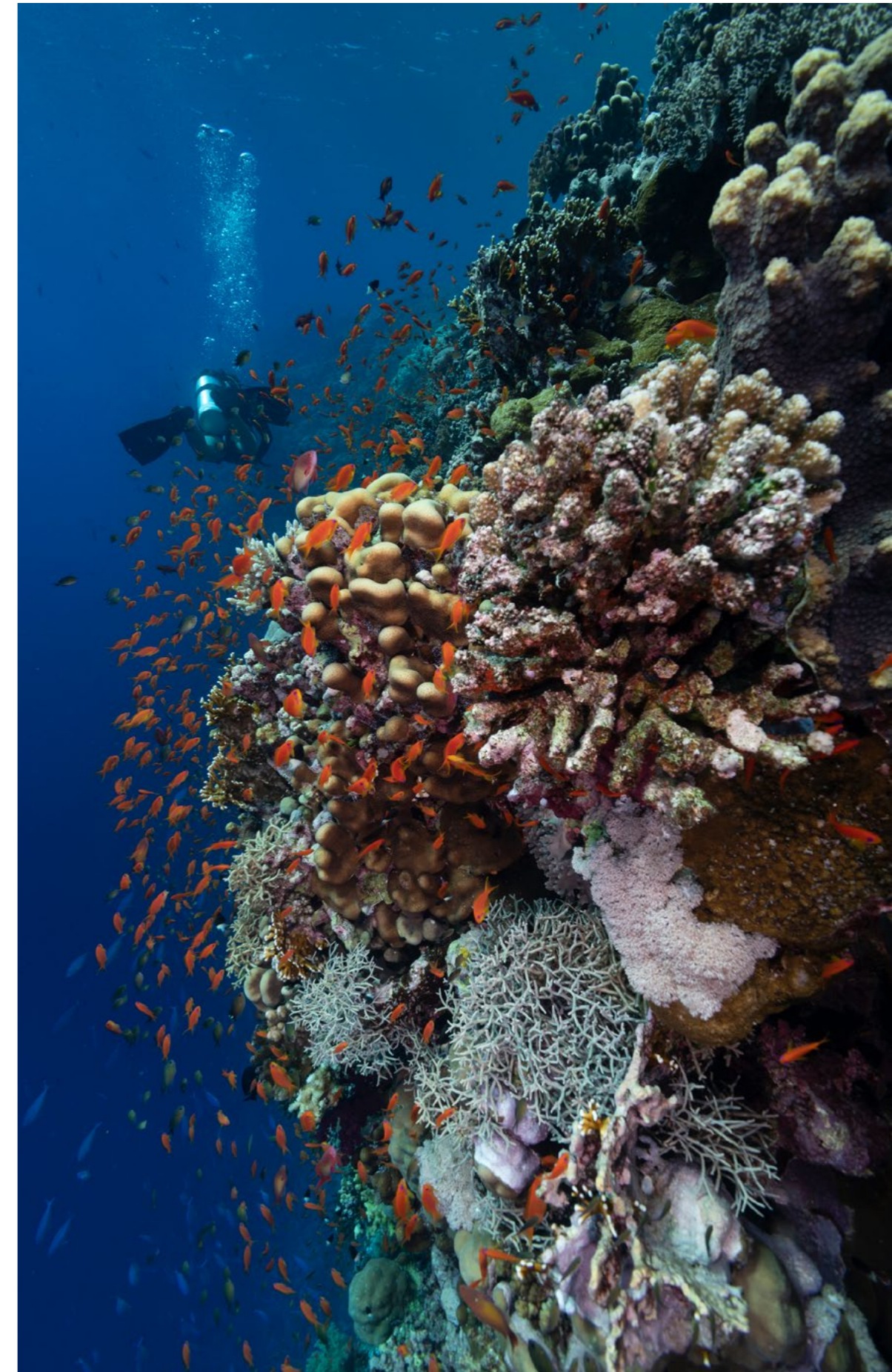
Shaab Sataya. With a diameter of 4,700m, Shaab Sataya is the largest reef in the Fury Shoals, where strong currents nourish robust corals and lure the big fish. It is also called "Dolphin House," due to a resident pod of spinner dolphins. After diving, we attempted to find the dolphins, but they remained elusive.

Shaab Claudio. Undeterred, we moved on to Shaab Claudio, where yet more stunning reefs awaited. The highlight was a small cavern system, with entrances located in the reef wall at 7m and 8m, and an exit at 4m. I wanted to photograph the Belgians swimming through the cavern, so Le'reyce led me in first and indicated a spot to position myself. Great fun!



Clouds of anthias on hard corals at Shaab Maksour Reef (right and below); School of Red Sea fusiliers hovers over Shaab Maksour Reef (bottom left)

Diver swims past swirling schools of anthias on wall with dense colonies of corals at Shaab Maksour Reef (below)



Shaab Maksour. On the northeastern periphery of the Fury Shoals, Shaab Maksour features a slender 1,500m long reef with steep walls plummeting to a depth of 100m. Finning alongside the wall revealed a remarkable expanse of life. Along with now-familiar faces, Red Sea fusiliers schooled in prolific numbers. Was it my imagination, or were the reefs getting better and better?

Daedalus Reef. Another overnight voyage brought us to one of the Red Sea's signature sites. Situated in the middle of the Red Sea, Daedalus Reef ascends from a depth of about 450m to encompass an area 1,070m long and 300m wide. Encircled by walls, Daedalus Reef descends to 20m and



Jewel grouper with cleaner wrasse and anthia at Daedalus Reef (above)

then slopes outwards to 40m before plunging to the depths. Far from any other reefs, its isolation is a pelagic magnet, attracting a plethora of species from far and wide. It is also the final resting place of the *Zealot*, a loaded cargo ship from the late 1880s, commencing at 75m and plunging to 110m.

Daedalus Reef Lighthouse. A small artificial island in the centre of the reef hosted a lighthouse. Constructed in 1863, rebuilt in 1931 and renewed in 1993, the 30m structure was painted in black and white horizontal bands. A two-story quarter building was utilised by the Egyptian Coast Guard and Navy.

The star attractions here were the schools of scalloped hammerhead sharks, being the only place in the Red Sea where they can be regularly encountered in large numbers.



Napolean wrasse at Daedalus Reef

Red Sea or two-banded anemonefish on anemones, with domino damselfish and anthias at Daedalus

Red Sea or two-banded anemonefish with domino damselfish on anemone (right) and *Porites* corals on wall (far right) at Daedalus Reef; Hammerhead shark at Daedalus Reef Lighthouse (below)



to stop as she scanned in all directions. I had been in this exact scenario on some dive trips in the past. "Sure," I thought. "We will sit here for 15 minutes, see nothing and then head back

A late-night arrival ensured an early morning hammerhead dive, so I readied my camera and had an early night, drifting off with visions of hammerheads dancing in my head.

The next morning saw a 5:30 a.m. wakeup call, necessitating several jolts of coffee. Along with the four Belgians and Le'reyce, I boarded the zodiac for the brief trip to our entry spot. "We need to do a negative entry due to the surface currents," explained Le'reyce. I was not happy doing this with a camera but figured there was no choice. Grasping it firmly to my chest, I did a backward roll and immediately started my descent.

At 26m, Le'reyce signalled to us

to the reef." And how wrong I was! Within five minutes, she gestured excitedly: A hammerhead was heading right in my direction! Incredulously, it came to within 3m, checked me out and promptly vanished. I managed to fire off a few shots, although I had been instructed not to use strobes. Amazing!

Strobe mishap

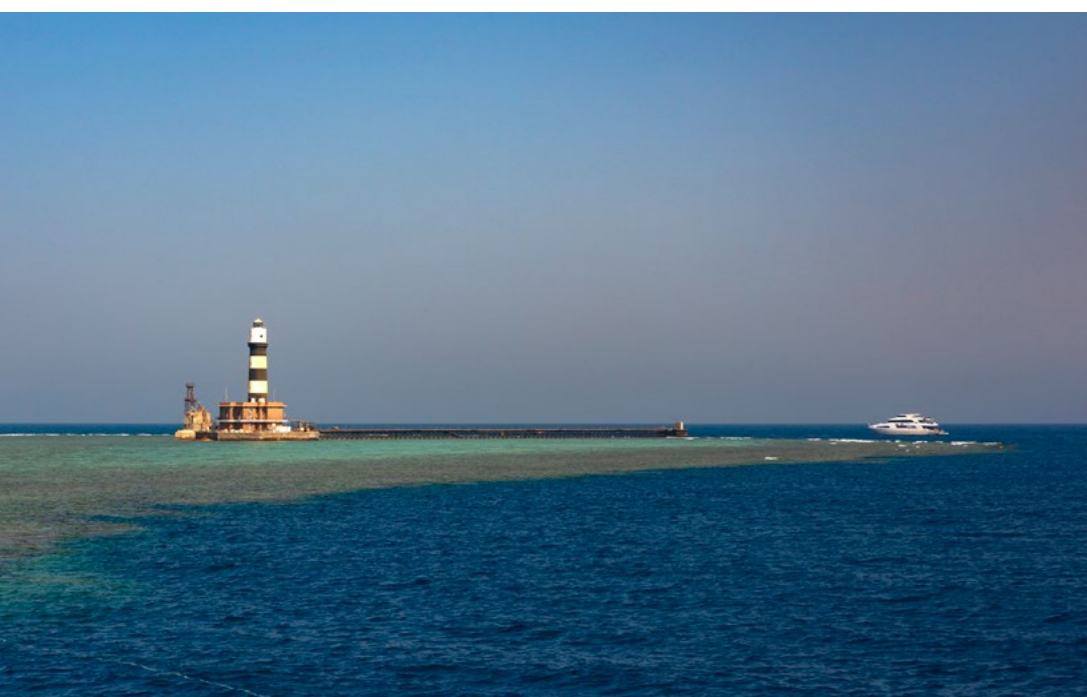
Heading back to the shallows, my elation turned to anguish. While attempting a shot of the reef, my strobes would not fire. In despair, I realised the flash sync cord had popped out during my backwards roll. Then, to add insult to injury, a huge Napoleon



wrasse appeared just an arm's length away. Undaunted, I photographed it and hoped for the best. Later, I was able to adjust the images back to their natural colour. Thanks, Photoshop!

Back on board, I explained

my predicament to Faisal, who instructed me to rinse the sync cord and camera bulkhead with fresh water, then vinegar and allow it to dry. The housing was okay, but the sync cord was damaged. Fortunately, I had spare



Daedalus Reef Lighthouse (above); Divers at Daedalus Reef (right)





THIS PAGE: Divers and huge gorgonian sea fans on walls at Elphinstone Reef

Back north

After two wonderful days, it was time to head back north. After another overnight passage, our last diving day saw return visits to Elphinstone and Ras Torombi.

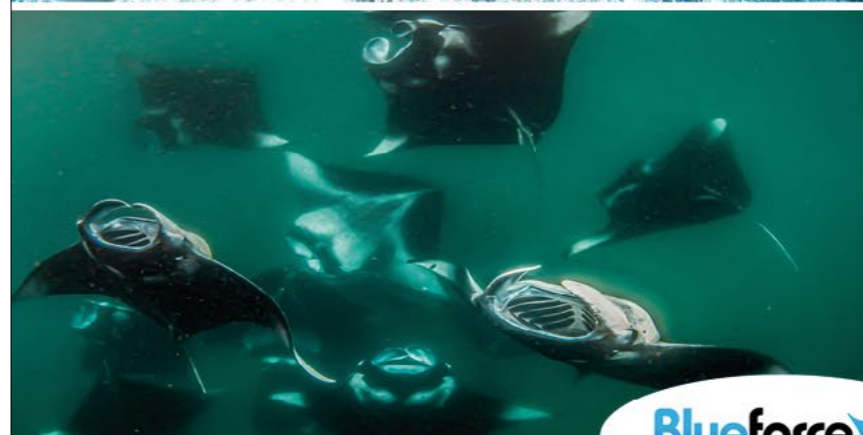
Elphinstone (revisited). At Elphinstone (my trip favourite), I switched to the fisheye lens, and with Maysara as our guide, explored the reef's northern end. The trifecta of gin-clear visibility, superb light and an explosion of fish life sent my camera into overdrive. A school of blue-fin trevally pulsed off the wall as lyretail grouper, common lionfish, scribbled filefish, freckled hawkfish and emperor angelfish mingled amongst the omnipresent anthias. A giant moray erupted from a crevice, swimming above the reef top before vanishing around the corner. Le'reyce motioned it was time to head back. "Five more minutes?" pleaded my expression.

Ras Torombi (revisited). At Ras Torombi, I played hide-and-peek with a Red Sea boxfish, while the sandy bottom was alive with blue-spotted stingrays. Heading for the seagrass, we hoped for a glimpse of turtles or dugong, but both remained ever elusive. Sadly, this would be our final dive, as it was time to head back north to Hurghada. On our final night, we enjoyed a selection of photos and videos by all the participants on the lounge TV. I was thrilled to see the Danes had a video of my hammer-head encounter.

Arriving in port before breakfast, we had plenty of time to finish packing and bid farewell to Faisal and his wonderful crew. We also said goodbye to Niels and Neil, who would not be joining us on the land tour. Even before stepping off the boat, I knew the Red Sea was a place I would return to. But onward now to new adventures!

strobes and cords. Note to self: no more back rolls holding a camera! That evening, Faisal announced we would remain at Daedalus for a second day, allowing the chance to make up for missed opportunities.

Sadly, I never got another up-close Napoleon encounter, but there was plenty more to photograph. *Porites* corals formed massive colonies, as Red Sea bannerfish, common bigeye, slingjaw wrasse, orangespine unicornfish and two-banded anemonefish swarmed in abundance. We even spotted the lone hammerhead shark again, as it patrolled the blue. With waters so warm, the school of hammerheads remained in the cooler depths.



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Luxor Temple (ca. 1400 BCE) is guarded by immense stone statues of pharaohs (above, top left and far left); Sunset on the Nile at Luxor (left)

Land tour

Setting out on the five-hour journey to Luxor, the scenery epitomised desolation, with parched plains strewn with

peaks. Approaching the city of Qena, things changed. Subtly at first, a tree appeared, then two... then a field, followed by another. Before long, an explo-

sion of fertility meant one thing: The Nile was near. Passing verdant fields of corn and sugar cane, roadside stalls groaned beneath immense melons and mangoes, as egrets gathered along numerous canals. However, the fertility was deceiving, extending only 6km on either side of the river.

We soon arrived in Luxor and had our first view of the Nile, with our hotel enjoying a riverside view. Waiting for us was Mr. Ahmed, who would be our guide

obelisk. Constructed in approximately 1400 BCE, a majestic colonnade of pillars led to an expansive court with halls and chambers beyond. With walls burnished by the setting sun, we had the run of the place, with Raf and I photographing to our hearts' content. As twilight deepened, floodlights lit the complex, perfecting the magical aura.

Valley of the Kings

I awoke early to admire the Nile from my

from Luxor to Aswan. To ease the following day's itinerary, Raf and Cisca suggested we visit Luxor Temple later in the afternoon.

Luxor Temple.

A short bus ride away, the temple was an impressive sight, its entrance guarded by immense statues of the pharaohs and a towering

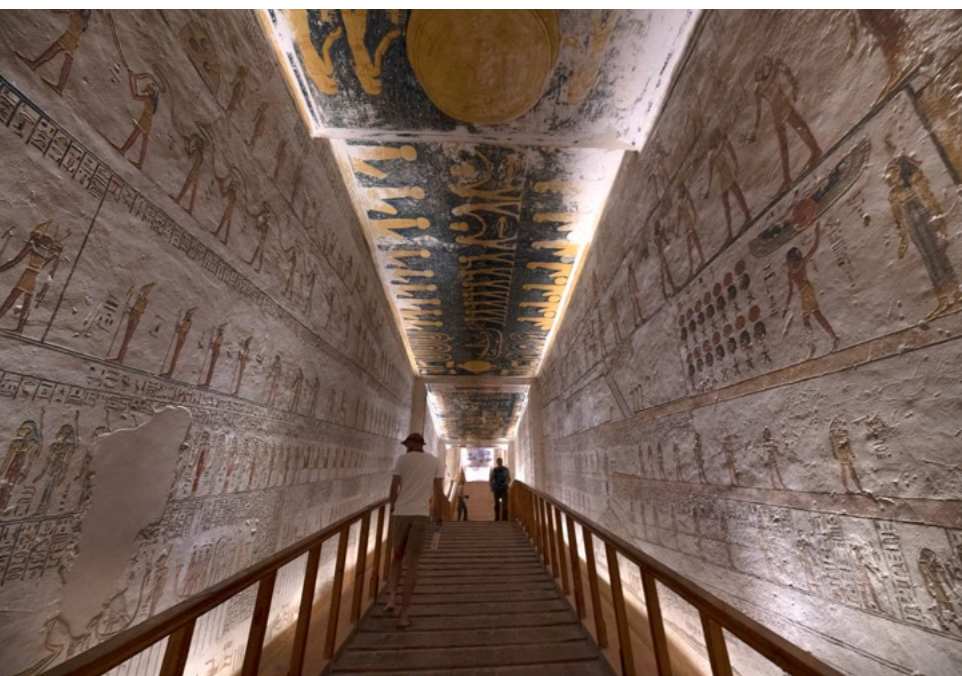
balcony, the stillness punctuated by the morning call to prayer. The calm was fleeting, as the day would soon prove intense. Our first stop was the Valley of the Kings but getting there by road required a detour to the Nile Bridge, 8km south of town.

Colossi of Memnon. Crossing to the West Bank, we stopped at the Colossi of Memnon, twin seated statues of immense proportions. Crumbling yet imposing, they marked an abrupt boundary where greenery ended, and desert began. Here, the road ascended to the Valley of the Kings, one of Egypt's most renowned archaeological attractions.

New Kingdom tombs

From the 16th to 11th century BCE, rock-cut tombs were excavated for the pharaohs and powerful nobles of the New Kingdom. Comprising of at least 63 tombs, the valley has been a tourism site throughout antiquity, especially during Roman times. It was mind-boggling to imagine how many people had passed here before us.

First, we had a major obstacle: a tourist



THIS PAGE: Painted wall reliefs inside Tomb KV9, initially built for Ramesses V, later used by Ramesses VI; Painting detail in KV16, tomb of Ramesses I (left)



Map of Egypt, with location of Egyptian Red Sea on a global map

three tombs, a second for two extra tombs, plus a photography permit), we boarded a tram to the site. With the mercury already hitting 46°C (~115°F), walking was not an enticing option.

We visited a total of five tombs of varying sizes and depths, the usual design featuring an inclined corridor descending through halls to a burial chamber.

Tomb KV9. For me, the most impressive was Tomb KV9. Originally built for Pharaoh Ramesses VI (ca. 1145 BCE),

his uncle Ramesses V later reused the tomb for himself. The decorations were astonishing, with much of the original colour still present.

Tutankhamun's tomb. The one tomb banning photography was Tutankhamun's; yet curiously, it was the least impressive. Apart from Tutankhamun's mummy, the tomb was empty, its contents sent to the Cairo Museum long ago. According to Mr. Ahmed, up to 10,000 visitors a day through the site during peak months, yet we counted less than 100. Exploring freely, I could scarcely imagine the oppressive hubbub of a jam-packed tomb.

bazaar rife with determined vendors. My strategy? Look straight ahead and walk FAST. After getting our tickets (one general admission ticket covering



The Temple of Hatshepsut (ca. 1507 BCE) located opposite the city of Luxor (above); Karnak Temple Complex (ca. 2000-30 BCE) near Luxor (right, far right and top right)

Mortuary Temple of Hatshepsut. Leaving the valley, we finished at the Mortuary Temple of Hatshepsut (ca. 1507 BCE), dramatically positioned beneath sheer cliffs. Dedicated to Egypt's most infamous female pharaoh, its expansive stepped platforms, pillared entryways, and colourful reliefs create one of Egypt's architectural masterpieces. In contrast, the politics of her ascension and reign would be fully at home on a TV reality show.

Rather than endure the 40-minute drive back to Luxor, Mr. Ahmed suggested we take a boat, as our hotel was in sight across the Nile. We crossed on board the *Titanic* (seriously, you cannot make these things up), with an eclectic assembly of toys and dolls suspended from its ceiling, as a matted plush bear sat alongside the captain like a first mate.



Nile cruise Later, we were back on the Nile for a sunset cruise. Along the riverfront, a flotilla of boats eagerly awaited customers with names like *Daydream*, *2 Queen Mary* (two of those), *Horus* and *Donald Duck* to name a few. Ours was named *Beautiful Dreams*, the ideal venue for a sundowner cruise. Feluccas, with their distinctive sails catching the breeze, drifted by as Luxor twinkled in the waning light.

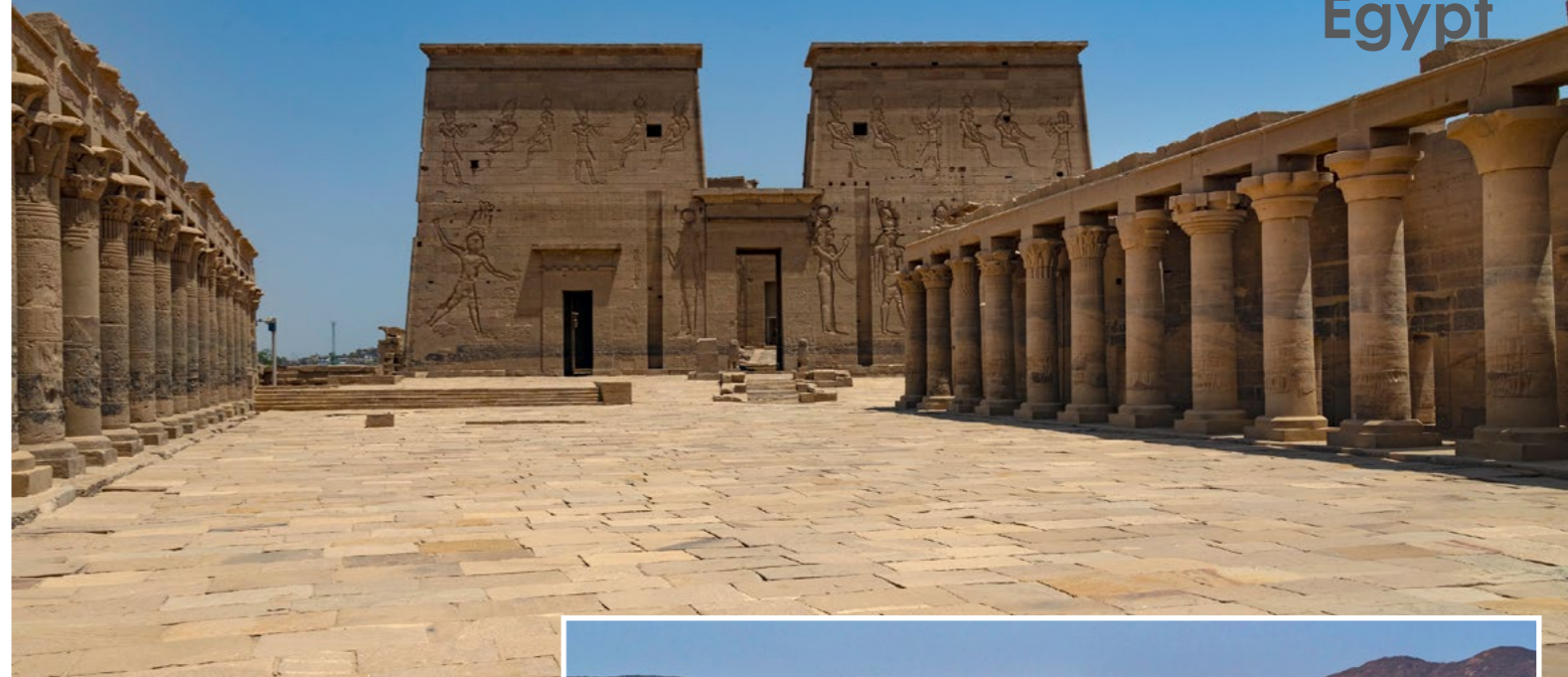
Coming ashore on a sandbar, we watched the Nile glow molten orange, mirrored by floodlights illuminating the Temple of Hatshepsut. Sheer magic!

Karnak The next morning, we concluded with a visit to Karnak (built ca. 2000-30 BCE), the



largest temple complex of the ancient world. Once again, an early arrival meant zero crowds. With its entrance bordered by an avenue of sphinxes, the site was overwhelming. The gigantic pillars, towering columns, chapels, and an obelisk

Felucca sailboat on the Nile at Luxor



Philae Temple Complex (above and top left) at Aswan (left and far right); Goods sold at the local market in Aswan included fresh produce (right), fresh baked breads (lower right), and baskets of hibiscus flower petals.

the late afternoon, the light was sublime, and I made a beeline for the rooftop terrace to get some photos.

next stop, the temple complex of Philae.

Unfinished Obelisk. The next day featured a packed itinerary. We first stopped at the quarry to see the over-

Philae Temple Complex. Originally established near the Nile's First Cataract, the entire site was dismantled and moved to its current location on Agilika Island before the dam's completion. A centre for the cult of Isis, Philae's temples were revered from the Pharaonic Era right through to Byzantine times, with each ruler making their own additions. Once again, we had the entire site to ourselves. In fact, there were more cats in the main temple than people!

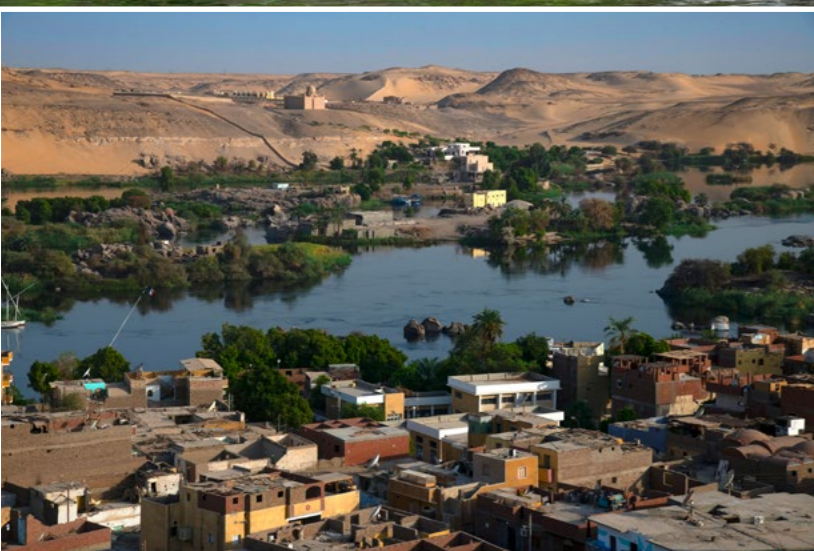
3,500-year-old unfinished obelisk, which, if completed, would have been the world's tallest, at 42m. After many months of work, the granite cracked before being dislodged from the bedrock. To say the pharaoh was displeased is likely an understatement.

Aswan High Dam. We then moved on to Egypt's modern engineering feat, the Aswan High Dam. Constructed between 1960 and 1970 to control flooding, provide water for irrigation and generate hydroelectricity, it also created Lake Nasser, one of the world's largest artificial lakes. However, its creation impacted our

Aswan market. Back in Aswan, I had arranged for Mr. Ahmed to take me to a local market. At first, many stalls seemed closed, but venturing farther, activity intensified. At a bakery, I sampled delicious flatbread, while another offered fresh dates. Cakes and sweets

tempted passers-by, along with sacks of hibiscus flowers, Hello Kitty carpets, immense kitchen pans, and everything in-between. Vendors were genuinely welcoming, with many posing for photos.

Without a tourist in sight, it was a wonderful way to spend two hours.



towering nearly 30m left one grasping for adjectives. The Great Hypostyle Hall alone was large enough to encompass the cathedral of Notre-Dame.

Aswan

Senses pummelled, we set out on the five-hour drive south to Aswan for a three-night stay. If Luxor's riverfront location was impressive, Aswan was magnificent! Here, a series of granite islands formed the Nile's first cataract, forming a barrier for the big cruise liners heading south. Perched on a high hilltop, our hotel offered stunning views of the city, river and surrounding desert. Arriving in



At Abu Simbel, the Great Temple of Ramesses II (above) and interior views (top right, right and left); Small Temple of Hathor and Nefertari (far right)



Abu Simbel
The next day would take us to the place most impacted by the High Dam, necessitating an engineering feat of epic proportions. Abu Simbel was a place I had long desired to see, having read about it way back in public school.

Desert Highway checkpoint for its 5:00 a.m. opening (driving is not permitted at night). Gates open, we motored on, not stopping until we reached our destination. Although a pair of minibuses had already arrived, the parking lot was empty. Almost. As the bus

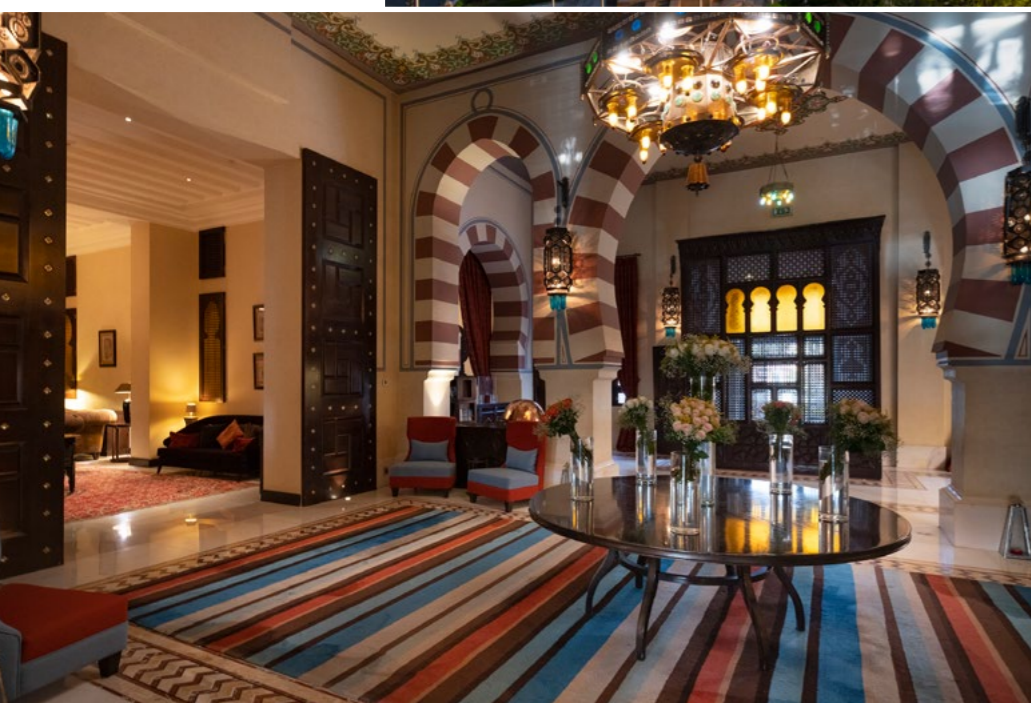
door opened, eager vendors flashed t-shirts and trinkets, despite it being only 8:15 a.m. Before entering, we viewed an exhibit chronicling the entire relocation process. Between 1964 and 1968, every section of the temple had to be cut, dismantled and reassembled at its new location 65m higher on an artificial mountain. The effort was jaw-dropping, although the first view was decidedly less so: an enormous facade interrupted by a small door. However, a walk to

the front revealed wonders! Dating from 1244 BCE, during the reign of Ramesses II, the site featured two temples: the Great Temple, dedicated to Ramesses himself; and the Small Temple, dedicated to Queen Nefertari. The Great Temple's entrance was flanked by a quartet of gigantic 20m statues, each representing

Ramesses II. The cavernous interior featured many side chambers, the walls engraved with bas-reliefs depicting battle scenes. Immense statues led to a rear chamber, occupied by four sculptures depicting Ra-Horakhty, the deified Ramesses, and gods Amun-Ra and Ptah. Everything looked so

natural, I could scarcely believe everything had been moved and reassembled. Venturing outside, I wandered over to the temple of Nefertiti, smaller in magnitude, yet equally impressive. During our visit, I counted 17 people, and our group accounted for eight of them! Heading back to the bus, the

View of the capital city of Cairo (right); The Museum of Egyptian Antiquities, also known as the Cairo Museum (far right); Old Cataract Hotel in Aswan where Agatha Christie wrote *Death on the Nile* (below); Scenes from the sprawling bazaar of Khan el-Khalili in the city centre (bottom centre and bottom right)



stalls had opened, and the vendors swarmed. An irritant, yes, but I could not be angry. Eighteen months without tourists had been rough, so I purchased a scarab beetle bottle opener. Back in Aswan by mid-afternoon, I stopped by the Old Cataract Hotel for afternoon tea. Radiating colonial elegance, it was where Agatha Christie penned *Death on the Nile*.

Off to Cairo

Bidding farewell to Mr. Ahmed, the next day saw the final leg of our journey as we boarded the overnight train to Cairo. Assigned my own sleeper compartment, the 13-hour journey was an adventure all by itself. A bit rough around the edges, it was hugely enjoyable, despite a few overnight lurches that nearly catapulted me out of bed. After breakfast, our

mountain of luggage quickly dominated the corridor. With a mere ten-minute stop at Giza Station, we had to move fast!

With all luggage and people accounted for, a 20-minute drive delivered us to the Novotel Cairo El Borg on Gezira Island, an oasis of green in the heart of Africa's largest city. With a free day at our disposal, Cisca, the Belgians and I

opted to visit the Museum of Egyptian Antiquities (also known as the Cairo Museum), located just across the Nile. Although much had been moved to the new Egyptian Grand Museum (STILL not open), a surprising amount remained on display, from delicate figurines to huge sarcophagi. The Tutankhamun artifacts were still there, while a separate room

(no photos) exhibited the infamous golden mask. With crowds absent, I admired it from less than a metre away.

Khan el-Khalili

Afterwards, we arranged to meet the others at Khan el-Khalili, the sprawling bazaar in the city centre. Grabbing taxis, we set out across Tahir Square's chaotic traffic



On the Giza Plateau, located in Greater Cairo, the Great Pyramid was constructed ca. 2600 BCE and the Khafre Pyramid was completed in 2570 BCE (left), and the Great Sphinx (above) was constructed during the reign of Khafre (ca. 2558–2532 BCE); Pyramid of Djoser in Saqqara was constructed 4,700 years ago (below).

circle before passing elegant yet tattered French colonial buildings. Twenty minutes in a Cairo taxi rivals any amusement park ride for thrills and flashes of sheer terror!

Finding the others amid the chaos seemed insurmountable, yet somehow, we did. Ornate gates and facades adorned labyrinthine alleys, the bewildering array of stalls selling everything from spices and incense to shishas, pharaoh busts and gold bikinis. I could have spent hours perusing the bazaar, but Cisca had arranged for my PCR test at the hotel, necessitating an early departure.

Giza Plateau

Our final day saved the best for last. Poised between golden dunes and sprawling suburbs, the Giza Plateau literally personifies Egypt. We have all seen the

pyramids on TV, films and media, but nothing compares to the real deal. To actually stand in front of the Khufu, or Great Pyramid, is simply awe-inspiring. The embodiment of history, approximately 2.3 million blocks of stone create the 5.75-million-ton structure.

I did not go inside the Great Chamber (it cost 400 Egyptian pounds and cameras were forbidden) but explored the exterior, marvelling as to how the massive blocks were even moved. A short drive brought us to Giza's other icon. The Sphinx was equally impressive and bigger than I expected. I asked our guide what he thought about the theories that it is much older than the accepted 2520 BCE. "Oh, I wouldn't be at all surprised," he mused. "Just don't bring up the subject of ETs—the government really *hates* that!"

Saqqara

Afterwards, we drove out of town to Saqqara for our final stop. Constructed 4,700 years ago, the Step Pyramid of Djoser is regarded by many archaeologists to be the very first large-scale cut stone pyramid. Consisting of six terraces 60m high, it is also considered by many to be the oldest known ancient Egyptian stone structure. Recently, a funerary temple was found, along with a burial shaft containing 3,000-year-old coffins. Clearly, Egypt has many more secrets to reveal.

After a full-on day, I debated whether to visit Islamic Cairo, but both camera and I were exhausted. Cairo is an amazing city, its sights overwhelming, and a return visit (or two) is definitely in order.

Afterthoughts

In the end, Egypt was everything

I had hoped for and more. Despite the inconvenience of PCR tests and masks, travelling during the

Covid-19 pandemic presented a unique benefit: experiencing Egypt without the crowds. It was an extraordinary privilege, and one likely never to be repeated.

If the Covid-19 pandemic taught us anything, it illustrated the complacency of "someday." Life is short and opportunities precious. With travel slowly returning to a state of normalcy, now is the perfect time to go. Each day on the trip, I counted my blessings. Like many businesses, dive operators suffered greatly during the pandemic and need your business. As long as sensible precautions are observed,

travel is not just possible but easy. Just go! ■

Thanks go to the African & Oriental Travel Company (orientafricatravel.com) and Red Sea Explorers (redseaexplorers.com).

Associate editor Scott Bennett is a widely published underwater pho-

tographer and dive travel writer based in Toronto, Canada, covering the Caribbean, Mediterranean, Red Sea, Europe, Africa, Southeast Asia, Oceania, South and East Pacific. More stories at: xray-mag.com/Contributors/Scott-Bennett

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Reunion Island

— *Jewel of the Southern Indian Ocean*

Text and photos by Pierre Constant, with
nudibranch photos by Myriam Dupuis

View over Reunion Island (left); Cascades Langevin, the waterfall, near St Joseph, on the southern coast (below). PREVIOUS PAGE: Two Spanish dancers (*Hexabranthus sanguineus*) at Les Douanes



Elliptical in shape, Reunion Island is located in the southern Indian Ocean, 800km east of Madagascar as the crow flies, and 200km west-south-west of Mauritius Island. With a surface of 2,512 sq km and a perimeter of 207km, it is the emerged tip of a volcanic mound that rose 7,000m above the ocean floor. Pierre Constant shares his adventure to this exotic and remote island.

the split of India from the African mainland. India drifted in a north-easterly direction. Sixty-five million years ago, the Indian Plate was located precisely where Reunion Island lies today (21°S, 55°30'E). It was the birth of a "hot spot," which led to exceptional volcanic activity.

