New Scuba Marketing & Gifts for Sea Divers

X-ray mag

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COVER PHOTO BY SCOTT BENNETT

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COVER PHOTO: *Pygmy Seahorse, Papua New Guinea*
PHOTO THIS PAGE: *South Emma, Kimbe Bay, Papua New Guinea.* Both photos by Scott Bennett

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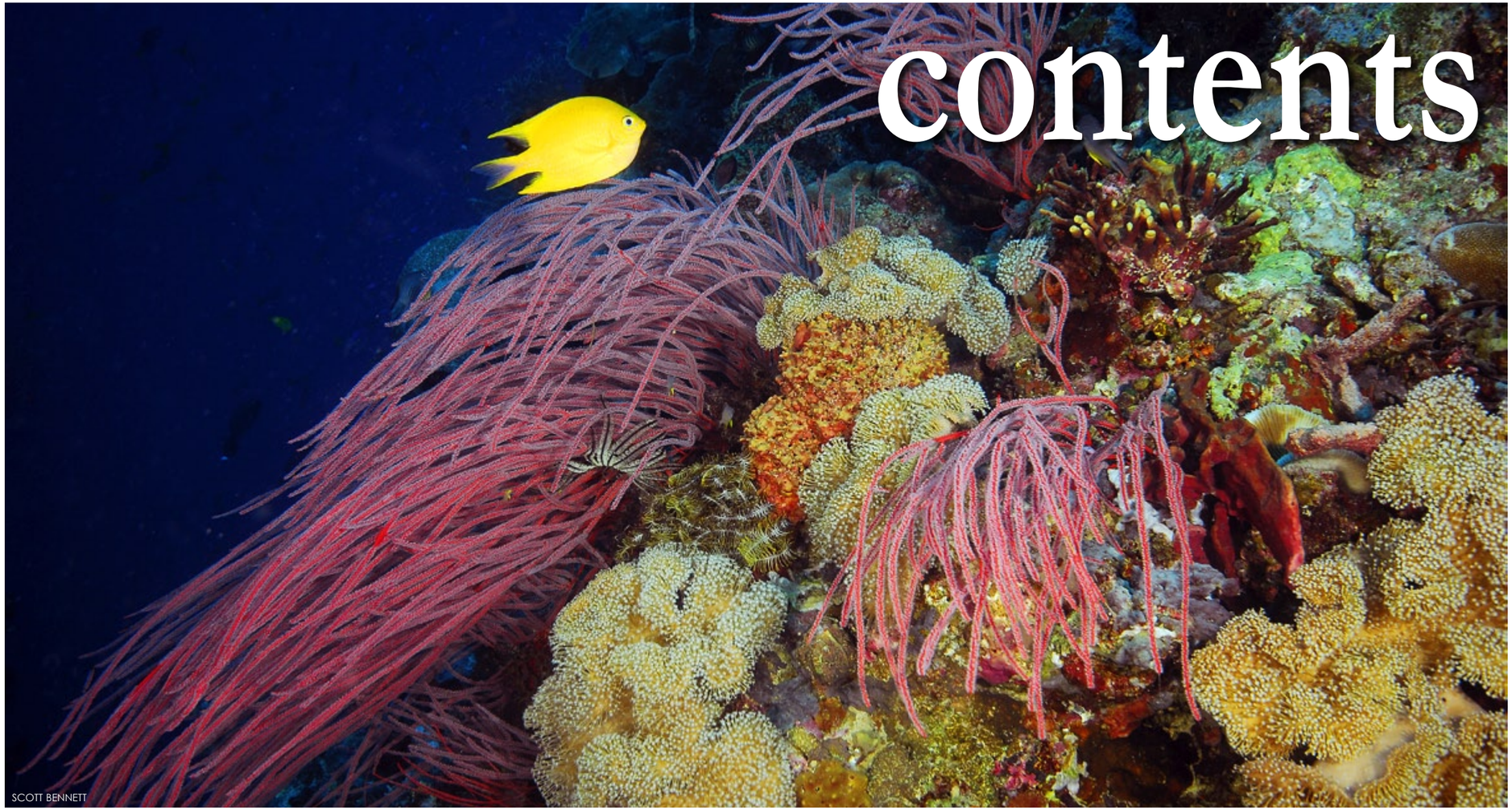

SCOTT BENNETT

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Recreational diving is not doing so well these days. Not only has the ongoing global financial crisis, and before that the spiralling fuel costs, had a deep impact on many dive centers and operators, but the dive industry also seems to be struggling to adapt to new realities, after decades of continuous growth and an increasing popularity of diving in the past century.

Did scuba diving just undergo a natural progression reaching a peak or saturation point around the turn of the millennium before falling somewhat out of fashion with the general public —— or is something more worrisome going on?

Look around at who is attending dive expos in Europe and the United States these years. It is hard to spot anybody under the age of 30, unless they are kids or teenagers accompanying their parents. The average scuba diver in the West is no longer a young, adventurous and athletic person in their 20's but a graying and somewhat middle-aged person in the late 40's. While it is on one hand impressive and reassuring that so many people have stayed loyal to their hobby for decades, it is also grounds for concern that a whole generation of new divers seems to be missing.

What went wrong? Was it just the fashion pendulum that swung the other way for a while?

A small—but by no means scientific—investigation which we conducted recently revealed that an overwhelming proportion of the over-40's cited their inspiration to start diving came from watching, as kids, the first underwater series on TV with Jacques-Yves Cousteau. This was mentioned over and over again, but so was Hans Hass and Sea Hunt. These pioneers inspired and made a whole generation dream. For baby-boomers, diving stood out as a special achievement and a fulfilment of childhood dreams. Becoming certified as divers became part of our identities.

As our inquiries soon made clear, most of the younger divers have only a vague notion of who these pioneers were and certainly no role models or heroes attracting them to the sport. Many would reply that diving is cool enough, but it ranks on the same level as so many other outdoor activities. Now it is just one of many fun things you can do on your holiday. Or you try it and then go onto something else.

In the 1990's, one leading training agency in particular went to great lengths to market scuba diving as something that everyone, pretty much, could undertake. While the efforts to change the perception of diving as something reserved for young, fit and adventurous athletes did appear to break down barriers and got even more people diving for a while, in hindsight one must also ask whether there was a hefty price to pay. By turning scuba diving into something more ordinary that even your middle-aged and overweight uncle could do, scuba diving became un-cool and ordinary. It didn't help that a range of companies chose as their role models and marketing figure heads tech divers who were often beer-bellied and bald middle-aged with grumpy or even scary expressions. All due respect to their achievements and skill levels, but as role models go, it was a very unwise choice. No teenager would like to look like them.

Scuba diving will bounce back. I have no doubts about that. The ocean is there and humankind has always been attracted to it and to playing in water. Exploration is also in our genes, and diving makes it possible for many of us to live out that dream,

I do also see signs that a new generation is taking to diving. The dive expos in Asia in particular are now filled with joyful youngsters who are clearly intrigued and attracted to the oceans. If only the West would look in that direction and learn. Jacques-Yves Cousteau and his films were instrumental for the rise of the dive industry, but he is now gone and so are many of the others who inspired a whole generation.

It is now time for the industry to finally move on and embrace the new reality and the new generation.

— Peter Symes, Editor-in-Chief

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Lacy Scorpionfish Totebag

X-ray mag

News edited
by Peter Symes
& Catherine G S Lim

deep stuff

NEWS

Shipworm enters the Baltic, threatens wooden wrecks and marine treasures

The shipworm invasion could prove disastrous for marine archaeology in the region, home to long-submerged prehistoric timber settlements and remarkably preserved wrecks such as the salvaged 17th century Swedish warship ***the Vasa***

The Baltic Sea is full of unique and well preserved shipwrecks, some of which date back to the Medieval and Viking Ages, that have now come under threat from shipworms, *Teredo navalis*. Shipworms are notorious for borrowing into and gradually destroying wooden structures in saltwater. These animals are capable of completely destroying large maritime archaeological finds in only ten years earning them the nickname "termites of the sea". The shipworm, which is really a wood-boring mollusc, has avoided the Baltic Sea in the past, since it does not do well in its low salinity water, but it has now been spotted in several locations along the along both the Danish, Swedish and German Baltic Sea coasts.

100,000 wrecks may be at risk

Thanks to the absence of *Teredo navalis* there are currently around 100,000 well-preserved shipwrecks resting in the Baltic Sea, a true treasure for historians and archaeologists. If the shipworm continues to spread, these ships may vanish before anyone has a chance to explore them.

Medieval shipwrecks attacked

"Wrecks that have been resting unharmed since the 14th century have now been attacked off the coast of Rügen in Germany, and we are also noticing attacks along the Swedish coast, including destruction of the Ribersborg cold bath house in Malmö," says Christin Appelqvist, with the Department of Marine Ecology, University of Gothenburg.

Another artefact of global warming?

Appelqvist and her colleagues suspect that increased water temperatures may be helping the shipworm to tolerate a lower salinity.

The shipworm invasion could prove disastrous for marine archaeology in the region, home to long-submerged prehistoric timber settlements and remarkably preserved wrecks—such as the salvaged 17th century Swedish warship, the *Vasa*, a major museum attraction in Stockholm.

"Really nice tall ships with the mast and everything intact are still being discovered," Appelqvist said. "Every time researchers go down there with remotely operated vehicles they find new wrecks."

Shipworms greatly damage wooden hulls and marine piling, and have been the subject of much study to find methods to avoid their attacks. Copper sheathing was used on wooden ships during the Age of Exploration, as a method of preventing damage by "teredo worms". ■

Shipworms have slender worm-like forms, but nonetheless possess the characteristic structures of bivalves. The valves of the shell of shipworms are small separate parts located at the anterior end of the worm, used for excavating the burrow

"Around 100 wrecks are already infested in the Southern Baltic"

When shipworms bore into submerged wood, bacteria in a special organ allow them to digest cellulose. The excavated burrow is usually lined with a calcareous tube

JIM CAPALDI — LICENSE LICENSED UNDER THE CREATIVE COMMONS ATTRIBUTION 2.0 GENERIC LICENSE

Freshwater stingrays use water as a "tool" in problem-solving tests, scientists have demonstratated for the first time. Using a plastic pipe with one end sealed and containing hidden food, researchers observed how the fish overcame the challenge of getting the meal from the container

Stingrays use tools to solve problems

Stingray tool use showcases its cognitive abilities

In a recent study just published in the in the scientific journal *Animal Cognition* a team of researchers tested the ability of captive South American stingrays *Potamotrygon castexi* to solve problems, by setting them a series of underwater tasks. All five test subjects quickly learned to use jets of water as a tool to extract a meal of hidden food from a plastic pipe. It reveals that the fish, once thought a "simple reflex animal", has cognitive abilities to rival birds, reptiles and mammals, scientists say.

The experimental protocol, which gave the animals the opportunity of correcting a wrong visual cue decision, resulted in four out of five subjects correcting an error rather than making an initial right choice. One of five subjects reached 100 percent correct trials in the visual discrimination task.

The ability to use water as an agent to extract food from the testing apparatus is a first indication of tool use in batoid fishes. Freshwater stingrays, found in many tropical waters such as the Amazon River, are related to ocean stingrays. Like sharks, they have skeletons made of cartilage, rather than bony skeletons of less closely related teleost fish. In the past, scientists have assumed that such cartilaginous fish have limited cognitive abilities, in part because they have been difficult to study, says Dr Michael Kuba from the Hebrew University of Jerusalem in Israel who undertook the latest study. The stingrays not only performed the tasks well but also demonstrated a range of problem-solving strategies.

"Tool use in fish is far from anything seen in birds or mammals," explained Kuba. He said that the definition of tool use, using an agent to achieve a goal, was set by cognitive scientist Dr Benjamin Beck in 1980.

The stingrays meet this definition by using water as a tool, manipulating their bodies to create a flow of water that moves food towards them. ■

YouTube

Why and how did gills really evolve?

Biologists have cast doubt on the long-held theory that fish gills evolved primarily for the purpose of breathing.

A new experiment suggests that it is likely that fish evolved gills for the primary purpose of regulating the chemicals in their bodies.

Gills usually consist of thin filaments of tissue that have a highly folded surface to increase surface area. A high surface area is crucial to the gas exchange of aquatic organisms, as water contains only 1/20 parts dissolved oxygen compared to air. The filaments contain blood by which gases are exchanged through the thin walls. Oxygen is carried by the blood to other parts of the body. Carbon dioxide passes from the blood through the thin gill tissue into the water.

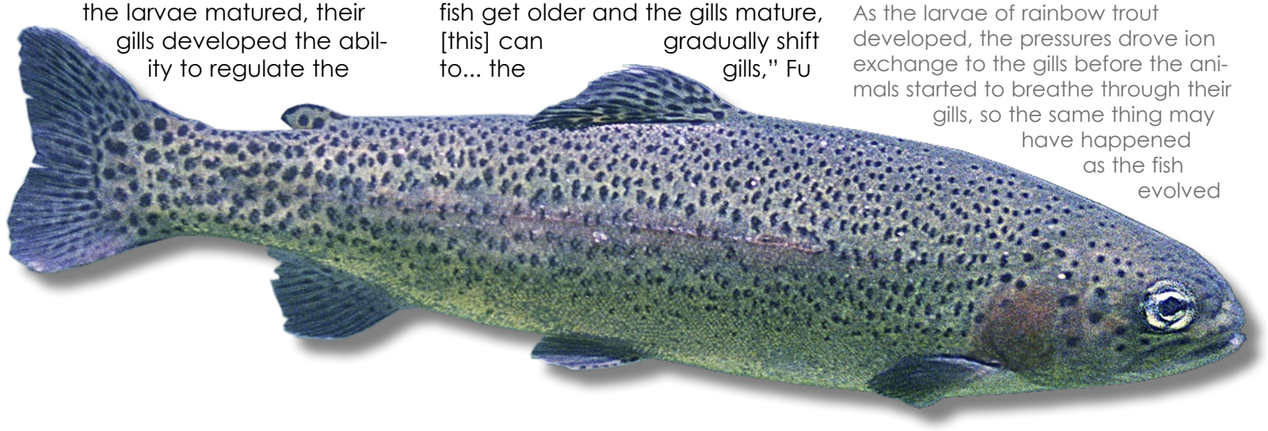
Clarice Fu, a zoologist from the University of British Columbia in Canada, and colleagues who studied the development of gills in rainbow trout larvae found, as the larvae matured, their gills developed the ability to regulate the chemicals in their blood earlier than they began to take up oxygen.

The team measured the uptake of ions across the gills. Ions, which are charged chemical particles such as sodium, are necessary for the body's cells to function, but they become toxic if their levels in the blood become too high. To maintain this delicate ion balance in their blood, fish exchange these ions with the surrounding water through their gills

"In freshwater fish, like rainbow trout, they tend to lose ions from their blood to the water, because the ion concentration in blood is greater than that of freshwater," Fu told the BBC.

"When the gills are still immature, a significant portion of ion uptake occurs at the skin. As the fish get older and the gills mature, [this] can gradually shift to... the gills," Fu added.

"We found that ion uptake shifted from the skin to the gills earlier than oxygen uptake. This led us to propose that the gills are needed for ion regulation earlier than they are needed for oxygen uptake." ■



As the larvae of rainbow trout developed, the pressures drove ion exchange to the gills before the animals started to breathe through their gills, so the same thing may have happened as the fish evolved

Amorous leafy sea dragons succumb to Christmas tradition

Blame it on the mistletoe

When Christmas decorations were put up at the Sea Life Centre in Weymouth, Dorset, UK, the leafy sea dragons went all-flutter. And this was precisely the reaction that the staff had wanted.

To encourage the leafy sea dragons to mate, the staff had placed some mistletoe in their tank. This intrusion caused the males to go into a mating frenzy.

"The males have suddenly started engaging in heated courtship with the females. It seems they view the Christmas decorations as potential rivals, and they are making sure they don't lose out," said display supervisor Fiona Smith. ■

Glass sponge

Underwater sponges could soak up uranium for nuclear power stations in Japan

A new fabric that's able to soak up minute amounts of uranium from the sea has been developed by a scientist from the Japan Atomic Energy Agency. This innovation, would enable the island nation of Japan to harvest the 8,000 tons of uranium needed yearly by its nuclear power industry. This would end its reliance on imports sourced from the uranium mines in Canada and Australia within five years. This situation would be most ideal, as about 4.5 billion tons of uranium can be found in the ocean, 1,000 times more than that found within uranium mines. In addition, the former is more environmentally friendly.

So, if things go according to plan, the future would see huge uranium farms on the seabed along Japan's eastern seaboard. At this initial stage, the fabric's developer, Dr Masao Tanada, simply hopes to build a 400 sqare mile underwater uranium farm once he manages to get the funding. This would meet one-sixth of Japan's uranium needs.

According to him, "Other countries are conducting similar research but none are as advanced as we are. We need to conduct more development research and be able to produce the absorbent material on a large scale, but we could achieve this within five years." ■

Sponges recycle carbon to give life to coral reefs

Even though *Halisarca caerulea* sponges grow in the deep cavities beneath coral reefs, they provide the colony with nutrients by recycling dissolved organic carbon.

In fact, 90 percent of the sponge's diet comprises of dissolved organic carbon, which their neighbours in the coral reef find inedible. This amounts to as much as half their body weight every day. Yet, as excessive as this sounds, the sponge does not get any larger.

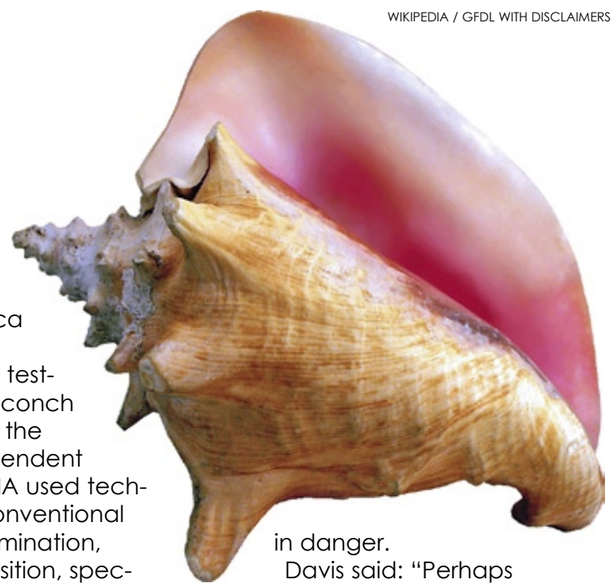
Could this be the weight loss solution that so many overweight individuals seek? Not necessarily.

What happens is that during the intake of carbon, half of the sponge's choanocyte (filtration) cells divide, with a cell division cycle was a surprisingly short 5.4 hours. "That is quicker than most bacteria divide," said researcher Jasper De Goeij.

Yet he still could not figure out where the excess weight was disappearing to. Then, working on a hunch from the audience when he presented his findings, he discovered that the division caused choanocytes to be shed everywhere. In the aquarium in the lab, tiny piles of brown material were found next to the sponges every morning.

De Goeji explained, "The sponges were shedding the newly divided cells, which other reef residents could now consume. *Halisarca caerulea* is the great recycler of energy for the reef by turning over energy that nobody else can use into energy that everyone can use." ■

Cultivated conch pearls demystified



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For over 25 years, researchers have attempted the tricky business of culturing pearls from the queen conch, *Strombus gigas*. Now, scientists from the Florida Atlantic University's Harbor Branch Oceanographic Institute (HBOI) have succeeded where others have failed. They have for the first time produced beaded, or nucleated, and non-beaded cultured pearls from the queen conch.

Using new methods they developed, co-inventors Dr Héctor Acosta-Salmón and Dr Megan Davis produced over 200 cultured pearls within just two years of research and experimentation. It is a major accomplishment as no high-quality queen conch pearls have been cultured prior to this breakthough. It is thought to be a feat comparable to the commercial application by the Japanese of the original pearl culture techniques for pearl oysters in the 1920's. With this discovery, a new gem can be introduced to the gem industry.

In collaboration with the Gemological Institute of America (GIA), HBOI conducted extensive testing of the queen conch cultured pearls in the laboratory. Independent analysis by the GIA used techniques such as conventional gemological examination, chemical composition, spectroscopy, spectrometry and microscopy. Results of the trials are to appear in the scientific journal, *Gems & Gemology*.

Senior vice president of the GIA Laboratory and Research, Tom Moses, said, "Several of the pearls we examined are truly top-quality gems. With the equipment and expertise available at the GIA Laboratory, identification criteria are being compiled to separate queen conch cultured pearls from their natural counterparts."

Shell issues

It is most likely due to the queen conch's complex shell and sensitivity to traditional pearl seeding techniques that previous efforts in culturing conch pearls were not successful. The challenging spiral shape of the shell makes it almost impossible to reach the gonad, one of the pearl-forming parts of pearl oysters, without putting the life of the animal in danger.

Davis said: "Perhaps the most significant outcome from our research is that the technique we have developed does not require sacrificing the conch in the process ... The 100 percent survival rate of queen conch after seeding and the fact that it will produce another pearl after the first pearl is harvested will make this culturing process more efficient and environmentally sustainable for commercial application."

In recent years, commercial fishing has depleted wild populations of queen conch, which were once abundant. They are now considered a commercially threatened species in Florida and throughout the Caribbean.

Of the six conch, or molluscan gastropod, species found in the shallow seagrass beds in these regions as well as the Bahamas, Bermuda, and the northern coasts of Central and South America, the queen conch is the largest. SOURCE: SCIENCEDAILY ■

Drawing of *Strombus gigas* by Louis Charles Kiener, 1834

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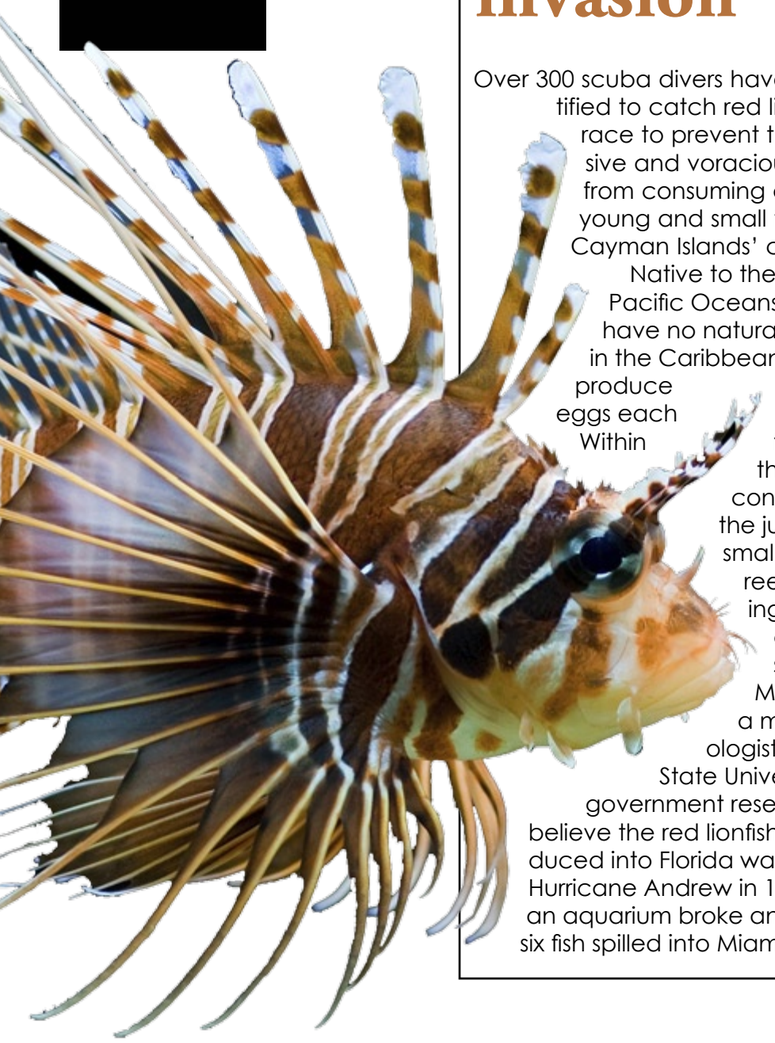
Caribbean dive operators enlist divers to fight lionfish invasion



Wanted: Lionfish, dead or alive

Over 300 scuba divers have been certified to catch red lionfish in a race to prevent the invasive and voracious species from consuming all the young and small fish on the Cayman Islands' corals reefs.

Native to the Indian and Pacific Oceans, red lionfish have no natural predators in the Caribbean and can produce 30,000 eggs each month. Within five weeks, they can consume all the juvenile and small fish on a reef, threatening the delicate ecosystem, said Mark Hixon, a marine biologist at Oregon State University. U.S. government researchers believe the red lionfish was introduced into Florida waters during Hurricane Andrew in 1992 when an aquarium broke and at least six fish spilled into Miami's Biscayne Bay.

Captain Don's Habitat on Bonaire is hosting the first "Lionfish Wrangler" event aimed at doing something about the growing lionfish problem. From March 6-13, scuba divers can actually earn a "bounty" every time they spot a lionfish during this weeklong event.

DiveTech on Grand Cayman is running a boat each week to specifically catch the fish. Licensed fishermen also collect them on regular boat trips and dives from the shore.