Magma floods spilled out like the icing of a cake and created the titanic, 1.5 million sq km plateau of the Deccan Traps, west of India. It is contemporary to the impact of the Chicxulub meteorite in Yucatán (66 million years ago) and the Cretaceous-Tertiary boundary, which led to a massive extinction and the disappearance of the dinosaurs. As the Indian Plate moved farther northward, leaving behind the continental block of the Seychelles, the hot spot gave birth to the Maldives, the Laccadive Islands and the Chagos Archipelago.



A rift appeared between the African (Somalian) Plate and the Indian Plate 45 million years ago, and the hot spot moved under the former. Rather dormant for the next 30 million years, it



The Souffleur blowhole near St Leu (above); Reunion stonechat or tec tec bird (*Saxicola tectes*) at Cirque de Salazie (left)





The village of Cilaos in the highlands (above); Mascarene paradise flycatcher, (*Terpsiphone bourbonnensis*) at Piton d'Anchain (left)

History

Although the Arabs were to place the island on the marine chart in the middle of the 12th century, under the name Dina Moghrabin (Island of the Occident), Portuguese navigator Pedro de Mascarenhas disembarked in 1513, giving his name to the Mascarene Islands. The island's history is closely related to that of nearby Madagascar. After a failed fateful attempt to establish themselves in Madagascar's southern location of Fort Dauphin in the 17th century—due to aggressive local tribes and the devastating effect of malaria fever—Jacques de Pronis of France moved the colony in 1642, to a then deserted island farther east.

Taking possession under the banner of the French king Louis XIII, the French landed in St. Paul, and named the island Ile Bourbon.

Some 20 years later, Malagasy slaves were brought to the island. With the creation in 1664 of the French East India Company, Jean Baptiste Colbert sent four ships to the island.

In 1715, Bourbon's governor started cultivating coffee beans. Many African and Malagasy slaves were shipped to work on the farms. Some of them fled to the pristine forested highlands of the interior to escape their masters and came to be called the "marrons." Following the French Revolution and the abolition of royalty, the island was renamed "Reunion," in reference to the reunion of the Parisian and Marseillais revolutionaries.

Despite a mutiny of the slaves in St. Leu in 1811, slavery was not abolished until 1848. Sugar cane was introduced to replace the ailing economy of coffee, and an Indian



became active again 10 million years ago, consequently creating the Mascarene Islands, which comprises Rodrigues, Mauritius and Reunion Island. Among the three, Reunion is the youngest and would have erupted only three million years ago. It is composed of black basaltic lava. Piton des Neiges (3,071m) is the original volcano, followed by Piton de la Fournaise (450,000 years ago).

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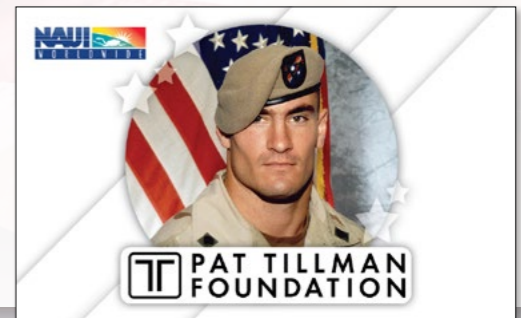
is a year-round campaign built on giving back to non-profits dedicated to our nation's greatest heroes - past and present. Each quarter, NAUI will present 1000 limited edition certification cards to all NAUI members for a \$10 donation at checkout. All proceeds will be made on your behalf at the end of each quarter to the non-profit or foundation. Our goal is to donate \$10,000 each quarter... are you in?!

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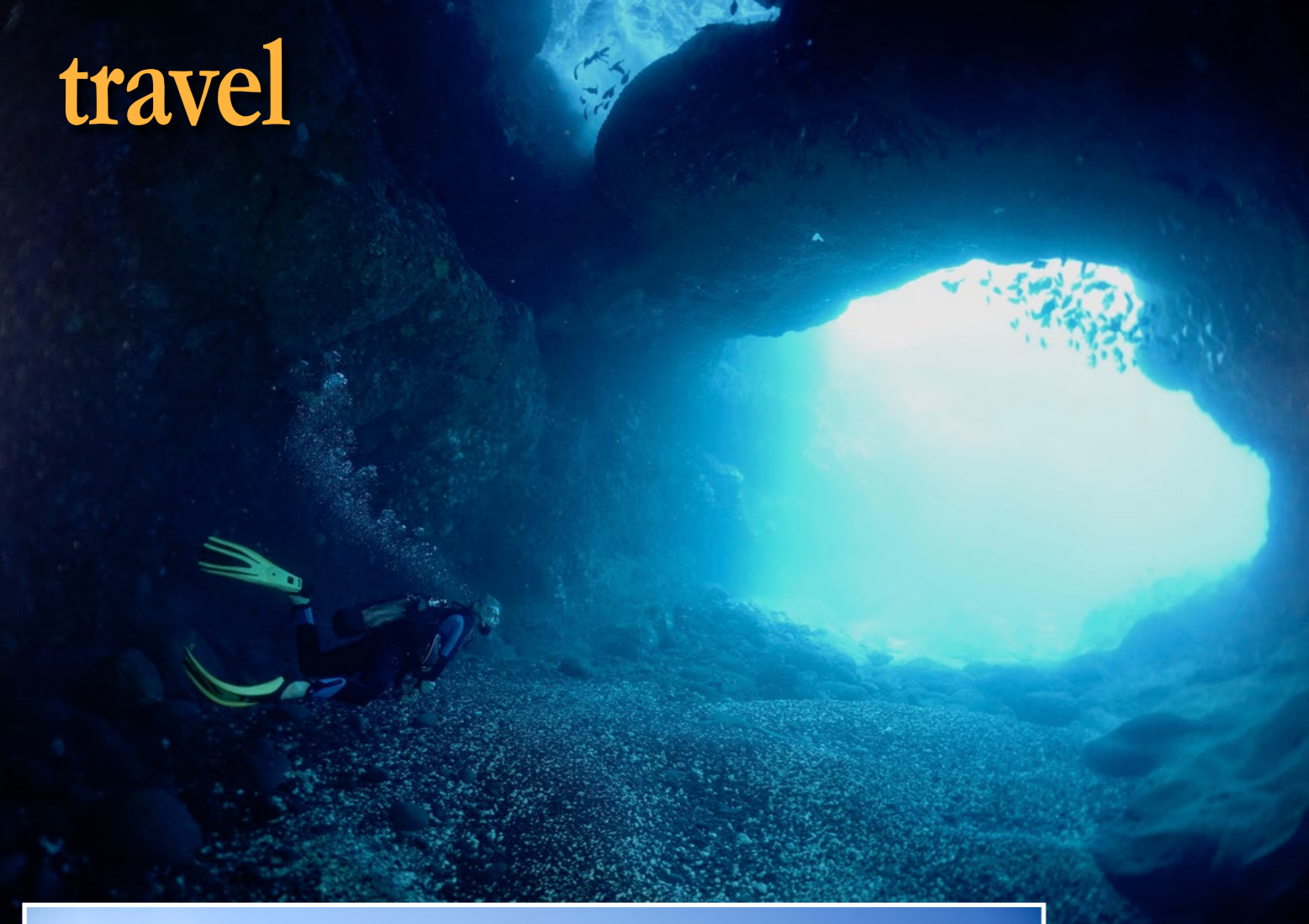
SkillBridge is an opportunity for you to access and leverage the world's most highly trained and motivated workforce at no cost for up to 180 days. Service members who participate in SkillBridge receive their military compensation and benefits, while you, our NAUI Approved VA Testing Centers, will provide the training and work experience. Our internship allows service members to use your G.I. Bill® to become a NAUI Dive Professional at one of our 65 NAUI VA approved testing centers around the world.

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SCAN FOR MORE INFO!





Hawksbill sea turtle at Cap La Houssaye (above); Laurent in cave at Cape La Houssaye (left); The marina at Le Port (bottom left)

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workforce was brought to the island by the planters. Indo-Muslim and Chinese immigration followed in the early 20th

century. In 1946, Reunion Island became an overseas French department.

Dive operations

There are about 50 dive centres on Reunion Island, with most of them located on the western coast. The busiest dive areas are St. Paul and St. Pierre. I met dive operator Laurent 12 years earlier on Madagascar's Nosy Be Island, where he once operated Oceane's Dream dive centre in Ambatoloaka. Since then, he has relocated to Le Port, slightly north of St. Paul, where the first settlers arrived in the 17th century.

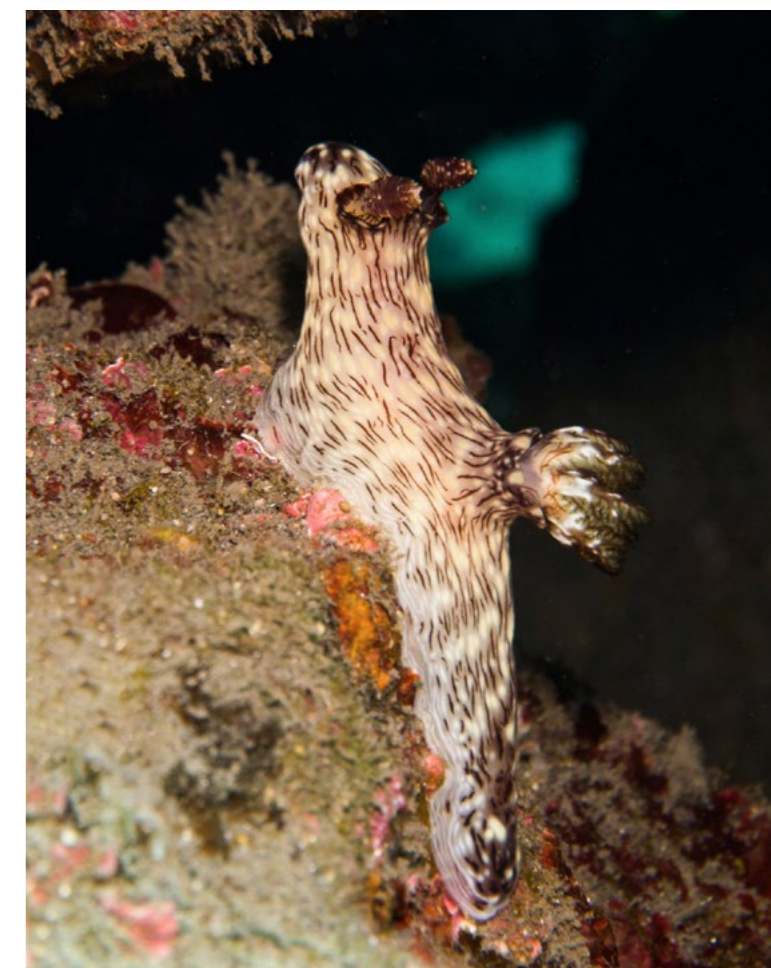
The renowned Cimetière Marin (Marine Cemetery) in St. Paul is the resting place of many early colonialists and slaves, including the infamous French pirate Olivier Levasseur (born in Calais on 5 November 1695). Known as "La Buse," he terrorised the Indian Ocean after skimming the Caribbean Sea. Associated with the British pirate John Taylor, Levasseur was credited with the capture of the Portuguese navy ship *Nossa Senhora do Cabo* (St.

Denis, April 1721). He was hanged in St. Paul in 1730, at the age of 45, for acts of piracy.

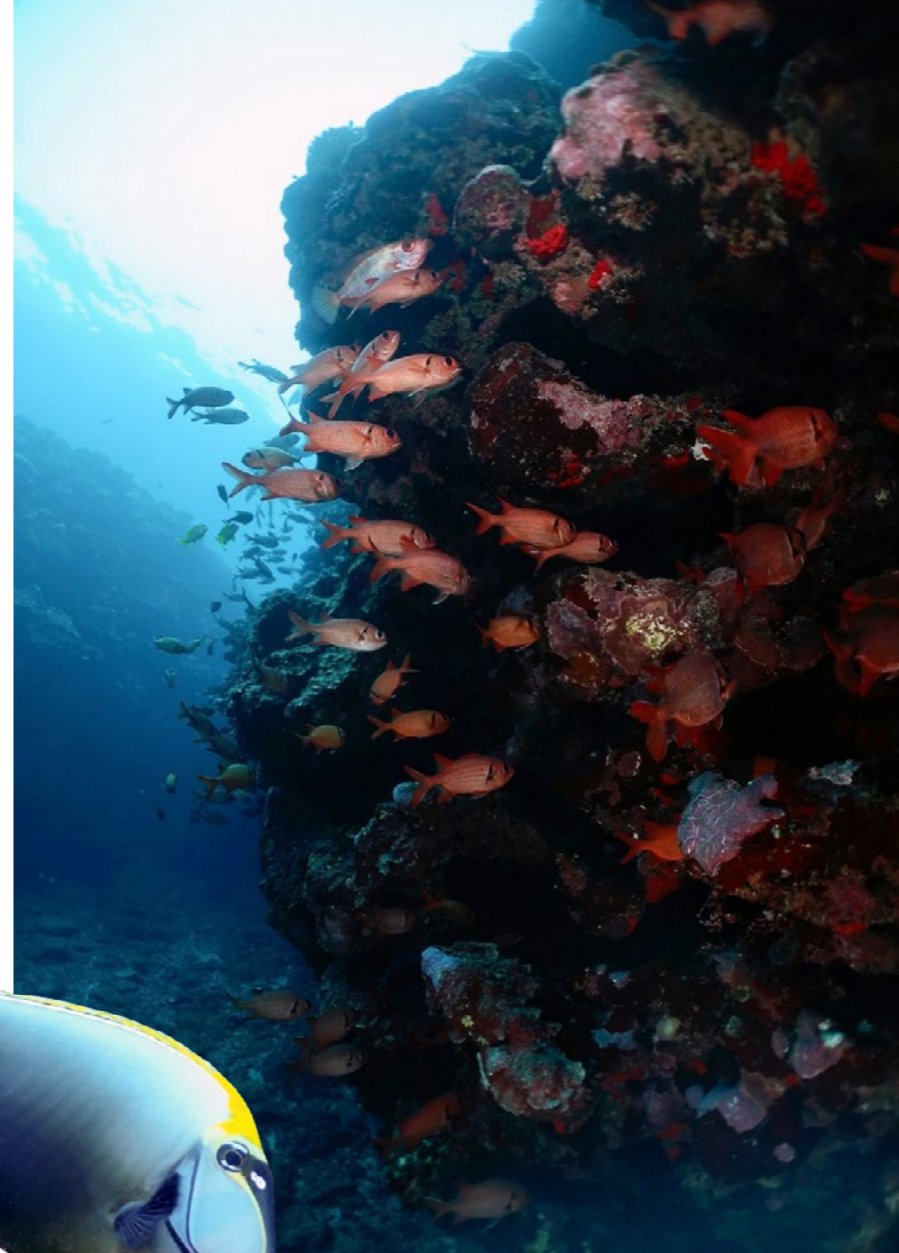
Fish life

Being primarily volcanic, diving Reunion is not to be compared with the rich coral reefs of the tropics or Indonesia. The fish and marine life are a mix of the Indo-Pacific fauna and that of the Indian Ocean. Fortunately, some fish species are endemic to the Mascarene region, and I would be clearly in search of those.

Since humans settled on Reunion Island almost 380 years ago, the island has been heavily fished, affecting fish populations and anything big, including sharks. The number of fishing lines found underwater is testimony to this. What remains are reef fishes, though colourful. Small fish schools are limited to common species such as Bengal snappers (*Lutjanus bengalensis*), yellowband goatfish (*Mulloidichthys vani-*



Jorunna rubescens nudibranch at Bouée Rouge



School of Bengal snapper at L'Ecole (above); Cloud of soldierfish on a canyon wall (top right) and a double bar surgeonfish (left) at Pain de Sucre; Elegant unicornfish (center)


have given Reunion Island a bad reputation. "But it only happened to bathers and surfers, not divers. I just do not see sharks underwater," said Laurent. Whenever an accident or a fatality occurs, the local government is quick to react with a massive cull and shark hunt, killing whatever they can find. Major beaches on the western coast are protected by shark nets, and the unfortunate creatures have virtually no right to live.

Diving



Most of the diving community was local, mainly French expats, as foreigners were practically unheard of. Based in Le Port, Dodo Palmé dive centre, founded 20 years ago, was run by Manu and his partner Laurent. Together, they were a cool, happy-go-lucky team, which currently offered a

lot of training and courses of the French FFESSM school, conducted by the charming Malagasy-born Morgane (daughter of Laurent) and a number of local instructors who pop in whenever needed. They were all friendly, good-natured people. Diving was done on a daily basis: one dive in the morning and one dive in the afternoon, depending on the wind, swell and sea conditions—except on Mondays when the dive centre was closed. After each dive, "ti punch" (rum and orange juice) was served at the bar; it was a tradition! Weekends were the busiest time. Dodo Palmé used an 8.5m aluminium boat, with a capacity of four to 12 divers. Night dives were conducted exclusively on Fridays before sundown.

The underwater landscape around Reunion Island was typically that of basaltic lava flows, carved by a maze of canyons, caves, swim-throughs, small arches, with lots of brown, salt-and-pepper-speckled expanses of volcanic sand.




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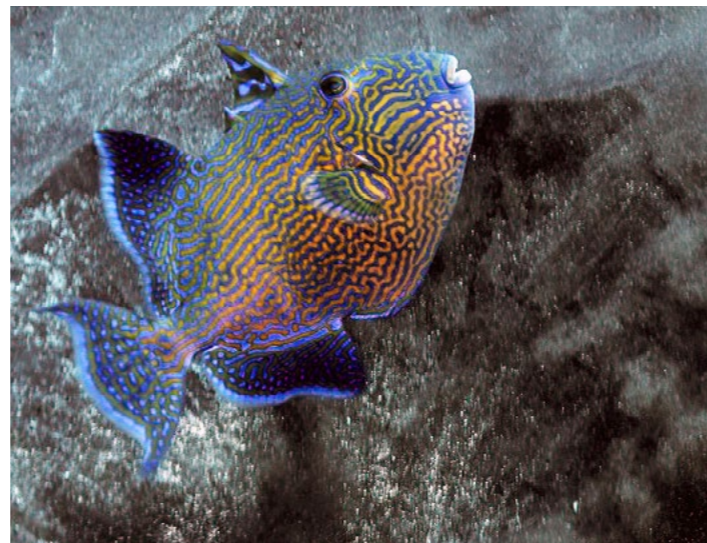
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MYRIAM DUPUIS



School of two-tone chromis (left), Laurent and white-spotted puffer (above), and *Bornella anguilla* nudibranch (right), at Cape La Houssaye; Gorgonian sea fan at Le Houlographe (top right)



MYRIAM DUPUIS



Subadult blue triggerfish (above), *Hypselodoris pulchella* nudibranch (right), and diver with old French cannon (center far right) at Cape La Houssaye



MYRIAM DUPUIS



Indian sailfin tang at Cape La Houssaye (right)

School of striped eel catfish at Cap La Houssaye

Cape La Houssaye. About 20 minutes from Le Port, southbound towards Boucan Canot, the cape was a basaltic extension of the land with a cliff carved with holes and caves. A school of two-tone chromis (*Chromis fieldi*), which are half black and half white, was seen among schools of yellowfin goatfish and convict tang (*Acanthurus triostegus*), which were

creamy white with thin black bars. A cute orange frogfish (*Antennarius commersonii*) inhabited the seafloor, often camouflaged on a sponge of the same colour. An evasive school of squid in stealth formation, flying over the sand, were curious of divers, but not tame! Worth having a look, the cave was actually an 80m long tunnel, with a cloud of golden cave sweep-

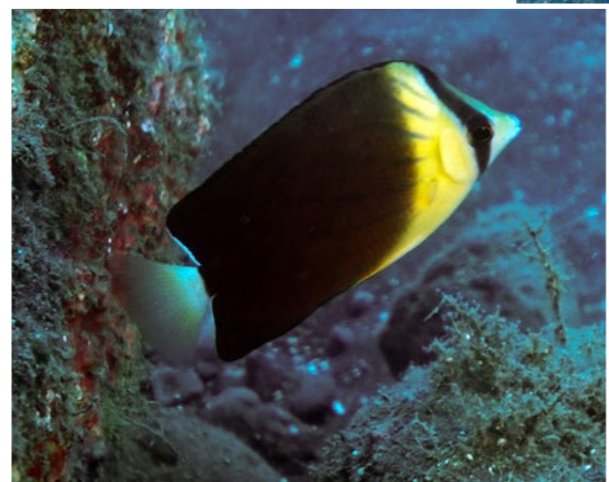
ers (*Pempheris vanicolensis*) around the entrance. An old cannon was an oddity resting on the basalt reef. The cape was a good spot for critters and nudibranchs such as *Glossodoris hikuerensis*, *Bornella anguilla* and *Hypselodoris pulchella*.

La Barge, nearby, was the wreck of an elongated floating platform at a depth

of 24m, with a resident school of Bengal snappers. Lionfish (*Pterois volitans*) hid inside the broken hull. Some old rusty anchors were found on the sand some distance away.

Le Houlographe was a floating buoy designed to measure the swell. It was a deep dive along the anchor chain, down





to 34m and beyond, where one could see a forest of white gorgonians. I noticed an interesting deep-water species, the African butterflyfish (*Chaetodon dolosus*), with a black mask over the eye and a black band along the caudal end. Some bearded scorpionfish (*Scorpaenopsis barbata*) gazed at me with a serious expression. I also marvelled at the Mauritian anemonefish

(*Amphiprion chrysogaster*), which was all black with three white bands, an orange belly and a white band on the caudal fin. The species is endemic to the Mascarene region.

Maharani. The afternoon dive took place at the tiny beach front and rocky shore of Boucan Canot.

There were big patches of lava in-between vast expanses of volcanic sand. Swim-throughs and small canyons added some spice to the dive. My eyes were caught by an attractive black-band-

ed hogfish (*Bodianus macrourus*), endemic to the Macarene Islands. Peacock groupers (*Cephalopholis argus*), sea chubs and large yellowtail snappers roamed the area. Orangespine unicornfish (*Naso lituratus*) were a visual treat.

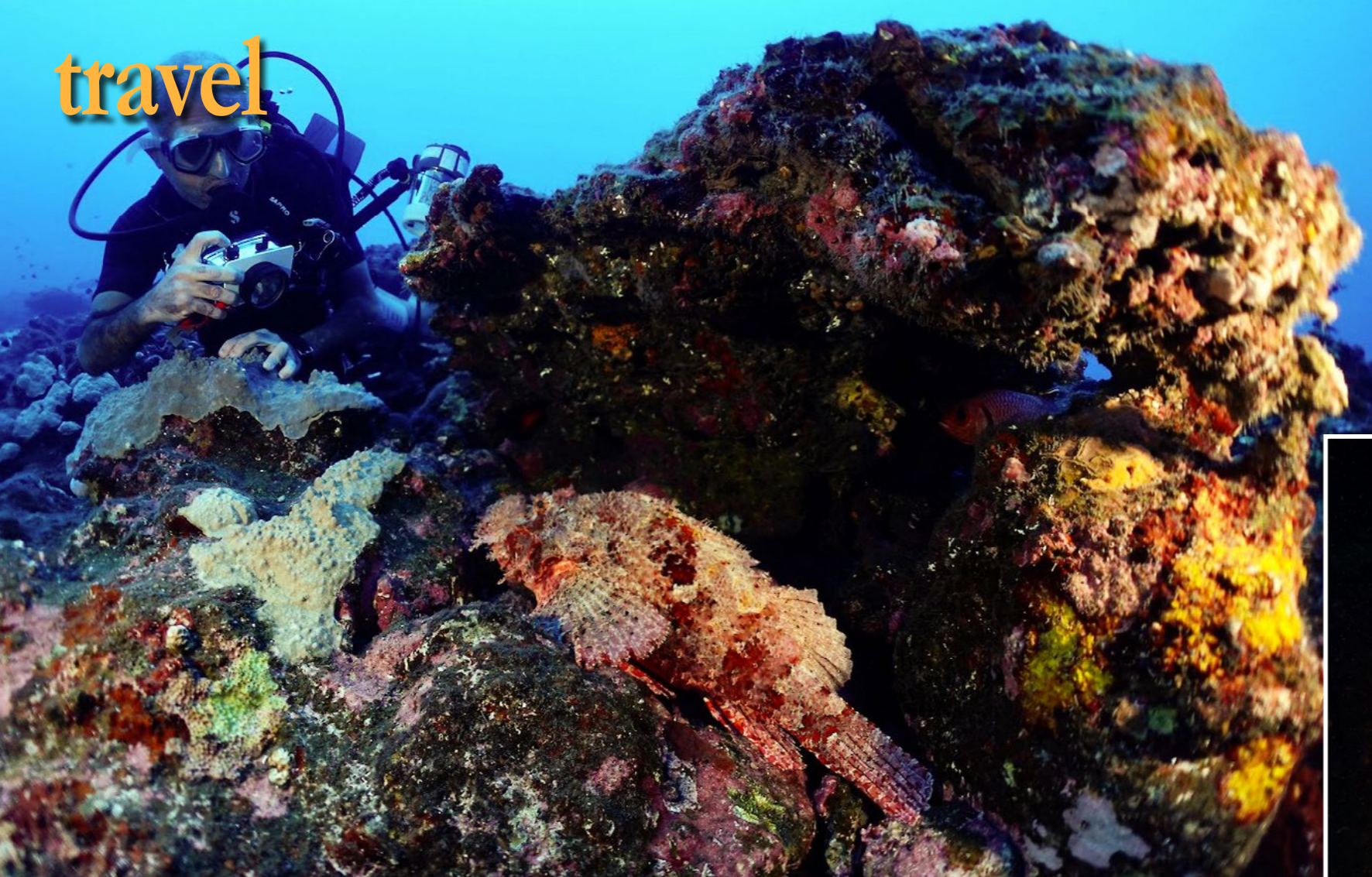
Le Vieux Fusil. Offshore from Le Port, this was another deep-water dive, in the 39m zone, where a ledge was found on the bottom. A cloud of black pyramid butterflyfish (*Hemitaurichthys zoster*), with a white band between two dark bands, was the attraction here, along with Indian doublebar goatfish (*Parupeneus trifasciatus*)—which had a crimson red and white body with dark bands

and thick lips—as well as clouds of red soldierfish. A yellowmouth moray (*Gymnothorax nudivomer*), which was brown with white dots, stared at me shyly from a hole in the rock. After 25 minutes on the bottom, a 11-minute decompression stop was compulsory.

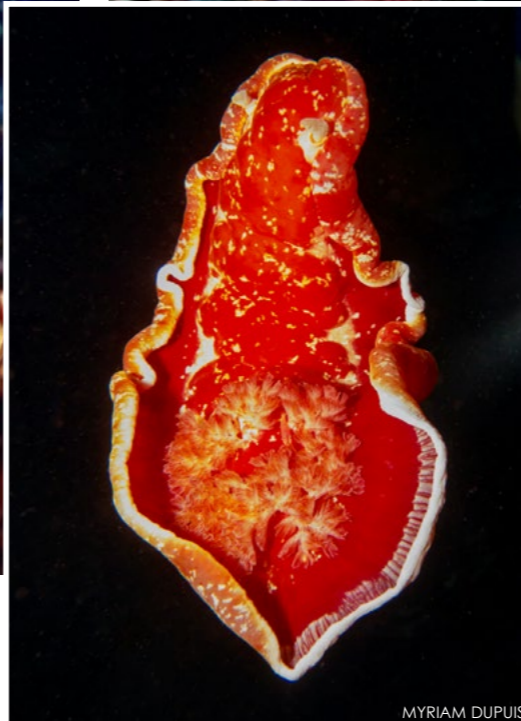
Les Douanes was located near the eastern side of Le Port. Nothing to rave about here. The bottom was a collection of rounded boulders at 18m, with a lot of brown sand all around. However, the presence of a species of stonefish (*Synanceia verrucosa*), which was grey and pink, was worth a mention. Unusual and lovely was the shadow butterflyfish, or



CLOCKWISE FROM ABOVE: Black-banded hogfish at Maharani; Madagascar butterflyfish at Les Douanes; Masked bannerfish at Maharani (top left); Shadow butterflyfish, or brownburnie, at Les Douanes; Geometric or grey moray at Les Douanes (top right); Yellowfin grouper at La Barge (far right); Phyllidia ocellata nudibranch at Les Douanes; Ardeadoris symmetrica nudibranch (center); Doublebar goatfish at Le Vieux Fusil (right)



Réunion



Diver with bearded scorpionfish (top left) and girdled triggerfish (above) at L'Ecole; Spanish dancer at Les Douanes (left); *Dendronephthya* sp. soft coral at Jardin de Corail (bottom left); Location of Réunion Island on global map (right); Map of Réunion Island (below)



browburnie (*Chaetodon blackburnii*), with a black body, yellow tail and white face; it is endemic to the triangle of East Africa, Madagascar and Mauritius. Also noted was the Madagascar butterflyfish (*Chaetodon madagascariensis*), which had a black chevron pattern on a white body, with half of the rear in orange. A geometric moray (*Gymnothorax griseus*), which was greyish white with tiny black dots on the head, poked its head out with curiosity from under a boulder. Stuck like an equilibrist between two rocks, a white leaffish was not photographer friendly. Les Douanes was also an interesting night dive where beautiful red or orange Spanish dancers (*Hexabranhus sanguineus*) could be observed. A rather similar deep dive was found at L'Ecole, a stone's throw away.

On to St. Pierre

In order to try another location, I drove down to St. Pierre, some 45 minutes south of St. Paul. The unpretentious dive centre of Kazabul, run by Julien (a local character straight out of a Western movie), was found at the harbour's marina. He took people out on his 5.5m semi-rigid inflatable boat powered by a Suzuki four-stroke outboard motor, in which he could happily fit ten divers, like sardines in a can. The diving here was different.

Jardin de Corail. The dive site of Jardin de Corail (coral garden) in the bay of Grambois had a reef flat at a depth of 12m, literally covered in hard corals. As we swam farther offshore, there was a reef wall between 20m and 30m of depth—an impressive sight, punctuated by *Dendronephthya* sp. soft coral, pur-

plish pink in colour. As one overlooked the sandy bottom below, the drop-off was carved by gullies. Fish life was inconspicuous though. Encounters included humpback unicornfish (*Naso brachycentron*) and elegant unicornfish (*Naso elegans*), as well as surgeonfish species such as the eyestripe surgeonfish (*Acanthurus dussumieri*) or the Indian sailfin tang (*Zebрасoma desjardini*). Mixed schools of Bengal snappers and goldspot emperorfish (*Gnathodentex aureolineatus*) mingled along the wall.

Back to Le Port

I then resumed my experience with Dodo Palmé for some more dives.





Green hard coral, *Tubastrea macrantha*, Le Vieux Fusil (above); Eyestripe surgeonfish at Pain de Sucre (top left)

Soldierfish under an overhang at Tahiti (above); Madagascar butterflyfish at Les Douanes (left); Female and male jewel fairy basslet at Tahiti (right)

Pain de Sucre. A thumb-shaped rock near Cap La Houssaye, this was a rather shallow dive at 15m but attractive enough with a maze of passages among rocky patches, including narrow canyons, overhangs and caves. There were hunting pairs of blacktail snappers (*Lutjanus fulvus*) and bluefin jacks (*Caranx melampygus*) as well as a couple of hawksbill sea turtles, one of which was bearing a GPS tracker on the top of its shell.

There were many species of surgeonfish such as eyestripe surgeonfish (*Acanthurus dussumieri*); doubleband surgeonfish (*Acanthurus tennentii*); epaulette surgeonfish (*Acanthurus nigricau-*

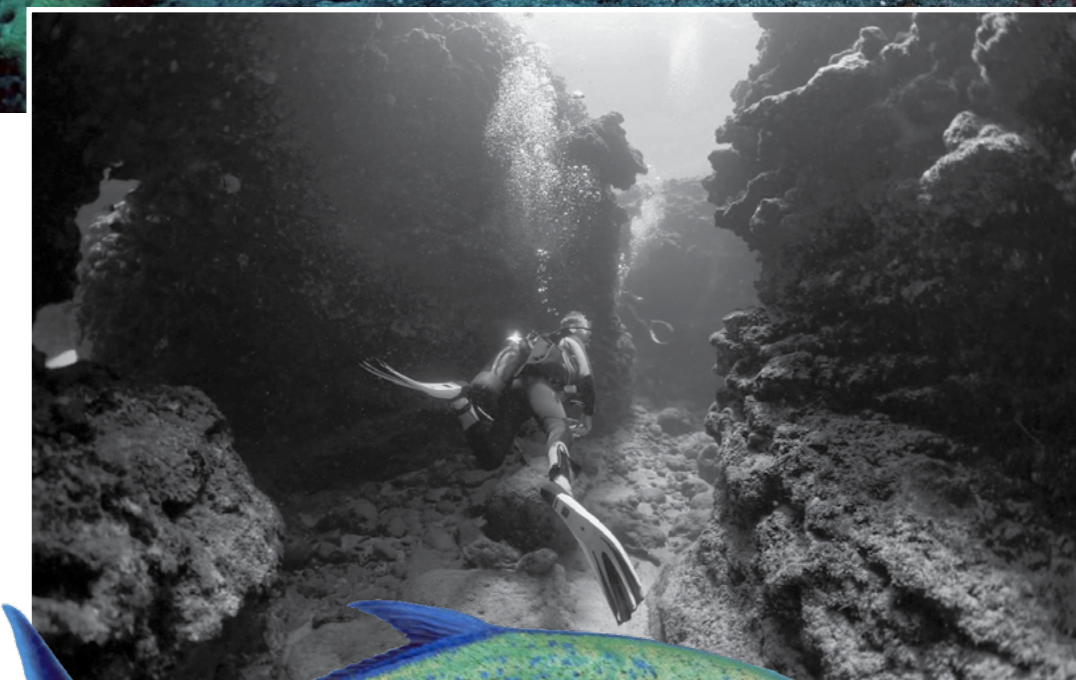
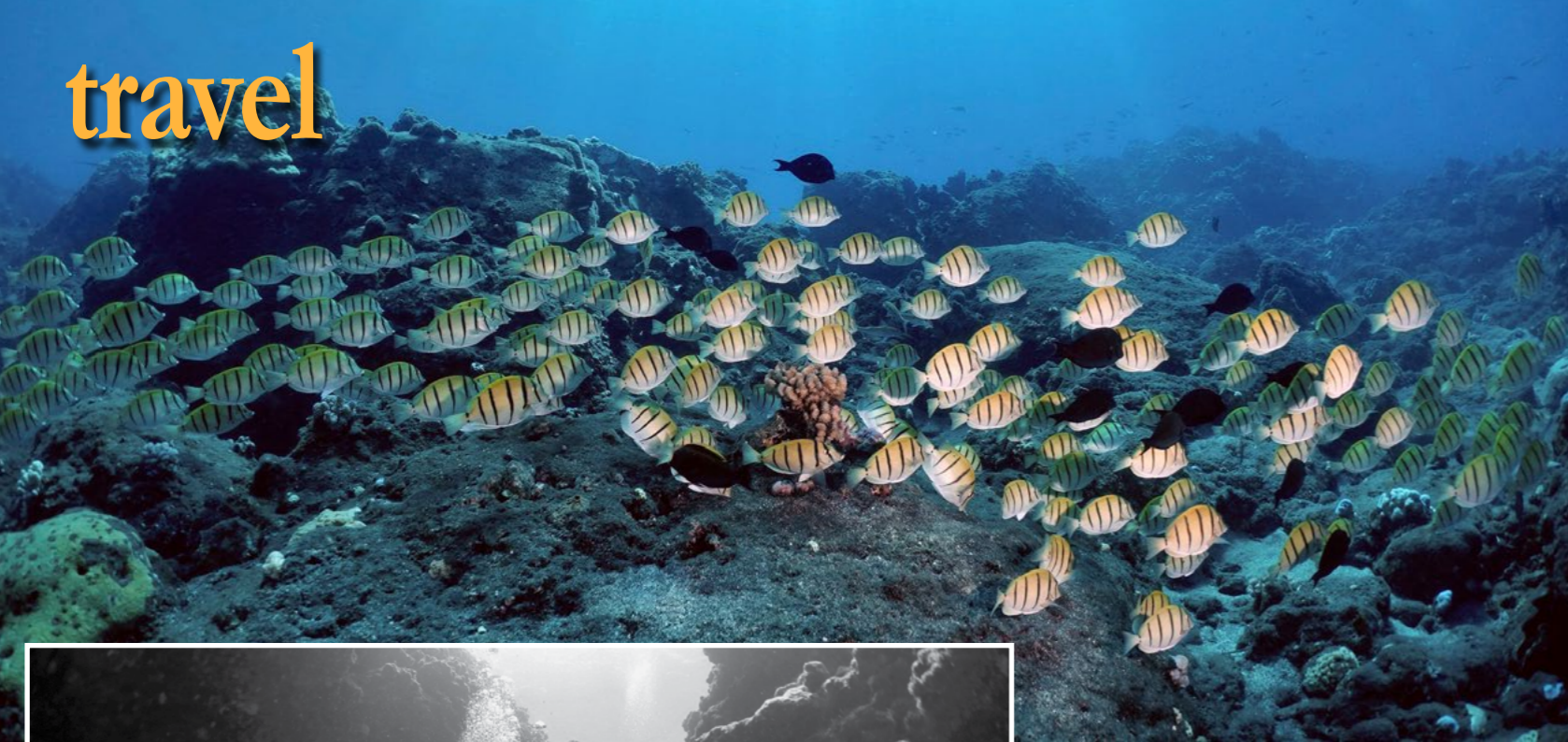
da), which were dark brown with a white band on the base of the tail; and spotted or two-tone tang (*Zebrasoma scopas*), which was a greenish brown and had a pointed nose. Morgane enthusiastically pointed out several longlegged spiny lobsters (*Panulirus longipes*) hiding in the cracks of the labyrinth. Bigeyes (*Priacanthus hamrur*), crimson red in colour, loomed everywhere in the darkness.

Tahiti dive site faced the big fuel tanks of eastern Le Port. A rocky shelf at 5m was covered with brocoli-like hard coral, white in colour. Under the overhang, curtains of Bengal snappers and red soldierfish

abounded. Giant cobblestones bedecked the slope below, which plummeted down to 40 metres on sand. Big rock patches were found at depth, some with gorgonians and schools of blacktail snappers circling in oblivion. A tame hawksbill sea turtle grazed between the rocks. Morgane showed me an exquisite zebra moray eel (*Gymnomuraena zebra*), which was reddish brown with thin white

Black-blotched stingray on the sandy bottom at Tahiti (above); Blacktail snapper at Pain de Sucre (top right)





Bluefin jack at La Tour

stripes, sharing its hole with a little green moray eel. In the shallows, little clouds of sea goldies (*Pseudanthias squamipinnis*) were an enchanting dash of orange (females) and pink (males), adding merrily to a rather austere landscape.

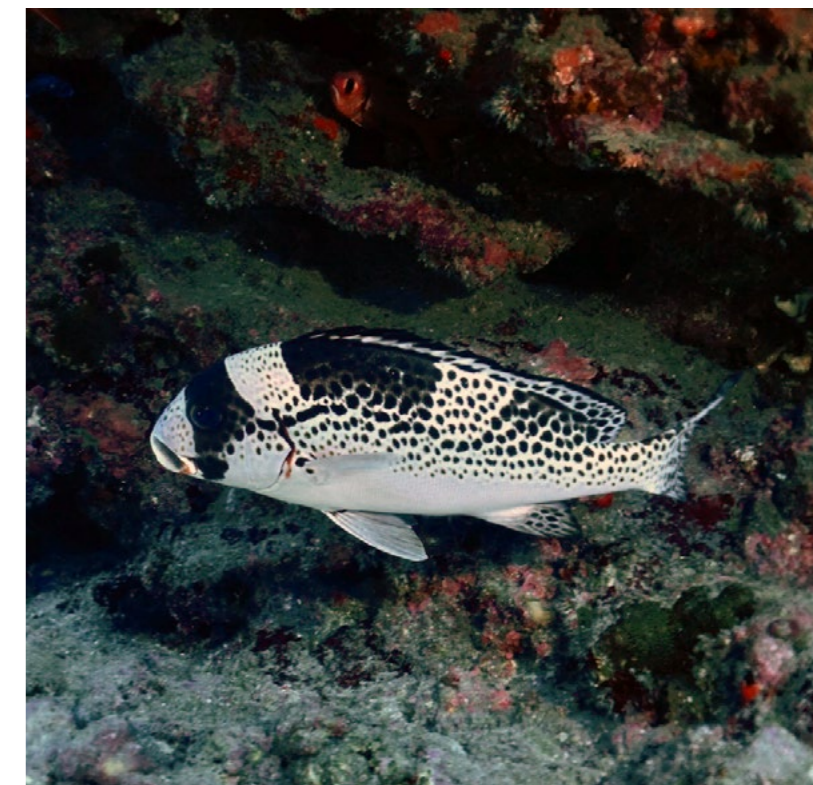
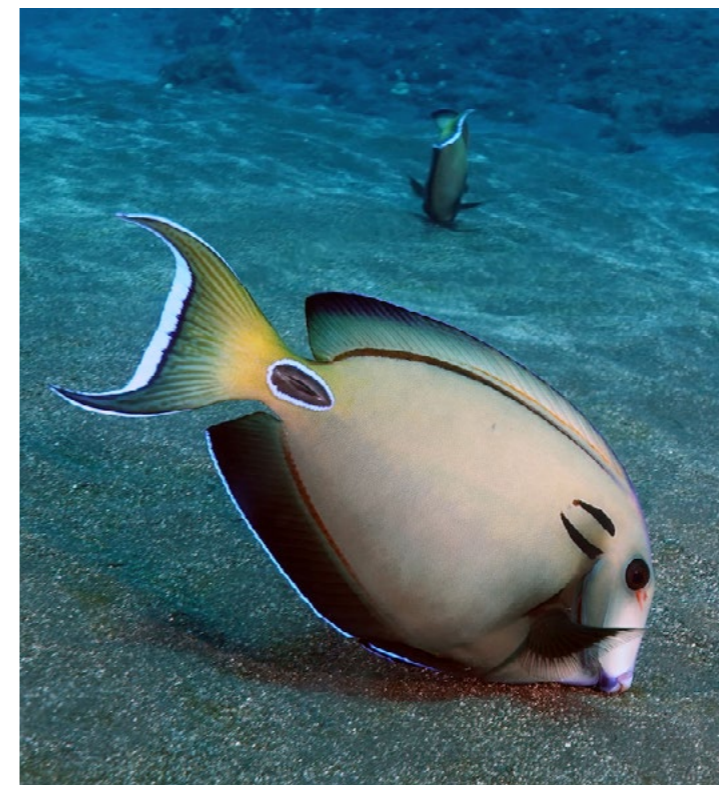
Myriam, Laurent's wife, was a keen underwater photographer

with a sharp eye for small stuff and critters. She would gladly point out a species that one would not even notice.

A professional guide and lecturer as well, she led people on historic tours in French, English and Russian.

La Tour. We had our last dive together with Laurent at La Tour, near Boucan Canot. The site was gifted with fabulous visibility and excellent sunlight. It was a wide-open space on the edge of a

rocky shelf, with canyons and swim-throughs, as well as islands of boulders in the sand. There were many species of groupers, including the masked grouper (*Gracila albomarginata*), white-edged lyretail grouper (*Variola albimarginata*) and the conspicuous blue-and-yellowfin grouper (*Epinephelus flavocaeruleus*), which turns rather dark and dull as an adult. We encountered a yellow-edged moray eel (*Gymnothorax flavimarginatus*) under a little rocky patch in the middle of a salt-and-pepper sandy flat. It was a cosmic experience on a perfect day.



School of convict tang at Cap La Houssaye (top left); Big eyes (top right) and subadult barred sweetlips (above right) at La Tour; Double band surgeonfish (above left) and orange frogfish (centre) at Cap La Houssaye; Diver in rocky maze at La Tour (far left)





CLOCKWISE: The author at Dolomieu Crater; Piton des Neiges volcano (3,071m), the highest summit on Reunion Island; The rim of the volcano, Le Maïdo; Notre Dame des Laves church, surrounded by the 1977 lava flow; Piton de la Fournaise volcano, and Formica Leo tuff cone inside the caldera



Volcanoes

No visit to Reunion Island would be complete without a visit to the three volcanic "cirques" (amphitheatre-shaped valleys) of Cilaos, Mafate and Salazie. These are found within a heavily eroded volcanic caldera, which belongs to the Piton des Neiges volcano in the central western area of the island. To enjoy this properly, you need to hire a car for a better approach. Then it is all about hiking and trekking to climb the mountains or

to experience the wet forest with beautiful *Cryptomeria* trees, an endemic conifer of Reunion Island, as well as giant acacia trees bearing mosses and lichens, wrapped in fog.

A must-do on your wish list is the unforgettable Piton de la Fournaise, better known as "The Volcano"—and a very active one at that! From Le Tampon and the desert heights of Plaine des Sables—amidst a unique lunar landscape—one reaches the end of the potholed dirt road at Pas de Bellecombe. From there, you enter the gate with a red-and-white signboard, which warns you that an eruption could possibly start in the next few days, and then you climb down into the caldera. On the *pahoehoe* lava flows (ropy

lava), one passes by the charming red-and-black tuff cone of Formica Leo, on the way to the imposing central volcano rising in the distance. Following the initial approach, the four-hour return hike leads one up to Cratère Dolomieu (2,632m), a 350m deep explosive pit, which is all that is left after Piton de la Fournaise blew its top in 2007. Numerous eruptions have taken place since then, with the last one occurring in 2019.

Ancient lava flows on the southeastern coast attest to the various events that cut the circular road repetitively. You will get a pretty good idea about how vegetation such as mosses, lichens, ferns, shrubs and trees colonised the new land over the years. Incredibly, the church of Notre Dame des Laves near Sainte-Rose was encircled by lava flow in 1977 but was somehow left standing and undestroyed in its pink and white aura. Locals

were prompted to call the event a miracle of divine intervention.

Waterfalls on the forested slope and in the depths of the ravines are a big attraction of the island on a hot day. Some of them may be too hard to reach, but Anse des Cascades near Sainte-Rose and Cascade Langevin on the southern coast, are definitely worth a look, for a dip or a picnic in a very natural environment.

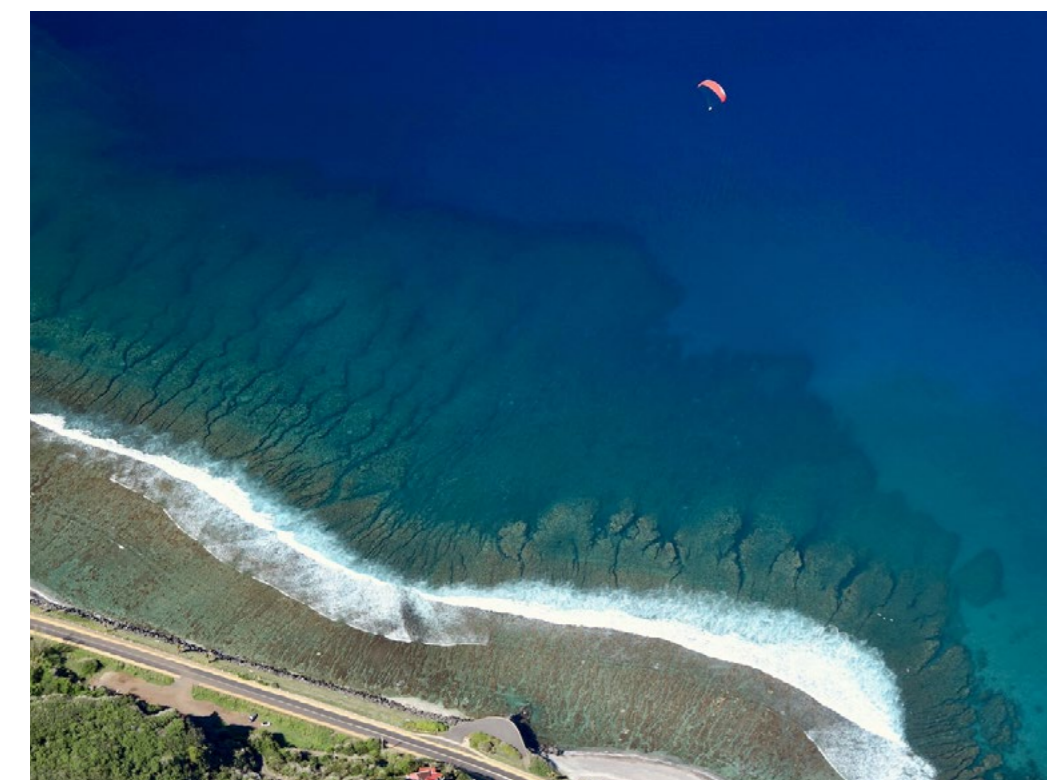
Air time

On a couple of dives with Dodo Palmé, I met a guy named Hans, who was a CSI policeman by night and free bird by day. This native Reunionese confessed that, deep down, he was a core enthusiast of flying. We had a nice chat, and once he understood the nature and purpose of my visit to Reunion Island, he surprised

me with an invitation: "What about a flight in a ULM (ultralight aircraft) over the island? Say, next Wednesday? I have a window..." An offer I could not refuse.

However, when the day came, the weather was not in our favour. It had been raining, and the fog would rise over the mountains. The flight was cancelled at the last minute. I was so disappointed.

"Postponed until next week?..." Hans suggested. So, I met him one early morning at the Planetair 974 shed at Pierrefonds Airport (near St. Pierre). This time, the gods were auspicious, and the weather was awesome.



crossed Cirque de Cilaos towards Col du Taïbit (which I had climbed a week earlier in the forest), and headed to the Cirque de Mafate and its charming

little villages spread out on diminutive plateaus in the green nature, and then went on to the balcony (panoramic viewpoint) of Maido, where I had been caught walking in fog, rain and wind. Finally, the ULM glided down towards St. Gilles on the western coast, over

the pastel-green reef flats of Passe de l'Hermitage, the elongated lagoon of La Saline, and the town of St. Leu. It was exhilarating! Without a shadow of doubt, after diving the depth of Reunion, an eagle's view of the island provided memories that would last forever. I made new friends here at Dodo Palmé, and who knows, I might be tempted to come back one day to explore more of this breathtaking hot spot, a jewel of the southern Indian Ocean. ■

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.

Sporting a flashy cherry red, the little twin-seater aircraft rose above Rivière des Remparts towards "The Volcano," which emerged from a ring of clouds. We circled the impressive Dolomieu Crater, and then headed towards the dented rim of ancient Piton des Neiges,

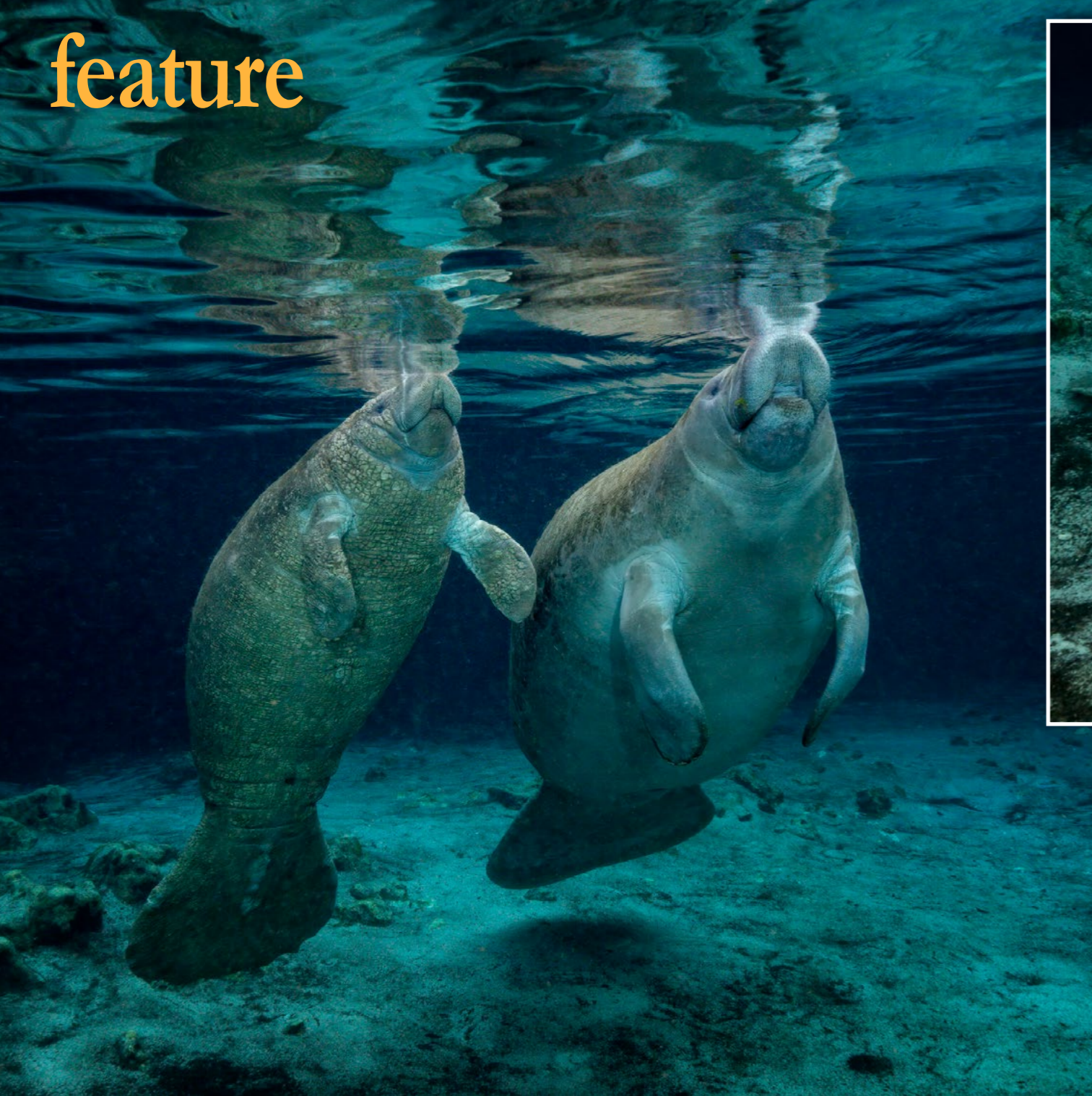
little villages spread out on diminutive plateaus in the green nature, and then went on to the balcony (panoramic viewpoint) of Maido, where I had been caught walking in fog, rain and wind. Finally, the ULM glided down towards St. Gilles on the western coast, over

THIS PAGE: Views from the flight. Rising up from the east, over the river, towards "The Volcano" (top left); Piton de la Fournaise volcano, looms above the clouds (top right); Cratère Dolomieu, Piton de la Fournaise (above); Paraglider on the southern coast; The author after the flight, next to Hans' ULM

Text and photos by John A. Ares, Larry Cohen, Anita George-Ares, Jennifer Idol, Kate Jonker, Celia Kujala, Matthew Meier, Brandi Mueller, Gary Rose, Don Silcock and Olga Torrey

We asked our contributors what their favorite images of broods and juveniles were, and they sent us photos and stories about the offspring and parenting behaviors of a variety of marine species. From a manatee mother and her calf to baby sea turtles to juvenile sharks, brooding Garibaldi fish to mantis shrimp protecting its eggs, a baby humpback whale to a rare nudibranch with a ribbon of eggs, *X-Ray Mag* contributors share their favorite images from near and far.

My Favorite Underwater
Progeny Pictures
Contributors' Picks from Around the World



Manatee calf with mother. Exposure: ISO 800, f/11, 1/60s (above); Exposure: ISO 800, f/11, 1/60s (left); Exposure: ISO 1000, f/10, 1/100s (right); Exposure: ISO 1000, f/10, 1/60s (previous page). Gear used for all images: Nikon D800 camera, Nikon 16-35mm lens, Nauticam housing, dual Ikelite DS160 strobes



Manatee Calf with its Mother, Crystal River, Florida, USA

Text and photos by Don Silcock

My favourite images of juvenile underwater creatures are those involving mammals. Their parent-child relationship is so much more intimate than with fish or reptiles, and my all-time personal picks would be from my trips to Crystal River in Florida to photograph the Florida manatees.

The Florida manatee is very much a protected species, and Crystal River is the

only place in the United States where one is allowed to be in the water with them. There is a great deal not to like about the whole "swim-with-the-manatee" industry, and on busy days, it is just awful. However, on quiet days or early mornings, it can be incredible. It is particularly so, if you are patient enough to learn how to read the manatee's behaviour patterns, and follow the rules on how you interact with them.

The very best spot in Crystal River to do

that is in Three Sisters Spring where, if you are there when it is quiet, the visibility can be astounding. Often it will be individual manatees that venture into Three Sisters Spring; but if you are really lucky, there will be a mother and her calf, and that is when you can observe the incredible bond between them. To read more about these wonderful creatures, please go to my complete **Guide to the Crystal River Manatees**.



Jawfish father with eggs in mouth, La Paz, Mexico (left). Exposure: ISO 100, f/4.5, 1/200s. Gear: Canon 10D camera, Sigma 50 macro lens, Ikelite housing, twin Ikelite 125 strobes

Progeny

Humpback whales, Silver Banks, Dominican Republic (left). Exposure: ISO 400, f/11, 1/250s. Gear: Canon F-1 film camera, Canon 20mm lens, Ikelite housing, ambient light. Converted to black and white with Nik Silver Efex photo software



Sea lion pups, Los Islotes, La Paz, Mexico (above). Exposure: ISO 100, f/4.5, 1/200s. Gear: Canon 10D camera, Tamron 11-18mm lens at 11mm, Ikelite housing, twin Ikelite 125 strobes



Mantis shrimp with eggs, Dumaguete, Philippines (left). Exposure: ISO 100, f/4.5, 1/200s. Gear: Canon Rebel SL1 camera, Canon 60mm f/2.8 macro lens, Ikelite housing, twin Ikelite DS-161 strobes

Humpback Calf, Sea Lion Pups, Mantis Shrimp & Jawfish Broods

Text and photos by John A. Ares

A humpback whale will bear a whopping 15-foot calf. However, photographing the calf is relatively easy. It must surface for air every five minutes or so. All you need to do is line up with the nose of the calf, and when it surfaces, you will be in position to see it up close. This black-and-white image of a humpback calf with its mother was taken with a film camera at Silver Banks in the Dominican Republic.

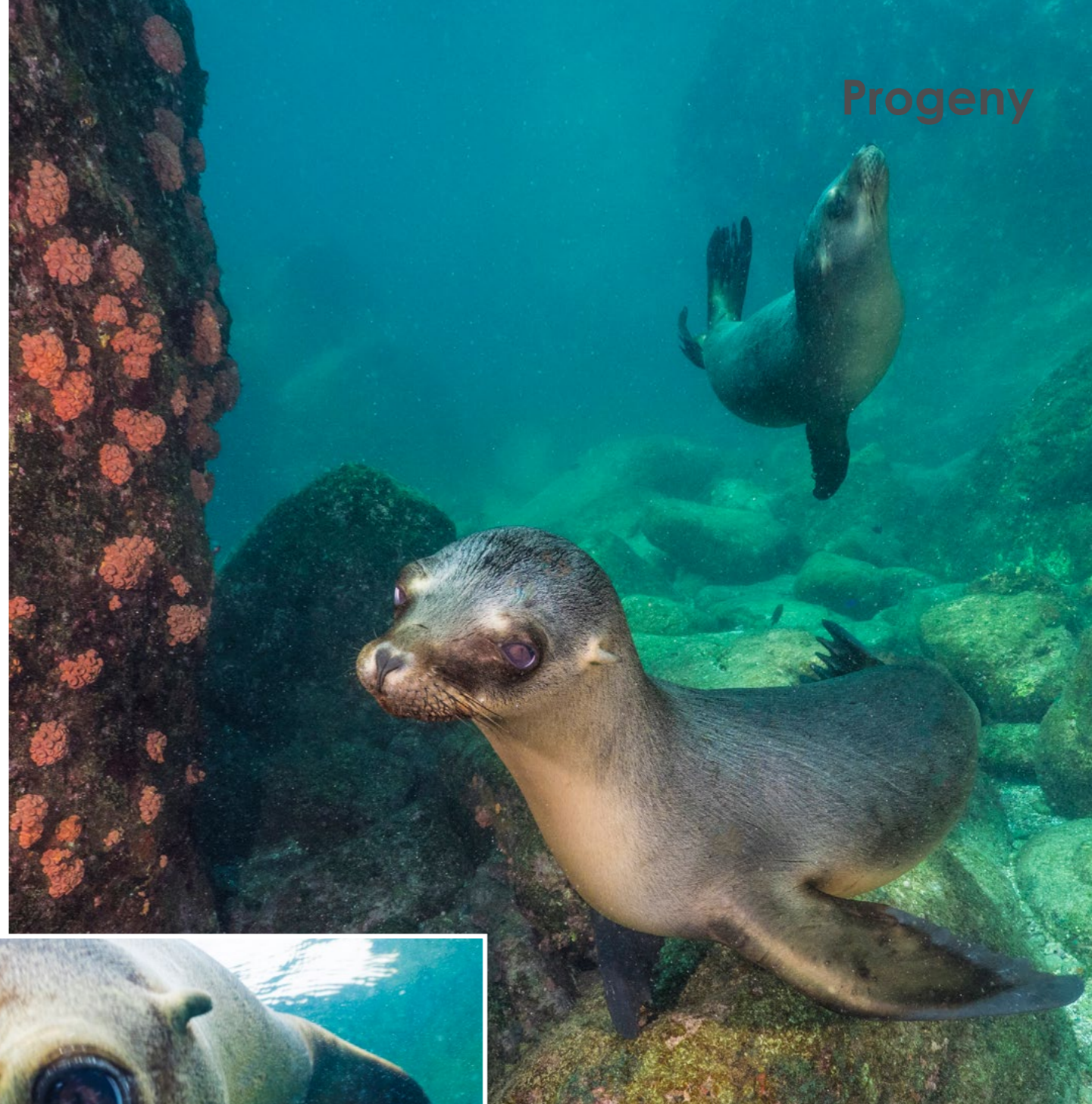
At just six feet in depth, Los Islotes at La Paz in Mexico is probably the world's best shallow dive. Here, sea lion pups cavort with divers and

live for play. Five pups are seen in the photograph. They were about seven months old in October and were big enough for the adults to leave them unsupervised for a short time.

Mantis shrimp eggs average 40 days to hatch. For this type of image, you need to work closely with dive guides and tell them what you want. I consider this shot, taken at Dumaguete in the Philippines, a "personal best."

Jawfish are mouth-breeders. The father takes on the role of incubating and aerating the eggs. Eggs take seven to nine days to hatch. This image was captured at La Paz in Mexico. Visit: johnaresphotographic.com





Progeny

Sea Lion Pups, Isla Espíritu Santo, La Paz, Mexico

Text and photos by Larry Cohen

Diving with sea lions, especially pups, is an awe-inspiring experience. It is like playing with a litter of puppy dogs! One of the best locations is Isla Espíritu Santo, a two-hour boat ride from La Paz, Mexico. There is a large sea lion colony to the north of the island. Here, you can experience the antics of adults and pups from just under the surface to about 60ft (18.29m).

Sea lion pups are unafraid of divers, and it is not unusual for them to come over and look you in the face. The juveniles compete with each other for attention. It was heartwarming to see the way the youngsters affectionately played with their mothers.

I had my dome port cover stored on my arm while I was taking photographs. I thought I had



Sea lion pup, Isla Espíritu Santo, Mexico (above and left). Exposure: ISO 200, f/8, 1/200s. Gear: Olympus OM-D E-M1 camera, Olympus 9-18mm lens at 9mm lens, Aquatica housing, dual Sea&Sea strobes; Mother and pup affectionately playing with each other (top left). Exposure: ISO 200, f/5.6, 1/180s. Gear: Olympus OM-D E-M1 camera, Olympus 9-18mm lens at 9mm lens, Aquatica housing, dual Sea&Sea strobes

lost the cover when I saw two sea lion pups having a great time tossing the cap from one to the other. So I grabbed my dome cover back, and the sea lions looked me in the eye and swam away. Visit: liquidimagesuw.com

feature



School of juvenile cardinalfish in black coral, Maaya Thila, Maldives (left). Exposure: ISO 200, f/8, 1/200s. Gear: Canon EOS Rebel SL1 camera, Canon EF-S 18-55mm f/3.5-5.6 IS STM lens, Ikelite housing, two Ikelite DS161 strobes

Saddleback anemonefish with eggs (right), Maayong Tubig Pier, Dumaguete, Philippines. Exposure: ISO 100, f/11, 1/200s. Gear: Canon EOS Digital Rebel XTi camera, Canon EF 50mm f/2.5 compact macro lens, Ikelite housing, two Ikelite DS161 strobes

Ringed pipefish carrying eggs in brood pouch, Bahura South, Dumaguete, Philippines (below). Exposure: ISO 200, f/11, 1/200s. Gear: Canon EOS Digital Rebel XTi camera, Canon EF 50mm f/2.5 compact macro lens, Ikelite housing, two Ikelite DS161 strobes

Spiny chromis guarding juveniles, Jalan Masuk, North Sulawesi, Indonesia (bottom right). Exposure: ISO 200, f/11, 1/200s. Gear: Canon EOS Rebel SL1 camera, Canon EF-S 18-55mm f/3.5-5.6 IS STM lens, Ikelite housing, two Ikelite DS161 strobes



Progeny



Spiny Chromis, Ringed Pipefish, Anemonefish & Cardinalfish

Text and photos by
Anita George-Ares

The spiny chromis guarding their young captivated me during several dives in North Sulawesi, Indonesia. Spiny chromis are unusual among fish in that the parents care for both their eggs and their juveniles. Unlike most fish species, the spiny chromis young do not have a pelagic (open water) stage. The adults aerate the eggs and chase potential predators away from the eggs

and juveniles. The young feed upon the mucous produced on their parents' skin.

I attempted to photograph adults with juveniles of different sizes and ages. This proved to be challenging, as it was difficult to focus on the constantly moving young. Spiny chromis have several color variations. The dark variation is common in Indonesia.

While diving off Dumaguete in the Philippines, it is not unusual

to find a pair of ringed pipefish under a coral ledge. Like the female seahorse, the female pipefish transfers her eggs into the male's brood pouch. The brood pouch provides nutrients and oxygen for the developing eggs. Depending on the pipefish species, the eggs hatch in about two to four weeks.

The anemonefish male assumes the responsibility of aerating and guarding the eggs until they

hatch. Compared to pipefish, anemonefish eggs hatch relatively quickly—within six to ten days.

The Maaya Thila dive site in the Maldives has beautiful stands of black coral. After photographing a hawksbill sea turtle foraging among the black coral, I

investigated another stand of black coral where I found this school of juvenile cardinal-

fish. Please visit my Facebook Page at: [facebook.com/profile.php?id=100016947967639](https://www.facebook.com/profile.php?id=100016947967639)





Progeny



An egg tooth helps these leatherback hatchlings crack through their shells before they fight to emerge (top right). Exposure: ISO 400, 500mm, f/9.0, 1/500s. Gear: Nikon D5 camera, Nikkor 200-500mm lens, Nauticam housing; Seaweed can be an obstacle for emerging hatchlings such as these Kemp's Ridley sea turtles, tiny in comparison (bottom right). Exposure: ISO 800, 60mm, f/9.0, 1/100s. Gear: Nikon D90 camera, Nikkor 60mm lens, Nauticam housing

Hatchlings are covered in sand until the first waves wash the granules from them and reveal their tiny eyes (top left). Exposure: ISO 400, 60mm, f/8.0, 1/80s. Gear: Nikon D90 camera, Nikkor 60mm lens, Nauticam housing; A clutch of leatherback sea turtles emerges from their nest in St. Croix (center inset). Exposure: ISO 400, 3300mm, f/7.1, 1/125s. Gear: Nikon D5 camera, Nikkor 200-500mm lens, Nauticam housing

A Hatchling's Life

Text and photos by Jennifer Idol

Aquatic life is weird. Sometimes adults do not look like their offspring, while other times, juveniles look like miniature replicas of their parents—even at the macro level. Regardless of the species, the young capture our hearts as we wonder how something so fragile could ever make it in their hostile environments. Of all juveniles, the sea turtle growth story is the most compelling for me.

The young are as small as an Oreo cookie, with fragile flippers and an enormous journey ahead. They begin life fighting to emerge from the sand for their first breaths before heading to the sea. Their journey across the sand is a gauntlet, escaping predators as they race to find cover and food in the open ocean.

I have photographed the largest of sea turtle hatchlings—the leatherback—and the smallest—the Olive Ridley sea turtle. Both emerge from nests buried in the sand and are subject to numerous dangers, including our footsteps with the potential

to crush or to pack sand. As few as one in 1,125 of these tiny replicas will grow to become adults and return to their beaches roughly 15 years later to lay their own nests.

In Texas, North Padre Island National Seashore works to protect as many hatchlings as possible and give them a head start through their incubation program, which significantly increases their survival rate. Sandy Bay National Recreation Area in St. Croix protects nests by closing beaches during nesting season. Both efforts help these slow-growing, long-lived sea turtles. Visit: uwDesigner.com





The mystery egg ribbon, Sterretjies Reef, Gordon's Bay, South Africa (top left). Exposure: ISO 160, f/8, 1/250s. Gear: Canon EOS 7D Mark II camera, Canon 60mm macro lens, Sea&Sea housing, two Sea&Sea YS-D1 strobes; Candelabra nudibranch with egg ribbon (top right). Exposure: ISO 200, f/25, 1/250s. Gear: Nikon D850 camera, Nikkor 60mm macro lens, Isotta housing, two Inon Z240 strobes with lardo's snoot, +12.5 diopter

Rare Nudibranch's Egg Ribbons

Text and photos by Kate Jonker

When searching for nudibranchs, it is often easier to spot them if you know what their egg ribbon looks like. If you can find the egg ribbon, you usually find the nudibranch. This is because most egg ribbons are white, or a light colour and easier to find than their (often) well-camouflaged parents.

A while back, I noticed an abundance of small, white, whorl-like egg ribbons on much of the red bait (*Pyura stolonifera*) at Sterretjies Reef in Gordon's Bay (near Cape Town, South Africa). But search as I might, I could not find the parents. Assuming they were well-camouflaged, I searched—but to no avail.

Six months went by, and the eggs slowly disappeared. Perhaps they had hatched

and were already well-camouflaged parents themselves.

Recently, I noticed that egg ribbons had started to reappear. However, the surge was huge, and staying in one spot without damaging the reef was challenging. Eventually, in a moment of calm, I was able to search the red bait for the parents. And lo and behold, they were home! I waited patiently, flying five metres one way and five metres back, until the next patch of calm arrived and I was able to photograph the 5mm-long brown-coloured nudibranchs.

After downloading my photos, I was excited to discover they were candelabra nudibranchs (*Eubranchus* sp.) which are rare and endemic to False Bay. The moral of the story: Rely on the offspring, be patient, and they will eventually lead you to their parents! Visit: katejonker.com



Candelabra nudibranch, showing its candelabra-shaped cerata. Exposure: ISO 200, f/25, 1/250s. Gear: Nikon D850 camera, Nikkor 60mm macro lens, Isotta housing, two Inon Z240 strobes with lardo's snoot, +12.5 diopter



Side view of the candelabra nudibranch, showing its glittery details (above). Exposure: ISO 200, f/25, 1/250s. Gear: Nikon D850 camera, Nikkor 60mm macro lens, Isotta housing, two Inon Z240 strobes with lardo's snoot, +12.5 diopter





California Sea Lion Pup with Mum

Text and photos by Celia Kujala

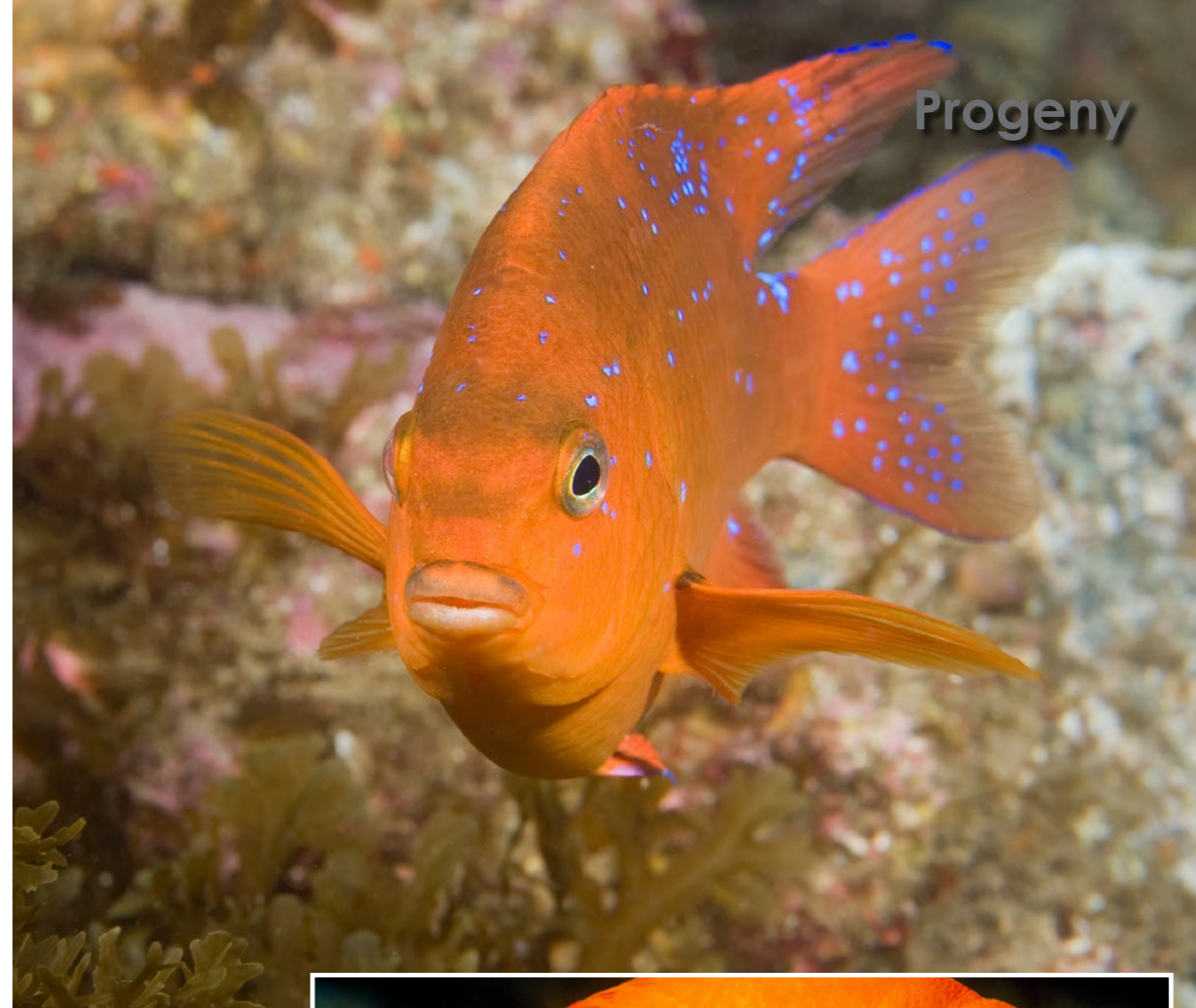
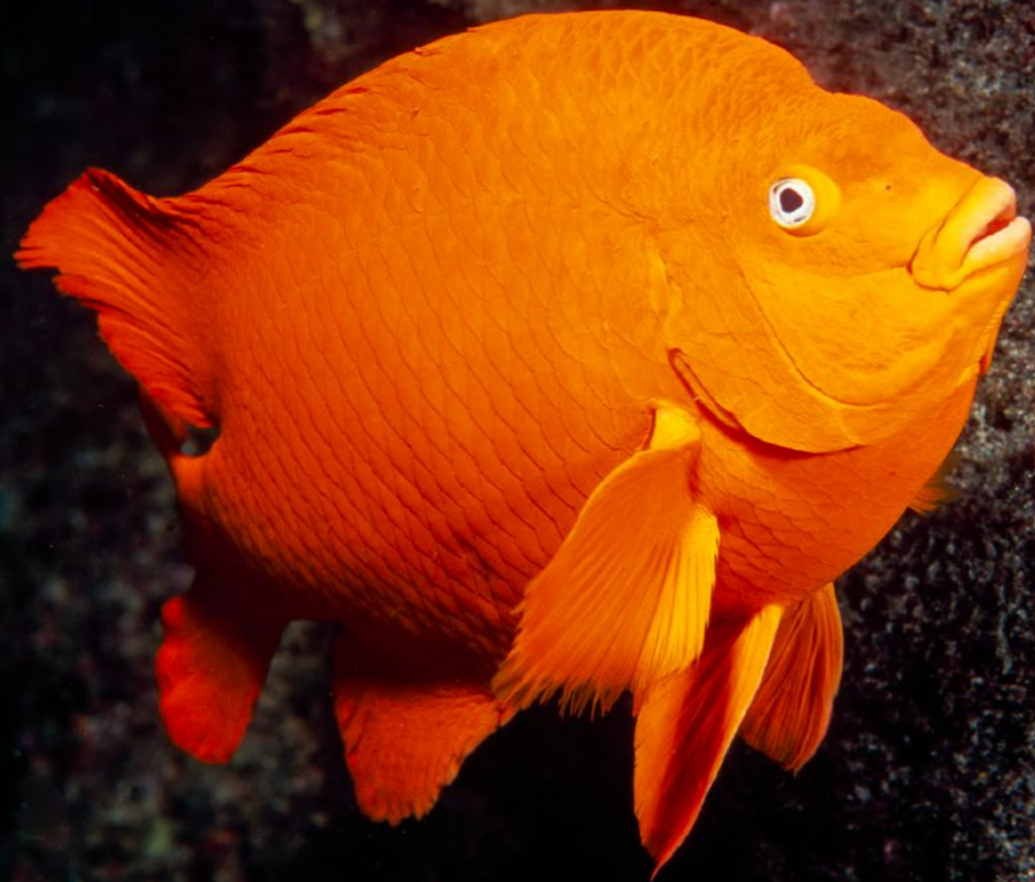
The California sea lion rookery of Los Islotes in Baja California Sur, Mexico, is the southernmost rookery of the species. It is a wonderful place to dive with sea lions because of the warm, beautiful blue water that one finds there during certain parts of the year. It was on one of my trips to the rookery in October that I had one of the most special experiences underwater.