Divers typically work in teams of two, using plastic nets, gloves, and sometimes sticks, to capture the fish, which has a large head with reddish-brown and white stripes and elongated, venomous spines. Without careful handling, it can cause a painful sting.

"We tell them this is not a pleasure dive and they are hunting fish," said Simon Dixon, a lionfish hunter and scuba instructor for DiveTech. ■

Florida: New watch list helps citizens report invasive marine fish

For the first time, a field guide for non-native marine fishes can be used to help prevent the establishment of invasive species that could pose risks to Florida's coastal ecosystems.

"Non-native fishes can have cascading effects that ultimately degrade the productivity and diversity of coral ecosystems," said Dr Pam Schofield, a USGS biologist and lead author of the field guide.

Many non-native fish spotted in coastal waters are thought to be aquarium fish that were released or escaped captivity. There may be a small window of opportunity to remove these invasive fish immediately, before they begin reproducing.

"Once they are established—that is, once their populations are self-sustaining—there's no known method for eradicating them," added Schofield.

The red lionfish, which was first documented off Florida in 1985, provides an example of what can happen once an invasive fish species becomes established. It is now widespread along the southeast United States and parts of the Caribbean, preying upon ecologically-important native species such as fishes and crustaceans.

If you want to help by volunteering your time to survey reefs, contact REEF (www.reef.org). ■

Ocean acidification rates pose disaster for marine life, major study shows

Ocean acidification is an "underwater time-bomb" that threatens fish stocks, marine life and coastal communities around the world, a Natural England report has warned.

The world's oceans are becoming acidic at a faster rate than at any time in the last 55 million years, threatening disaster for marine life and food supplies across the globe. A report by more than 100 of Europe's leading marine scientists, released at the recent climate talks in Copenhagen, states that the seas are absorbing dangerous levels of carbon dioxide as a direct result of human activity. This is already affecting marine species, for example, by interfering with whale navigation and depleting planktonic species at the base of the food chain.

Acidity in the seas has increased 30 percent since the start of the industrial revolution. Many of the effects of this acidification are already irreversible and are expected to accelerate, according to the scientists.

The report, published by the EU-funded European Project on Ocean Acidification, a consortium of 27 research institutes and environment agencies, states that the survival of a number of marine species is affected or threatened, in ways not recognised and understood until now.

Dr Helen Phillips

Dr Helen Phillips, chief executive of Natural England, which co-sponsored the report, said, "The threat to the delicate balance of the marine environment cannot be overstated; this is a conservation challenge of unprecedented scale and highlights the urgent need for effective marine management and protection."

Although oceans have acidified naturally in the past, the current rate of acidification is so fast that it is becoming extremely difficult for species and habitats to adapt. "We're counting it in decades, and that's the real take-home message," said Dr John Baxter, a senior scientist with Scottish Natural Heritage and the report's co-author. "This is happening fast." ■

Starfish and sea urchins counteract our carbon emissions

Out of the estimated 5.5 gigatonnes of carbon emitted each year by human activities, about 1.8 percent are removed from the air and stored by echinoderms such as starfish, sea urchins, brittle stars and sea lilies. This makes them less important "carbon sinkers" than plankton, but the finding is still significant since no one expected them to catch such a large proportion of our wayward carbon.

The new discovery is the result of a study led by Mario Lebrato, a PhD student at the Leibniz Institute of Marine Science. The body of an echinoderm consists of up to 80 percent calcium carbonate, and according to the Lebrato study, these hard-shelled animals collectively capture 100 billion tons of carbon each year. ■

The study has been published in the journal, *ESA Ecological Monographs*

"This sort of evidence may help persuade governments to reduce the fishing of key herbivores like parrotfishes, and help reefs cope with the inevitable threats posed by climate change."

Coral able to recover from climate change damage

A surprising and encouraging research study performed by scientists at the University of Exeter indicates that coral reefs may be far more resilient and capable of bouncing back than we had previously believed.

Scientists and environmentalists have warned that coral reefs may not be able to recover from the damage caused by climate change, and that these unique environments could soon be lost forever. Now, this new research adds weight to the argument that reducing levels of fishing is a viable way of protecting the world's most delicate aquatic ecosystems.

Approximately two percent of the world's coral reefs are located within marine reserves, areas of the sea that are protected against potentially-damaging human activity like dredging and fishing.

The researchers conducted surveys of ten sites inside and outside marine reserves of the Bahamas over 2.5 years. These reefs have been severely damaged by bleaching and then by hurricane Frances in the summer of 2004. At the beginning of the study, the reefs had an average of seven percent coral cover. By the end of the project, coral cover in marine protected areas had increased by an average of 19 percent, while reefs in non-reserve sites showed no recovery. ■

"In order to protect reefs in the long-term, we need radical action to reduce CO_2 emissions. However, our research shows that local action to reduce the effects of fishing can contribute meaningfully to the fate of reefs."

Unique data from the Indian Ocean

A team of the world's leading marine experts, paired with scientists from the Indian Ocean region, returned from a six-week research expedition above seamounts in the high seas of the Indian Ocean with a whole new understanding of seamount ecosystems. They gathered a very rich collection of data and specimens, including some strange-looking marine creatures.

The scientific survey was organized by IUCN, the International Union for Conservation of Nature, and its partners to improve knowledge of seamounts across the southwest Indian Ocean ridge.

Hotspots

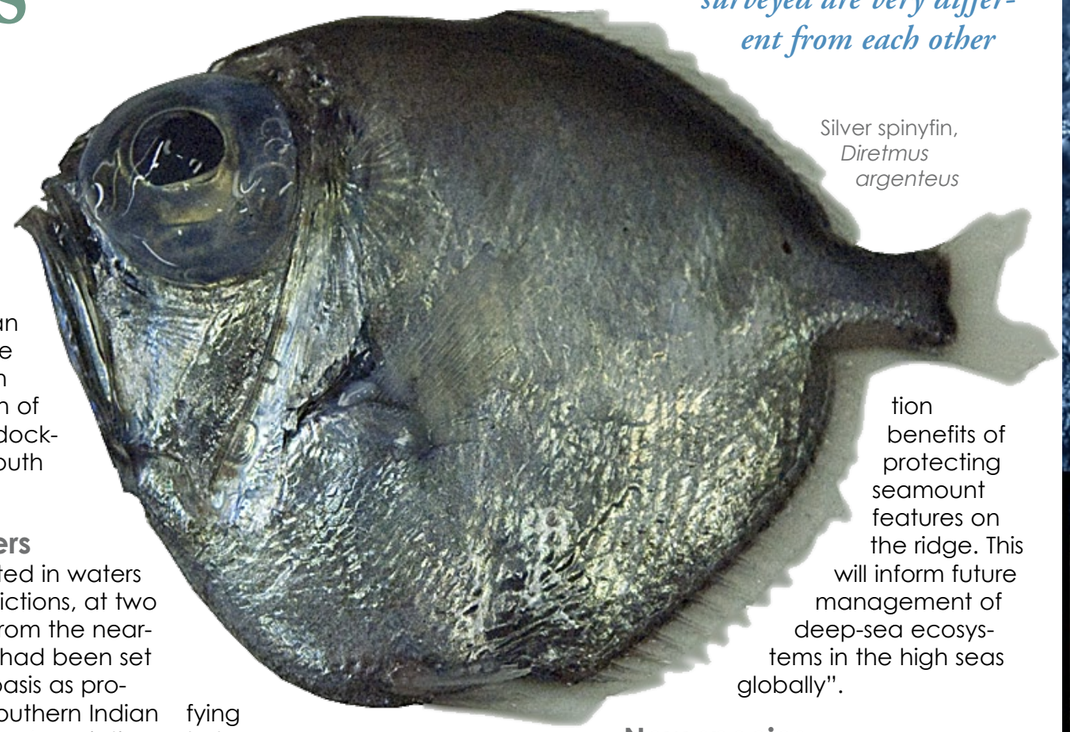
Seamounts, underwater mountains of volcanic and tectonic origin, are known to be hotpots of biodiversity and attract a range of oceanic predators, including seabirds, whales and sharks. They also attract deepwater fisheries, as they host many species of commercial interest, most of which are very vulnerable to over-exploitation. The results of the research do not only have a scientific interest, but will help improve conservation and management of Indian Ocean marine resources.

"I am extremely pleased with the data that we have collected and the number of species that we have encountered", says Dr Alex David Rogers, Chief Scientist of the Cruise and Senior Research Fellow at the Zoological Society of London. "The diversity of species that we sampled is higher than what I would have expected. Some species have been recorded for the first time in the region, and we hope to have found some species new to science. It was also very interesting to discover that the six seamounts we surveyed are very different from each other, and I believe our findings will certainly improve our global knowledge of seamount ecosystems".

The Norwegian research vessel Dr Fridtjof Nansen left on 12 November from Reunion island, and travelled 6,000 miles in 40 days to

Splendid Alfonsino, *Beryx splendens*. Photo by Oddgeir Alvhaeim

The six seamounts we surveyed are very different from each other



Silver spinyfin, *Diretmus argenteus*

study five seamounts on the southwest Indian Ocean Ridge, and one seamount further north on Walters Shoal, south of Madagascar, before docking in Port Elisabeth, South Africa, today.

International waters

All features were located in waters beyond national jurisdictions, at two to three days' sailing from the nearest land. Two of them had been set aside on a voluntary basis as protected areas by the Southern Indian Ocean Deepsea Fishers Association, which would allow comparison between fished and unfished seamounts.

"It is gratifying to know that this work is not an isolated scientific trip, but will directly feed into conservation and management recommendations", says Sarah Gotheil, Programme Officer with IUCN's Global Marine Programme. "Through our study we hope to confirm the conservation benefits of protecting seamount features on the ridge. This will inform future management of deep-sea ecosystems in the high seas globally".

New species

In total, nearly 7,000 specimens have been collected and labeled, from two-metre long fish to tiny crustacean larvae. They include an impressive variety of fish, shrimps, squids and gelatinous marine creatures. Many more microscopic species of phytoplankton and zooplankton, representing the base of the food chain in the ocean, have also been collected. The two seabird and marine mammal observers recorded thousands of seabirds from as many as 36 species, and 26 marine mammals. Two of them, majestic humpback whales, even offered the team a wonderful 30-minute show of jumping around at just a few metres from the ship. ■

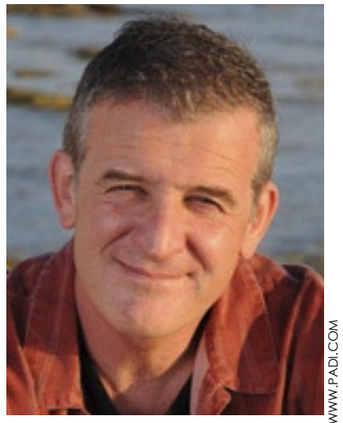
AIDA elects new president and board

WWW.AIDA-INTERNATIONAL.ORG

Kimmo Lahtinen is the new president of AIDA International

AIDA International has a new executive board. The number of board members has been reduced from 12 to nine, and they also have some new positions. AIDA has also created a special Medical and Sience Commission for which Dr John Fritz-Clarke will be the chairman. The original election in late November 2009 re-elected Bill Stromberg president, who promptly resigned two days later. Kimmo Lahtinen was voted in as the new president. ■

Mark Caney appointed President of European Underwater Federation



WWW.PADI.COM

Mark Caney

During the European Underwater Federation's recent General Assembly in Amsterdam, Mark Caney was elected President. He will serve in this position until the end of 2012.

It is the second time Mark Caney, who is also Vice President of Training, Education and Memberships at PADI International Limited in England, is serving as president of the EUF.

The European Underwater Federation (EUF) is a body representing the interests of over three million divers in the European region and has a membership consisting of a broad range of European training agencies, including both for-profit and non-profit organisations.

The EUF has become a highly influential body within world of diving, in part through its involvement in EUF Certification International—a separate body that audits training systems and, where appropriate, certifies them as being compliant with European and ISO Standards for Recreational Diving. Such certification has become a legal requirement for dive operations in several countries such as Egypt and Greece.

For more information about the EUF, visit www.euf.eu ■

Freediving legend Patrick Musimu returns, teams up with Karol Meyer

Patrick Musimu and Karol Meyer attempt new world record in Tandem No Limit

Belgian freediver, Patrick Musimu, has announced his comeback to freediving and world record attempts together with Brazilian freediver, Karol Meyer, who have jointly announced a No-Limits Tandem World Record attempt for May 2010, to -140 metres.