During that time of year, sea lion pups are growing up fast, but they are still young and dependent on their mothers. I have had the chance to observe many mom-and-pup interactions on land, but this was the first time I had the opportunity to observe the intimate bond of the mom and pup underwater. When the cuddles got to be too much, the pup did not hesitate to give her mom a playful bite. Later in that dive, I saw a mom-and-pup pair dance in the sunbeams in what appeared to be a beautifully choreographed dance. The sunbeams were shining on them like a spotlight. It was the same area I had seen the pair earlier, and I will always wonder if it was them. Visit: sealpeace.com

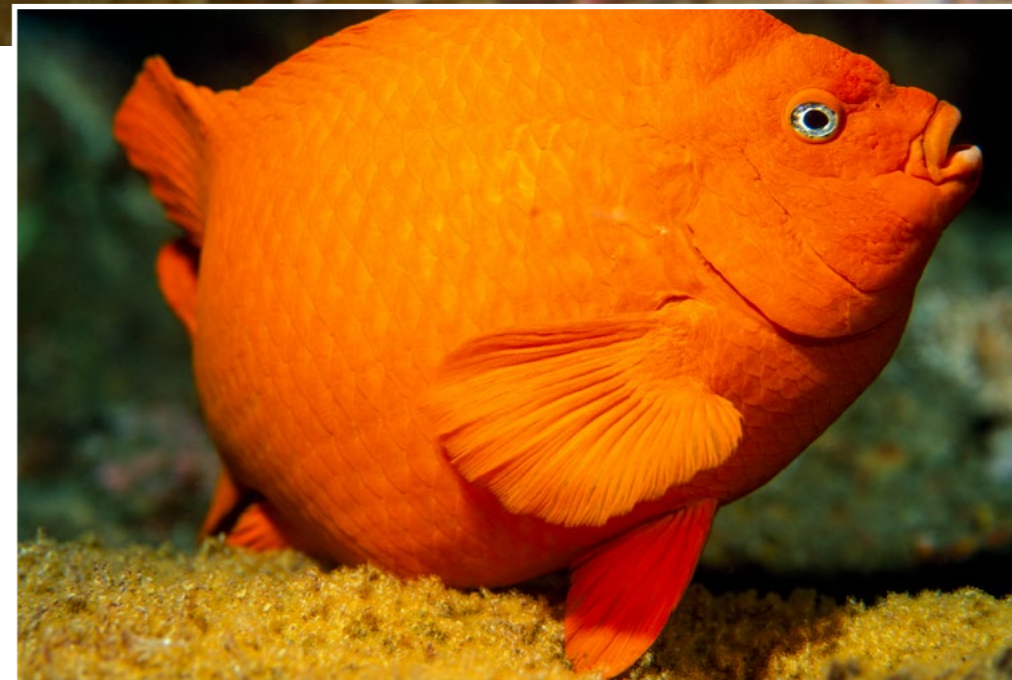


Gear used for all images: Nikon D500 camera, Tokina 10-17mm fisheye lens, Nauticam NA-D500 housing, dual Sea&Sea YS-D2J strobes. *Cuddles* (top left). Exposure: ISO 320, f/14, 1/250s; *Dance of the Mom and Pup* (top right). Exposure: ISO 320, f/14, 1/250s; *Tiny Bite* (above). Exposure: ISO 320, f/14, 1/250s; *Peering* (left). Exposure: ISO 320, f/14, 1/250s





Progeny



A male Garibaldi aerating its nest of eggs with its fins, Santa Cruz Island, California (above). Gear: Nikon F4 film camera, Nikon 105mm macro lens, Subal housing, two Ikelite strobes; A blue-spotted, intermediate-phase juvenile Garibaldi, Catalina Island, California (top right). Gear: Nikon D3 camera, Nikon 105mm Macro lens, Subal housing, two Sea&Sea YS-250 strobes. Exposure: ISO 200, f/16, 1/125s

A male Garibaldi guarding its nest of eggs, Catalina Island, California, USA (top left). Gear: Nikon F4 film camera, Nikon 105mm macro lens, Subal housing, two Ikelite strobes; An adult male Garibaldi swimming above red and purple sea urchins, Santa Cruz Island, California (left). Gear: Nikon F4 film camera, Nikon 20mm lens, Subal housing, two Ikelite strobes

Garibaldi Damsel fish, California, USA

Text and photos by Matthew Meier

One of my favorite parenting behaviors to witness plays out in my own backyard. The Garibaldi (*Hypsypops rubicundus*) is the largest member of the damsselfish family, growing up to 15 inches (38cm) in length, and has been granted protection from the fishing and aquarium trades as the official California state marine fish. It inhabits a range from Monterey Bay, California down to Baja California, Mexico and is easy to recognize with its uniformly vivid orange coloration. Juveniles appear similar to adults except for the numerous bright blue spots covering their bodies and fins.

Like all damsselfish, the male tends to the eggs, which the female deposits on a section of bare

rock prepared by the male within its territory. Fanning the eggs with its fins and blowing water over them with its mouth, the male aerates the eggs, in a similar fashion to its smaller clownfish relatives. During the roughly three weeks it takes for the eggs to hatch, the male maintains a close watch over the nest and aggressively defends its vulnerable brood from any creature, large or small.

On several occasions, I have taken advantage of this predictable behavior by locating a pleasing composition near an active nest and patiently waiting until the Garibaldi swam into the frame before snapping a photo. If conditions and bottom times allowed, I would shoot the same scene over and over again, firing the shutter each time the Garibaldi swam over to investigate. Visit:

MatthewMeierPhoto.com





Progeny

A peacock mantis shrimp holding its bright pink eggs, Lembah, Indonesia (above). Exposure: ISO 200, f/16, 1/200s. Gear: Nikon D90 camera, Nikon 105mm lens, Ikelite housing, dual Ikelite DS161 strobe; A weedy seadragon with only a few unhatched eggs left on its tail, Tasmania, Australia (top right). Exposure: ISO 250, f/16, 1/160s. Gear: Nikon D750 camera, Nikon 60mm lens, Ikelite housing, dual Ikelite DS161 strobes

Family Portraits

Text and photos by Brandi Mueller

The original underwater maternity shoot. Some of my favorite behaviors to see underwater are marine life caring for the next generation. In the strange world below, parental care is often quite different from what we are used to up on the surface, and I love it when critters pose for the camera, showing off their future offspring.

Nudibranchs, like the *Costasiella sp.* (also known as Shaun the Sheep nudibranch), lay their eggs in coils on a leaf of algae, and this Shaun in the

photo seems to be proudly displaying its future baby nudibranchs. The yellowhead jawfish (and other jawfish species) are mouth-brooders that protect their eggs by holding them in their mouths, occasionally spitting them out to aerate and rotate them, keeping them healthy until they hatch.

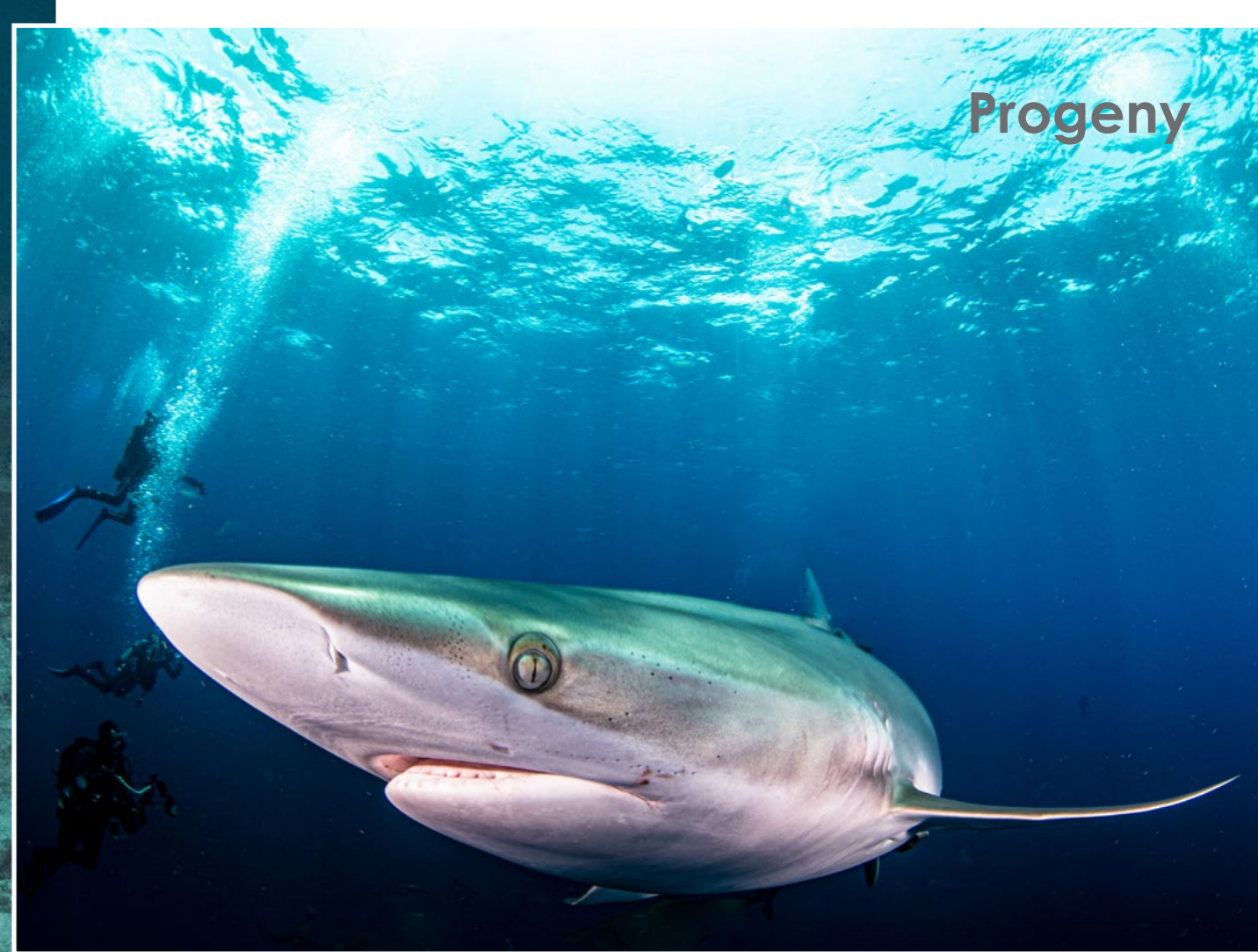
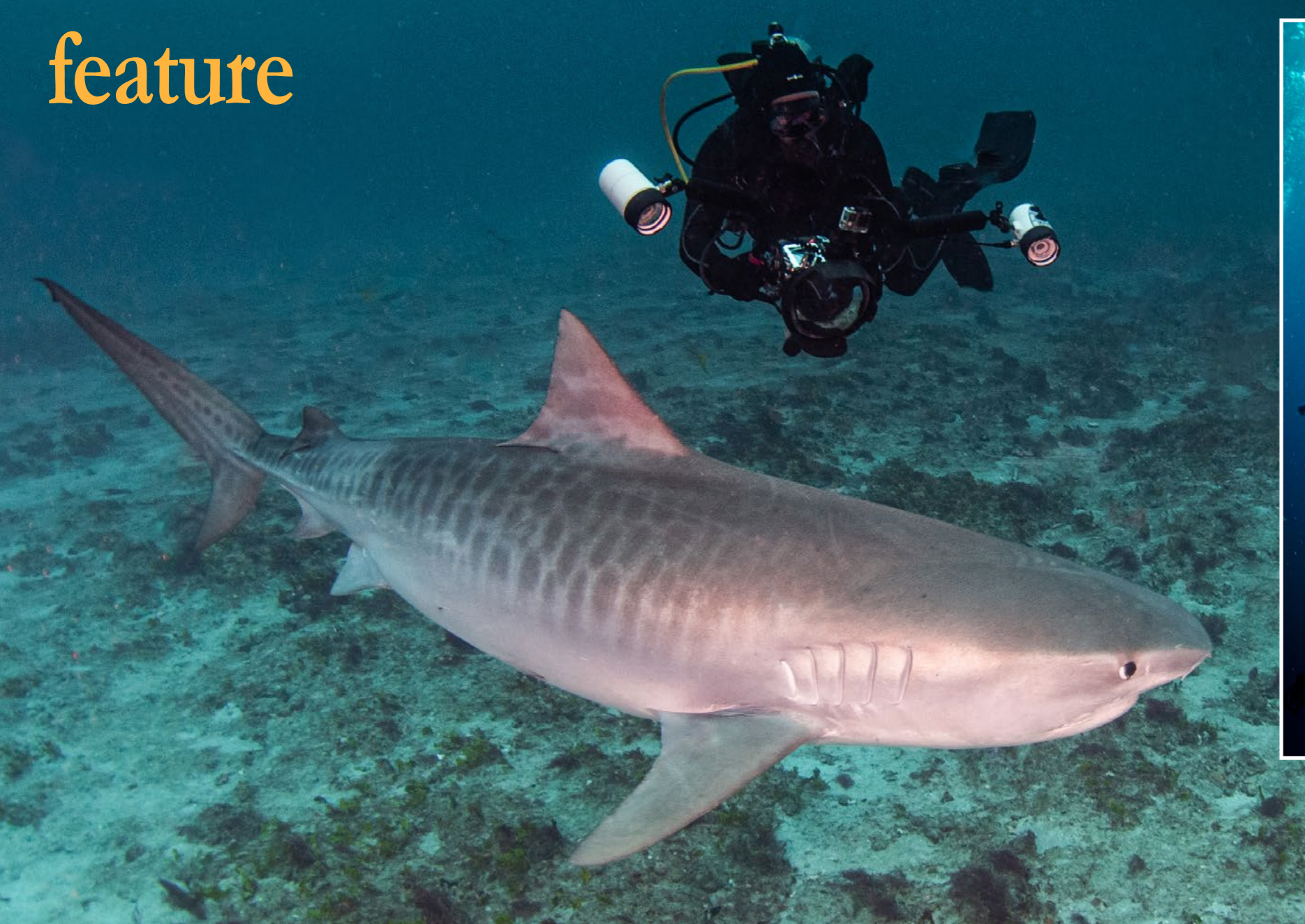
Peacock mantis shrimp hold their eggs in their front appendages, and some species share the holding duties between mated pairs, passing them back and forth, or in some cases, dividing them in half for both to carry. Other fish, like the weedy seadragon and pipefish, carry eggs on their tails until they hatch and swim off, making their own way in the world. Visit: brandiunderwater.com



A yellowhead jawfish aerates its eggs, Turks and Caicos. Exposure: ISO 200, f/9, 1/160s. Gear: Nikon D90 camera, Nikon 105mm lens, Ikelite housing, dual Ikelite DS161 strobes



Shaun the Sheep nudibranch with eggs on a leaf of algae, Dumaguete, Philippines. Exposure: ISO 200, f/25, 1/200s. Gear: Nikon D750 camera, Nikon 105mm lens, Ikelite housing, dual Ikelite DS161 strobes



Juvenile tiger shark with diver, Jupiter, Florida, USA (above). Exposure: ISO 100, f/5.6, 1/125s; Juvenile silky shark (top right). Exposure: ISO 250, f/11, 1/160s; Juvenile sandbar shark (bottom right). Exposure: ISO 100, f/8, 1/125s. Gear used for all photos: Nikon D500 camera, Tokina 10-17 lens, Nauticam housing, Inon Z330 strobes

Summer's Shark Juveniles

Text and photos by Gary Rose, MD

I particularly love the summer months of diving in Jupiter, Florida, USA. It is during these times of warm and calm seas that I have had some very wonderful introductions to juvenile sharks. It is not uncommon to dive with very young, one- to three-foot silky sharks, dusky sharks, sandbar sharks and occasional bull sharks. This past spring, I even had the amazing experience of diving with a juvenile female tiger shark.

Granted, young tiger sharks present on a much grander scale than most other young sharks. She swam by our group of divers, far on the periphery for a few weeks, and then finally came in close enough for her first photo shoot. She was gorgeous, shy, and about 4.5 feet long. I will tell you a little secret about her: She had been following Patrick, our rare male "adolescent" tiger shark. Just like with humans, juveniles become adolescents, adolescents become adults, and then... I will leave what comes next to your imagination.

The most enjoyable aspect of div-

ing with juvenile sharks is that they are so playful and awkward—constantly bumping, prodding, and exploring—a real joy. They have no hesitation in swimming right up and bumping into a camera housing dome port, which becomes a fantastic photo op. They will also nip at strobes, strobe wires, arms and hands. Juveniles are juveniles, and they will stop at nothing to explore and learn about their new environment. Just when you think it could not get any better, it does. Each year brings new juvenile sharks. Visit: garyrosephotos.com





Progeny

Adult wolf eels do not age well! Exposure: ISO 400, f/5.6, 1/60s. Gear: Olympus OM-D E-M5 camera, Olympus 12-50mm lens set on 12mm, Nauticam housing, dual Sea&Sea strobes

Juvenile Wolf Eel

Text and photos by Olga Torrey

From the first day I started scuba diving, I had always wanted to explore the cold waters of British Columbia in Canada. One of the reasons why I wanted to go there was to see and photograph a wolf eel. These gentle fish have a face that only a mother could love. They also have an easy-going personality and enjoy interacting with divers. Female wolf eels lay about 10,000 eggs, which take 13 to 16 weeks to mature and hatch (according to Wikipedia). What I did not realize is how different a juvenile looks from an adult wolf eel.

While exploring a wall, I saw a cute, tiny eel swimming freely above me. I followed the fish until the creature went into a small hole in the rocky reef wall. It was as curious about me as I was of it. The fish poked its head out of the hole and stared at me, as I stared at it. I captured an image of the eel with my Olympus 12-50mm lens, set to shoot in macro mode. Unfortunately, I had no idea what species this tiny eel was. After surfacing and returning to the Nautilus Swell liveaboard, I showed the image to the captain. I was surprised to learn that it was a juvenile wolf eel. I thought to myself, they certainly do not age well! Please visit: fitimage.nyc

The juvenile wolf eel looks very different from the adult. Exposure: ISO 400, f/8, 1/125s. Gear: Olympus OM-D E-M5 camera, Olympus 12-50mm lens set for macro, Nauticam housing, dual Sea&Sea strobes



CLOCKWISE FROM RIGHT: Jeff Lindsay talks about shipwrecks in the Great Lakes at the Diving Talks conference, which took place in Portugal in October 2021; Mark Powell giving his presentation; Aqualuz Troia Mar & Rio Hotel at Tróia Resort complex; Immi Walling talks about her ongoing search for WWII wrecks in the Gulf of Finland (below)

Dive Shows Are Back

Text and photos by Peter Symes

Dive shows and events are back after a long hiatus due to the coronavirus pandemic.

It felt a bit surreal heading to the airport again for the first time in almost two years. I used to frequently attend various dive shows, events and conferences and go through the airport as a matter of routine. But that was before the pandemic shut everything down some 21 months ago.

For the duration, I have felt relatively safe from Covid-19 by staying put in my office and residing in a country exercising responsible and effective handling of the pandemic, but now I was once again on my way to another country, passing through airports and was about to become exposed to crowds of people from all over. Ah well, I thought, one cannot sit caged up forever.

As I was on my way to Diving Talks in Portugal and boarded my flight to Lisbon, I also felt excited about attending the first dive event since January 2020

and interacting with the dive community again. I also plainly looked forward to visiting Portugal.

The flight from Northern Europe was straightforward and uncomplicated. It took a little over three hours, and upon arrival, I was greeted by members of the event's organising team who transferred me, and some other attendees, to Tróia resort, which is located about an hour's transport south of Lisbon. This was where I was going to spend the next two days and nights.

Since I was not an exhibitor or a presenter, I had no responsibilities or tasks to perform other than to network and catch up with industry colleagues I had not seen in a long while. Thus, I could take it a bit easier this time around and mostly just observe things, which I appreciated.

The Tróia resort, with its big and

spacious hotel complex, seemed quite well suited for hosting an event of this type and size. It had a conference centre in an annex on the premise, placed on the opposite side of the spacious outside pool area. The hotel rooms were also nice and quite spacious, albeit I found mine a tad too impersonal to be cosy. On the upside, the

whole resort complex is surrounded by beaches and a nature reserve, which I however did not have time to explore much this time around, aside from a short walk on the beach behind the ho-

tel. I did, however, have a direct view to the crescent moon rising on the western horizon.

Inaugural event

As this was an inaugural event,



Landing in Lisbon offers a perfect view of the downtown area and historic centre.





A taste of Portugal (top row left to right); Ahmed Gabr going through his depth record dive (below); Divers heading out of Peniche, towards the Berlengas (centre)



I could not help wondering how many teething problems would appear, as putting on a conference with international attendance and a string of presenters, some of whom had to give their presentations via video-link due to the pandemic, is a complex endeavour. There was just such a myriad of potential disconnects, coordination challenges or technical hiccups that could throw a spanner in the works, but I found that the event ran smoothly, at least from a casual observer's point of view.

During post-event conversations with the organiser, Arlindo Serrao, he related to me that there were various aspects that did not quite go as planned, or that there were some parts of the event and choices made with which



he was not all that pleased. While I applauded his striving for perfection and a mindset of looking into how matters could be improved. I also felt he was a tad too

harsh on himself.

Again, with a complex arrangement, it is quite difficult to ensure every detail and process unfolds to perfection, and to have the foresight to anticipate and pre-empt every combination of issues that may arise, and get every arrangement just right. Most often, potential improvements are at best, or only, spotted in hindsight. More importantly, I do not think anyone took notice of any imperfections. The bottom line, as far as I am concerned, is that the organisers did a pretty good job, and the event unfolded as smoothly as could be reasonably expected.

Unlike several other conferences, there were not any parallel sessions but just a single string of presentations. This was a deliberate choice, Serrao explained, to not force attendees to choose.

As I understand that this single line of sessions will be a policy carrying over to



Sylvia Earle was one of several overseas presenters who was prevented from being present in person this year because of the pandemic but instead gave a talk via video-link during which she expressed her desire to take part in person next time.



Sami Paakkarinen, a technical, cave and rebreather instructor based in Finland, gave a talk on exploring a cave on northern Norway.



Diving Talks organiser Arlindo Serrao



CLOCKWISE FROM TOP LEFT: Berlingas Island as seen from Peniche; Cobble streets in Obidos; Town of Obidos; Lisbon tram; Although the origins are difficult to trace, Fado is a musical genre that can be traced to the 1820s in Lisbon.



the next event, which is going to be held next year, I find there are both benefits and drawbacks to this approach. The main challenge I foresee is that a single line of sessions will require that every single presenter is both top class and the topics of their talks is of general interest. It was not quite the case this time around.

The line-up of presenters covered various topics, including technical diving, dive medicine, ecology, NGOs, destinations and some new equip-

ment. Also, some public agencies such as the Portuguese Navy and Search & Rescue organisation gave overviews of their organisations.

As such, the event was not a tech conference such as EuroTek, DiveTekUSA or OZTek, and although the format was similar, it covered a much broader variety of topics.

While there were some stellar presenters and crowd-pleasers, such as Sylvia Earle giving a presentation via video-link, and many others were quite good too, there were also a couple of talks I found either uninteresting or just poorly performed. Presenting is a skill, and while some are natural entertainers and excellent teachers, there are others who either struggle with the format or are, dare I say, outright boring to listen to. Having said that, I would like to stress that most presentations, including those who had to be conducted via video-link because of travel restrictions, were of high quality and well worth attending the conference for.

Presentations aside

What also made this event extra

pleasant was the great food, and that the temperature outdoors was very comfortable and balmy. When compared to so many other conferences, which are often held during late fall or winter in colder and darker regions, being able to sit outside and dine in pleasant temperatures and still be able to walk around in shorts and short sleeves was a real bonus.

After the event, we were given the opportunity to go on a tour for a couple of days to see more of the country before we returned home. This tour, guided by Serrao, took us up to the seaside municipality of Peniche, a fishing town also known for its long beaches and watersports, where we spent a couple of days. Just some 10km off the coast of the Peniche, the Berlengas Islands form a nature reserve where there is also good diving, which I hope to try some other time.

Before returning to Lisbon, where

we were given a guided tour courtesy of the city's tourism authority, we stopped at the historic town of Obidos, which could trace its roots back to a Celtic settlement, and later, to an ancient Roman one. ■

Text and photos
by Michael Menduno

What do you get when you bring together a group of 60 enthusiastic technical divers from a dozen countries; provide boats and beach access, rebreathers, doubles and scooters; ply them with plenty of helium, nitrox, oxygen and sorb; supply nightly brain food and then turn them loose—sans gloves—on some of the most bodacious reefs on the planet? An epic week of unforgettable diving and community!

Masks off to Buddy Dive Resort and especially, German Arango, aka “Mr G,” and his tech team for making the tenth-anniversary edition of Bonaire Tek (sponsored by AP Diving, Buddy Dive, DAN World, Dive Rite, Halcyon, O'Dive, SANTI and Sub-Gravity) a huge success.

Attendees were not only treated to some amazing reef and wreck diving—with water temperatures at 28°C and visibility of 30m or more—but fed a diet of heady nightly talks on subjects ranging from human factors in diving to an inside look at DAN World and their new incident reporting system, as well as algorithmic implementations



Bodacious Bonaire Tek 2-9 October 2021

in dive computers, creating custom decompression protocols, and the use of hydrogen for über-deep dives. We also paid a tribute to the irrepressible and much-loved anesthesiologist and hyperbaric physician, Dr Fiona Sharp, who died in a solo rebreather diving **accident** at Bonaire, three days after Bonaire Tek 2019. She will be sorely missed.

The theme of this year's event was improving diving safety, which was the focus of most of the talks. As part of the program, DAN World Research Director Frauke Tillmans and team monitored and collected bubble data from willing participants as part of a

research study. A representative from Azoth Systems, which make the O'Dive connected (Doppler) sensor, was also there to demonstrate the O'Dive sensor and software and take diver bubble measurements. The good news: No one got bent—though several people,

including myself, adjusted their gradient factors as a result.

We wrapped up the event with a kilometer-long afternoon swim to Klein Bonaire, the island just across the channel from Buddy Dive Resort—a perfect ending, at least for a swimmer like me.

Events like Bonaire Tek remind one of how much fun technical diving can be and the joy of being part of the community. I will definitely be back for more.

Here is a little taste of the event, created by photographer, filmmaker and diver Lorenzo Mittiga. Check it out at: **Bonaire Tek 10th Anniversary** ■



Click on the screenshot to go to Lorenzo Mittiga's video of the event



THIS PAGE: Scenes from Buddy Dive Resort in Bonaire

Edited by
G Symes

View over
the Malaysia
International Dive
Expo in Kuala
Lumpur in 2019



COURTESY OF MIDE

Malaysia International Dive Expo is back!

After a break of over 20 months due to the Covid-19 pandemic, MIDE is finally back on 3-5 December 2021 at the World Trade Centre in Kuala Lumpur. It will be the show's 15th year of exhibition, given 2020 was a write-off.

The show's focus will be on reconnecting Malaysian dive businesses with the local dive community, encouraging fellow underwater enthusiasts to visit the many local dive destinations found in Malaysia. Hence, this year's theme will be "Let's Meet & Dive Locally."

In a press release, the show organizers wrote: "As we know, the pandemic has crippled the economy and destroyed many businesses. Without a doubt, this has been one of the most challenging times for us in the dive industry. The rollercoaster of 2020's standard operating procedures saw many stop-starts across every industry, including ours, taking a toll on all aspects of running a business."

"Indeed, it has been a long and weary road for everyone, but the light at the end of the tunnel is bright, and we look forward to end

2021 with a bang! Welcoming back our dive community of water lovers, businesses, underwater experts and partners, we look to spearhead our beloved industry into 2022 with sheer excitement and enthusiasm!"

What to expect at MIDE 2021
Due to the standard operating procedures and concerns throughout the pandemic, MIDE will be presenting more of a boutique show. Visitors will discover and enjoy a balanced mix of exhibitors from dive operators and destination tourism bureaus to dive equipment suppliers and more.

A variety of presenters and speakers will share their knowledge and expertise on various topics, including marine life, sustainability, photography, diver health and more.

Once again, with a minimum spend at the expo, there is a chance for attendees to win some fabulous prizes, courtesy of the exhibitors.

Health and safety

Responding to the new norms while adhering to strict guidelines laid out by the Malaysian health and security authorities (MKN and KKM), the show's setup and thorough screening facilities will assure the health and

safety of all staff members, crew, exhibitors and attendees.

Visitors will need to check in with the MySejahtera QR code, and temperatures will be taken before admittance into the exhibition hall. While attending the expo, physical distancing among visitors, exhibitors and team members will also need to be observed, in accordance with the guidelines.

Since visitor numbers are limited, team members at the door will maintain proper order of all visitors entering the exhibition hall, while keeping track of the number of attendees inside the show at all times.

About MIDE

Since 2006, the Malaysia International Dive Expo (MIDE) has been a very popular international event, drawing over 10,000 recorded visitors every year. With 95% of MIDE attendees being divers with backgrounds in recreational, technical, occupational and commercial diving, the expo has become a platform that connects and welcomes divers and major industry players to Malaysia and the world of dive business.

For more information, please visit: mide.com.my.

MIDE 2021 - BACK IN ACTION



MALAYSIA INTERNATIONAL
DIVE EXPO
3-5 DEC 2021
WORLD TRADE CENTRE, KUALA LUMPUR



"LET'S MEET & DIVE LOCALLY"

Mark your calendar! We will see you very soon!



For more information, contact us 603 7980 9902 or email info@mide.com.my



Text and photos
courtesy of Gareth Lock

On 24-25 September 2021, the first-ever Human Factors in Diving Conference ran. There were 27 speakers from across the globe (New Zealand, Australia, Dubai, Europe, United States and Mexico) supported by the platform hosts LexGo Live. Just less than 25 hours of content was produced during the two eight-hour days and was uploaded in near-real-time, which will contribute to the learning about and application of human factors, non-technical skills, Just Culture and psychological safety in the sports, military, commercial and public safety diving sectors.

So, how did it start and what can you learn from the development of this event if you want to put something similar together?

The Idea

The genesis of the idea really started in July 2019 when I was running a two-day Human Factors in Diving face-to-face class in Edinburgh. There was a conversation between a few of the students who were from DAN Europe and the health-care sector. Ideas were bounced around, but nothing really happened, partly because of the Covid-19 pandemic in 2020 and 2021, there were no dive shows!



Creating a **Virtual Event** *From an Acorn to a Global Conference in Four Months*

PHOTO-ILLUSTRATION BY G. SYMES COMPILED WITH IMAGES FROM PIXABAY



However, in January 2021, colleagues of mine working in the veterinary medicine domain (VetLed) organised the first Veterinary Human Factors Conference (virtually) and I attended. At that time, I was in quarantine in New Zealand, and this reignited my thoughts for a diving conference. Unfortunately, I was then busy for the next two months and missed the window for “pre-season” in the United Kingdom.

I am not sure what happened at the start of June, but I decided that I was going to make this happen in 2021. I reckoned it would take about three months to get people interested and get a date

in people's diaries. I was also conscious that it was still diving season in the United Kingdom so chose a Friday and a Saturday.

Then, I arranged a meeting with my marketing advisor, Ros Conkie (Ros Conkie Marketing), and Mickey Wilson (Firestarter Marketing) to work out a strategy. We developed a delegate journey, aiming for a public announcement on 28 June. This would give three clear months to market and sell tickets. It also gave me about three weeks to find a hosting platform and work out the costs for something I had never done before. How hard could it be?

Screenshot from the virtual event Human Factors in Diving Conference presented by Gareth Lock (right)

T-3 months

I wanted a virtual platform that recreated the social interaction of a physical conference, and I was reminded of a platform that had been recommended some three months prior, called LexGo Live. Fundamentally, I did not want a Zoom-like experience, which had only one-way communication, and all the solutions I had seen, apart from LexGo, were similar.

After some discussions with LexGo, I settled with them, and we built an excellent relationship. They appeared to be more expensive than the other solutions I had looked at, but they were going to be providing a fair



amount of conference support along with event producers who would be backstage making sure that all appeared fine out front, and in hindsight, it was worth it for the delegate experience.

The website was launched with live (US\$80), live plus recordings (US\$150) and VIP tickets (US\$250). The conference had two “main halls” with seven speaking slots in each, plus a large stage for the opening and closing addresses—30 presentations in total, running from 9:00-17:00 UTC. Each slot was 50 minutes long, starting with 35 to 40 minutes for the presentation, then 10 to 15 minutes for questions and answers with the audience, and ending with 10 minutes for the changeover. Each talk would start on the hour, making it easier to deal with multiple time zones. It was going to be intense!

The plan was for 300 tickets, with 50 of those for the speakers, media and training agencies so that they could see what the conference was. This would provide enough to cover the costs and then allow research and more course development to happen afterwards. Smaller would be bet-

ter for the interactions that LexGo would support.

With my own (over) self-confidence, I had hoped that a large percentage of the tickets would be sold in the first few days, as I had built up some significant interest on social media and had 350+ people pre-register. Only 50 sold on launch day and over the next couple of days... I was disappointed.

Costs at this stage were expected to be in the order of GB£ 25k covering the LexGo hosting platform and support, marketing (pre-, during and post-event), video production and editing.

T-1 month

Between 28 June and the start of September, I worked with LexGo to refine what the conference would look like. Bringing in professional event producers was an excellent idea as this allowed their expertise to be utilised in terms of the speaker and delegate interactions.

Ticket sales still were not great, but then sales tend to pick up closer to the event date. However, I started getting responses saying that potential

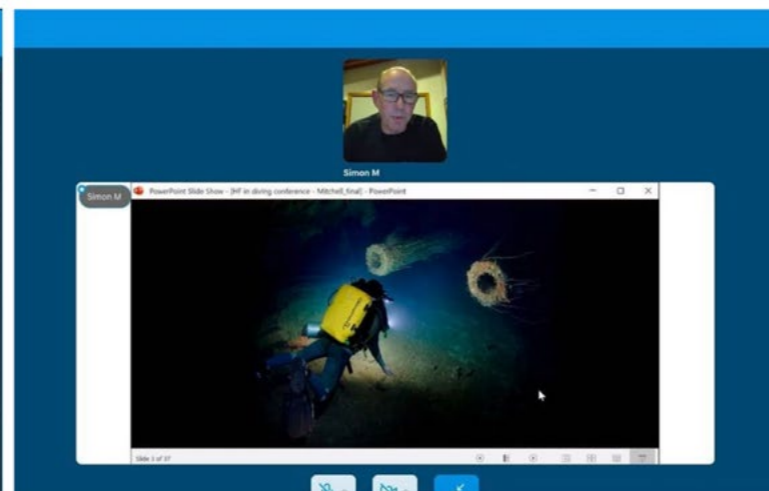
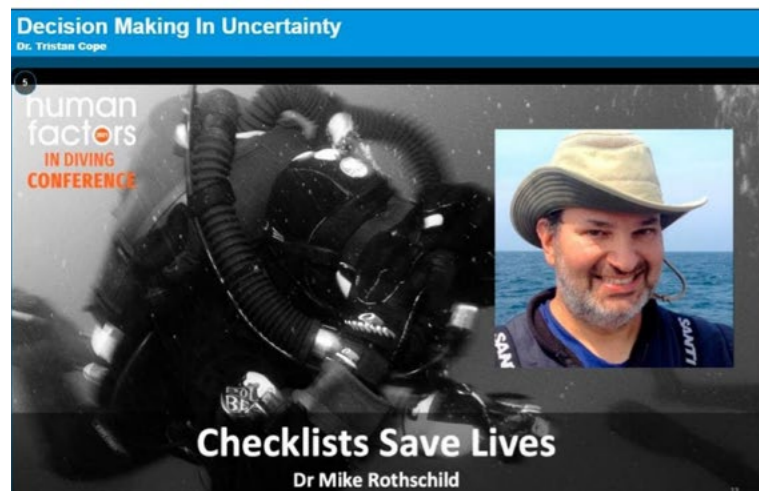
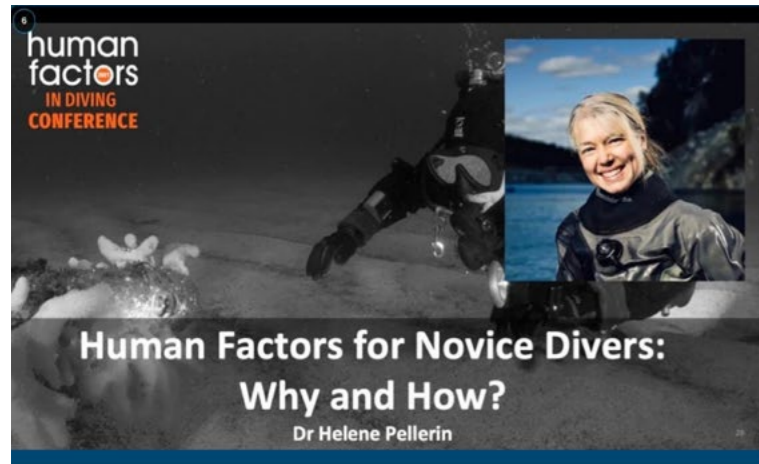
attendees were now busy that weekend...

T-2 weeks

Things were now starting to hot up! As one of my maxims is to plan to fail safely, I had asked all the speakers to get their presentations and video recordings of those presentations to me two weeks prior to the event. This would allow me to see what they were presenting, as my opening and closing addresses would be influenced by their content. It would also allow me to see if the content hit the mark as some of the speakers had never presented to an audience like this, or to the diving community. Most of the materials did not arrive at T-2 weeks...

Emails sent to training agencies were followed up, again. Eleven organisations were invited, five responded, and four provided names and email addresses for their free tickets. Somewhat disappointed with the uptake, as this topic has been recognised by everyone who has done a course with The Human Diver (diver training organisation) as being critical to improving diving safety.





EVENT SCREENSHOTS: There were 27 speakers from around the world at the Human Factors in Diving Conference, including: Dr Hellene Pellerin, Dr Laura Walton, Dr Simon Mitchell and Dr Mike Rothschild (left, clockwise); Andrzej Gornicki, Cdr Geir Gunderson, David L. Conlin, and Darryl Owen (below, clockwise).

cal glitches with the LexGo Live, mainly due to some of the hosted videos, but overall, everyone was pleased (speakers and delegates).

One thing that was not picked up until the morning of the second day was the impact a work firewall would have on video and audio. With the exception of two speakers, they were all given training on how to use LexGo prior to the event. The room captains had their training in the morning as there was not much for them to do. It was at this point we realised that I would have to stand in as a room captain for Hall 2! On Friday, I had been roving around and acting as a "catch-all," and so that spare capacity was missing. Fortunately, Alex from LexGo

stepped into that role.

Each day, there was a short debrief with the LexGo team to see what gaps needed covering for the following day, or immediately after the conference, for other clients.

The video recordings were uploaded by the video production team within one hour of each day's end, which meant people could watch the sessions they missed straightaway! Emails were sent out to everyone letting them know about this feature, once the videos were in place.

Delegate feedback

Overall, the feedback was really positive. LexGo Live provided an opportunity to meet people at

their tables while watching the presentations. They could also move over to a table in the foyer and talk with the speakers, the same as you can do in a live conference. This generated some rich conversations, and it also provided the opportunity for others to listen in on the conversations that were taking place and gain knowledge that way.

What worked well and why

- **Regular communication** with delegates and speakers via the Kajabi email system and personal emails kept the interest up, and while some speakers complained of too much information, others said it was perfect.

Recording-only tickets were made available at US\$120. In hindsight, this probably should have been done either much earlier or not until after the event.

T-1 week

My internal pressure was rising. A combination of short timescales and a realisation that there was still lots to do, and that the conference might not add the value I had hoped it would, added to the stress.

The week was mainly spent sorting out presentations and recordings, marketing the conference, having podcast interviews (I did five in the end!), along with writing a new presentation as one of the speakers now said they could not take part!

Monday evening, four days before kick-off: We ran through an excellent dress rehearsal with LexGo, the production team, and me walking/talking through the delegate and speaker journeys.

This proved invaluable, identifying gaps in knowledge, validating assumptions that we had made, and ensuring that the media would run.

This highlighted that there was not a way of broadcasting to everyone who the next speakers were, like a Tannoy public-address system or bell, so I created 30 reminder emails within Kajabi, which would go out at T-3 minutes to the next speaker giving their details and the one after that. This worked like a treat!

We also reduced the number of tables in the conference halls, as we were only at a total 146 live attendees.

T-48 hours

Emails were sent out to speakers and delegates with a PDF related to the speaker/delegate that gave them all the information they needed for the conference experience, including screenshots. A video was also produced

by LexGo, and this was sent out at T-24 hours and T-1 hour.

T-3 hours

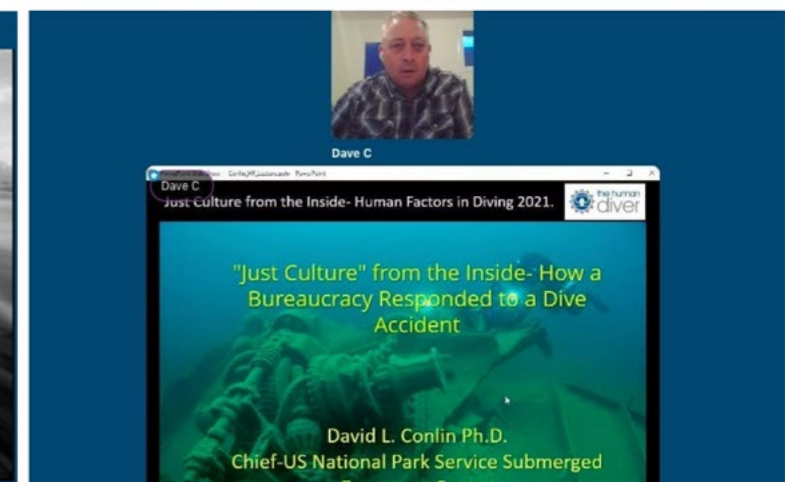
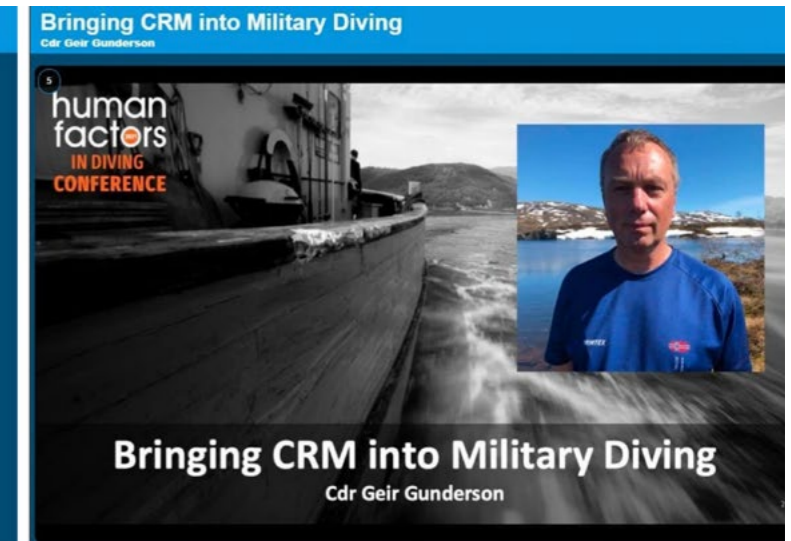
The final speaker video presentation was uploaded into the system! This, and two others, were needed on the first day of the conference due to several extenuating circumstances, so it was definitely worth having the pre-recordings.

T-1 hour

Teams assembled and everything was tested to make sure it worked. Room captains were briefed; they had already been emailed about their roles and responsibilities, along with the biographies and synopses of the speakers as well as two to three questions from each speaker in case there were no questions from the floor.

Zero Hour, and onwards!

The conference went really well. There were some minor techni-



EVENT SCREENSHOTS: Speakers at the Human Factors in Diving Conference also included Sally Tindall, Dr Frauke Tillmans, Jenny Lord, and Beatrice Rivoira (right, clockwise); Dr Tristan Cope, Pierre LeFevre and Robin Kirkpatrick, Tim Andro, and Tim Clements (below, clockwise).

- **Having a professional production and support team.** I soon realised that I was not going to be able to do this role and would need support. The same goes for the video recording production team. Pay an expert and they will do it much more quickly and effectively than you can!
- **Working with LexGo** because they recognised that the end customer, the delegate, is the person you have to please, and are adaptive and proactive in making that experience work well. They still kept their direct client (me) happy by listening to what I wanted from the event. They had a much more personable style than the other vendors I approached.

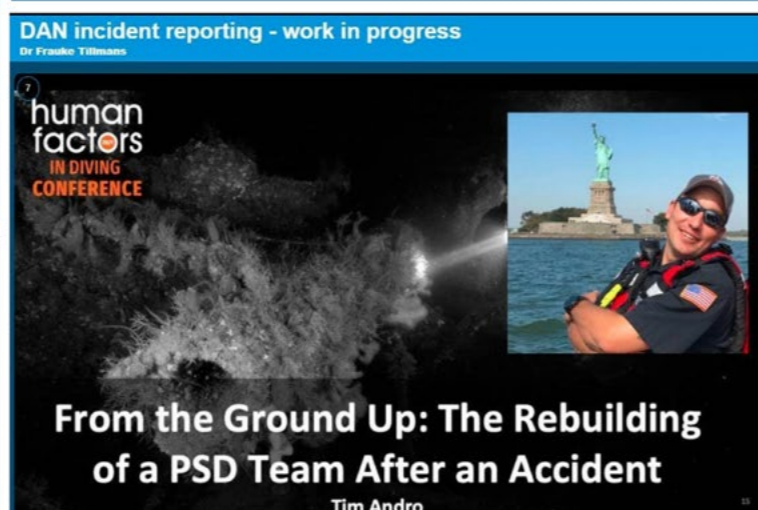
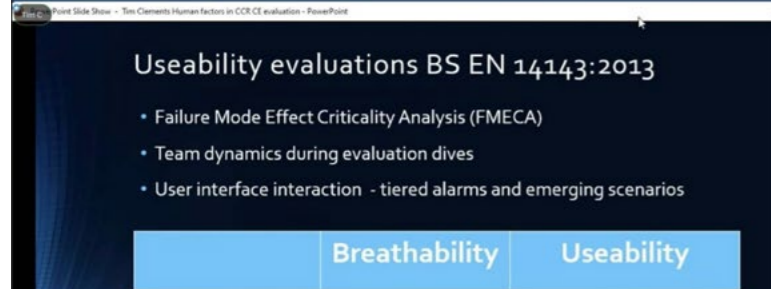
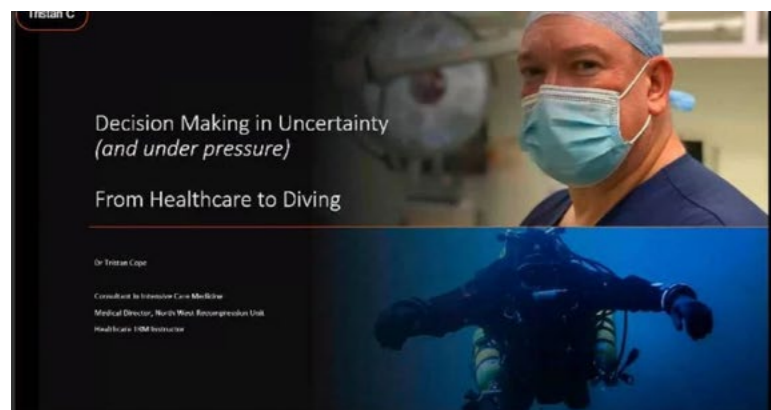
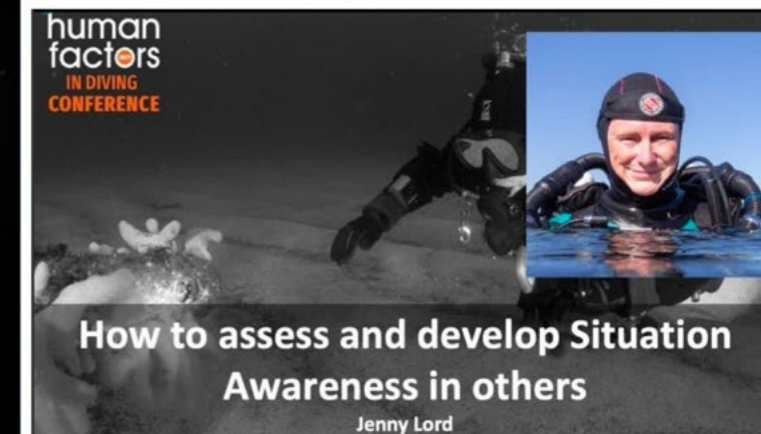
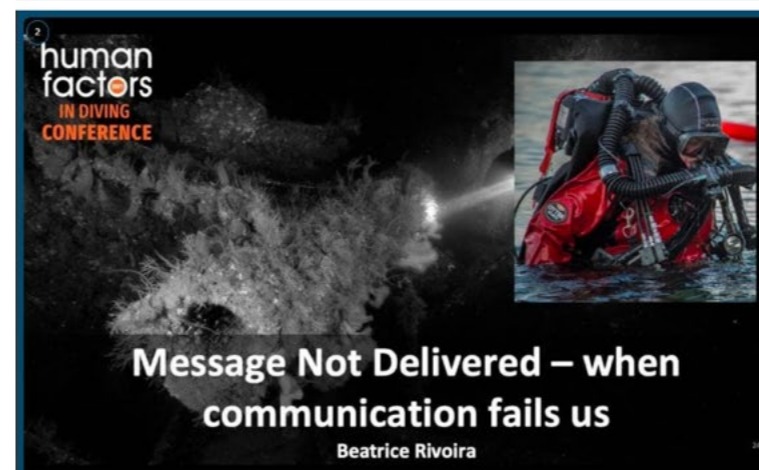
- **Use of the Kajabi platform** for hosting and viewing the recorded presentations and providing a platform for additional speaker materials.
- **Giving explicit guidance**, and potentially coaching, to speakers about the length of their presentation. Pre-recording forces that reflection to happen.
- **Pre-recording** meant that when a speaker was not available, the live delegates still got useful content.

What needs to be improved and how Articulating the value of human factors. The value of human factors, non-technical skills and a Just Culture need to be articulated in a manner so that divers,

training agency staff, military and commercial diving supervisors want to attend a conference like this. This is something I still struggle with.

Once seen, the effect of applying human factors principles and practices cannot be unseen. The challenge is opening the eyes to start with. One piece of feedback highlighted that many people are willing to be social media supporters of human factors and incident discussion with "likes," but few are willing to spend money to invest in their own personal development.

This meant that an expected profit of GB£ 10k to support research about human factors in diving turned into a GB£ 5k loss. Only 62 post-conference recordings have been sold to date.



Zoom fatigue. Eighteen months of Zoom and Teams calls due to Covid-19 pandemic restrictions meant that many divers did not want to spend more time in front of a monitor for a whole day.

Working with a start-up is great because there is an opportunity to shape how things look. However, it also means that some of the automations and features are not there yet.

Deadlines mean different things to different people! Explaining the reason for a deadline helps cement why the time/date is as it is. Ask delegates if they have anything in the weeks prior to the conference that could impact their delivery of materials and work around that.

Conclusion
Would I do this again? Definitely! Is it possible to run a virtual global conference with one person organising it? Yes, but expect to

invest around 100 to 120 hours of preparation plus live time, and the follow-up effort, which I reckon will be another 40 to 60 hours. None of this personal time has been recovered; it was the direct costs that were approximately GB£ 25k.

Do I think it was worth it? Yes. The conference proceedings will be published before 31 Dec 2021 by Divers Alert Network Europe, and I am hoping that they will get wider circulation than the videos. One opportunity would be to add a day onto an existing physical conference, but then this would likely produce costs greater than a virtual conference, and the latter would have a global reach in real time.

Change in this area is going to be very slow because the results are not easily identifiable when the metric of safety is the number of divers who are injured or killed. Furthermore, including human factors content into training materials has cost and time impli-

cations, especially when it comes to ensuring that the instructors know what it means and can teach it. The Human Diver will continue doing what it does, playing the Infinite Game in which there are no individual winners. ■

The Human Diver was created by founder and experienced diver Gareth Lock who has committed his life to diving, diver training and the training of high-performance teams after his 25-year career in the Royal Air Force. To date, he has completed more than 800 dives around the globe on OC and CCR and to depths in excess of 70m. Gareth knows from his role as Squadron Leader in the Royal Air Force that the most effective teams never lose sight of each other's interactions and performance. It is something deep in the psyche of the RAF and aviation in general. For more information, visit: thehumandiver.com.

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ON BOLD LINKS



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Edited by
Lelle Malmström
and Peter Symes

Equipment



Dive industry affected by global supply chain disruptions

All sorts of product-based businesses have been affected by disruptions in the global supply chain, which followed in the wake of the Covid-19 pandemic and continue to affect deliveries of goods. The dive industry is no exception.

It is primarily deliveries of microchips for use in various electronic devices such as dive computers, as well as neoprene, which have posed challenges for dive equipment manufacturers, but supply of other raw materials have also been affected.

“We are managing OK”

After speaking to a range of manufacturers, the general picture is that the situation is still posing some challenges, and while it is expected that bottlenecks in the supply chain will last far into next year, most manufacturers expect to be able to fulfil current and expected orders—some, however, with a few minor delays. Overall, this is a more positive outlook than was expressed just a month or two ago.

What mostly seem to be affected is the introduction of new products, some of which may require different raw materials. Several sources stated that lead times on some materials have gone up from three to 14 months. Meanwhile, others have found ways to replace materials in short supply with alternatives. In any case, we have been informed that the intended introductions of various new products at DEMA this month have been pushed to 2022.

Will prices increase?

They may, as that is how supply and demand usually works; however, at this point in time, projections remain little more than speculation and educated guesses. ■



HW Bottomtimer

Once upon a time, before dive computers came of age and gained widespread use, bottom timers were the first simple electronic instruments to supplant simple depth gauges. Responding to popular demand, German manufacturer Heinrichs Weikamp has revived this classic—this time making use of modern technology. The Bottomtimer, which is made from aluminium and rated to a whopping 200m, comes with a bright and sharp LCD display showing depth, dive time, maximum and average depth. It takes AA batteries and battery life is up to 100h. heinrichsweikamp.com

T-Valve

A360/S360 T-Valve from Polish manufacturer Ammonite is a low profile drysuit inflation valve with a connector to a heated undergarment. The valve can swivel 360 degrees, allowing for a wide range of hose configurations, and can be used with backmount, side-mount and rebreathers. An extra-large recessed push-button makes it easy to operate even with thick gloves or cold hands. The coaxial E/O cable is designed with a wider copper conductor, which has lower electrical resistance, resulting in better performance. The valve can be easily installed and removed with the supplied wrench and without the use of additional tools. Ammonitesystem.com



Swift

The Swift is a “next generation smart AI transmitter” from Canadian brand Shearwater Research. The transmitter is designed with an avoidance system that prevents other transmitters from interfering with the connection and ensures reliability when using multiple transmitters. The Swift connects to SR’s own Teric, Perdix AI and Nerd 2 computers and is compatible with many other computers, which are already on the market. It does not require any tools to install and the battery, which lasts up to 300 dives, is user replaceable. The depth rating is 200m. Shearwater.com



Super Sub

Right. Perhaps a big win in the lottery is needed to afford one of these fancy subs from Dutch submersible manufacturer U-Boat Worx, but dreams are free. The Super Sub, which is capable of diving to 300m, is equipped with a luxury supercar interior that comfortably accommodates two passengers and one pilot. Conceived by an owner whose aim was to create a submarine capable of keeping up with large marine life, the design comprises an ultra-clear acrylic hull, which provides unobstructed views in every direction. Uboatworx.com



Diving Dry

Text by Stefan Beskow. Photos by Stefan Beskow, Andre Bizyukin & Rickard Andersson

A Guide to Your Next Drysuit

Are you thinking of buying a drysuit? Maybe for the first time, or is it time to buy a new one? Using a drysuit can feel a little strange to many at first, but with today's suits, there is a large range of models to meet every requirement. Stefan Beskow offers a basic guide to drysuits and what to look for in a drysuit for your particular needs.

You do not have to live north of the Arctic Circle to benefit from buying a drysuit. It keeps you warm in a much more effective way than a wetsuit—before, during and after a dive. For those of you who already dive with a drysuit but are like me and do not change drysuits year to year, you will notice that there are a lot of choices on the market these days with new features, which have probably been added to drysuits since the last time you bought one, especially if it has been a while.

Since I just bought a new drysuit after my 13-year-old Ursuit started looking a little tired, I thought I would share some of my thoughts and the choices I made, as well as the model that I finally decided to get.

The author kitted up in an Ursuit drysuit and hood, on location with his underwater camera

Material

Depending on what your preferences are, you can very easily divide drysuits into neoprene suits and shell suits. Neoprene suits have the advantage in that you do not need to wear as much thermal garments underneath them, because the neoprene itself insulates against the cold. Some divers even like the slightly tighter fit, which traps less air than a shell suit. Then there is the "dive feeling" itself, which appeals to proponents of the neoprene suit.

downside is that the deeper you dive, the more the insulating effect decreases as the neoprene is compressed. Neoprene is quite high in buoyancy so you will need more lead weights when diving with a neoprene suit. Neoprene means that you also lose some mobility compared to a shell suit and it takes longer to dry the suit after a dive.

There are also suits made of crushed neoprene. They are thinner than regular neoprene suits and do not compress as much under pressure. You also do not need as many lead weights when diving in them, compared to a regular neoprene suit.

Shell drysuits

When it comes to shell suits, there are a variety of materials available, and they all have different pros and cons, so it is important to choose the material that

is best suited for the type of diving you do. Different manufacturers sometimes have different designations for their materials, but in most cases, there are similar properties across most brands. It often consists of two to three (trilaminar) different layers of different materials put together to get the properties that are in demand.

ments, depending on which season you dive—a thermal undergarment for the winter and a cooler one in the summer. To get an overview of how many different materials are offered in shell suits, I have made a short list of different materials used in their manufacture. In this list, I refer primarily to some of Ursuit's designations for its materials, but similar properties can be obtained from all major brands of drysuits.

Cordura. The big advantage of Cordura is that it is extremely durable. If you want a suit that can withstand tough conditions, it is often Cordura that is recommended. The downside with Cordura is that it is quite heavy (not travel-friendly) and slightly stiffer than other materials (however, there is significantly more mobility with a Cordura suit than a neoprene suit). In principle, all

manufacturers have a Cordura suit in their range.

Softdura is a variant of Cordura, which is almost as durable but, as the name suggests, is slightly softer than Cordura.

Trilaminar is a much lighter suit, which is travel-friendly and is easy to move in. Despite its lightness, the material is durable.

Goretex is a lightweight material that breathes. So, if you need to travel with a drysuit, this may be a good material, but it is, however, at the expense of sustainability.

Other drysuit features

In addition to the actual material that the drysuit is made of, there are a lot of other things to consider.

Seals

Seals are available in mainly three different materials: neoprene, latex and silicone.

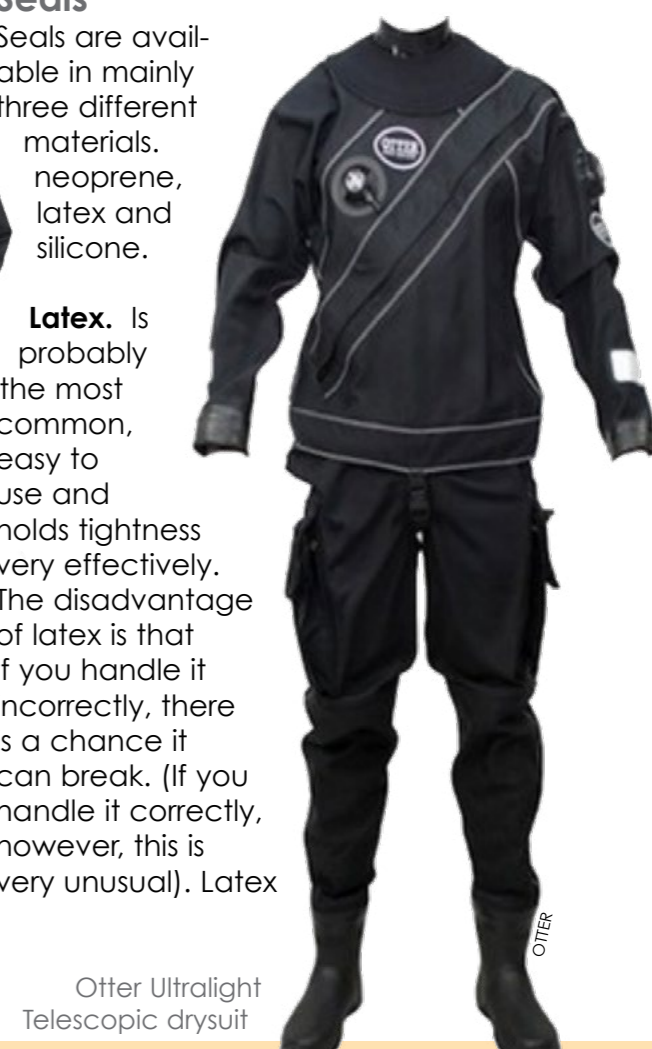
Latex. Is probably the most common, easy to use and holds tightness very effectively. The disadvantage of latex is that if you handle it incorrectly, there is a chance it can break. (If you handle it correctly, however, this is very unusual). Latex



Waterproof D7X Cordura drysuit for women and men



DUI TLS 350 trilaminar drysuit for men and women



Otter Ultralight Telescopic drysuit

Which brand should you choose? Today, there is a plethora of good drysuits on the market. Each brand has its advocates. What is important to keep in mind is that your drysuit should suit you! Then, it does not matter if the brand is Bare, DUI, Fourth Element, Otter, Santi, Waterproof, or another brand. I chose Ursuit this time because I was happy with my previous suit from Ursuit, and the fit was good for me. If you have the opportunity, it is a good idea to try the suit on before you buy it and get help with proper sizing from the dive store staff, as a drysuit is a fairly large investment, which will hopefully keep you dry for many years.



ANDREY BIZYUKIN



ANDREY BIZYUKIN

also ages, so you need to keep track of your seals. If they start to show small "dry cracks," it is definitely time to change them! In addition, some people may have problems with a latex allergy and will need to use another material.

Neoprene. Neoprene is soft, lasts a long time, and does not have allergy issues. On the other hand, neoprene is not as good at keeping a tight fit, so you can often count on a few drops of water penetrating at the seals.

Silicone. Silicone is a fairly "new" material when it comes to drysuit seals and has become very popular. It is flexible, seals well, and has no allergy issues. Also, it does not wear out as much as latex.

Pocket

Most drysuits have one or two pockets on the leg, which can be very useful. Make sure there is a D-ring, or similar attachment, which you can use if you need to be sure that things do not fall out of your pockets underwater.

Zipper

Today, there are two types of drysuit zippers: steel and plastic. The steel zipper requires a little more care and breaks more easily if the drysuit ends up under something heavy. But if you take good care of it, it lasts a long time! The plastic zipper does not break as easily and is not as slow to pull as the steel zipper. It is basically maintenance-free but perhaps not quite as robust as the steel zipper. The plastic zipper is a very popular choice these days.

Front zip or back zip?

Both types of zippers have their pros and cons. Nowadays, the front zip is the most common placement of the zipper and allows you to put on the suit by yourself, if you do not have a buddy who can help you. Plus, the front zip does not bear as much, load-wise, from dive equipment. Back-zip suits may be

a little easier to get in and out of, but as I said, you need a buddy to close and open the zipper. This can be frustrating after a long dive if you come up with a full bladder. An important detail to consider is to make sure that there is protection over the zipper itself, which can protect it from unnecessary wear.

Hood

Fixed hoods and detachable hoods both have advantages and disadvantages. The most popular is the detachable hood. It is convenient and comfortable when you are on land and do not want to wear the hood. It is easy to change the hood if it wears out or if you want a different size. If you have long hair, the detachable hood is definitely more comfortable to use. However, the fixed hood is warmer, and there is no risk that you will

forget the hood on a dive.

Optional features

There are several different optional features. Some of the most common include:

- Rings for drysuit gloves, which are good for freezing dives, making it easy to change wrist seals even when diving with wet gloves



SANTI E.Motion Plus drysuit for men and women



FOURTH ELEMENT Argonaut 2.0 custom drysuit for women and men



BARE Sentry Tech neoprene drysuit for men

BARE Guardian Tech neoprene drysuit for women



feature



Author in his new Ursuit with Cordura shell, front-zip and fixed hood (left); Leg pocket has a handy D-ring to attach things to, so they do not fall out (above).

My choice

I chose the Ursuit Cordura FZ with optional ring system for dry gloves, fixed hood, steel zipper and slightly smaller boots than the standard model.

Since I dive a lot and take underwater photographs, I wanted a suit with maximum durability. Therefore, a shell suit of Cordura was the best choice. Personally, I do not think that the material is in any way so stiff that it becomes a problem when I photograph.

I chose the Ursuit brand because I was very happy with my previous suit of

the same brand. I had previously had a back-zip suit but wanted the opportunity to be able to open and close the suit myself, so I chose a front-zip model. I decided to go with a steel zipper (rather than a plastic one) because it was slightly more robust. I like a fixed hood due to its increased warmth, and I believe I would probably forget to bring a detachable hood more than once!

Initial experiences

After ten dives, I can state that I am very happy with my Ursuit. It has kept me 100% dry and is very comfortable. It feels like the cut on this suit is more pliant than the previous model I used, so it generally fits me better. It is also stylish!

In the beginning, it felt strange to use a front zip, and it was a little more difficult to get in and out of this suit than the one I had before. However, I have gotten used to it now and do not think there is any major difference. The suit feels comfortable underwater, and the valves are well placed to fill and empty the suit of air. The pockets were large and easy to access. The real steel in the D-rings made it easy to attach things to them. I look forward to many dives in my new outfit! ■

Underwater photography instructor and dive writer Stefan Beskow is a teacher of mathematics and natural science based in Varberg, Sweden. His articles and underwater photographs have been published in sev-

eral international magazines, and he is an ambassador for Exposure Underwater, an online underwater photography equipment sales and service provider. In addition, Beskow has created two instructional films on photography for Moderskeppet, the largest producer of online courses and e-books for digital creators in Scandinavia. He conducts underwater photography workshops and is a proud member of Naturfotograferna, a society of nature photographers in Sweden.



A ring system for dry gloves is a popular option.

Pocket on the leg of the Ursuit is useful for storing small tools and items during a dive.

Drysuits

Thermal Protection & Drysuits



Dr Neal Pollock, Research Chair in Hyperbaric and Diving Medicine at Laval University in Quebec, Canada, discusses how thermal issues affect the comfort, performance and decompression stress experienced by divers. The impact varies with the timing, direction and magnitude of the thermal stress. Thermal protection can be provided by a variety of passive and active systems. Active systems should be used with particular care since they can markedly alter inert gas exchange and decompression risk. Click on the above image or go to: xray-mag.com/content/thermal-stress



"The Zen of Diving Drysuits" covers types of drysuits, why you should stay warm, seals and hoods, dry gloves, configurations and care of zippers, accessories, considerations when shopping for a drysuit and undergarments, drysuits for women, how to don a drysuit and mastering buoyancy in drysuits. Click on the image above or go to: xray-mag.com/content/drysuits



She-P

The Sea Gods' Gift to Female Divers

Text and photos by Susanne Paulsen

Once technical diving women found a solution that worked, they did not want to be without it on their more "conventional" recreational dives.

For many female divers, especially those in technical diving, to be able to drink all the liquid one wants and actually needs before a dive, to avoid having to take off one's drysuit and undergarments to relieve oneself, to avoid asking the guys to look away when using the "gal bucket" on board, and not to have the last part of a dive ruined by an urge to go, is really important. Susanne Paulsen takes a look at the topic of diving and the urge to go, as well as the She-P innovation to help solve the problem.

The water is comfortably warm, at least by Nordic standards, and you have planned a slightly longer pre-dive. The air in your tank will suffice, with a good margin. You and your dive buddy fully enjoy the rich wildlife beneath the surface. You have time to take a leisurely look at the bommie that you missed the last time you were here. After half the dive time passes, you turn around and can now make a relaxed gradual ascent, heading back to the dive's starting point.

The first ten minutes back are really pleasant. You are not freezing, the visibility is good, and you have lots of air. There are many curious fish to look at, which are beautiful with the sunlight shining down through the surface, glittering over the sea bottom over a fine vista. A large lobster becomes curious about your dive lamp and comes forward to say hello.

It is at this point that the "call of nature" starts to dawn on you. You start to feel unfocused. "I should not have drunk so



The She-P was developed in the Netherlands by Heleen Graauw, a female diver, dedicated to technical diving, who, during long deco stops, experienced great urges to go and wanted a better solution than diapers.

much coffee this morning," you think yourself, and start paddling home a little faster. It is pressing hard now. "Must pee as soon as I get up." Your thoughts have stopped revolving around the variety of wildlife before you, and the beautiful school of fish you pass feels quite uninteresting. The last 15 minutes of the dive mostly feel like an unnecessary pastime. Now, all you can think about is ascending, getting rid of your suit, and quickly easing the pressure. At the safety stop, the minutes seem go by as slowly as possible. Finally, you surface.

You leave the equipment at the shore and run up to the nearest helping hand for help with the zipper. You have a hard time standing still. Your dive friends happily ask, "How was it? How was the visibility? Did you see the nudibranchs at five meters, right by the bridge?" But you only have one goal in mind. You say a hopefully friendly, "Just a moment," literally

jump out of the suit and run the last bit, with the base halfway off, and finally—Aah...

NOW that you are relaxed, you can stroll back to your dive gang and be a little social, talk about the fantastic dive, take care of the equipment, and have a coffee. You bring out the water bottle. Half a liter may suffice. You do not want to face the same dilemma on the next dive...

Do you recognize yourself in this story? Good news, there is help available.

Background

Our male dive friends have long had the opportunity to "connect" with the wet elements of the environment via a pee valve (a condom catheter and urine dump valve). This made it possible for them to take longer dives, to practice technical diving, and to stay properly hydrated. As a male dive friend of

mine said: "When I had to pee in my suit twice—once during the tech course and once on a wreck dive—I decided to get a pee valve."

Historically, for female divers who wanted to get into technical diving, the only option for them had long been diapers. Both male and female divers use diapers, especially on advanced technical diving trips where "No. 2" must also be performed. But for most people, a diaper was not a good option. It was perhaps used more as a complement to the pee valve, so that (not to be indelicate here) there was no mixing of bodily excretions.

Enter the She-P

The She-P was developed in the Netherlands by Heleen Graauw, a female diver, dedicated to technical diving, who, during long deco stops, experienced great urges to relieve herself and needed a better solution. Since 2003,

she has developed the She-P in several stages, from an experimentally hard and uncomfortable tube with a "backup diaper" to today's flexible silicone cup with quick coupling.

The doors suddenly opened wide for women who wanted to practice technical diving—but also recreational diving. Once the tech women got a solution that worked, they did not want to be without it on their more "conventional" dives either. We are now talking about fairly common dives such as a weekend trip with the local dive club, with many repeated dives, or on a boat trip where one is happy to keep the suit on between dives and there may not even be a toilet on board. Or if it is a bit cold or rainy on land and you want to avoid taking off both your suit and your "one piece" undergarment and sit half-naked on a cold outdoor toilet, or behind a bush, just to be able to do your business.

Suddenly, the pieces of the puzzle fell into place.