Sponsored by Buddy Dive of Bonaire, where the attempt will be held, Musimu and Meyer will stage the Tandem No-Limit, which is a unique category of freediving created by the International Freediving Association under the supervision of Francisco (Pipin) Ferreras. ■

Austrian Freediver Herbert Nitsch sets three new World Records

WWW.AIDA-INTERNATIONAL.ORG

Herbert Nitsch

Herbert set a Variable Weight record to 142m, a Free Immersion record to 112m, and a Constant Weight (CWT) record to 123m at the Dean's Blue Hole in the Bahamas. In Variable Weight, the freediver descends with the help of a ballast weight and ascends using his own strength—arms and/or legs—either by pulling or not pulling on the rope. In Free Immersion, the freediver dives underwater without the use of propulsion equipment, but only by pulling on the rope during descent and ascent. In Constant Weight, the freediver descends and ascends using his fins, or monofin, and/or with the use of his arms without pulling on the rope or changing his ballast; only a single hold of the rope to stop the descent and start the ascent is allowed. ■

Longest dive

Will Goodman broke the world record for staying underwater by remaining submerged for a total of 48 hours, nine minutes and 17 seconds.

The 33-year-old Briton has previously made two unofficial world records—the first in 2005 when he spent 24 hours underwater and a second in 2008 when he spent 33 hours underwater. This new record has been duly witnessed and will be registered with Guinness World Records. ■

Director of *The Cove* wins for best documentary

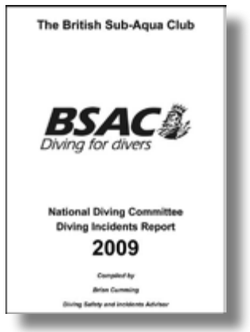
The Directors Guild of America named Louie Psihoyos the best documentary director of 2009 for *The Cove*.

The film, a shocking piece of advocacy filmmaking about dolphin slaughter in Japan, documented the clandestine killing of the mammals in a small fishing village of Taiji. ■

Training bulletin

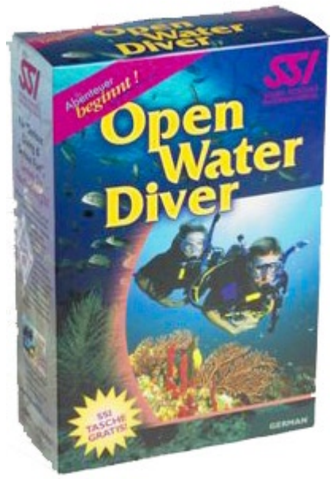
Edited by Peter Symes

BSAC has published their Annual Diving Incident Report



SSI Moves Dive Tables in the Open Water Diver Student Manual

SSI has chosen to focus on the use of dive computers in their Open Water Program. Dive tables are not being eliminated from the manual altogether, but they are now placed in the Appendix. This will allow dive centers and dive professionals the option to use the tables if they choose. For the past two years, it has been optional for SSI dive centers and professionals to train with either dive tables or computers. The dive tables can still be used as another way to help students understand how divers absorb, eliminate and track nitrogen. Then, students will have the knowledge they need to complete their recreational dives with a computer. ■



IAHD acquired by WOSD

As of 1 January 2010, IAHD, International Association for Handicapped Divers, has a new owner, the World Organisation of Scuba Diving (WOSD).

IAHD aims to be a leading global dive training organisation for people who are either physically or mentally challenged. In this regard, IAHD has undergone a substantial expansion in the later years though not without certain 'growing pains'. In response, the organisation has extended its board of directors to cope with the additional tasks at hand.

In the next phases, IAHD plans to further professionalize its staff and implement a number of necessary changes all of which requires more resources than hitherto available. For this reason, Klaas Brouwer, president of IAHD and previous owner of IAHD, initiated contact with various parties.

WOSD came forward as an organisation that presented itself with viable ideas and a clear strategy for the future. IAHD will remain IAHD while bringing to the board of directors the new main shareholders, Gerard Oynhausen and Fred Siebers.

Plans

As of the publication date of this issue, the two organisations have been cooperating for a period of time. Over the coming months, additional changes are going to be implemented. A new website is said to be in the pipeline, and a new 'house style' with a fresh new logo has won approval. Additional projects are on the planning board. Already in place is a new members' area of the IAHD website, the link to the Member Database, which was developed by WOSD. WOSD has a logistic system, into which IAHD can be seamlessly integrated. Through this system, the entire application process for scuba certification will be improved and simplified. In addition, WOSD has developed a completely new training system, which can be used by IAHD for their courses. This system is called the "Digital Learning System" or "D-Learning". This system provides the trainee with a highly flexible approach to learning the required theoretical knowledge using multi-media tools and the Internet, or, a traditional classroom with an instructor. ■

German WW2 U-Boat discovered in Gulf of Oman

In the deep waters of the Gulf of Oman lies the remains of a twin-screwed, 76.8-meter-long Nazi U-boat, the *U-533* that was lost during the Second World War.

Dubai shipwreck hunter and diver William Leeman discovered the U-boat, lying 108 meters deep on the seabed a few years ago, and a new deep-sea mission deployed in October 2009 confirmed that the vessel went down after a blast ripped her rear port side, sealing the fate of her 52 crew members.

Equipped with electric underwater scooters and high-powered spotlights, Leeman's team observed a two-meter gash near the U-boat's propellers, confirming reports made by 244 RAF Squadron of a British light bomber aircraft direct strike attack on 16 October 1943.

"This is where she was hit by a depth charge by a British Blenheim that struck from the air," said Leeman. "During our last dive, we could see the jagged edges of the hole where she was blown up. That was the moment of truth—the ship then sank to the bottom in a forward motion marking the epic death of 52 German mariners."

Only one crewmember somehow made it to safety from the wreckage. Mechanic, Gunther Schmidt, survived the heavy seas for more than a day before reaching the coast, only to be taken prisoner. "How the survivor got out, we can't say," Leeman said.

In recent years, along with fellow members of the Desert Sports Diving Club of Dubai, Leeman returned often to the wreck, but usually in poor visibility conditions. The last expedition found surprisingly clear waters, with great visibility that enabled an unobstructed view of the *U-533*.

"A lot of people have told me I don't have proof that the ship we found is the *U-533*. If you look at the British and German military records, they confirm that this is, in fact, that submarine. The British recorded a direct hit on the sub, we have a German survivor, and we have dived it." ■

IMAGE SUPPLIED VIA PRESS RELEASE

The two-metre gash near the propellers confirms reports that a British aircraft scored a direct strike on the submarine

YouTube

The sunken freighter is expected to provide a boost to both the South Florida diving and fishing industries, as well as strengthen the marine habitat

Sea Taxi scuttled for new artificial reef off Miami

In an effort to help the local marine ecosystem, as well as the diving and fishing industries, the 40-year-old *Ophelia Brian*, a.k.a. Sea Taxi, was scuttled off the coast of Miami-Dade County, Florida. It used to be a German freighter until it was seized in a drug bust.

After such a shady past, it's rechristening was due after Miami philanthropists Brian and Lavinia Snyder bought the ship for their daughter, Ophelia, and the ship was later donated to the county. The ship was the latest addition to a long list of retired vessels, currently laying on the seabed of Key Biscayne. The event was the largest artificial reef sinking off the coast of Miami-Dade, since 2003. "Over the years, we've put down approximately about 30 to 40 various large-sized vessels, as well as a variety of other materials that help to enhance and create a habitat on the bottom for corals, sea life," said Stephen Blair, a member of the Miami-Dade Department of Environmental Resources Management

Many SCUBA diving companies in the area base their outings around artificial reefs. "This is going to add to a destination for environmentalists looking at fish and reef restoration and sports divers looking for another opportunity to seize underneath-the-water adventures," said Miami-Dade County Commissioner Sally Heyman.

Immediately after the vessel settled down, over twenty amateur scuba divers started exploring the wreck. "It was the first time for me to see something like this. It was great to be able to witness it. It'd be great to come back in a few years and see what's new and what sea life has moved in," said one of the divers.

Environmental experts declared that it should take only a few weeks before wildlife begins to settle in on the wreck. ■

Newly discovered *Centaur* paid special hommage

Australian Federal Environment Minister, Peter Garrett, approved a special permit allowing a unique homage to be performed on a protected shipwreck.

Under any normal circumstances, the Historic Shipwrecks Act 1976 would have prevented a ROV (remote operated vehicle) from carrying a plaque more than two thousand meters deep, and attaching it to the wreck of the recently discovered *AHS Centaur*.

She was finally discovered after going down 67 years ago, sunk by a Japanese sub that was patrolling the are off Queensland. The *Centaur* was a hospital ship on its way to Port Moresby, during the final days of WWII. The vessel's end marked the highest number of casualties on any non-military ship sunk in the Pacific stage of the War.

Acting Premier Paul Lucas said the war grave, would be policed by Australian Customs.

British shipwreck hunter David Mearns, the wreck's discoverer, believes it was done just in time. "Probably in ten or 15, 20 years, all the paintwork on the vessel that really gave it that iconic look that everybody could recognize (and say) 'that's the *Centaur*'—the white background, the red cross, the green band—will be gone. Mearns was also responsible for finding *HMAS Sydney* and the German raider *Kormoran* in 2008, both off Western Australia.

"The 47s (identification numbers) are nearly gone now, and slowly but surely, the vessel will erode away. So, it was very timely to do that so the families could get comfort from looking at a ship that they recognized." The *Centaur* task force's next mission is to memorial service for survivors and relatives, in consultation with the Centaur Association, the RSL and other interested parties. ■

Expedition seeks to uncover secrets of Great Barrier Reef wrecks

—A testiment to human endurance

The 430 ton armed cargo ship *Cato* was making its way to when got grounded, along with another ship called *HMS Porpoise* on a sand-bank, northeast of Sand Cape, on the Great Barrier Reef, Australia, on the morning of 17 August 1803. A third vessel, the *Bridgewater*, made it from the treacherous waters and sailed away, not risking an attempted salvage operation. The shipwrecked crews and passengers were able to land on a sandbank (today known as Wreck Reefs and located in the southern part of the Coral Sea Islands, nearby Cato Reef, so named after the wreck-age) just as both their ships broke up.

With no sign of rescue by August 26, *HMS Porpoise's* passenger Matthew Flinders (the explorer and author of *A Voyage to Terra Australis*), *Cato's* captain, John Park, and 12 crewmen sailed to Sydney on the only ship left avail-able (aptly rechristened *Hope*) and headed to Sydney to seek rescue.

The *Hope* made it to Port Jackson by September 8, under hard conditions, and the remain-ing passengers were rescued. Only three lives were lost in the joint shipwreck when many more could might have perished, if not for the courageous endeavors of a few.

The Unknown Wreck

While most of the survivors remained aboard the *HMS Porpoise*, other crewmembers made a startling discovery on the treeless sandbank: the tim-ber remains of a previous wreck. Among the crew were master's mate and a ship's carpenter, both expert witnesses with an intimate knowledge of marine technology.

Apparently, the timber used on their vessel's repair came from the stern of a 400-ton, sturdily built ship, which had already been on the reef for a long time. There is no other hard evidence, as they immediately burnt the timber as firewood.

"What was another wreck doing there when the *Cato* hit the san-bank?" That is a truly intriguing mystery, which a team of maritime archaeologists, divers and marine scientists will try to solve on that remote location.

Kieran Hosty, the expedition's leader, explained that the expe-dition might well provide clues to one of many untold sagas of mari-time history.

At the time, when Flinders heard of the discovery, he deduced the wreckage must be the remains of one of the French explorer La Perouse's shipwrecked vessels, the *Astrolabe* or the *Boussole*, which had gone missing after leaving Botany Bay in 1788. We know today, however, that the *Boussole* lies on another location, on the Santa Cruz Islands.

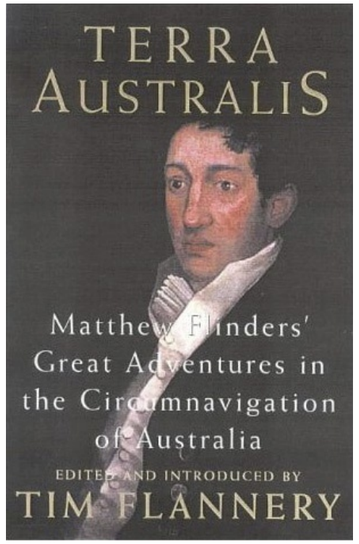
Alternatives to the wreck's origin include the Dutch (however unlike-ly) and the Portuguese fleets.

"I think it is most likely to have been American," Hosty concludes. "There were certainly American whalers in that area around that time."

"Our objective is to continue to explore the *Porpoise*, confirm the wreck of the *Cato* and, hopefully, locate the pre-1803 wreck. We pre-sume it did the same thing as the *Porpoise* and *Cato*: came up on the southern side of the reef, where the wreckage was found, then sank in between ten and 20 meters of water."

If that wreck truly predates Cook's voyages along the east coast of Australia, they might uncover another important part of Australian maritime history.

Hosty declares that it will prob-ably not be as spectacular as finding a ship as old as the Dutch *Duyfken* (which translates to "Little Dove" in English), credited with the first authenticated European discovery of Australia, in 1606. "The crew from the *Porpoise* would have recognized it if the wreckage was that old." ■



Matthew Flinders is the man who gave Australia its name. *A Voyage to Terra Australis,* first published in two volumes in 1814, is his masterwork describing his circumnavigation of the great island continent in the late eighteenth and early nineteenth centuries

wreck rap

U-Boats

Separating Cultural Myth from Historical Reality

U-352
A Type VIIC u-boat, the *U-352,* was sunk on 9 May 1942 after being depth charged by the U.S. Coast Guard cutter *Icarus.* Many of the u-boat's crew died in the initial attack, and the sub's engines were disabled, leaving its captain no choice but to order the remainder of his crew to surface the boat and abandon ship.

The damaged u-boat didn't remain at the surface for long though. It quickly took on water and sunk to the bottom, coming to rest off the coast of North Carolina. The wreck of the *U-352* was discovered in 1975. Since then, it's been stripped of most of its artifacts. But, it's still a popular destination with recreational scuba divers.

The u-boat is also the topic of a unique display at the North Carolina Aquarium at Pine Knoll Shores. The main section of the sunken u-boat has been replicated in fiberglass, at three-quarter scale, and is the centerpiece of the 306,000-gallon "Living Shipwreck" exhibit. The giant aquarium tank is home to hundreds of schooling fishes and a nine foot-long sand tiger shark. ■

Text by Rob Rondeau
Photos courtesy of the North Carolina Aquarium at Pine Knoll Shores, USA

Interpreting artifacts is the most important aspect of archaeology—either on land or underwater. Deciding what an artifact is, or rather—what it was, can be tricky though.

Who built it and why? How was it used? Why did it end up where it did?

On land, artifacts from different periods can get mixed up. And, most artifacts recovered from sites on land are mere remnants—broken bits and pieces that were either thrown away intentionally or were left behind accidentally.

Archaeological sites found underwater are unique because they were lost (usually) due to a single event, such as a ship sinking or a city flooding. A shipwreck contains everything that was aboard at the time it went down. If people were forced to flee their community because of an impeding flood, they didn't have time to take much, if anything. In either case, more is left for an archaeologist to find underwater than would be on a typical land site.

The older a culture is the easier it is to be objective about it. I've never had anyone criticize me for working on ancient Greek and Roman underwater sites—or what I've said about the need to protect them. Everyone seems to appreciate their historical significance—partly because they're so rare!

But, this isn't the case with newer shipwrecks I've worked on, especially those from WWII. Artifacts from this period, most notably German ones, are (for many) irresistible.

Our current popular culture loves u-boats. They're the topic of books and movies, and genuine artifacts from them command high prices from collectors and enthusiasts. Divers have risked their lives (some losing them) to acquire trophies.

But, such u-boat worship is directly at odds with the historical record. True, they were fearsome killing machines, but u-boats were ineffective in changing the War's outcome.

One group on the Web, which describes itself as "the" authority on all things u-boat helps perpetuate the myth—going so far as to organize annual social events where enthusiasts can meet former u-boat captains. They dine and drink with the old submariners, sing Kreigsmarine songs and listen to stories from the u-boats' "happy time!"

But, the perception that the u-boat war was good for Germany isn't reality. The facts tell a much different story. Of

Composite photo of the wreck of *U-532*

THIS PAGE: You don't have to be a diver to appreciate the wreck of the *U-532*

LOWER LEFT: The replica fiberglass u-boat under construction

the 42,682 merchant ships that traveled between North America and Britain carrying much needed war supplies for the Allies, only 438 were sunk by u-boats.

This isn't to say that the damage caused by u-boats wasn't significant. It was. Canada, for example, lost 22 navy ships defending the convoys. And, more than 4,000 Canadian sailors and merchant seamen died during "the Battle of the Atlantic". It was the longest campaign of WWII.

In fact, Germany's u-boat effort was an abject military failure. More than two-thirds of its u-boats, and their crews, didn't survive the war. The fact that we are increasingly finding so many of them on the seafloor confirms this.

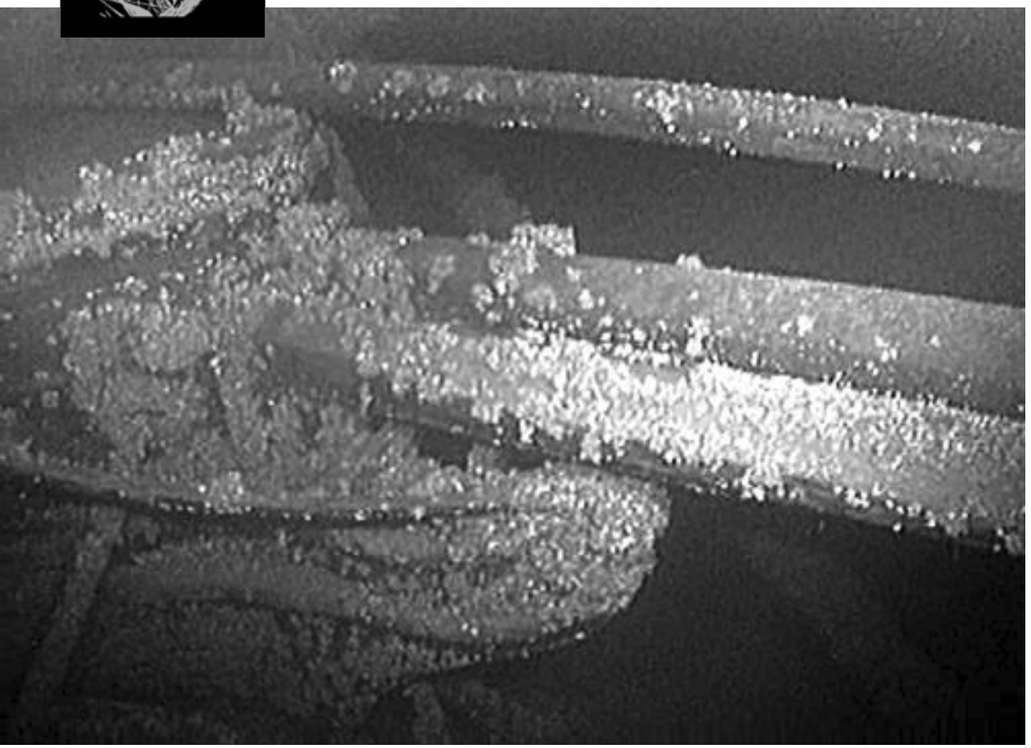
And, the German government of today wants nothing to do with its Nazi past. It turns a blind eye when u-boat wrecks are found and expressly forbids anyone looking for such if asked. I know this from first-hand experience.

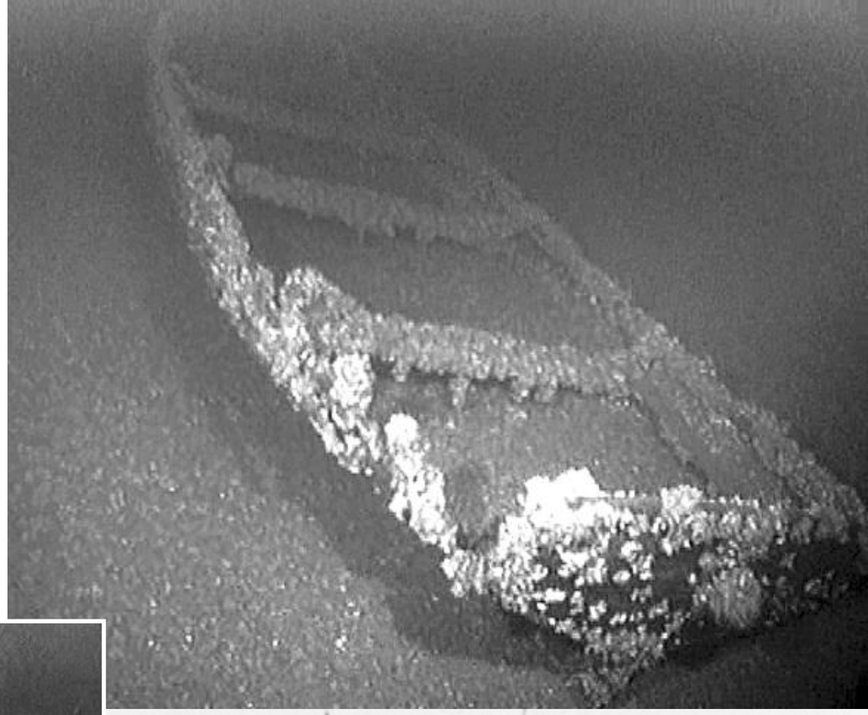
U-boats are a good example of why marine archaeology is important. It helps set history straight, separating fact from fiction—reality from perception ■

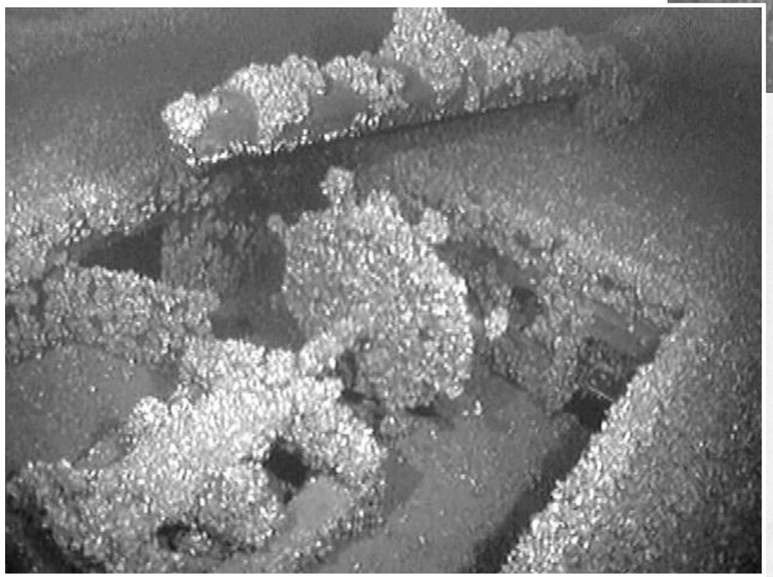
— Rob Rondeau
Marine Archaeologist
PROCOM Marine Survey & Archaeology

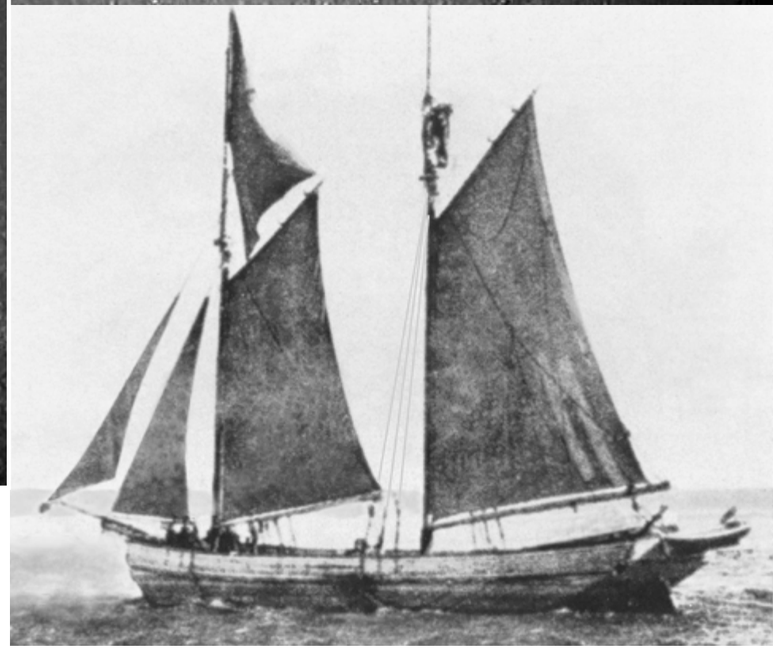
wreck rap

Wreck hunters find another intact schooner in Lake Ontario









Two masted gaff rigged schooner similar to the *C. Reeve*

Text and images courtesy of
Dan Scoville and Jim Kennard

A 19th century schooner has been discovered in deep water off the southern shore of Lake Ontario near Oak Orchard, New York, USA. Shipwreck enthusiasts, Jim Kennard and Dan Scoville, finally located the old schooner after a search effort that took them more than five years.

Schooners collide at night

During the early evening hours on 22 November 1862, a blinding snow storm set in across Lake Erie with a strong wind coming out of the North and visibility was almost nonexistent. The schooner *C. Reeve* was travelling east to Oswego, New York, and the *Enchange* was headed west for the Welland Canal. Neither crew could see ahead of them, and the schooner *Exchange* collided with the *Reeve*. The accident occurred approximately three to four miles off the port of Oak Orchard, New York.