So, how do other women solve this problem then? There are still only a few who actually use the She-P. Most of the women I talked to kept their fluid intake down during the day for the above practical reasons. They "solved the problem" by drinking less fluid between dives, holding on until they turned blue in the face, and/or made shorter dives—not because they wanted to, but because it would have been unbearable otherwise. They more or less accepted the fact that 25 percent of the dive would become painful.

Some divers plan their fluid intake by drinking a lot of fluid all at once and then waiting until it all has passed, before going diving. Then, they drink again after the dive to compensate. But regardless of whether you try to plan your fluid intake or not, you will need to relieve



The She-P is a soft medical-grade silicone cup that is attached to the skin with the help of medical glue.

She-P

now control. For me, the She-P has taken diving to new levels.

What others say

Several of my female dive buddies use the She-P, and they all say the same thing. They use it in their usual recreational dives and experience the feeling of freedom as the biggest positive effect. To be able to drink all the liquid you want and actually need, to avoid taking off your suit and undergarments, to avoid asking the guys to look away when using the “gal bucket” on the boat, and not to have the last part of the dive ruined by a pressing urge, is really something that has great importance to all these women.

You will know who they are when you see their relaxed facial expressions during and after the dive. If you are in any way unsure, look for the small extra valve they have on the leg. These are the women you should ask, if you are interested in knowing more from someone who has tried it. You can buy the She-P at your local dive centre. If they do not have it in stock, ask them to order it for you, or order it directly from the maker’s online shop at she-p.com.

How does it work?

Many are interested, but few dare to ask. The She-P is a soft medical-grade silicone cup that is attached to the skin with the help of medical glue. It takes some practice to

learn how to attach it securely, and you have to be extremely careful. The first few times, you should simply try to do it at home until you get it right, by touch. Once you have learned it, you can affix it quickly and easily before a dive. Then, the She-P works with all balanced pee valves in the same way as for men. After use, it is easily detached from the skin and cleaned with a special wet wipe, adapted for the purpose.

The team of women who developed the She-P have put a lot of effort into designing an instructional video, which is available on the website at: she-p.com. (Be careful with the spelling of the url—otherwise, you can end up on the wrong sort of webpages...). If you are thinking of becoming a new user, watch the video! It is very clear and pedagogically structured. There is also a closed group on Facebook called “The Divine Secret of the She-P Sisterhood,” in which users all over the world can ask questions and share their experiences.

Is the She-P for everyone? Absolutely not. As long as you do not feel that you have a problem, you do not need to fix it. Dive and enjoy! But if the urge to go bothers you or limits your diving, thank the gods, it’s there... ■

Susanne Paulsen is a technical diver, underwater photographer and dive writer based in Sweden. With her husband, Glen, she runs Team Paulsen AB, a dive and Poseidon rebreather centre in Gullmarn. For more information, visit: teampaulsen.se



The She-P comes in two models and a variety of colors, including red, blue, pink, black and maroon.

yourself. Why is this?

Planning your fluid intake can work quite well; but above all else, it is the time in the water that is the culprit in this drama. When a body is immersed in water, it is affected by the effects of immersion.

Diving and the urge to go

You will need to pee. Sometimes sooner, sometimes later. For the most part, far too early. You must compensate both for the fluid the body “accidentally” got rid of, in its belief that it has had too much fluid, and as fluid compensation for the dry air you breathe from your tank. Then there is the “normal” liquid consumption, which

of course depends on the temperature on land, etc.

For me, diving is a relaxing activity, a kind of meditation that makes me be in the “here and now,” letting go of everyday life and just floating weightlessly in another world. For us recreational divers, this is how diving should be—a pleasure. You therefore want to try to avoid all the reasons why the dive might become difficult or stressful at some point. Will there be enough air? How is my dive buddy? Will I freeze? How is the visibility? Does the equipment work?

Some things can be influenced, others cannot. The amount of air can be adjusted. You can make sure that you have

more than enough air, and possibly deco gas, for the planned dive—and a little bit more. With several different efforts, the cold can be set at an acceptable level, both by choosing the right equipment and by letting the water temperature control the dive time.

By using the She-P, I have now removed yet another obstacle to a comfortable and safe dive. My dive time varies between 30 and 120 minutes, depending on the conditions at the dive site and the day’s plan for me and my dive buddy. Nothing else. I can drink water whenever I want and how much I want, and I do not have to worry about the dive being ruined for reasons I can



Text by Simon Pridmore

There are thousands of dive centres, resorts and liveaboards all over the world. Some are very good and provide excellent, safe and highly professional service. Others are not so good and are best avoided.

Unfortunately, in many places where people travel to scuba dive, there are no governing bodies that inspect dive operators to verify their standards or performance, nor are penalties imposed when an operator is negligent, and divers come to harm or have a near miss. Every year, diving accidents take place, which are directly attributable to inadequate safety procedures on the part of the operator, but you are unlikely to know about these incidents as they usually receive no publicity, and the operator certainly is not going to advertise them.

I no longer run a scuba-diving operation, but I know a lot of people all over the world who do, and I have gone out diving with many of them over the years, for both work and fun. So, friends who are planning a dive holiday somewhere they know I have been to sometimes ask me for recommendations. You and your friends may do the same thing.

I usually respond with a list of opera-

tions for them to choose from. They then narrow the list down to two or three dive centres or dive boats, write to each and make their choice based on the response they get. Everybody wins—the visitors get some great diving, and the good operators get some well-deserved business.

It does not always go so well, however. A few years ago, two dive industry pros, former colleagues, were planning a trip to Bali, a place with which I am very well acquainted. They told me the sort of things they wanted to see and asked for recommendations, so I gave them a list

of sites and suggested a few operators.

A few weeks later, having heard nothing back from them, I wrote and asked how their diving had been.

"Terrible," they replied. "We booked a three-tank trip out to the sites you recommended. Then, when we arrived at

the dock, they tried to get us to agree to a change of plan, but we insisted on going to the places they had promised. This led to a big argument between the divemaster and the boat captain. After the first dive, on the way to the second site, the boat ran out of petrol, so we



Beware of the Corner Cutters

ILLUSTRATION BY G SYMES COMPILED WITH IMAGES FROM PIXABAY



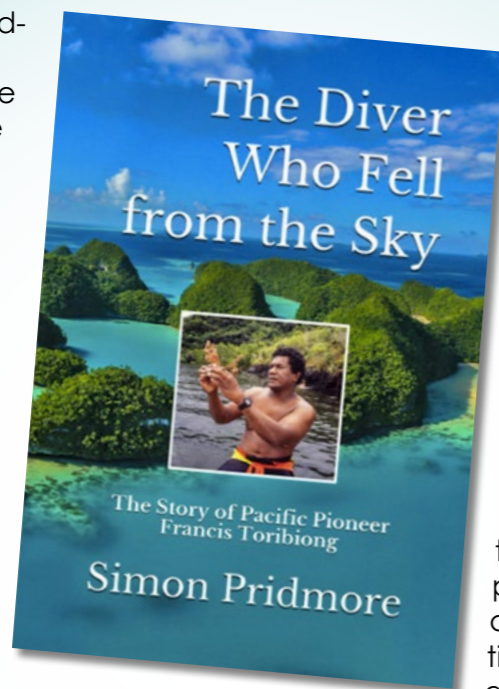


spent an hour bobbing around in high waves, waiting for someone to bring out a jerry can. The lost time meant that we only did two dives instead of three. We asked for a refund, but they refused and blamed us for the problems they had experienced. Oh yes, and while we

were hanging out in mid-ocean trying to avoid being sick and getting sunburnt (the boat had no shade), we were chatting with the divemaster, and he admitted that he had actually never been out to these sites before. Nor was he really a divemaster. Our trip was actually part

A New Book from Simon Pridmore

When his country needed him most, Palauan Francis Toribiong came along and helped the Pacific island nation find its place in the world and become an independent, forward-looking 20th century state. And he achieved this, improbably, via the sport of scuba diving. This is the inspiring tale of an absolutely unique life, written by Simon Pridmore and illustrated with images of the beautiful islands of Palau, above and below the water.



him this title, people were speaking both literally and figuratively.

Toribiong was so completely different from all of his contemporaries in terms of his demeanor, his ambitions and his vision, that it was as if he had come from outer space. Palau had never seen anybody quite like him and there was no historical precedent for what he did. He had no operations manual to consult and no examples to follow. He wrote his own life.

Toribiong was born poor, had no academic leanings and no talent for diplomacy. Yet he was driven to succeed by a combination of duty, faith, a deep-seated determination to do the right thing and an absolute refusal ever to compromise his values. And, as well as all that, he was Palau's first ever parachutist—known by islanders as “the Palauan who fell from the sky.” In giving

Toribiong was the first Palauan ever to seek and seize the international narrative. No Palauan, in any context or field, had previously thought to go out into the world and say: “This is Palau—what we have is wonderful. Come and see!” This is his astonishing story.

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ILLUSTRATION BY G SYMES / PHOTO BY PETER SYMES

of his divemaster training. The whole thing was a dreadful experience.”

I was horrified and asked them which of the operators I had suggested was responsible for this disastrous day. The answer came back. “Oh, none of them,” they said. “All the people you recommended were nice enough, but they were all really expensive. So, we decided to wait until we got to Bali before deciding. Then, soon after we arrived, we met a really friendly guy on the beach. We told him what we wanted to do, and he offered us a great deal. We even checked out his website and everything looked OK, so we went for that instead. But the trip turned out to be not at all what we were promised.”

The corner cutters

Everywhere in the world, scuba diving businesses that run their dive trips properly have similar costs, work on a similar profit margin, and ask a similar price. Therefore, if you are offered a trip for significantly less than the going rate, it is highly likely that there will be something missing. Corners will have been cut

some- where. You get what you pay for and, if you pay less, you will get less.

This is not to say that all cheaper operators are cheats. With the honest ones, it is easy to see where they are economising, and they will readily point this out if asked. For instance, live-a-board cabins may have bunks instead of double beds and buffet lunches instead of à la carte meals. Land-based dive centres may be using ancient trucks instead of comfortable passenger vans and have rusty, faded old gear for rent instead of new models. A trip on a large boat with many divers and a high staff-to-diver ratio can be expected to cost less than a personalised trip on a smaller boat with your own dive guide. This is all above board. You know in advance what you are getting and can make your choice according to your budget

and needs. However, other cheap operators save money in other ways that are less easy to detect, as my friends discovered to their detriment.

The fact that someone is introduced as your “divemaster” does not necessarily mean that they have a professional qualification. Divers pay to be guided and looked after by an expert, but a corner-cutting operator may give the job to somebody who is unqualified, has little diving experience and therefore can be paid a lower wage—or no wage at all! In the above story, it may even have been the case that the “divemaster” was actually paying the operator for the privilege of working as part of his training. You will not know what is going on unless the subject comes up in an unguarded moment of conversation or your divemaster's poor skill set raises your suspicions.

Another thing that some corner-cutting dive operators do to reduce their costs and enable them to offer cheaper prices is charter what could best be described as a “taxi-boat,” instead of a professional dive boat. The taxi-boat's only function is to get divers out to the sites and back home again, so the cap-



opinion

Know that cheaper prices always involve corner cutting of some sort. Sometimes you can see it and it just involves the level of comfort or service. Sometimes you cannot see it and it may be prejudicial to your safety.

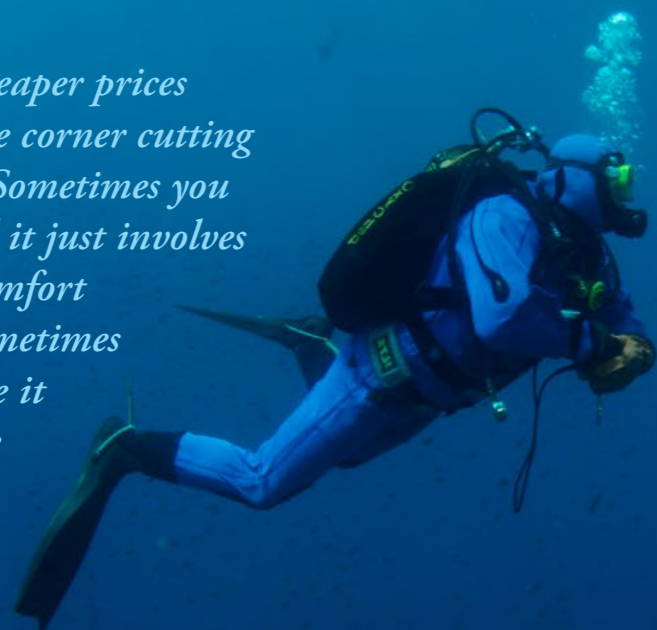


PHOTO-ILLUSTRATION BY G SYMES COMPILED WITH IMAGES FROM PETER SYMES AND PIXABAY

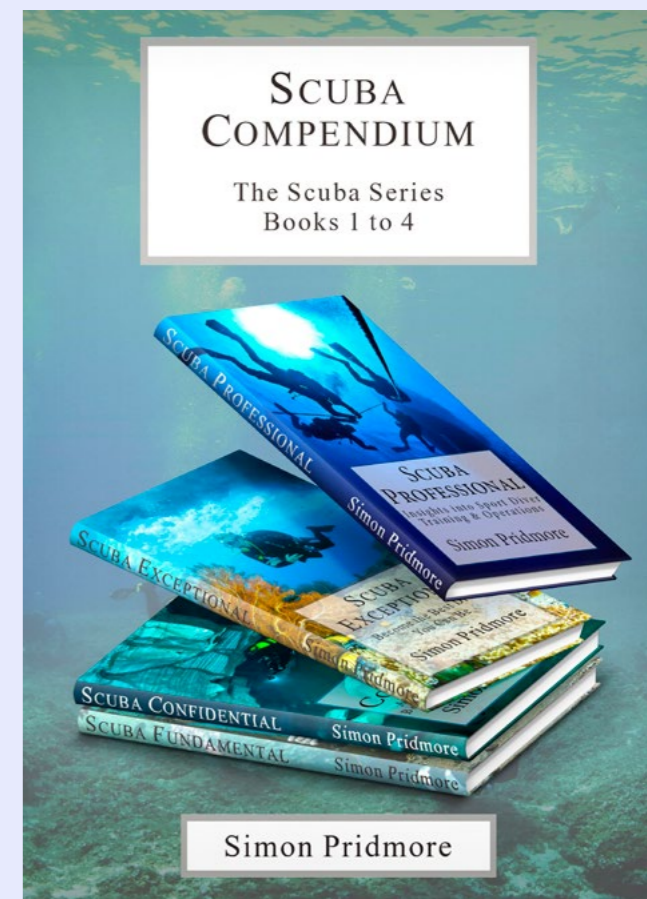
New e-Book

Author Simon Pridmore has just released a new single volume e-book that brings together four books in his bestselling *Scuba* series:

- *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*

As Simon puts it, this is "a remastering and repackaging of the original albums rather than a greatest hits." Nothing is missing. *Scuba Compendium* gives e-book readers the advantage of being able to access all the knowledge contained in the four books in one place, making this a unique and easily searchable work of reference for divers at every level.

Simon has always promoted the idea of safer diving through the acquisition of knowledge, which is why he has chosen to release this highly accessible version. If you have read his work before, you will know that he provides divers with extremely useful advice and information, much of it unavailable elsewhere; his points often illustrated by real life experiences and cautionary



tales. He examines familiar issues from new angles, looks at the wider picture and borrows techniques and procedures from other areas of human activity.

E-book File Size: 5298 KB
Published by Sandsmedia
Sold by: **Amazon, Kobo**, Tolino and others
Language: English
ASIN: B09DBGHJSC

www.simonpridmore.com

tain charges the dive operator a low fee for the service. This fee does not include fuel. The dive operator is expected to supply the fuel, based on the dive sites they want to visit and the captain's assessment of how much fuel is required. The corner-cutting operator will oblige but will only deliver exactly the quantity of fuel requested, not a drop more. In the event of anything unexpected taking place, such as the guests refusing to accept the operator's bait-and-switch tactics regarding the sites to be visited, the boat runs out of fuel.

The taxi-boat captain and crew may even be wearing the operator's t-shirts, so they look like a dive boat team, but this is just a device on the part of the operator to make you think you are getting a better service. The truth is revealed by the crew's actions, not their t-shirts. A knowledgeable, professional crew will be handing out weights, helping set up cylinders, stowing away gear properly, watching the ocean and advising the divemaster on the best way to dive the sites that day. They will be helping divers with their entry and exit, and staying alert

for other boat traffic and divers surfacing early. On a taxi-boat, either the divemasters will be doing all these things or nobody will be doing them.

Takeaways

- In locations where there is good diving, a glut of dive operators and no official oversight, expect that intense competition will produce corner-cutting and be wary.
- Trust that if several well-known and well-reviewed dive operators offer a

similar price for a dive trip, then that is probably the right price.

- Know that cheaper prices always involve corner-cutting of some sort. Sometimes you can see it and it just involves the level of comfort or service. Sometimes you cannot see it and it may be prejudicial to your safety. ■

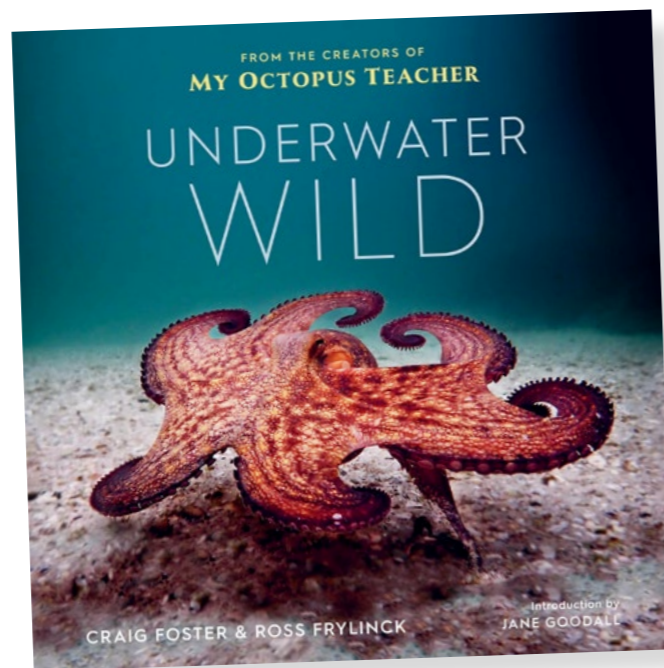
Simon Pridmore is the author of the international bestsellers Scuba Fundamental: Start Diving the Right Way, Scuba Confidential: An Insider's Guide to Becoming a Better

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, see his website at: SimonPridmore.com





Edited by Catherine GS Lim

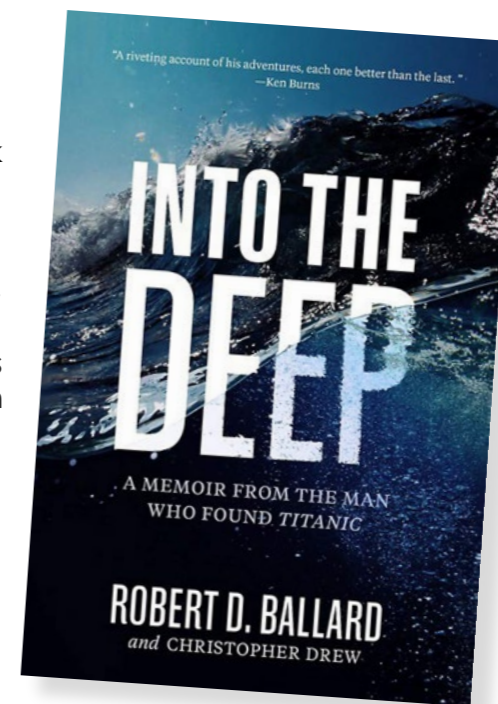


Underwater

Underwater Wild: My Octopus Teacher's Extraordinary World, by Craig Foster and Ross Frylinck

Written by Craig Foster (of *My Octopus Teacher* fame), this book shares the journey of Ross Frylinck as he transforms from a skeptic to a student of the underwater wild. Readers also partake in stunning photos, heart-wrenching stories and intriguing animal behaviour, some of which have never been documented before. With an introduction by Jane Goodall, and written with a down-to-earth delicate touch, the book promises new insights into marine biology, life-changing revelations and an unforgettable personal underwater journey.

Publisher: Mariner Books
Date: 16 November 2021
Hardcover: 344 pages
ISBN-10: 0358664756
ISBN-13: 978-0358664758



Explorer

Into the Deep: A Memoir From the Man Who Found Titanic, by Robert Ballard and Christopher Drew

Explorer Robert Ballard gets personal in this biography. We learn about the man behind the discovery of the *Titanic* in 1985, from his rise to prominence as a scientist and his many other discoveries. We also read about aspects of his personal life, like his struggles with dyslexia, the death of his 20-year-old son and his failed marriage. Using insightful tales from his life, Ballard shares with readers the perils, discoveries, conflicts and triumphs he has encountered on his life journey.

Publisher: National Geographic
Date: 11 May 2021
Hardcover: 36 pages
ISBN-10: 1426220995
ISBN-13: 978-1426220999

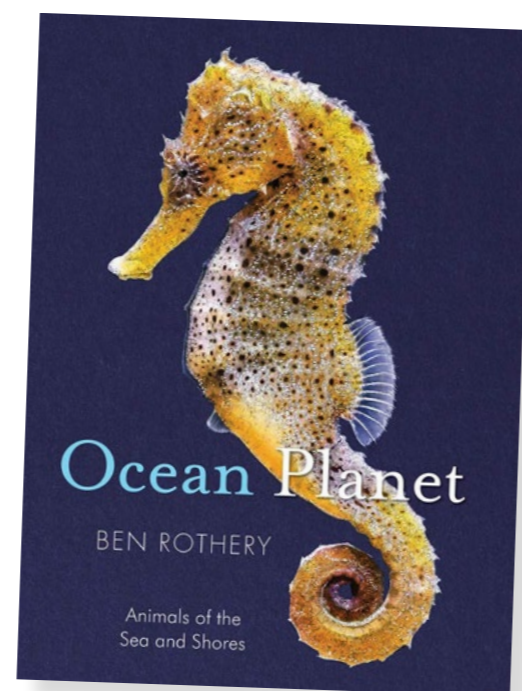
Ocean

National Geographic Ocean: A Global Odyssey, by Sylvia Earle

Written by world-renowned oceanographer Sylvia Earle, this book describes the evolution, beauty and impact of the oceans, the challenges they face, and the many ways we can help protect them. It examines the oceans' origins and the nature of water, and features the diverse life be-

neath the waves, from marine creatures to sponges, kelp and zooplankton. Also within the covers are more than 100 maps and diagrams of all the seas and oceans on Earth, as well as narratives that demonstrate the power and significance of the oceans and their vital role in supporting the planet's lifeforms.

Publisher: National Geographic
Date: 16 November 2021
Hardcover: 512 pages
ISBN-10: 1426221924
ISBN-13: 978-1426221927



Ocean Planet

Ocean Planet: Animals of the Sea and Shores, by Ben Rothery

This children's book presents a myriad of marine creatures as well as shore dwellers who depend on the sea. Between the covers are intriguing and wondrous details about animals from the Pacific walrus, king penguins, squid and seahorse, to polar bears, otters, ring-tailed lemurs, Bengal tigers and British Columbia wolves, and more. Bringing the animals to life are the author's full-colour, photorealistic illustrations. Expect an awe-inspiring journey that takes place over diverse environments, from extreme oceans and polar seas, to tropical reefs, open oceans, kelp forests, mangroves, etc.

Publisher: Tilbury House Publishers
Date: 5 October 2021
Hardcover: 80 pages
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ISBN-13: 978-0884489160

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Edited by Catherine GS Lim



NEW SCIENTIST

Screengrab from *New Scientist's* video showing the mud ring made by the dolphins in the Caribbean

Dolphins in Caribbean trap fish with mud nets

Some bottlenose dolphins in the Caribbean have been using mud rings when hunting prey, a strategy previously believed to be unique to the bottlenose dolphins in Florida.

In 2019, a pair of bottlenose dolphins in the Caribbean—a mother and her calf—was filmed in the Chetumal-Corozal Bay in northern Belize using mud rings to catch fish.

This method of catching fish was first observed and documented in several parts of Florida by Stefanie Gazda, a researcher from University of Florida in 2005.

In this hunting strategy, one of the dolphins swims down to the seabed and uses their tail to stir up plumes of mud in a ring-shaped configuration. The loosened mud

raises and forms a barrier that traps and corrals fish within.

When the fish attempt to escape by jumping out of the water, the other dolphins would be waiting, ready to lunge out of the water at the fish with open mouths.

Normally, this strategy is utilized by dolphins working in groups, though a video by Michael McCarthy showed a lone dolphin employing this strategy in Seminole, Florida. McCarthy has witnessed other solo dolphins using this strategy in the St. Petersburg area as well.

Same tactics used by two different groups

To find out whether the same hunting tactics were used by the bottlenose dolphins in Florida and in the Caribbean, Eric Ramos, a PhD candidate in animal behavior and comparative psychology in the Department of Psychology at The Graduate Center of City

University in New York City, traveled to Florida to collect satellite imagery of the mud rings there for comparison.

While amazed at how two separate groups of dolphins came up with the same hunting strategy, he was not totally surprised, due to the similarity of the two locations.

“...It seems a strong case that they likely converged on this solution and learned to create mud rings to hunt fish in a similar circumstance, which is incredible to me that they would devise similar complicated tactics,” he said, in an article in *The Independent*.

“You’d kind of expect the dolphins would do it but we hadn’t had evidence before showing that they could innovate a complex foraging tactic that’s so similar in different populations that are not close,” he added. ■

SOURCE: MARINE MAMMALS SCIENCE JOURNAL

How toothed whales use echolocation to hunt

A recent study looked into how toothed whales used echolocation to track their prey.

Can hunting by echolocation be as fast as hunting by sight?

As visual animals, we may find this a peculiar question—not so if one applies it to animals that hunt using echolocation, like bats, dolphins and whales. These animals emit clicking sounds and use the reflected echoes to determine the location of objects and other animals.

Can animals that hunt using echolocation lock onto their prey and

track their movements, and how fast can they react? These were questions that an international team of researchers sought to answer.

To find out, they attached sound and movement loggers to six wild harbour porpoises and eight Blainville’s beaked whales. The first group hunted in the shallow waters off Denmark, while the other group comprised deep-diving animals that hunted off the Canary Islands.

Researchers found out that both whale species adapted their clicking rates as they tracked their prey; when giving chase, they might emit as many as 500 clicks per second. They were able to

adapt their clicking rate in response to sudden changes in their prey’s position in as fast as 50 to 200 milliseconds.

“Despite the high clicking rates of the whales, their response speeds were similar to visual responses in monkeys and humans, suggesting that their brains may be wired in much the same way as visual animals,” said Heather Vance, a postgraduate student at the Sea Mammal Research Unit, University of St Andrews, Scotland, United Kingdom.

Vance is part of the research team and the first author of a paper on this topic published in the *eLife* journal. ■



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Harbour porpoise in Denmark



shark tales

Edited by
Peter Symes



STEFAN KELLER / PIXABAY

Surfers are in the highest-risk group for fatal shark bites, especially by juvenile white sharks.

Why do sharks bite people? “Mistaken identity” theory tested

Why sharks sometimes bite humans remains unclear, but potential reasons include mistaken identity, whereby sharks are thought to mistake humans for their typical prey; curiosity; hunger; and defensive or offensive aggression.

The mistaken identity theory has received little scientific scrutiny and the visual similarity between humans and pinnipeds at the surface has been debated largely on the basis of human visual perception, rather than that of sharks.

However, recent progress in our understanding of the shark's visual system has enabled a team of researchers from Australia's Macquarie University in Sydney, to investigate further the

similarities between pinnipeds and humans from a shark's perspective.

What do sharks see?

The team is working on non-invasive vision-based devices to potentially protect surfers and swimmers from shark bites. In this study, the scientists measured and compared the visual cues emitted by different objects from the perspective of juvenile white sharks to test the mistaken identity hypothesis.

The researchers attached a GoPro to an underwater scooter, and set it to travel at a typical cruising speed for predatory sharks. Back in the lab, the team drew on extensive shark neuroscience data to apply filters to the video footage, and then create modelling programs to simulate the way that a juvenile white shark would process the movements and shapes of different objects.

They concluded that the poor spatial resolving power of the shark retina may result in bites on humans as a result of mistaken identity or ambiguous visual cues.

“Surfers are the highest-risk group for fatal shark bites, especially by juvenile white sharks,” says lead author Dr Laura Ryan, a post-doctoral researcher in animal sensory systems at Macquarie University's Neurobiology Lab.

“We found that surfers, swimmers and pinnipeds (seals and sea lions) on the surface of the ocean will look the same to a white shark looking up from below because these sharks can't see fine details or colours.” ■

SOURCES:
JOURNAL OF THE ROYAL SOCIETY INTERFACE,
MACQUARIE UNIVERSITY PRESS RELEASE

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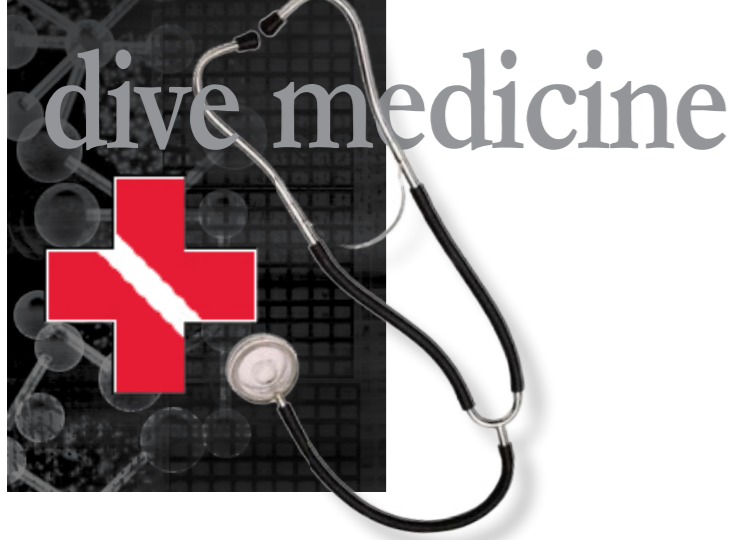
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Blood Test for Decompression Sickness?

Text by Peter Symes

Will it become possible to diagnose decompression sickness through a blood test? We take a closer look at the implications of some recently published research.

That decompression causes bubbles to form in our tissues, which in turn could lead to decompression sickness (DCS) and serious injury, is elementary knowledge for any certified diver.

During our entry-level training, many of us have seen bubble formation explained by comparing it to a bottle of carbonated water that gets opened too fast. From there it does not require much imagination to picture how bubbles, being physical entities, cause problems through mechanical effects, i.e. by physically obstructing anatomical function or biochemical pathways. That is probably the mental image most of us were left with.

Inflammation

Little were we taught, at least at that stage, that there is also an inflammatory reaction to DCS and that it is a significant part of the pathology.

An inflammatory response can result from different types of injury, irritation, or trauma—including DCS. Inflammation is a complex cellular process involving various types of immune cells, clotting proteins and signalling molecules.



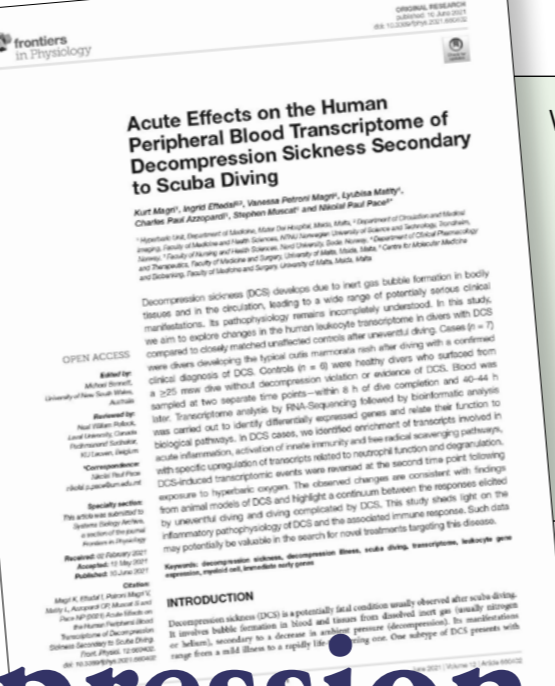
Because of this complexity, or rather the huge number of possible expressions, a response can exhibit a specific signature in the form of various proteins that get produced as a result. This signature can be characteristic for various conditions, and therefore possibly constitute a diagnostic tool.

Unique signature?

It thus begs the question of whether DCS elicits a response that is specific enough to be identifiable and detectable in blood samples in suspected cases. In other words, whether it is possible to find blood markers that can unequivocally confirm decompression sickness.

That is what an international team of hyperbaric researchers from Norway and Malta set out to find out. Their research, published in *Frontiers in Physiology* this summer, aimed to “shed light on the inflammatory pathophysiology of DCS and the associated immune response.”

“Such data may potentially be valuable in the search for



WHAT IS BEING MEASURED?

RNA translates DNA (our genes) into proteins. The transcriptome is the set of all RNA transcripts in an individual or a population of cells. The term is a portmanteau of the words “transcript” and “genome.” Both uneventful diving and DCS trigger changes in the peripheral blood transcriptome. This study evaluated the DCS-induced transcriptomic signature in humans and looked into what distinguished physiological responses from pathological changes. More specifically, the researchers explored the evolution of leukocyte gene expression in human subjects with DCS compared to closely matched divers after uneventful diving by means of RNA sequencing.

novel treatments targeting this disease,” the abstract reads. Surely sounds promising.

As a result, some other dive media were quick to jump to conclusions and enthusiastically report that this research was leading to a blood test that would make it easier to diagnose DCS.

Perhaps one day it will. But at this point in time, such conclusions are premature.

We conferred with Dr Neal Pollock, associate professor at Laval University, a frequent contributor to this magazine, and our go-to-expert in the field of hyperbaric research.

The conducted research is a pilot trial, which indeed showed there are some cytokine and leukocyte responses that appear to be strong in decompression sickness. (Cytokines are a broad category of small proteins which act as signal molecules that play an important role in the immune response.)

It should also be noted that the study was conducted on a quite small number of cases, and it lacked baseline measures such as knowing what the patients' status were prior to their dives. (Both these limitations were addressed by the authors in the paper.)

Potential

Dr Pollock pointed out that the value of this study is demonstrating that RNA has the potential to show physiological changes that might be important for diagnosing and evaluating decompression sickness. But the odds are against a simple test because there is so much variability.

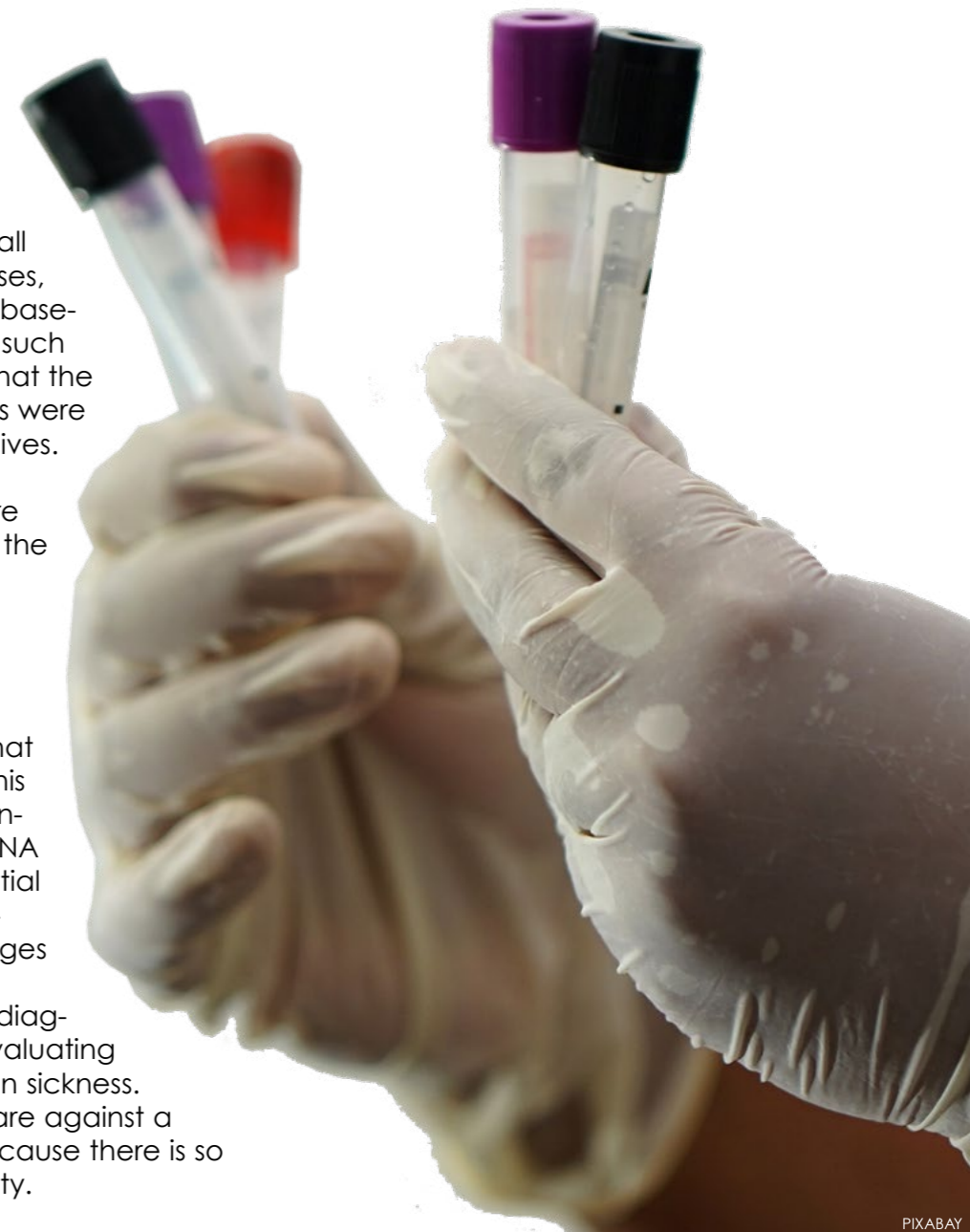




PHOTO-ILLUSTRATION BY G SYMES COMPILED WITH IMAGES FROM PIXABAY

As matters stand, it requires a whole suite of measures, all showing changes pointing in the same direction, before it is possible to be firmer in the evaluation of a suspected case of DCS.