The *Exchange* had plowed right into the rigging that secured the *Reeve's* foremast to the starboard side of the ship. This caused the foremast to lose any support, and it immediately toppled over the side of the ship. The collision also created a large gap in the side of the *Reeve's* hull allowing water to pour into the schooner. Within a few minutes, the *Reeve* sank out of sight into the depths of Lake Ontario.

No lives lost

The *Exchange* was not without significant damage either, as she lost her bowsprit, which became tangled in the foremast rigging. She also sustained severe damage to her cutwater, the forward portion of the stem of the vessel which cuts through the water. Leaking but still afloat, the *Exchange* was able to take on board the crew of the *Reeve*, then turned about and headed back for the port of Rochester. The crew of the *Reeve* only had enough time to save themselves, and consequently, lost all their personal effects.

Discovered by chance

After searching for many hours with sophisticated sonar technology and precise positioning equipment and not finding any potential targets to check out, the shipwreck searchers were in the process of packing up their equipment for the day and took a few minutes to eat before heading back to port. Meanwhile the boat was being pushed along the lake by a light breeze. Dan Scoville glanced over at the depth recorder just as the wind was taking their boat for a ride right over the top of a shipwreck. The position was quickly noted for a return trip. In August, the explorers returned to the wreck site and deployed a remote operated vehicle (ROV) developed by Scoville to do the actual underwater exploration and to try to confirm the identity of the shipwreck that they had discovered by chance. The ship was lying nearly 400 feet beneath the surface and at a depth beyond the limits (135 feet) for recreational SCUBA divers and for most technical divers utilizing mixed gases. ■

wreck rap

The Lost Treasures of the *Santa Margarita*

Text by Carol Tedesco

Inconveniently for mere mortals, serendipity is not concerned with time, so twists of fate often pass unknown, witnessed only by the sun, wind, and ripples on the sea. For W. Keith Webb and the team of the shipwreck search and discovery company Blue Water Ventures of Key West, the quest for the famed treasure galleon *Santa Margarita* has been as much about discovering her mysteries as in uncovering her treasures.

The saga of the *Santa Margarita* begins in 1622. Namesake of the patron saint of homeless people, midwives and reformed prostitutes, *Santa Margarita* was a Spanish galleon of 600 tons, armed with 25 cannon. One of a fleet of 28 ships, she was voyaging to Spain with an enormous cargo of plundered New World treasures. In registered wealth, the *Santa Margarita* carried 166,574 silver "pieces of eight" treasure coins, more than 550 ingots of silver weighing some 10,000 pounds, and over 9,000 ounces of gold in the form of bars, discs and bits. Additionally, there was contraband—a fortune in "unregistered" treasure having been smuggled on board to avoid paying a 20 percent tax to the Spanish king. The *Santa Margarita* also carried riches in the form of copper, silverware, indigo, and personal possessions of officers, passengers, and crew, including medical tools, navigational instruments, gold coins, and precious jewelry of almost unimaginable opulence.

Spain and her creditors awaited the arrival of the fleet anxiously, as its return would refresh the royal coffers, repay loans, and lessen the financial pressures that plagued the kingdom. But when news of the fleet arrived, it wasn't good. Subsequent to departing the island of Cuba on September 4, the fleet was overtaken by a rapidly developing storm. Within days, the *Santa Margarita,* along with five other ships in the fleet, were wrecked near the Marqueses Keys in the Florida Straits. Drowned were 550 passengers and crew, 142 from the *Santa Margarita*. Lost was a king's ransom in treasure, a serious setback for Spain, whose supremacy in the world was upheld by the wealth of the Indies.

Salvage

Margarita in Greek means "pearl," and the first attempt to find and salvage the *Santa Margarita* and other fleet casualties was undertaken almost immediately by the Spanish mariner Captain Gaspar de Vargas, who, knowing of their skill's, sent for pearl divers—from the island of Margarita—to aid in the search.

Then, in 1624, Havana politician Francisco Melián obtained a royal salvage contract for the fleet galleons. This inventive risk-taker manufactured a remarkable piece of equipment that allowed his divers to see and breathe while working underwater. It was a diving bell, and it was this invention that allowed an enslaved diver to locate the first treasure of the *Santa Margarita* and win his freedom.

Melián continued, with some success, to salvage treasure from the galleon for several years, though his efforts were frequently interrupted by weather and Dutch sea forces. Eventually, however, search and recovery became unfeasible, and ended, and a vast fortune was left buried in the deep shifting sands of the Florida Straits. In time, the *Santa Margarita* was forgotten, but not forever. Records of Melián's salvage efforts survived in fragile worm chewed papers in Spain's archives.

Fast forward to the 21st century, and the emergence of search and salvage company Blue Water Ventures, founded by entrepreneur W. Keith Webb.

Largely the result of extensive research conducted for the late treasure hunter Mel Fisher by historian Dr Eugene

Gold chalice discovered by Blue Water Ventures (right) and detail of chalice arms (bottom); Gold toothpick and earwax scoop grooming tool (below). Photos this page by Ron Pierson, Blue Water Productions

wreck rap

CAROL TEDESCO

W. Keith Webb, President and CEO, Blue Water Ventures Key West

LEFT TO RIGHT: Crew diver Gavin Rall (left) and Captain Dan Porter (right) surface with encrusted silver candlestick; Gold and rock crystal reliquary; Search and recovery vessel, *Blue Water Rose*; CENTER: The newly discovered gold chalice before conservation held by Mike DeMar, the diver who discovered it on his first expedition at age 21. Photos by Ron Pierson, Blue Water Productions

ABOVE: Close up of some of the rare natural pearls discovered on namesake *Santa Margarita* by Blue Water Ventures Key West

LEFT: Box of *Santa Margarita* pearls. Photos by Ron Pierson, Blue Water Productions

Lyon, a portion of the *Santa Margarita* was discovered in 1980. "The rest—multi-millions in treasures and artifacts—is still out there," said Webb. "Remote sensing technology has progressed dramatically since the last significant finds occurred, and this advancement prompted me to contact Mel Fishers Treasures (MFT), the company that holds the federal permit to search the area. I proposed a joint-venture partnership whereby I would bring my own team, vessels, and technology to work."

With a partnership agreed upon, Webb began to recruit a world-class lineup of professionals that today includes historian Lyon; archaeologist/conservator James Sinclair; and as Operations Manager, second-generation search and recovery specialist Dan Porter. Captain Porter and Gary Randolph, Blue Water's Chief Technical Advisor and MFT Vice President of Operations, immediately began digitizing old charts and coalescing the past with the present.

This aligning of knowledge, experience and skill, backed by resources, technology, and the requisite touch of luck has resulted in the most successful series of discoveries on the site in more than 20 years.

Treasure

The value of the treasure recovered from the *Santa Margarita* by the Blue Water Ventures team has well exceeded US$16 million to date. The search and recovery is funded by investors who share in the discoveries, receiving their portions each year following a formal legal adjudication and division procedure.

The *Santa Margarita* broke apart and was scattered in a series of storms. Over time the wood disintegrated and the ship's remains and cargo became buried in deep sand and mud. By mapping and recording all finds, the team is able to identify scatter patterns, which eventually serve as pointers to substantial deposits. Now, working further north than ever before, the crew of the companies primary search vessel, *Blue Water Rose,* have made astounding discoveries of elaborate gold artifacts, chains and jewelry, gold bars, rare silver coins, a gold and rock crystal religious reliquary, a captivating solid gold combination toothpick/earwax removal spoon, a magnificent solid gold chalice, and one of *Santa Margarita's* most serendipitous hidden treasures—a lead box containing 16,184 rare and valuable natural pearls, not listed on the ship's manifest—now believed to have originated from the pearl island of Margarita.

For more information on Keith Webb's Blue Water Ventures of Key West, visit the companies web site at ***www.bwvkw.com.*** ■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The Conferring of the Sword on the Coat-of-Arms of Haarlem, by Pieter Franz de Grebber

Exploring the mystery of a

17th Century Seal Discovered

in the Florida Straits

Text by Carol Tedesco

On 6 September 1622, a violent tempest ripped through the Florida Straits, destroying no less than half a dozen vessels of the 28 ship Tierra Firme fleet. Among the fatalities were two of the richest Spanish galleons ever lost at sea, the legendary *Nuestra Senora de Atocha* and *Santa Margarita*.

It was the final quarter of the 20th century and I was a teenager in Texas when I began dreaming about shipwrecks and their treasures. It was the *Atocha* and the *Margarita* that inspired those dreams. What else to do but follow them to Key West, Florida? By the summer of 2000, I had nearly a decade of historic shipwreck professional work behind me, and now was partnering up with two world-class diving and shipwreck professionals, Andy Matroci and Kevin Gurr, in a project to conduct search and recovery on the *Santa Margarita*. On the deck of the *MV Southland*, surrounded by a blazing sunset at the end of our first day at sea, I blissfully whispered to myself, "My dreams are coming true!"

The mirthful universe must have thought this story in need of a twist, because soon I was jerked awake from my happy dream. In a ludicrous accident that occurred between the deck of the *Southland* and the shallow ocean floor, I fractured a bone in my ankle. It was a sharp, quick pain that I chose to ignore.

Settling down on the sea floor not far from Andy, who was operating the airlift, I immediately and happily discovered one silver "piece of eight" treasure coin. Then, still refusing to look at my foot, I began to perform my work of measuring and recording the dimensions of the excavation area, and exploring it with a metal detector.

Finally, I could no longer ignore the discomfort, nor the odd "clicking" sensation when I tried to kick with my left fin. Looking back over my shoulder I gasped with dismay; my ankle had swollen to immense proportions. Returning to the boat ladder, I discovered that my foot could not bear even the slightest weight. Kevin had to haul me up the ladder.

The next day, after 24 hours of staring at my foot and waiting for it to miraculously heal itself, I returned to Key West and a doctor who (gleefully, it seemed to me) pronounced a spiral fracture and a sentence of at least three months in a no-weight cast.

I believed the adventure was done for me—our funding and our window of opportunity was limited. Then, one of our team discovered an artifact; it was dark, flat, and circular—about the size of a quarter—but with one side folded under, and the other folded up. There were markings on it, but barely visible due to a layer of marine encrustation. It was so small and nondescript that it could easily have been disregarded and passed over if it had been happened upon anywhere else, but on the site of a historic shipwreck, everything is of consequence.


DYLAN KIBLER

Research

Our group was a subcontractor of Motivation, Inc., now Mel Fisher's Treasures, who holds the admiralty claim on the *Santa Margarita*, so every artifact we discovered went to their lab in Key West for conservation and curation. Once their conservator had done his magic, the markings on the artifact became visible. We could see that an Arabic number 20 clearly dominated one side, but the design on the opposite side was difficult to fully decipher, due to the folding.


Lead seal obverse view (left) and reverse view (right)

No one on the *Southland* or MFT teams was familiar with an artifact of this sort, so the next step was to consult with historian Dr Eugene Lyon, an expert on the Spanish colonial period. He immediately recognized the small disc as a type of identification seal used between the 13th and 19th centuries for merchandise and cargo regulation. Dr Lyon added that the partially visible markings were a coat of arms, though it was not a crest that he could immediately identify.

How intriguing! Whose arms were they? What did the number 20 represent? This was just the mystery and challenge needed to take my mind off of my foot.

We documented the arms side of the seal as the "obverse," noting: Within a "bouche" style frame, a centered sword blade points directly above to a cross. Three visible stars located at approximate positions of 1.5 o'clock, 3.5 o'clock, and 10.5 o'clock frame the sword blade, suggesting a fourth star would be located at the 7.5 o'clock

LEFT & BELOW: 17th century Dutch bale seal R & A — Regten en Accisen, state finance department

BELOW LEFT: 1678 Dutch lead bale seal. Photos this page courtesy of Wiard Krook

position, under the fold. Some letters of a surrounding legend are visible, including the letters "ET", preceded by what could be an "O" or a "D" from approximately 9:00 to 11:00 positions, and an "R" near 4:00.

In the year 2000, the internet was just beginning to emerge as the invaluable research resource it is today. There was not much information to be had on lead seals; but there were a number of resources for family arms. Initially, I suspected that the legend on our seal was similar to the legend found on Spanish Colonial coins, with the letters "ET" being as in "Hispaniarum ET Indiarum Rex," and since the *Santa Margarita* was a Spanish galleon, it seemed reasonable to start my research with Spanish family arms.

None looked remotely like those on our seal.

When they returned from the sea every ten days or so to re-supply, Andy and Kevin would climb the three flights of stairs to my apartment, and we would exchange discovery stories: theirs—silver coins, a rare 16th century gold "doubloon" coin, gold jewelry and beads, a pre-Colombian jade pendant, and little flakes of gold that had to be picked out of the sand with tweezers—and mine—two different types of seals, disc cloth seals joined by a connecting strip.

This kind of seal was the most thoroughly documented type. These were folded around each side of a textile and were stamped closed, similar to the way coins were stamped. Ours, however, was a single disc without a connecting strip, and the fact that it folded under and over indicated that it was a bale seal, used to fasten a cord that once encircled a parcel of merchandise.

Origins

So, now we knew more about types of seals, and how they were used, but still no information had come to light on the origin of this particular one. Then, one sleepless night while sending out a string of internet search queries, a miracle occurred. It was a link to an article about a special event in which a particular guest was named, Professor Alexander Wieber—an expert on lead seals.

By early morning I had found contact information for Professor Wieber. I was so excited that I could hardly wait until the sun was up to call him. Professor Wieber was kind and gracious and said he would be happy to look at the seal. But he soon called to say that after combing more than 10,000 European coats of arms in his research books, he had not found a match.

Shortly thereafter, he called again. He had solved the mystery.

Professor Wieber had received a large shipment of seals—the contents of a small private museum in the Netherlands. Opening the first box, Professor Wieber reached inside, and to his astonishment there in his hand was the same coat of arms—sword and four stars. It was not Spanish, and it was not a family crest. It was the seal of the city of Haarlem, Netherlands.

Professor Weiber explained that this type of seal would typically display a city's arms, while the reverse would record data such as the length or width of fabric or the weight of a parcel. The visible letters "ET" in the legend of the *Santa Margarita* lead seal is, in fact, a

The Haarlem Arms, *Vicit, Vim, Virtus*

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17th c Seal

Capturing Damietta by Cornelis Claesz. van Wieringen, oil on canvas, 1628, Frans Hals Museum, Haarlem, the Netherlands

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LEFT: City map of Haarlem, ca 1550. BELOW: *Dutch Ships Ramming Spanish Galleys off the Flemish Coast in October 1602,* by Hendrick Cornelisz. Vroom, oil on canvas, 1617. Rijksmuseum, Amsterdam

portion of the legend "HAERLEMS GOET" or "Goods from Haarlem."

Haarlem

Now that we had a place of origin for our seal, the next step was to find experts able to solve the remaining pieces of the puzzle. These materialized in the forms of Karla Brouwer, of the Stichting Archeologische Werkgroep Haarlem, and Wiard Krook, of the Amsterdam Department of Archeology.

Krook revealed that the Arabic number 20 located on the seal's reverse refers to a length of fabric measured in Dutch els. The Low Countries city of Haarlem was the hub of the linen industry for much of the 16th and 17th centuries and was renowned for the fine linens it exported.

He wrote, "From the official regulations of the city of Leiden, we know that one full woolen laken (in 17th century Dutch spelled as "laeken" or "laecken", meaning one uncut length of woven woolen fabric packed and folded to a bundle), should measure 40 Leidse (or old Dutch) el in total.

So, a half laken should be 20 el long. Before it was released for selling, it was officially measured, and the final length indicated on a lead seal. One Leidse el is converted to 69 centimeters, making one full laken 27.6 meter and one half laken 13.8 meter. The width of a laken from Leiden was between 1 el (69 cm) and 3 3/4 el."

As for the arms symbolism, Brouwer explained that the interpretation is found in a poem by 15th century poet Dirc Mathijszen, inspired by a legend from the time of the fifth crusade. It tells of crusaders from Haarlem who fought as knights and succeeded in taking the town of Damiate in Egypt. In reward, the Emperor bequeathed Haarlem a banner red as blood with a sword pointing toward heaven. The Pope gave them their cross, and because they came so far, the patriarchs of Jerusalem delivered the stars. A painting of this event, entitled, *Wapenvermeerdering* (The Increasing of Arms) by Pieter Franz de Grebber (1630), hangs in Haarlem's City Hall. The accompanying legend, "Vicit Vim Virtus", translates to English as "Virtue Has Conquered Violence".

The presence of a Dutch seal on a 1622 Spanish galleon in the Florida Straits is tantalizing because of the complex historic relationship that existed between the Netherlands and Spain at the time. But that is another story.

The lead bale seal our team discovered during the summer of 2000 is now on permanent display at the Mel Fisher Maritime Museum in Key West, Florida. I am back to work on the *Santa Margarita* adventure, now as a consultant for Keith Webb's Blue Water Ventures Key West (joint venture partner/Mel Fishers Treasures) whose team is working to solve *Santa Margarita's* foremost puzzle—the location of the missing portions of the vessel and the treasures stowed there—and a smaller, but familiarly tantalizing enigma—the origin of a mysterious coat of arms roughly engraved in a recently discovered, magnificent solid gold drinking cup.

To learn more about the adventures of Blue Water Ventures Key West, and to see pictures of the golden chalice and its yet unidentified coat of arms, visit ***www.bwvkw.com****.* ■

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travel news

Edited by
Scott Bennett

Queensland tourism authorities back away from proposal to sink F-111 fighter jet off the Gold Coast

Queensland Scuba Diving Company owner, Mark Salter, initially proposed the sinking of military aircraft to Gold Coast City Council in January last year. The proposal has won eager support from scuba dive operators, who say it could become the first of its kind. Gold Coast dive operator, Ian Banks, said a sunken F-111 would be a major draw-card for domestic and international tourists but would only work as part of an artificial reef. The F-111 jets are due to be decommissioned in December of this year.

Gold Coast Tourism spokesman John Kaarsberg said it was too early to speculate on what the artificial reef may feature."We were putting the horse before the cart in making any suggestion of possible dive structures," he said."It may not be financially feasible." In response, the state government has commissioned a AU$71,800 study into the feasibility of a man-made reef, among a range of new attractions on the Gold Coast.

Sunken military aircraft had proven to be hugely popular in waters off Phuket, in southeast Thailand. ■

Cebu Pacific offers excess baggage fees to be paid at time of booking

The mere mention of the term "Excess baggage" is enough to make the average air traveller wince. We divers are especially cursed. Travelling with dive gear is bad enough, but add underwater photo gear to the mix coupled with baggae restriction rules that change like the wind direction, and its enough to put a damper on any dive trip. Fortunately, in this sea of travel gloom is the odd glimmer of reprieve.

While making an online booking for a Cebu Pacific domestic flight in the Philippines, I was somewhat surprised to see options for excess baggage payment. There are a variety of selections based on weight; just figure out how much weight you are over, click the box, and the amount will be added to the purchase price. Divers will like the sporting goods option, which includes dive equipment. The payment will be indicated on your e-ticket. ■

Australian shipwreck proves popular on debut

Since its official unveiling on 9 December 2009, hundreds of divers flocked to the *HMAS Canberra* dive site in the Australian state of Victoria.

Queenscliff Dive Centre managing director, Jason Salter, said business has boomed since the innaugural weekend in December."Without a doubt this is the best artificial reef in Australia, and I think it will make people realise just how good the diving is around here," Salter said. "The thing is it will take one person about 20 dives to really see everything the wreck has to offer."

Resting in approximately 28m of water, experienced divers can explore many sections of the ship including flight decks, the bridge, engine rooms, galley, and accommodation quarters. Many of the vessel's original fixtures and fittings have been preserved. Over time, the vessel will become a haven for marine life, transforming it into a spectacular reef.

A dive booking and permit is required from Parks Victoria for recreational dives from private boats on the ex-*HMAS Canberra*. The currently proposed fee for a dive/snorkel permit is AU$5 per diver/snorkeller. The ex-*HMAS Canberra* is located offshore from Ocean Grove within Bass Strait in Victoria. It is approximately 25 minutes by boat from Queenscliff Harbour (on the Bellarine Peninsula) or Portsea (on the Mornington Peninsula). ■

HMAS Canberra

Fiji flights make Guam stronger hub

As a result of the new non-stop Continental Micronesia service between Guam and Fiji, Guam will become a major transit hub for passengers flying from Japan and Hawaii. The twice weekly flights are operated using two-cabin Boeing 737-800 aircraft with 155 seats.

"Nadi is a popular vacation spot that attracts visitors from around the world and fits well with our portfolio of destinations throughout the Pacific," said Jim Compton, Continental's executive vice president of marketing. "We've scheduled the Fiji flights to conveniently connect with Continental's flights from the U.S. mainland, Japan and Micronesia," he said in a press release.

The Fiji to Guam service commenced after another airline's direct flights between Tokyo and Fiji ceased in April. Continental Micronesia is the Guam-based subsidiary of Continental Airlines. ■

Four Red Sea liveaboards destroyed by fire

The four boats—*MY Typhoon, MY VIP One, MY Hyatt* and *Sweet Dream*—were in dry dock at Suez when the fire started, according to the Egyptian Chamber of Diving and Water Sports (CDWS). Nobody was injured in the fire.

Authorities are conducting an investigation, and preliminary findings indicate that the fire started in the electrical system aboard *MY Typhoon*. Firefighters tried rescue the four boats, but they fought in vain as the fire spread quickly and was difficult to control because of strong winds and sandstorms in the Suez region.

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MY Typhoon of the Tornado Marine Fleet was one of the Red Sea liveaboards that were lost in the blaze

The operators are now working hard on finding alternative options for guests who would be with the four boats later this year. Guests who have booked tours will be contacted as soon as possible, a spokesman for one of the affected operators, Red Sea Diving College, which owned *MY VIP One*, tells CDWS.

"The boat will be missed, but we hope to announce an expansion of the fleet in the near future," Typhoon Marine Fleet, who owned *MY Typhoon,* added in a statement. ■

Snuba Gains Popularity in the Caribbean

A hybrid of snorkeling and scuba diving, snuba provides the unique opportunity for people to experience the underwater world without dive certification. While offered in a few places in California, Florida and Hawaii, the activity has caught on in the Caribbean, where tourists can experience Snuba diving in Aruba, Turks and Caicos, Cancun, and San Juan, Puerto Rico.

Snuba has been around since at least the late 1980s, when a group of California divers started Snuba International. The Snuba experience starts with a training session on safety procedures. Participants are then outfitted with flippers, a weight belt, a mask and a regulator linked to a long, snaking tube connected to an oxygen tank that rests on a small raft at the surface. There are limitations however, specifcally the 20-foot air line attached to a raft above. ■

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Walindi & Loloata

Papua New Guinea

Text and photos by Scott Bennett

Papua New Guinea. A name evocative of the exotic, this island nation is one of superlatives. Lying south of the equator some 450 miles north of Australia, it shares the world's second largest island with the Indonesian province of West Papua. It is a magnificent, untamed land of towering snow-capped peaks, smoking volcanoes, impenetrable forests, exotic wildlife and even more exotic cultures. A population of just over six million is comprised of a staggering 700 cultural groups speaking 800 languages. The multitude of attractions aren't limited to the land; its vibrant tropical seas are home to some of the best diving on the planet.

The allure of this island nation has always beckoned, and as I was going to be in North Queensland, the opportunity was too good to pass up. With my time somewhat limited, I'd arranged to visit two of the country's most famous dive resorts: The Walindi Plantation Resort, located on the island of New Britain, and Loloata, a mere stone's throw from Port Moresby's International Airport.

The adventure began at Cairns' International airport for my 70-minute flight to the capitol of Port Moresby.

Feather stars decorate the reef at Baldwin's Bommie, Loloata

CLOCKWISE: Volcanoes are a dominant feature of the New Britain landscape; Whip corals frame an orange sponge; A blennie plays hide and seek; Walindi Plantation Resort

From there, I would connect with a domestic flight to Hoskins, on the island of New Britain. Checking in, I was struck with a bombshell: I'd have to pay AU$260.00 in excess baggage fees! The carry-on rules were equally strict, allowing only one bag. I stuffed my computer and hard drives in my camera bag and grudgingly paid my bill. Someone once told me that situations like these are the reason God created credit cards.

Soon, all was forgotten as my flight winged its way over the azure waters of the Coral Sea. Upon arrival in Port Moresby, I collected my bags and headed to the domestic terminal. Several hours later, I boarded a Dash 8 and took off for Hoskins, hoping to get to Walindi in time to squeeze in a night dive. Shortly after takeoff, we traversed the cloud-swathed spine of emerald mountains bisecting the island. Upon crossing the Dampier Strait, the clouds rolled in and by the time we landed, the heavens had opened into a torrential downpour.

More troubling was the realization that two of my bags were missing, one of which contained all of my underwater camera equipment. A quick phone call to Port Moresby confirmed they were still there and would arrive the next morning.

My driver then loaded the van with my sole suitcase and headed for Walindi. Minutes later, the heavy downpour ceased abruptly. However, the air was still laden with humidity, a fact evidenced by the swathes of mist wafting lazily above the road. Legions of frogs were scattered along the damp pavement, of which my driver did an impeccable job of avoiding!