That said, if a marker could be found that could be reliably isolated, and if it was truly responsive, it is quite conceivable someone could one day come up with a quick test of blood.

Dr Pollock does not, however, foresee that a field test is just around the corner as, among other things, one has to find something that is sufficiently specific to qualify as such a marker.

Confounding causes

For starters, inflammation can be triggered by many other events unrelated to diving, which may create the same kind of response. Maybe the patient has a virus or suffers from a food allergy, which could show up in tests.

As Dr Pollock succinctly put it: "Let's say you have somebody who steps

on a sea urchin or hits some invertebrate that results in an allergic response. You then have to be sure that the profile of the response you saw to the decompression stress was different from any one of these other common injuries that a diver could face. Otherwise, you might want to say everybody who runs into a jellyfish should be treated for DCS."

Where you have a broad response, and there is so much overlap between the different conditions, it is really hard to say when one is one and when it is another, Dr Pollock added. What we are seeing right now is the ability to measure generalized response to stress, which is good, but it is not that powerful.

And that is not the end of possible complications and challenges, which remain to be solved.

Different cases of DCS can also elicit different immune responses. For instance, people can get hit in a variety of different tissues, which would presumably evoke a different pattern of response, even in the

same individual, which makes a single diagnostic pattern of response unlikely to be seen.

In search of such a pattern, we would have to measure a system that works with incredible finesse and possibly have to look at hundreds of inflammatory responses. Ultimately, we may achieve the required sensitivity to perform such measurements, but we have a long way to go before we have that capability, Dr Pollock explained.

This study alone is more proof of capability than any confirmation of what it means for decompression. The paper does not provide any answers, but it does encourage more research.

That the desired end-goal remains elusive at this juncture, does not mean that this line of research is not worthwhile either. It is, in fact, quite important, as it brings molecular biology tools to diving science and that, in the long run, could be very useful. ■
SOURCE: FRONTIERS IN PHYSIOLOGY

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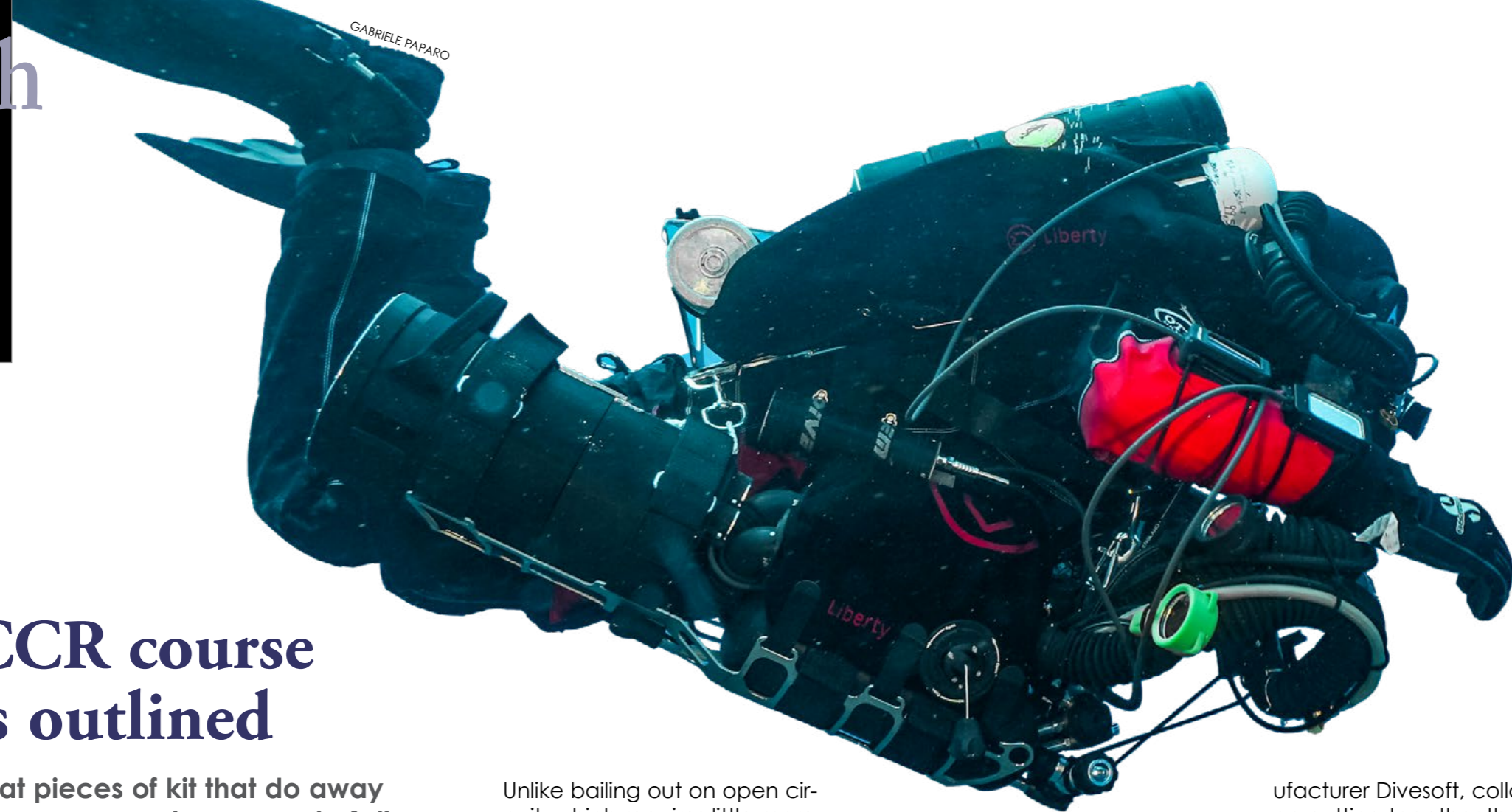
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tech

GABRIELE PAPARO



Bailout CCR course standards outlined

Rebreathers are great pieces of kit that do away with the need to carry an excessive amount of dive cylinders on deeper dives. However, this advantage is offset by the need to also carry additional open-circuit cylinders on which a diver can bail out in case of a rebreather malfunction. Using another rebreather could be a better solution, and to that end, a bailout rebreather course has been developed.

So, why can't you just strap on another rebreather and switch to it, if need be? Well, it is not quite that simple.

Rebreathers are quite bulky pieces of equipment, so two rebreathers take up a lot of space. They also demand a lot of a diver's attention, providing a degree of task loading.

Various dual rebreather designs have provided different takes on a solution, but many of these constructs comprise a double set of

scrubbers, controllers and some other core components, packed and fitted inside one unit but still sharing the same loop. Obviously, such designs do not offer any protection against catastrophic flooding of the loop.

Enter sidemount rebreathers, which, being compact, are both easier to attach and to carry, and some are complete units on their own.

Procedure is different

Then there is the matter of how to bail out to another rebreather.

Unlike bailing out on open circuit, which requires little more than a simple swap of mouthpieces while closing a valve or flipping a lever, there is more to it when it comes to closed circuits and a different set of issues to tend to.

For example, when bailing out to an open circuit, the diver can immediately breathe from the regulator; however, when switching to a secondary rebreather, it is also of paramount importance to ensure that the pressure of the breathing loop equals that of the ambient pressure. If the pressures are not equal, the diver will not be able to breathe.

A relative vacuum in the loop will result in collapsed counterlung, squeezed hoses and possibly ingress of water. Any attempt to breathe from a device in this state could result in instantly sucking the gas out of the diver's lung,

resulting in drowning. The inverse problem in which the loop is over-pressurised could cause lung or stomach barotrauma.

The correct procedure is therefore to switch to open circuit first, either through a BOV or a second stage regulator, while testing and preparing the loop on the bailout rebreather, and only move onto it once it has been ascertained that the loop has the same pressure and the gas is breathable.

Course standards

This is but one example among several salient points the developers of the first standards for a bailout rebreather diving course are addressing in their program. Matthew Jevon, who our readers will recognise as a regular contributor to this publication, and Jakub Simanek from Czech man-

ufacturer Divesoft, collaborated on putting together the course standards, which have now been adopted by TDI. It is understood that other agencies are either considering also adopting this outline or working on developing their own.

The stated objective of the course is "to train divers in the benefits, hazards and proper procedures for utilising a rebreather in back-up/bailout mode up to the level of their existing CCR qualification on both the unit planned to be

the primary rebreather and the unit to be utilised as a bailout/back-up rebreather."

Needless to say, this is not a course for newcomers but primarily aimed at advanced mixed-gas rebreather divers. Enrolling in the course requires a minimum of 100 hours logged on both units, a minimum of 50 dives on each unit being used as the primary rebreather and that at least 20 dives on each should be mixed-gas dives.

Sidemount rebreathers

There are little over half a dozen units on the market being labelled as sidemount rebreathers, but almost all of them need offboard O₂ diluent or both. The only fully self-contained unit currently on the market is Divesoft's Liberty.

At the recent DivingTalks conference in Portugal, I have also seen presented a late prototype of the ECBOB (Electronic Compact Bailout Rebreather), which is designed specifically for this purpose. It is a compact design with a number of neat features and solutions, but that is a story for another day. ■



Divesoft's Liberty sidemount rebreather

GUE releases new version of DecoPlanner software

Global Underwater Explorers (GUE) has released version four of DecoPlanner, their dive-planning software. It is available as an app for iOS and Android, and has desktop versions for Mac and PC.

Modern dive computers are fantastic tools, which are getting still easier to use, with clear and nicely designed interfaces that are easy to read and intuitive to use. Many of the later models are also great-looking wearable tech and sleek enough to pass for a fancy wristwatch. But wouldn't it sometimes be nice to have a closer look at what is behind those shifting digits and the mechanics of decompression calculations?

Enter decompression software, such as DecoPlanner, which provides the user with precisely such a window into how dive profiles and decompression are calculated.

By saying that one can “toy” around with this software and try all sorts of settings to see what happens, I do not mean to imply that this is a toy. Because it certainly is not one; but, it is a valuable tool and a great aid in planning a dive, in particular when decompression and change of gases are required.

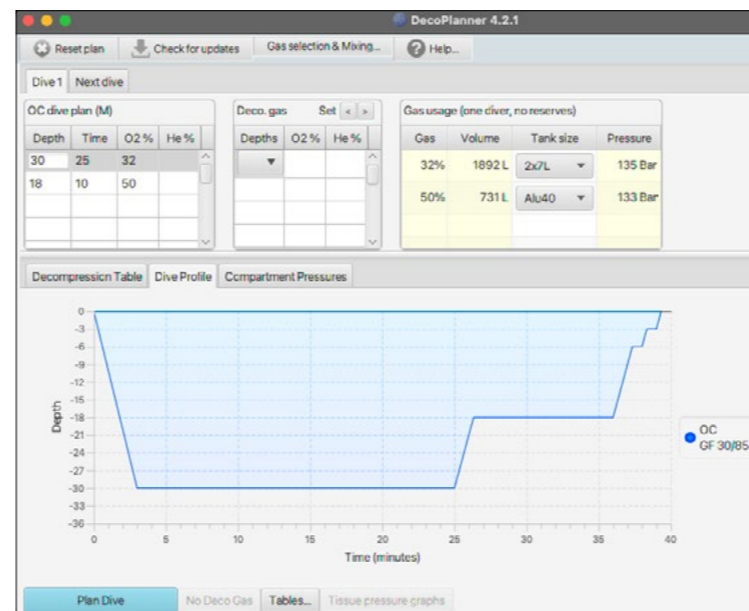
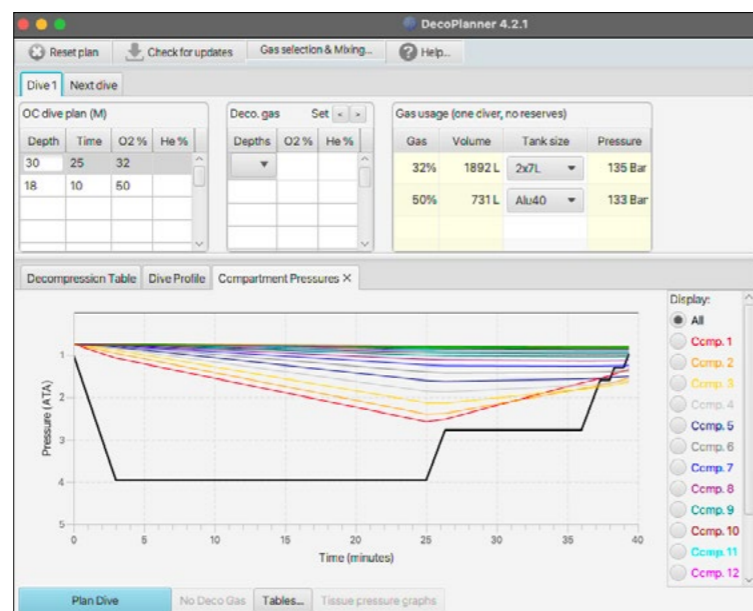
Visual aid
It is a tool that will display, in the

form of graphs, how depths and dive time can be matched with various choices of gases and tank sizes while, say, visualising how various tissue compartments on-gas and off-gas during the dive. In doing so, risks get highlighted so one can easily mitigate them by making better and safer choices.

Let's look at some simple examples. Say, I plan on visiting a wreck resting at 30m. I will use 32% nitrox on the bottom (staying

for 25 minutes) and 50% from 18m where I plan a 10-minute stop before ascending. Since I am a right wuss, I want to keep a wide berth around any significant tissue loading, and I do not want to carry heavy tanks. This software shows me that I can do away with using my 2 x 7-litre twinset for the bottom gas and an Alu40 (5.7-litre) sling tank for the ascent, and have some gas to spare.

Another dive to 45m for 50 minutes, on the other hand, would require the use of 2 x 18-litre twin tanks and an Alu80 (11 litres) with 50% nitrox for accelerated decompression. Decompression will also result in an ascent time of 59 minutes and 119 minutes of total dive time. This dive is outlined on the graph on the right (below), but with a different display.



These oversimplified examples are just scraping the surface of what this software is capable of doing, as we have not even made a mention of trimix or open circuit, which is where its strengths come to the fore. There is also a long list of options for setting parameters and preferences, which can be seen on the right side of the screenshot (below).

Try it
But you can explore it for yourself, as you can now get a free 15-day trial license at the link below, so you can try it out before deciding to buy. ■

► **DecoPlanner 4 software download from GUE's website**

- DecoPlanner 4 is a complete rewrite of previous versions, and now includes convenient features such as:
- CCR and OC planning
- graphical comparison of dive profiles, such as CCR vs. OC and/or ZH-L16 vs. VPM-B
- Improved tissue pressure graphs
- Easy self-updates when a new version is available



Poseidon launches app

The app, which is called “Reef,” is a dive planner for both open circuit and rebreather divers. It offers different dive modes and deco models available to match any setup and preferences, regardless of level. It calculates needed stops for both a single dive and a series of dives, and lets you analyse your dives. It lets you tune gradient factors to see

the difference in dive time and get a summary of the result as well as a detailed list of runtime and gas switches, if applicable. By connecting it to a Poseidon dive computer after a dive, the app can visualise data such as depth, water temperature, tank pressure, loop temperature, pO₂ alarms and more. For more information, visit: Poseidon.com ■

Tip: Do not attempt to export rebreathers to Libya if you do not want to go to jail

Remember Peter Sotis? He was Rob Stewart's dive buddy when the filmmaker tragically lost his life on a deep rebreather dive in 2017, resulting in him getting sued.

That was not the end of his woes, however. A federal jury in Florida has just convicted Sotis and Emilie Voissem of participating “in a scheme to cause the illegal export of rebreather diving equipment to Libya in August 2016”. The pair is now facing a penalty of 20 years in prison and a million-dollar fine.

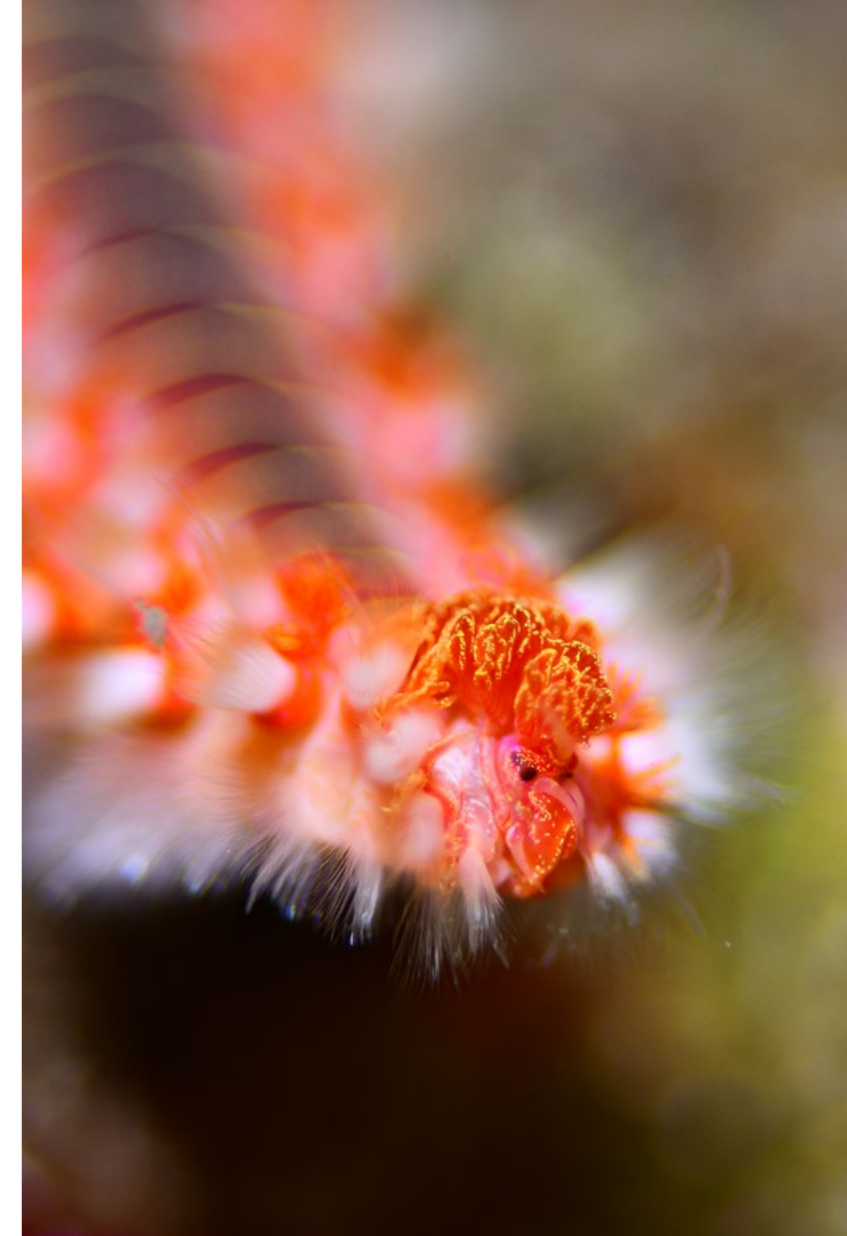
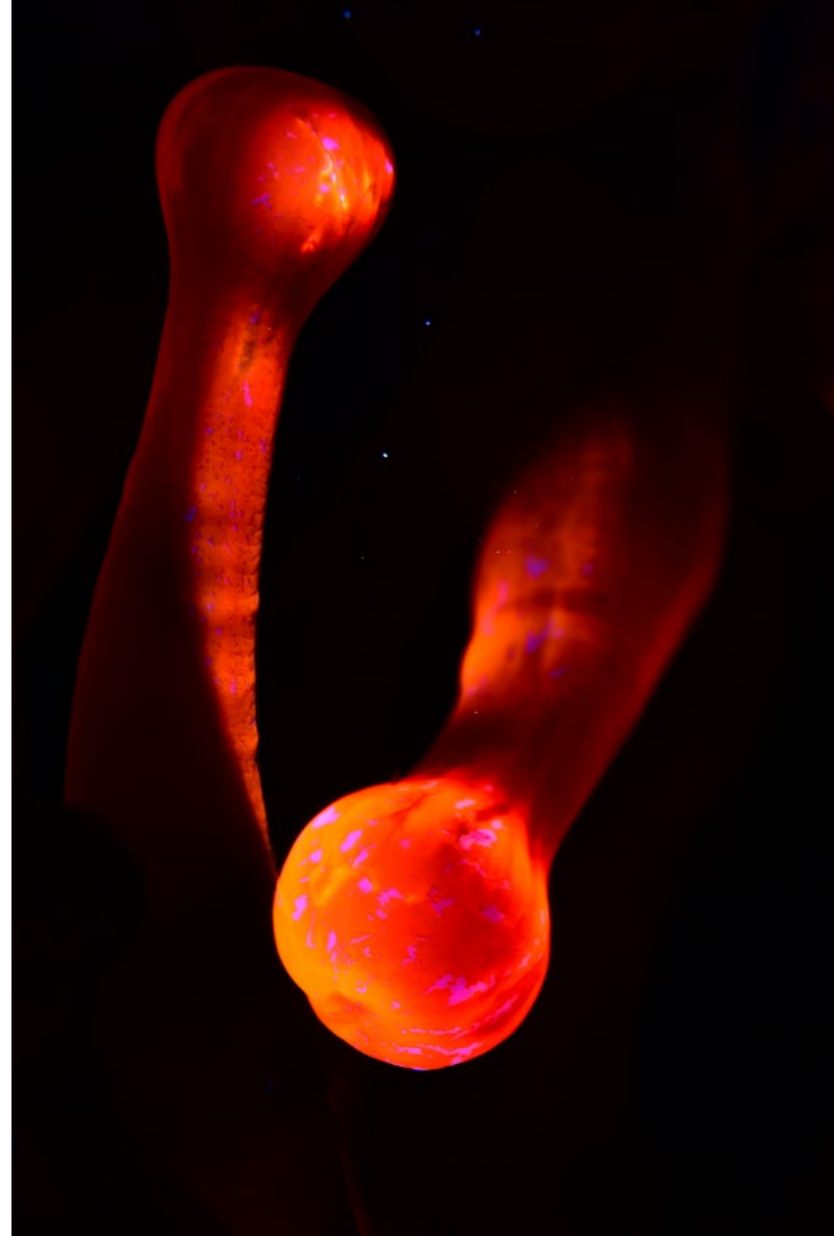
Because rebreathers have both civilian and military uses, they are

on a list of dual-use items that are export controlled and licensed by the US Department of Commerce Bureau of Industry and Security (DOC-BIS). As such a license must be obtained in order to export rebreathers to any country with national security concerns, such as Libya.

According to the US Department of Justice, the defendants wilfully attempted to export those items after receiving an instruction from a Department of Commerce special agent that such items were detained and not to be exported while a license determination was pending. ■



LEFT TO RIGHT: Close-Up Category. 1st Place: José Tomás Yakasovic and Gustavo Duarte, Chile; 2nd Place: Jesus Yeray Delgado Dorta and Abigail Martin Hernández, Spain; 3rd Place: Sebastien Ameeuw and Delphine Fraysse, France



Text by Adam Hanlon
Photos by the contest winners

The tiny charming and picturesque island of Porto Santo—the northernmost and easternmost island of the Portuguese archipelago of Madeira, located in the Atlantic Ocean—played host to the CMAS World Championship of Underwater Photography and Video, which took place on 4-9 October 2021. This biannual event was now in its eighteenth year and had attracted 48 teams from 18 countries, each competing for national and individual glory. Adam Hanlon reports.

2021 CMAS World Championship of Underwater Photography & Video

The CMAS World Championships are perhaps underrepresented by many of us in the underwater imaging media. Many of the teams are selected by their national bodies and attract funding from Olympic bodies. Placing or doing well in this event ensures both national acclaim and individual success.

One of the reasons for its relative obscurity is the actual format of the contest. It is based on the “photo-sub” style, with teams and individuals diving on specific sites and submitting images directly from the camera. Hence, the images are judged against other images taken under very similar conditions. So, it is the

best photographer or filmmaker of the day who wins, rather than photographers who have the time, money or occupation that allows them to spend long periods of time in exotic locations.

Diving

The diving at Porto Santo is temperate, with clear blue water and excellent visibility. At the time of the contest, the water temperature was 24°C (75°F), which is as warm as it gets. The dive sites are characterised by dramatic underwater scenery with encrusted boulders and a large variety of fish and critter life.

The Portuguese government has pro-

vided funding for the deliberate sinking of rocks to provide artificial reefs and attractions for visiting divers. Porto Santo has the wreck of the NRP *General Pereira d’Eça*, which was a corvette of the João Coutinho class. She rests at around 30m and is intact, providing a home to a variety of fish life, including grey triggerfish (*Balistes capriscus*), which are bitey like their larger relatives, although they are too small to do any significant damage!

Serious competition

To emphasise how seriously the competing teams take this event, many of them have been on the island for some time

before the official start of the contest, carrying out training dives to figure out how to maximise the opportunities. I was fortunate enough to join them on a few dives to explore the diving and to see what they were up to.

Having been in “travel isolation” for the past 18 months, and hence not having dived in blue water for that period, Porto Santos’ clear, blue and relatively warm waters reminded me how much I have missed it! The locals all told me that the visibility was not as good as it could be, and was improving, but given my recent diet of green water diving at home, it seemed wonderful!





photo & video

Creative Category. 1st Place: Eser Pasa and Tolga Pat, Turkey (top right); 2nd Place: Rafael Fernández and Esteban Montserrat Veja Moreno, Spain (left); 3rd Place: Hakan Basar and Ersin Tohumat, Turkey (bottom right)

Covid-19 restrictions

Travel in general was still not an easy process, with (in this case) pre-flight testing required and registration on arrival. In general, I would say that mask use in public indoor and outdoor spaces was being well adhered to, with mask-wearing being the norm. There did seem to be a general willingness to put other's health ahead of one's own convenience, which boded well for the removal of travel restrictions in the future.

Day One

The first day of the CMAS World Championship of Underwater Photography and Video was largely one of paperwork and ceremony. The nature of the event and the number of contestants inevitably meant that this process was somewhat protracted.

All the contestants were now ensconced in the competition's official hotel: the Vila Baleira in Porto Santo. As most of you reading this will probably know, underwater image-makers do not travel light, so it was fair to say that the lobby was knee-deep in housings and diving gear.

This was complicated by the additional steps needed to ensure that the contest was safe and did not become a superspreader event for Covid-19. To this end, all the contestants and staff were required to take a test, which was carried out as part of the registration process.

The local Portuguese CMAS Federation was critically involved in making this process run smoothly. The true heroes of the event were the scores of volunteers who worked incredibly hard to make the event a success.

Pedro Vasconcelos was the driving force behind the choice of Porto Santo as the venue, as well as the organization of the contest. He was joined at the registration by CMAS' appointed Technical Director for the contest, Cenk Ceylanoglu, and Director of Visual Communications, Kerim Sabuncuoglu.

After lunch, the whole assembly headed off to the center of Porto Santo town for a parade with all the contestants, and the offi-

cial opening of the contest. As always, this was a high-spirited and colorful affair, with much flag-waving and high jinks.

During the procession, each team was led by local school children. As a part of the contest, local children would also be participating in a program of snorkeling, drawing and creative exercises, beach clean-ups and rock pooling. It was great to see the competition performing an important and active role in developing

young people's attitudes towards the sea.

The contestants were welcomed by a group of local dignitaries, local government officials and CMAS representatives. CMAS' Sabuncuoglu formally declared the event open.

The last order of business for the day was the technical meeting. This was a venue to discuss the contest's rules and to brief the contestants on its organization. Vasconcelos introduced the contestants

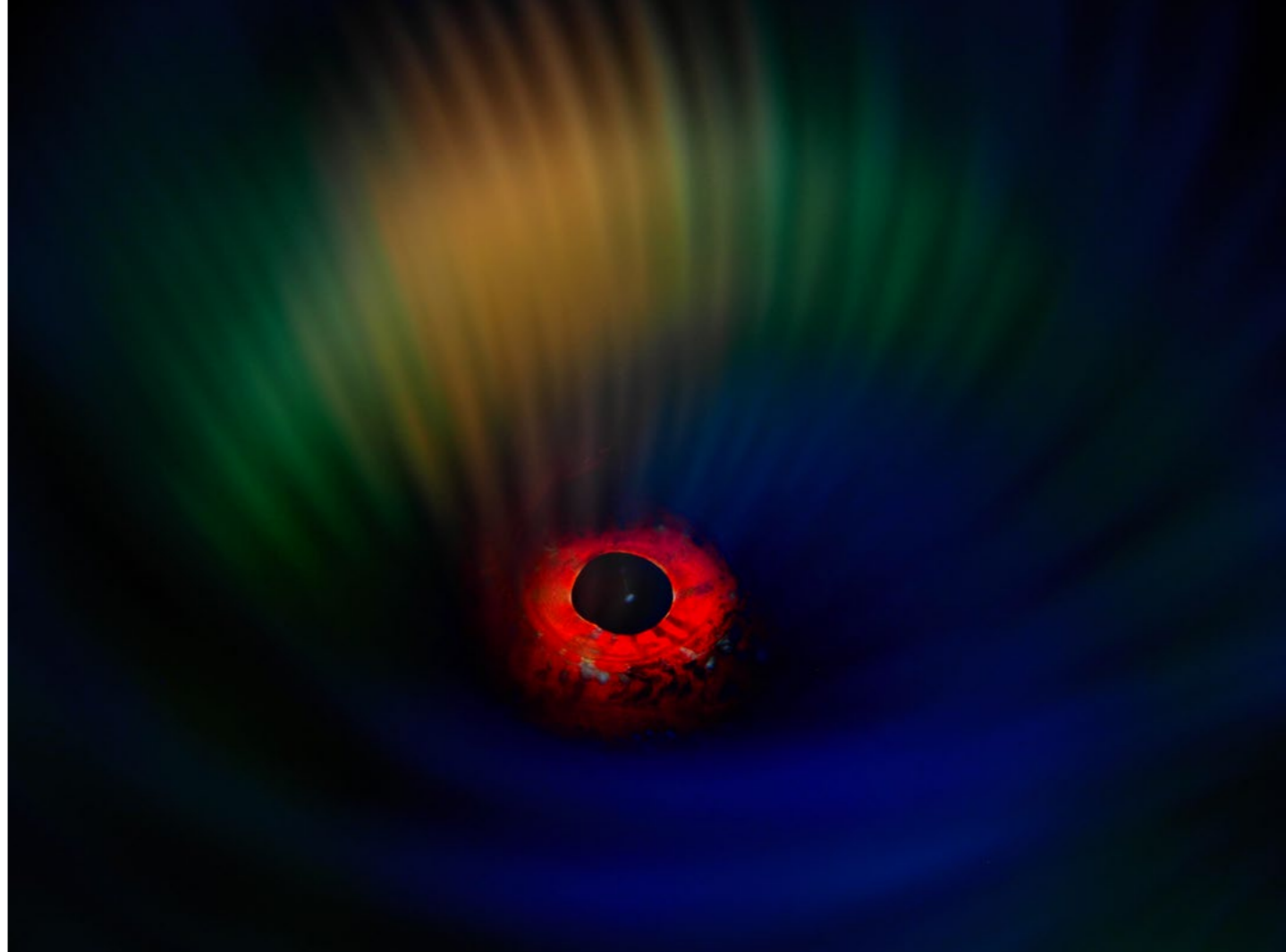




photo & video

Fish Category. 1st Place: José Tomás Yakasovic and Gustavo Duarte, Chile (right); 2nd Place: Filip Staes and Thomas Van Puymbroeck, Belgium (top right); 3rd Place: Francesco Sesso and Alessandra Pagliaro, Italy (bottom right)

to the team that would be supporting the diving operations, from a doctor on standby to the boat skippers that each team will be diving with. The head of the judging panel for the video contest, Julie Ouimet, had arrived from Canada and was roped into helping draw the group allocations.

Tomorrow, there would be "dress rehearsal" day, which would allow the organizers to iron out any last-minute organizational challenges, before the two days of competition began. I looked forward to visiting the clear blue waters of Porto Santo again!

Day Two

Day Two was a practice day for the contestants. As Technical Director Ceylanoglu noted, this was as much a rehearsal for the organizers as it was for the participants.

The structure of the contest was somewhat unfamiliar to many participants from the Wetpixel community. The goal of the competition was to select winners who produced the best results on the day.

The dive teams rotated through each dive site and were strictly limited in terms of dive time, depth and reserve air supplies.

The only edits allowed were those available to contestants in-camera and had to be carried out during the dive. Each contestant was limited in terms of the total number of images they could shoot.

Deletions not allowed

To enforce these rules, each camera had its memory card formatted while being overseen by a judge and the housing was then sealed. It could not be opened, except under the supervision of an official. A verification image was then taken, and the camera was reset to a (standardized) random date.

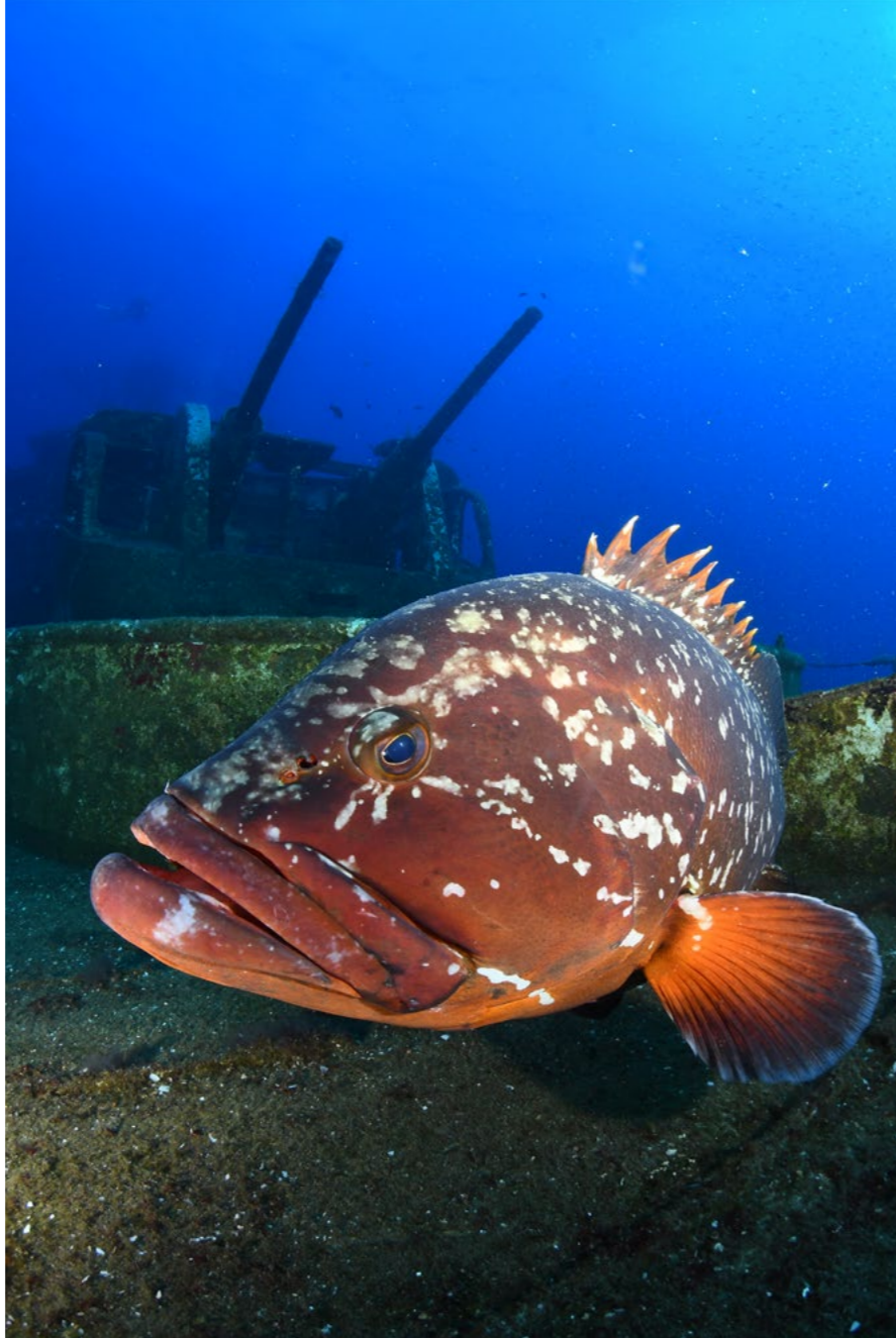
At the end of each day, a final verification image was taken, and then the organizers broke the housing seals, collecting the

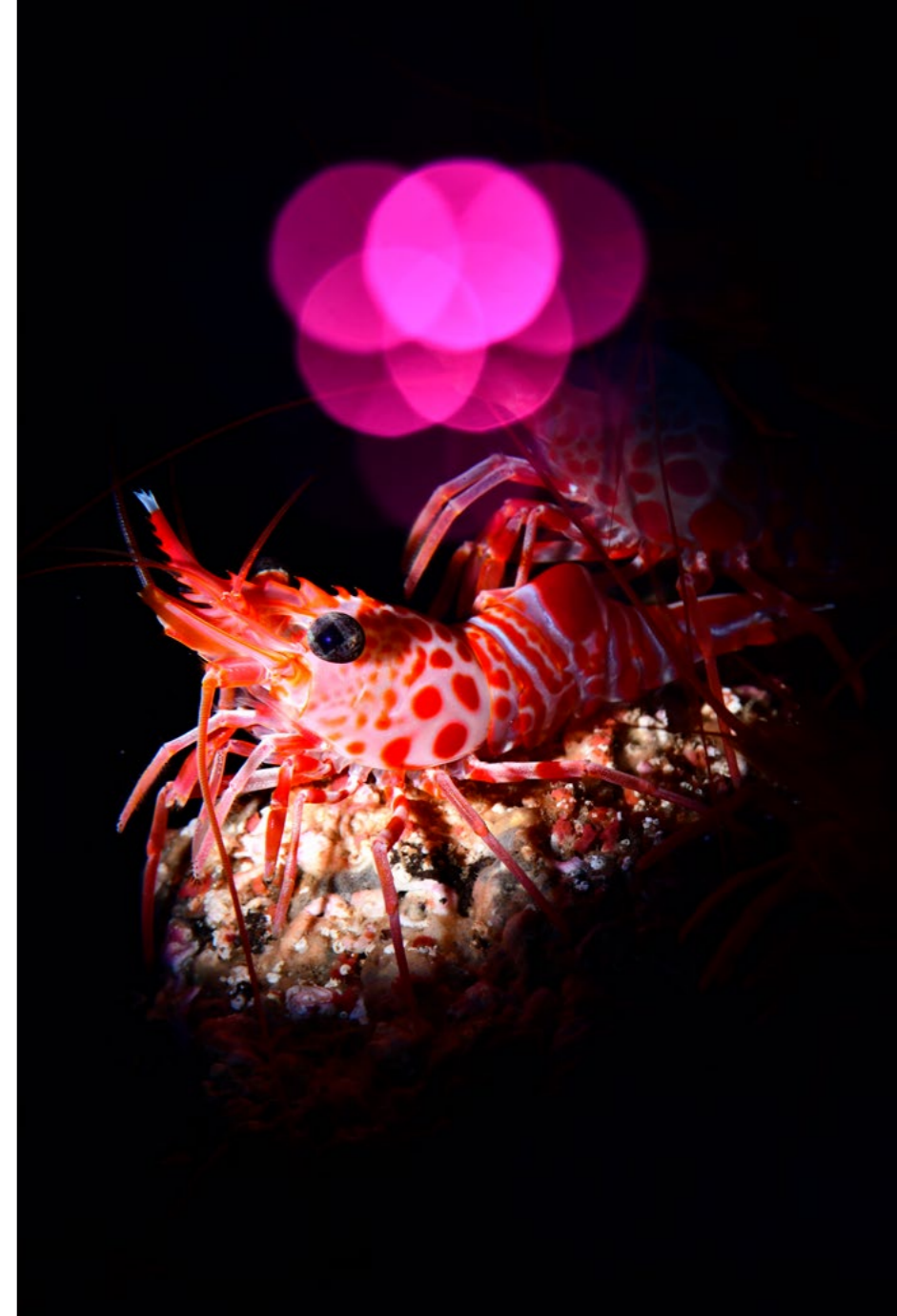
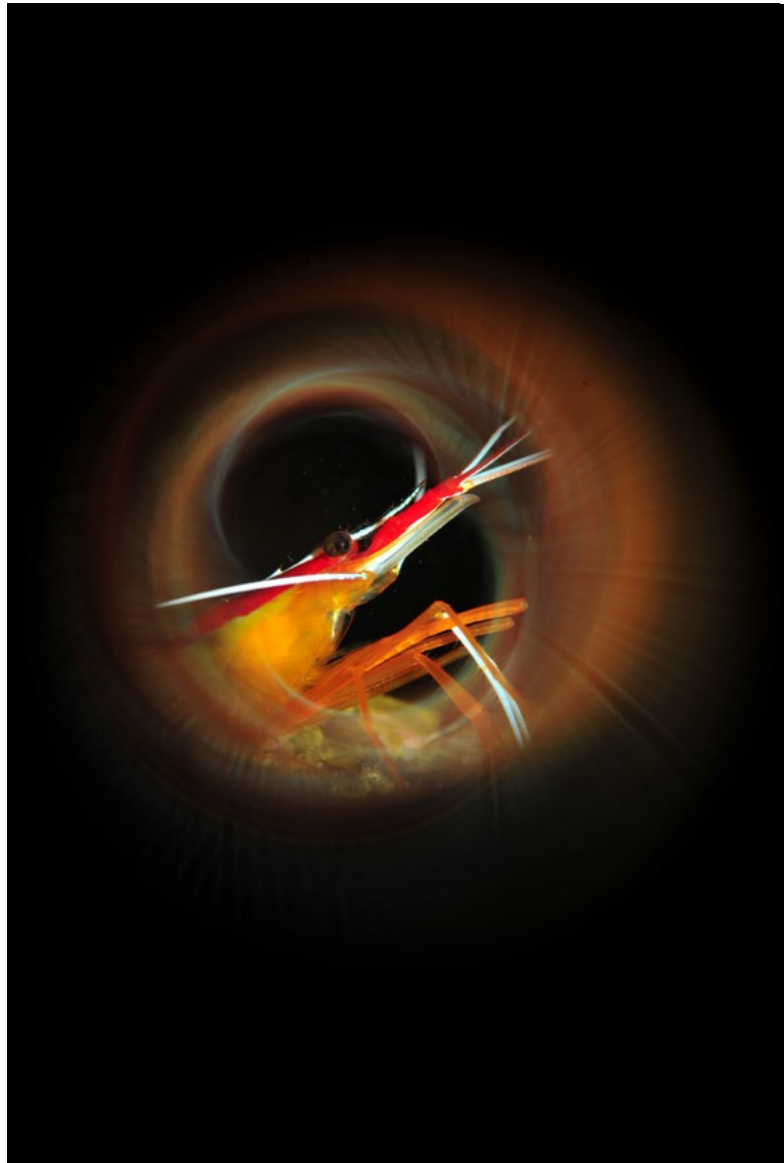
memory cards, which were then stored in sealed bags. At the beginning of the next day, the cards were distributed, and the housings were sealed again under supervision. All this took huge amounts of organization, with numerous moving parts that needed to be practiced by both contestants and staff alike.

So, at 8:00 a.m. sharp, buses promptly set out from the contestants' hotel, bound for the con-

test site at the harbor. Upon arrival, the teams got their dive gear set up and went through the process of formatting their memory cards and having their housings sealed (as described above).

Boat and dive site allocations had been selected in the draw at the technical briefing, and once the formalities had been completed, there was a mass exodus as people headed out to their boats. Once at their boats, and after sort-





Theme Category. 1st Place: Damir Zurub and Katarina Mihaljinec, Croatia (right); 2nd Place: Rui Bernardo and Sonia Bernardo, Portugal (above); 3rd Place: Marino Brzac and Sandra Sertic, Croatia (left)

ing out an islandwide shortage of lead diving weights (!), the boats headed out to the dive sites. The maximum time allowed on each dive was 90 minutes, so predictably, after around two hours, the flotilla all returned.

Many of the contestants reported significant current on some the allocated sites, which made conditions challenging. While this may have seemed somewhat unfair to the observer, it was important to remember that given that all

ambulance and a doctor continuously in attendance. After the dive, a member of the Netherlands team was unfortunate enough to fall over while rinsing his equipment, and in doing so, managed to injure his knee badly.

The paramedics and the doctor onsite splinted his leg, and he was then taken to hospital. Once his leg had been X-rayed, it was determined that he needed to be evacuated to Madeira in order for his injury to be treated. The

the contestants would dive each of the sites, they all faced the same difficulties. The format of the competition was based very much on recognizing the best images captured during the contest, where each participant would encounter the same difficulties.

Safety

CMAS takes safety at their events especially seriously. To this end, there was an

Portuguese military arranged for a low-level flight.

Second practice dive

After lunch, a second "practice dive" was carried out. I was able to join some of the contestants underwater, diving on the wonderful wreck of the NRP *General Pereira d'Eça*.

I used a Nauticam Extended Macro Wide-Angle Lens (EMWL) in blue water for the first time and was very impressed with its image quality and the perspective that the lens provided. It is perhaps the ultimate close-focus wide-angle tool. Despite being used with a SAGA adaptor on my Seacam housing, it balanced beautifully underwater and was much easier to handle underwater than expected. I used both the 130° and 110° objective lenses.

At the end of the day's diving, the administration team collected the contestants' memory cards and secured them, ready for the start of the first actual day of competition shooting on the next day.

The contestants were all very focused now and had formulated plans that they hoped would give them an edge over the other teams. As an observer, I was excited to see how these plans would pan out.

Day Three

Today was the first day of the Championship proper, here in Porto Santo. The spring tides caused some issues with current on some of the allocated dive sites the day before, so the start time was brought forward to allow dives to be timed to minimize their impact. In addition, most of the procedural and equipment issues that became apparent during the dress rehearsal were ironed out, making for a super-efficient start.

As before, the image-makers had to format their memory cards while under the watchful eyes of the judges, and to reset their cameras' dates. In addition, once

the cards had been formatted, the housings were sealed. Lastly, each contestant had to shoot a picture or a short video clip of a printed sign on a nearby wall.

The boats all left by 10 o'clock. Once they got out of the harbor, they encountered some pretty rough conditions, and the large boat carrying the video teams was struggling to maintain station on the dive site. This led to some rapid reorganization, and the boat shifted to a site that was less exposed.

After the first dive, the contestants returned, and if they needed to change lenses, did so under the watchful eyes of the judges.

Modern technology has made the





photo & video

Wide-Angle Category. 1st Place: Lorinc Ferenc Lorincz and Yvette Takár, Hungary (right); 2nd Place: Niklas Nilsson and Catarina Josteus, Sweden (far right); 3rd Place: Fredrik Blomqvist and Andreas Kron, Sweden (bottom right)

organizers' job somewhat harder. The ability to transfer images to mobile devices via Bluetooth or Wi-Fi creates a potential for people to edit their images on these devices. Hence, the rules forbid people from having these devices near their cameras during the contest. Given that most of us tend to have such devices with us most of the time, many contestants had overlooked this rule.

Organizer Vasconcelos was forced to call a meeting with the team captains, reminding them that having or using a mobile device near their cameras would cause them to be disqualified.

The head of the photography judging panel, Renee Grinnell Capozzola, arrived today and joined the head of the video panel, Julie Ouimet.

After lunch, the teams all left for a second dive. Due to the time lost due to the conditions, the video teams actually had packed lunches brought to them. Given that the video contestants had the added burden of editing and rendering their videos, the time saved by doing this meant that they were able to get on with

their edits.

The day concluded with the breaking of the seals on the contestants' cameras and the collection of memory cards. The cards were downloaded, formatted and returned, so that they could be used on the next day.

As is perhaps inevitable, there were several reports of contestants having breached rules during the dives. In fact, one team was observed sharing air in order to extend their time underwater. The result was that the judges disallowed the images from that dive.

As mentioned yesterday, the Championship has huge support from an army of local dive center owners and employees, students and members of the local CMAS federation. They were the unsung heroes of the whole event!

Tomorrow would largely be a mirror image of today, with the teams rotating through the allowed dive sites.



Day Four

The cards have been submitted, the images selected, and the diving gear packed away. The fate of the teams and contestants now rested in the hands of the judging panel. The teams had all completed dives on each of the four selected sites.

Another early start saw all the competitors descend on the Club Navale. The contest worked like a well-oiled machine, with the format-

ting of memory cards and sealing of housings being done swiftly and efficiently.

Today was the final day for the contestants to capture images or video to enter into the contest. To some extent, the pressure was really mounting on them to "come up with the goods." Given that the contest was an individual, team and international event, the pressure to do well was very high.

Due to high tides produc-

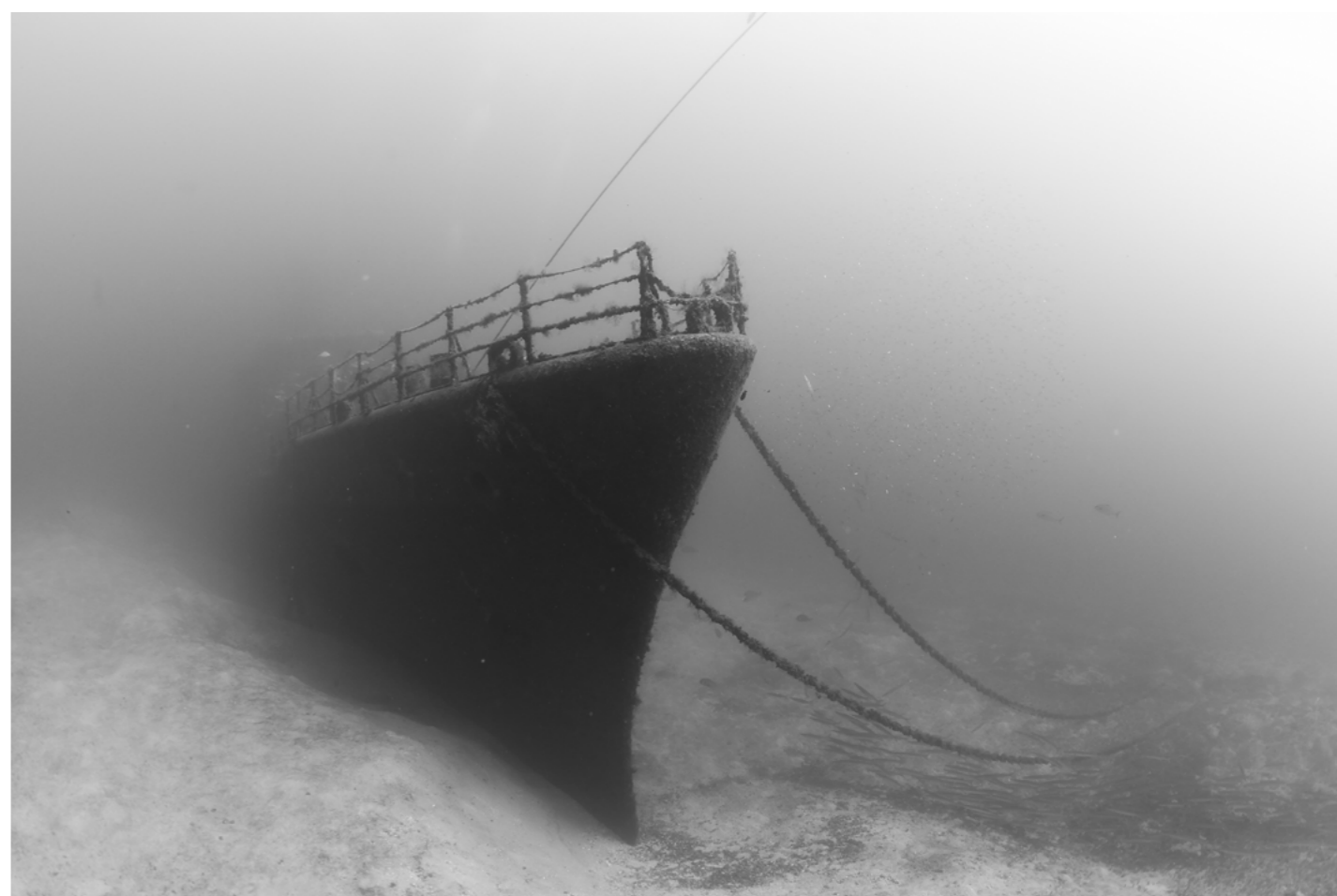




photo & video

Wide-Angle with Model Category. 1st Place: - Guglielmo Cicerchia and Iwona Molsa, Italy (right); 2nd Place: Francesco Sesso and Alessandra Pagliaro, Italy; 3rd Place: Jesus Yeray Delgado Dorta and Abigail Martin Hernández, Spain (bottom right)

ing strong currents, the boat departures were staggered, with the video contestants leaving after the photographers. In fact, one of the sites proved impossible to use, due to the current, and the organizers had to use a contingency site.

These mishaps showed that despite excellent planning, the "sea always wins." What was great to observe was the contestants taking these challenges in their stride and were able to adjust their plans to cope with them.

It was also notable how good-natured and positive they all were too. Perhaps the nature of team-based photo-sub-style events involve accepting the fact that dive sites are simply what they are and trying to use vision and skill to work with the elements available.

All the teams completed two dives without mishap, and now the familiar process of handing in their memory cards began. Like image-makers everywhere, they all spent lots of time

talking about equipment!

Once again, it was important to stress the role that support teams played in the success of the event. Organizer Vasconcelos had garnered support from a multitude of people from mainland Portugal, Madeira and Porto Santo, who worked tirelessly to make the contest safe, efficient, fair and successful.

The process from this point on saw the memory cards of each contestant downloaded and each contestants' images were placed in a folder. These folders were then shared with the contestants, and in collaboration with their team captains and fellow teammates, they chose which of their images to enter.

It was slightly different for the video categories. As they were producing short films and were allo-

cated eight hours of editing and rendering time. Prior to the deadline, they had to edit and prepare the films in the contest's specified format.

Having done so, the organizers distributed the contestants' selected images to the judging panels. It was my understanding was that Technical Director Ceylanoglu and Director of Visual Communications Sabuncuoglu completed

this process at 4:30 in the morning!

The heads of both judging panels, Capozzola and Ouimet, were present in Porto Santo. The other judges, who had received the images online, submitted their scores back to Capozzola and Ouimet. The results would be announced the next day at an awards ceremony, followed by a gala dinner at the hotel.

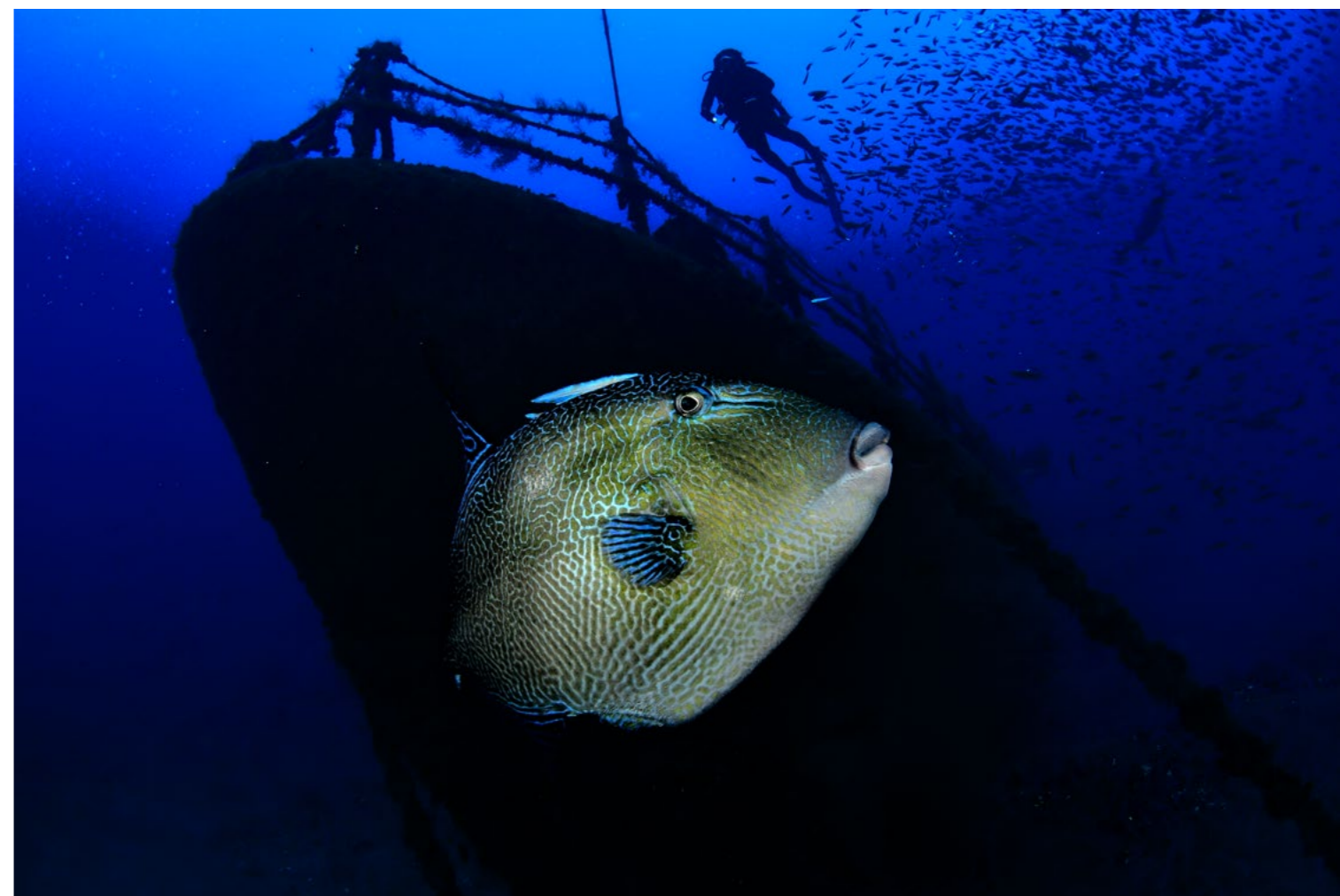
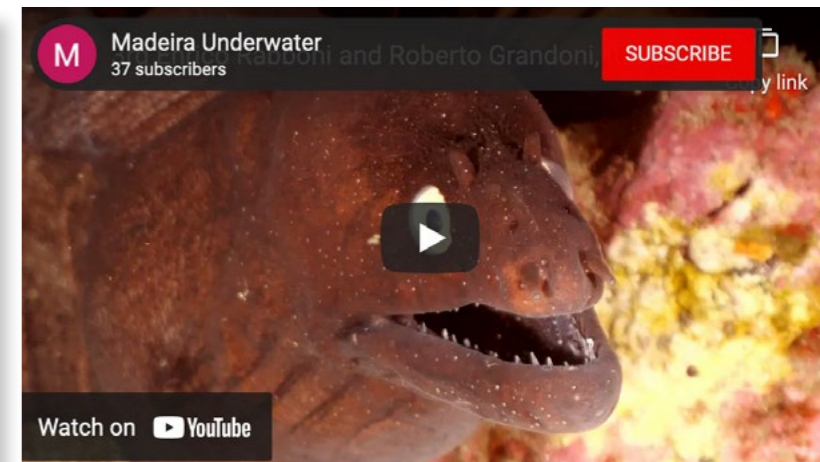




photo & video

TOP ROW LEFT TO RIGHT: Four-Minute Video Category. 1st Place: Jorge Candan and Pilar Barros, 2nd Place: Héctor Gasco and Lledó Ferrer, Spain; 3rd Place: Enrico Rabboni and Roberto Grandoni, Italy

MIDDLE ROW LEFT TO RIGHT: One-Minute Video Category. 1st Place: Laurent Maignot and François Locqueneux, France; 2nd Place: Héctor Gasco and Lledó Ferrer, Spain; 3rd Place: Gui Costa and Paulo Correia, Portugal



BOTTOM ROW LEFT TO RIGHT: One-Minute Unedited Video Category. 1st Place: Joerg Boettcher and Riko Riegel, Germany; 2nd Place: Jorge Candan and Pilar Barros, Spain; 3rd Place: Katja Kieslich and Frank Pastor, Germany

Awards ceremony

The last two days of the 2021 CMAS World Championship had given the organizers time to collect, collate and process all the entries. In addition, there were parties, ceremonies and dinners! As mentioned earlier, the teams submitted their entries for each category late on Thursday night. These were then collated and distributed to the two judging panels. Capozzola and Ouimet were on hand as the heads of the judging panels for still and video images respectively, but the actual judging was carried out online

by a panel of judges. For still images, this included Henley Spiers, Pierre Yves Cousteau, Simon Shin, Nicholas Samaras, Imran Ahmad and Rodney Bursiel; and for video, Kay Burn Lim, Jason Isley, Fan Ping, Luftu Tanriover, Jeff Goodman and myself. As the panels were globally based, there was inevitably some delay in getting some of the scores back. Hence, the process of tabulating the scores took most of the day. So, we went diving! The day concluded with a party at the contestants' hotel. Despite there being a serious emphasis on the com-

petition during the event, now that the entries were all in, everyone just got on with partying, like a big happy family! High jinks and crazy dancing ensued, accompanied by an eccentric one-man-band/accordion player. The final day's schedule started off with the formal awards ceremony back in the center of Porto Santo, and was attended by local dignitaries. Alongside the World Championship was a contest for local school children, who produced marine-related drawings. Each video and photo category was

then awarded, with bronze, silver and gold awards. There was a lot of celebration! The final event was a gala dinner, celebrating the contest. As was tradition, team Italia finished it off with a spirited guitar rendition! The 2021 CMAS World Championship of Underwater Photography and Video was an amazing event. The style of the competition was designed to find and award the best photographer "of the day." The organizers are too numerous to mention, but Kerim Sabuncuoglu, Cenk Ceylanoglu, Pedro Vasconcelos, and the amazing

Portuguese host team made it not only a challenging contest but also a happy and very enjoyable event. I look forward to the next championship in 2023! ■ Underwater photographer Adam Hanlon is the editor and owner of **Wetpixel**, one of the world's leading resources on underwater imaging. Through **Wetpixel Expeditions**, he leads regular photography expeditions and workshops around the world. He also owns a successful **dive school** based near Lancaster, United Kingdom.

Lisa Tubach



P O R T F O L I O

portfolio

King Nudibranch (right), oil and acrylic on canvas, 48 x 72 inches; and *Bommie and the Wrasse* (previous page), oil and acrylic on canvas, 48 x 60 inches, by Lisa Tubbach

Text edited by G. Symes
All artwork by Lisa Tubbach

Drawing on profound experiences underwater, as well as shark and reef conservation work in Belize, Hawaii, Puget Sound, Bahamas and Australia, American artist and James Madison University professor Lisa Tubbach creates exuberant, dynamic and compelling paintings inspired by underwater forms, creatures and ecosystems, as well as the perils facing the ocean's fragile reefs. *X-Ray Mag* interviewed the artist to learn more about her perspectives, creative process and artwork, which has been exhibited in the United States, Peru, Suriname, France, Scotland, Japan and Australia.

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

LT: I was born and raised in a very landlocked location in the United States: Nebraska. From a young age, any trip to the coasts, or to large bodies of water of any kind, was magical to me. I was, and continue to be, an avid swimmer; as a young person, I spent hours and hours in the pool each summer. An early field trip with my primary school class to collect water from a pond and analyze the sample with a microscope was such a profound revelation—what was initially hidden was just teeming with life.



My father is an artist, so that influence was profound from an early age. While I settled on visual art as a path, I was long drawn to the sciences (biology in particular), history, creative writing, and journalism (my father was also the art director for the Omaha World-Herald). In the end, this all influenced why I became an art-

ist—but also is the bedrock of why I am interested in making images about our natural world and our need to preserve these ecologies. Knowing the science—the data—behind what is happening to our planet drives the images I make. My paintings are quiet calls to action.

X-RAY MAG: Why marine life and underwater themes? How did you come to these themes and how did you develop your style of painting?

LT: As an artist, I have been working with themes of the natural world for most of my career. I have always loved being out-

side and experiencing the spaces of our fellow creatures, investigating their lives. Perhaps underwater spaces are most compelling to me because they are in a world whose riches are typically hidden to us humans. In order to visit such splendor, one needs not only to be prepared, but one can only stay a short time. It is very



Ancient Oceans, Current Clime,
oil and acrylic on canvas,
30 x 30 inches, by Lisa Tubach



Hol Chan (For Jamie), oil and acrylic on canvas, 72 x 48 inches, by Lisa Tubach

magical for that reason.

We are related to these sea creatures, of course (we actually share 23 percent of our DNA with a sea sponge), but at the same time, the sea is so vast and filled with so many surprises. I love thinking about this foundational connection to creatures that seem so other-worldly.

As a painter, I am also really interested in the beauty of organic shapes, color subtleties, and balancing conceptual and formal forces (i.e., abstraction versus representation, macro versus micro). I am interested in depicting a space that is always in motion—changing light, current, and constantly-moving creatures. I love watching fish shoaling or schooling together and getting moved about by [the current in] their space. I think it is a nice reminder of how we need to honor natural forces—and a reminder that we are not always in control.

X-RAY MAG: Who or what has inspired your artwork and why?

LT: There are so many artists and scientists I admire (Sylvia Earle, without a doubt), and a number have influenced my thinking at some point in this journey. Most profoundly is the influence of my father, also a painter. My mother was an attorney for many years, dedicated to justice—this passion to right wrongs was deeply instilled in me and certainly influences my commitment to environmentalism. I was incredibly inspired by the painter Jim Adley at Michigan State University, where I did my Master of Fine Arts degree—to paint large canvases, in particular—images that would envelop you. I am forever indebted to the sculptor Stan Sears, at Macalester College, who really showed me the life of a practicing artist. I am so grateful for every ounce of experience I had at New York University (NYU) in the digital video area; it monumentally informs my art practice, as well as my teaching.

In terms of artists/movements that I feel a kindred spirit with—or have been influ-



enced by on some level—I would include Pierre Bonnard for color; Andy Goldsworthy for his poetic, temporary installations of natural forms in the wild; Mel Chin's "Revival Field," where he uses plants to remediate toxic landscapes—making science an artistic statement; and Bill Viola for his brilliant video works. I love the painted, other-worldly spaces by Ati Maier; Terry Winters' painted repetitions; Firelei Báez's works that draw upon Caribbean folklore; and Neo Rauch's surreal collections of subjects, where scale is off-balance and beautifully strange. While in Australia, I took in as much art as I could—the Museum of Old and

New Art in Tasmania was a showstopper. Absolutely incredible. The Contemporary Aboriginal Art of the National Gallery of Victoria (NGV) in Melbourne was also amazing to experience firsthand.

I started my art journey as a sculptor; perhaps this is why I am really drawn to this medium as well (I love the work of Doris Salcedo and Cornelia Parker).

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

LT: Documenting reefs and related spaces/creatures is fundamental to my process;



Circling (World on Fire), oil and acrylic on canvas, 48 x 72 inches, by Lisa Tubach

Lisa Tubach

have plunged into Alaskan waters near Ketchikan, and I have worked with shark conservation near Riversdale, Belize. My most recent research led me to document both the Great Barrier Reef and the Belize Barrier Reef—the two largest in the world. They were jaw-dropping in their magnitude. Fields of staghorn coral. I had never seen anything quite like it.

I have so many favorite interactions with underwater life. It was my job in Eleuthera (Bahamas) to count a particular type of fish (grunts)—of which there were many. I became very fond of them and was always the last one left in the water. I loved seeing baby creatures of all types gather near the roots of the mangroves on the coastline—little lemon sharks, little everything; or the curious barracuda that just stare with that toothy “grin;” or the green moray eel that came out to greet me in Belize at the Mexican Rocks site; or the spotted eagle rays. It is all so wonderful.

One of the most incredible experiences—regarding coral—was my visit to the Gates Coral Lab [also known as the Coral Resilience Lab] on Oahu (in the US state of Hawaii). There, they showed me confocal microscopic images of coral polyps—all the many individuals, gathered together, to create a community. It was stunning.

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

LT: Ocean conservation and coral reef management is at the core of what motivates my work. My paintings are illustrating the richness of what we must fight to preserve—and are losing, frankly, by delays in action (as one factor). It is a complex issue—but our survival truly depends on the survival of the oceans and their biodiversity.

When I first started down this path of scientific volunteerism—as a means to get closer to the science and the sub-

scientific field work becomes the first stage in my artistic practice. The resulting images pulled from video that I take underwater become references for the paintings. Ultimately, the paintings are compilations of spaces/places... no one video still becomes a singular painting—I like to blend observed reality with invention. In other words, I am

interested in both representing what I see and abstracting that vision. The distortions/abstractions speak to a constantly changing space in motion, with flickering light, darting creatures—but also speaks to my great anxiety about what is happening to our precious natural spaces. It speaks to the emotional quandaries of the Anthropocene.

X-RAY MAG: What is your relationship to the underwater world and coral reefs? How have your experiences underwater influenced your art? In your relationship with reefs and the sea, where have you had your favorite experiences?

LT: As I mentioned above, a large part of my artistic process involves seeking

out opportunities for volunteer field work experiences with scientists. I document these experiences thoroughly, with my GoPro camera. It is important to me to have authentic imagery and experiences that undergird the work. It is hard to pin down a favorite—I am willing, with wetsuit, to jump into nearly any body of water to see what is under the surface. I



portfolio

A World Within a World Within a World, oil on canvas, 48 x 60 inches, by Lisa Tubach

jects at hand—my first trip was to Eleuthera (Bahamas), where the goal was to survey the health of the patch reefs in the area, and how they might serve the larger reef systems nearby. I worked with Alastair Harborne, who, at the time, was a researcher from University of Queensland. Had I done that work as a teenager, I probably would have gone into marine biology, as a career path—I fell in love with the field work process immediately.

A few years later, I visited the Gates Coral Lab in Oahu (part of the University of Hawaii)—I contacted Ruth Gates, after reading a wonderful article by Elizabeth Kolbert in *The*

New Yorker, mentioning her incredible research aims. I was grateful that she invited me to visit and to help assist in some of the coral bed maintenance. At the time of my visit, they were working to help coral withstand the Earth's changes, via an attempt to develop "super-coral."

These activities just keep birthing new opportunities and interests. Ultimately, it fuels my work in the studio. I wanted to weave my passions together and contribute to efforts to investigate, and ultimately, work towards solutions for climate change, ocean acidification and habitat loss.

X-RAY MAG: Can you point to specific artworks, for example, and describe how they relate to or came about from your marine conservation experiences?

LT: *Circling (World on Fire)* was inspired by two research opportunities: 1) my work with shark conservation in Belize, and 2) my experience researching the Great Barrier Reef at a time when Australia experienced some of its worst fires in its history (fall 2019). A number of paintings blend terrestrial content as well as marine—to speak to the issue that each ecosystem ultimately needs the other—a balancing act that humans are sadly interrupting. The result of this, ultimately, is the more intense (and devastating) fire season. The title also refers to when I painted the work (spring 2020)—in the middle of the pandemic.

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King Nudibranch was influenced by two research opportunities: 1) my visit to the Gates Coral Lab (University of Hawaii, Oahu), and 2) my time at the Friday Harbor Labs on San Juan Island, Washington (USA). In Hawaii, I assisted with the coral garden efforts; at Friday Harbor, I assisted a visiting researcher in the collection of *Nemertea* (a phylum of sea worms); I also had access to the wet labs where I discovered the nudibranch—commonly referred to as a sea slug: it is a shell-less marine gastropod. What an amazing creature—so many species, many with wild colors and flourishes.

The form in the center of this painting is a nudibranch—hovering behind and through a view of a reef in Hawaii. I enjoy playing with perspective—making the small large, or providing a tension between macro and micro. The



nudibranch's presence is larger than life, almost magical—I was thinking of the ancient Roman god Neptune, as I painted this piece.

A World Within a World Within a World is a piece that resulted from viewing coral through a confocal microscope at the Gates

Coral Lab (Oahu). This work utilizes the micro/macro balance I mentioned above; imagery of rice coral (*Montipora capitata*) is shrouded by another, larger mounding coral—and coral polyps populate the picture plane like flowers.

Bommie and the Wrass includes marine imagery from my research trip to the Great Barrier Reef (Australia). "Bommie" refers to a type of coral formation that is an outcrop of coral and resembles a high column. This piece also includes a visual reference to the

sandstone formations from the Blue Mountains (New South Wales)—the stripes, undergirding parts of the composition. I completed an artist residency at the BigCi (Bilpin International Ground for Creative Initiatives) in Bilpin (NSW), close to that mountain range.





Lisa Tubach

Hol Chan (For Jamie) was completed shortly after my visit to Belize to document the Barrier Reef. I also worked with a shark conservation team, dropping BRUVs (baited remote underwater video cameras) and tagging sharks. This piece was inspired by two locations—coral around Riversdale (mid-Belize) and Hol Chan, a marine reserve in northern Belize. “Hol Chan” is Mayan for “little channel.”

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

LT: I want the viewers to be pulled into the complexity and get lost in it. Simultaneously, I am hoping that—between the imagery and my artist statement—they become passionate about doing their part to help the planet.

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?

LT: The benefit and the curse is the online presence that is essential—but it can also distract from what is right in front of you. Technology clearly allows me to do what I do—to document with the magic of high tech, etc (and to connect with people all over the world with my work)—but we also need to step away from it and really SEE. Looking through a viewfinder of a camera is a mediated experience. It is important to just be there. That said, I think it is quite wonderful that Instagram, for instance, has been such a connective device for artists and galleries—an emphasis on the power

of the image is really at the heart of it. I would advise aspiring artists to—no matter what—keep working. Do not give up. Be dedicated to spending time in the studio, even if you are bone tired. Keep thinking. Keep looking... it is the persistence that will eventually help to achieve successes. Take time to be quiet and absorb and note the beauty of what is right in front of you.

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

LT: People respond in a variety of ways—but often are excited about things they notice after looking for a longer period of time. I have a lot of people who respond positively to the color that is present in the works—and the concepts

behind the images. They often comment that they are glad I am making work about these issues. I am so appreciative that they are moved by my paintings. I really could not make work about anything else.

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

LT: My work was most recently exhibited at the Amy Kaslow Gallery in Washington, DC—through September 25th. I am working towards a research project next summer that will take me to Iceland. I am very interested in seeing the geothermal activity through the fissures there. I am also interested in returning to Australia to visit Ningaloo Reef. ■

For more information, visit the artist's website at: lisatubach.com

Lehulehu (Augusta to Hanauma), oil and acrylic on canvas, 24 x 24 inches, by Lisa Tubach