Around 30 minutes later, we finally turned up the tree-lined roadway leading to the Walindi Plantation Resort. On hand to meet me was owner, Max Benjamin, along with a pair of curious canines that he jokingly called his sniffer dogs. Having checked out the new arrival, they quickly retreated for the dining area. I was just in time for a BBQ dinner and a cold South Pacific lager, the perfect antidote for a long day of travel.

Enroute to my bungalow after dinner, the rain returned, necessitating a somewhat a hasty retreat. With no camera gear to assemble, I decided to call it an early night. The rhythmic patter of rain on the roof accompanied with a chorus of frogs soon lulled me into a deep and pleasant slumber.

PNG

Early the next morning, stepping outside my fan-cooled bungalow was like stepping into a sauna. The rain that had fallen throughout the night had finally ceased and was replaced by humidity of epic proportions.

The resort grounds were like an immense tropical garden. Massive trees dripped with epiphytic ferns, while the air was redolent with a profusion of tropical flowers. Something else was in the air too; a faint yet unmistakable hint of sulphur. I discovered the resort's next-door neighbour is Mt Garuna, an active yet benign volcano.

Walindi

Walindi Plantation Resort really is a plantation. Initially established as a cocoa plantation in 1935, the property was purchased in 1969 by Australian agriculturist, Max Benjamin, who replanted the property with oil palms.

In the early 1970's, Max began to explore Kimbe Bay and soon discovered a marine habitat of unparalled diversity right on his own doorstep. Max eventually shifted his focus from the palm plantation to running a dive business with his wife Cecile. By 1983, two guest bungalows

CLOCKWISE: Massive orange sponges are common at Kimbe Bay; A scribbled filefish poses on fan coral; barracuda school cruises the reef top; Chilling out at Walindi Plantation Resort

had been established, with an additional six constructed over the ensuing decade. Today, a maximum of twenty-four guests are catered to in 12 self-contained bungalows nestled amidst the luxuriant tropical vegetation.

Max and Cecile are also actively involved with the Mahonia Na Dari Conservation and Research Centre. Translated as "Guardians of the Sea" in the local dialect, the organization was established in 1996 as a headquarters for marine and terrestrial research supporting conservation of some of the world's richest environments.

With pristine reefs and rainforests on the doorstep, scientists have easy access to ecosystems of astonishing diversity. The Centre is operated by a local non-government organization whose goal is to be a national leader for conservation education and awareness, community action and sustainable development in the area.

Diving

After breakfast, I wandered over to the dive shop, where I met managers, Dan and Cat, who gave me a rundown on the diving. Walindi's dive boats regularly visit approximately 25 dive sites, with travel times ranging from five to 75 minutes.

Largely unspoiled by human activity, the nutrient-rich waters boast more than 200 reefs and dive sites possessing a staggering 70 percent of all coral species recorded in the Indo/Pacific region. Fish species are equally prolific, with 900 recorded species present; a total sure to increase as additional research is carried out. I was really starting to miss my camera!

With an hour to relax before my bags arrived, I took position on a comfortable lounge chair overlooking the bay for a snooze. My relaxation was interrupted by the arrival of Dan with the ominous question, "Do you want the good news or the bad news?" It turned out my bags were coming, but the flight had been delayed until 4:00 pm, effectively putting the brakes on the day's underwater photographic endeavours.

However, this was a reminder that diving isn't all about photography. With all that diversity on the doorstep, I was eager to get into the water, gear or no gear. Dan suggested a dive after lunch, and my arm didn't have to be twisted!

Arriving at the dive shop, I required a full set of gear. As I've never been fond of shortie wetsuits (due to a hodgepodge of cuts and stings obtained on previous occasions) I was fitted with a sleek blue lycra wetsuit. Once suited up, Kat joked that I looked like one of the X-Men!

Dive sites

Our destination was Hanging

CLOCKWISE: Anemone and attendants; Complaint cuttlefish poses for a portrait; Pinjalo School; Chevron barracudas

Gardens, a mere five minutes away from the dive shop. Plunging in, the water temperature was a bath-like 31 degrees. The previous evening's downpour had severely hampered visibility but not our enthusiasm, as we descended to a precipitous wall that plunged to nearly 30m.

The site's dominant feature is the masses of rope sponge cascading from the rock walls. Reaching lengths up to three meters, the sponges were everywhere, their intricate tangles adorned with a multitude of feather stars. In addition to several large caverns, the vertical wall was riddled with a plethora ledges and overhangs, which were home to an abundance of sponges, sea squirts and nudibranchs. Just off the wall, a school of juvenile bigeye trevalley kept close tabs on our progress.

At first, I almost felt naked to be to be diving without my camera, but after a short while, it almost became somewhat liberating. As a photographer, it becomes all too easy to be wrapped up with taking pictures. I was able to enjoy my environs and dive for the sheer enjoyment of it.

Mind you, I didn't wish to become permanently liberated and was looking forward to finally getting my housings for the next day's diving. A full-day excursion was on the agenda to visit some of the outlying dive sites including Susan's Reef, one of Walindi's signature sites.

Luggage woes

Upon reaching the jetty after the dive, I was informed the van had arrived from the airport with my luggage conspicuously absent. When I told Max, he immediately got on the phone to the airport in Port Moresby. Within a matter of minutes, they were tracked down, and we were assured they would arrive on the early flight the next morning and should be at the resort around 7:00AM. In addition, I had my flight changed to a day later to make up for the missed day.

Still, I can't really complain; in all the years of travelling, I'd never lost any luggage, and the law of averages dictates it would happen somewhere. Oh well, time for another South Pacific Lager!

I awoke early the next morning, eager for the day's diving that lay ahead. Upon exiting the dining hall, the girl at reception gave me" the look" accompanied with a somewhat timid "excuse me…" I immediately knew what that meant.

It seemed my bags wouldn't arrive until 10:00AM, effectively scuttling my participation in the 8:00AM departure. Down but not out, I headed back to my bungalow and resigned myself to taking some more shots around the resort.

Setting up a shot ten minutes later, I stared in utter disbelief as I saw my bags being carried to the front desk! Euphoria set in, and I made a mad dash for the dive shop while the bags were delivered. "My bags arrived. Don't leave without me!" I blurted out to Dan, as I broke a land speed record racing back to my bungalow. Assembling my housing in record time, I ran back to the dive shop and made the 8:00 departure in the nick of time.

It was a full boat. In addition to dive guides, Andrew and Keiko, were a French couple I'd met the day before, and a trio of Japanese loaded with cameras. As we departed the jetty and progressed further into the bay, I finally got to see the source of the sulphurous aromas. Looming large behind the resort was the silhouette of Mt. Garuna volcano. Scanning the horizon in all directions, I discerned the landscape was strewn volcanic cones, a testament to the island's violent geological history.

Inglis Shoals

Forty-five minutes later, we arrived at

CLOCKWISE: Kimbe Bay; coral trout hides amongst an intricate tangle of whip corals; incredible undersea gardens of Susan's Reef; Curious grey reef shark comes in for a look; Feather star clings to a mass of whip corals

Inglis Shoals, an isolated seamount whose distance from shore ensured visibility would be unaffected by sediment from the recent heavy rains.

Descending along the mooring line to the reef top at 12m, we were soon engulfed by a multitude of fish, including a small school of chevron barracuda. I immediately approached them to get a few shots, assuming they'd immediately disperse at our presence.

After a few per functionary glances, they ignored us and continued patrolling the perimeter of the reef.

Below, the pinnacle's summit was shrouded with a patchwork of anemones, giant orange sponges, and table and staghorn corals. Swirling amongst them were successions of purple anthias, angelfish, surgeonfish, triggerfish and one very compliant cuttlefish whose tentacles practically touched the domeport of my housing.

At the northern edge of the reef, a red fan coral was home to a scribbled filefish while a school of pinjalo hovered above the nearby drop-off, their deep red color contrasting sharply with the blue of the open water.

During our safety stop, a couple of grey reef sharks arrived to check us out. Coming progressively closer with each pass, they were starting to make me a tad uneasy, and I was eager to get back on the boat. Dan told me later that this happens at Inglis Shoals all the time, and the sharks were merely curious. (To my knowledge, all divers have made it back to the resort intact) Still, I'd take a shark over a titan triggerfish any day!

Susan's Reef

Our next stop was the most anticipated dive of my visit. Susan's Reef has made many a diver's top ten dive site list—winning accolades for its dense aggregation of whip corals. Occupying a submerged ridge, Susan's is connected to a much larger reef by a saddle, which creates a channel between them. I was initially concerned that we might miss the whip corals, an assumption that was quickly laid to rest.

At 16m, it came into glorious view, an impenetrable tangle of red punctuated with sponges and plate corals. Truly stunning! The southern end of the reef proved more spectacular, with dense congregations of staghorn corals, elephant ear sponges and magnificent fan corals. Encrusted with a myriad of feather stars, some specimens were nearly three meters across! All the while, legions of fish went about their business, oblivious to the unbridled splendour of their surroundings.

The magnitude of life jam-packed into this relatively small area was like an undersea Garden of Eden. With unlimited

LEFT TO RIGHT: Fan corals, Kimbe Bay; Colourful but unglamorously named varicose wart slug; A variety of corals crowd the reef tops of Kimbe Bay

photo ops at every turn, I could have easily spent all day in this one exquisite location.

After a surface interval and lunch, I wondered what other marvels Kimbe Bay had in store for our final dive. Susan's was a tough act to follow, but Christine's Reef admirably rose to the challenge and delivered in spades!

The *thelenota rubolineata* sea cucumber is one of the most colourful members of its family

Christine's Reef

A series of detached reefs connected by underwater ridges, Christine's was another knock-your-fins-off site with all the Kimbe trademarks. Towering barrel sponges adorned with multicoloured feather stars sprouted from the rugged terrain as mélange of gorgonians, soft corals, whip corals, and massive orange sponges set the reef ablaze with riotous abandon.

Even the sea cucumbers were stunning! Inching across the sandy bottom was the remarkable *thelenota rubolineata*. With its intricate network of vivid red lines and knobby protuberances, it must rank as one of the most photogenic members of its family.

By the end of the dive, I wasn't sure who was more exhausted; the camera or me!

Finally, it was time to head back to the resort, arriving at the jetty moments before a late-afternoon cloudburst doused the intense tropical heat. Earlier in the day, I had asked reception if it was possible to change my flight back to Port Moresby to a day later in order make up for the missed diving. Upon arrival, I was ecstatic to discover my flight had been changed, giving me an extra day of diving. The photo gods were finally smiling!

Joel's Reef

The next morning, I awoke with a plan. It's a cruel inevitablity that whatever camera setup I take on a dive, something will present itself that makes me wish I had the OTHER one! This time, I decided to take both housings on each dive—one set for wide-angle and the other for macro.

The sea was calm as we headed out, our progress made somewhat tricky by the low tide. In front of the resort, the dogs joyfully bounded across the exposed flats trying to catch any hapless shorebirds they could get their paws on. Apparently, they have yet to meet with any success!

After the superlative dives of the previous day, I couldn't wait to see what guides Keiko and Peter had in store. First up was Joel's Reef, another outlying seamount. Commencing the dive was a case of deja vue.

While descending the mooring line, the first thing we encoun-

Some of Kimbe Bay's fan corals stretch an impressive three metres across

LEFT TO RIGHT: Barrel sponge towers above the reef; Anemones of Kimbe Bay come in a vivid array of colours; Big-eye trevalley school; Dwarf Stonefish

tered was a school of chevron barracuda, this time attendant school of big-eye trevalley in tow. Below, the reef top was blanketed with magnificent hard coral gardens interspersed with numerous anemones and sponges.

After taking a few wide-angle shots, I spotted some phyllidia nudibranchs and switched to macro. Boasting harlequin patterns of black and blue accented with yellow pustules, their colourful appearance belies their rather unappealing common name of wart slugs!

Nearby was a short hand commensal shrimp, its transparent body accented by a colourful wardrobe of large white spots and a tail punctuated with five black and orange ocelli.

Good buoyancy was imperative here; during our dive brief, we were informed a large portion of the reef top was blanketed with fire coral!

Emma Reef

Next up, South Emma Reef was another site of superlatives. The reef top was bursting with a myriad of reef fish, including butterflyfish, fire Dartfish, clown triggerfish, batfish, longfin bannerfish and the all-pervading species of anemonefish. Further down, at 12m, the bommie boasted a prolific mantle of hard corals, soft corals and sponges.

Restorf Island

Our final stop of the day was Restorf Island. Turquoise waters gently lapped a luminous beach of white sand, while a short distance away, the tropical forest crept right to the water's edge. During the surface interval, the boys took our gear ashore, as we all tucked into a tasty buffet lunch.

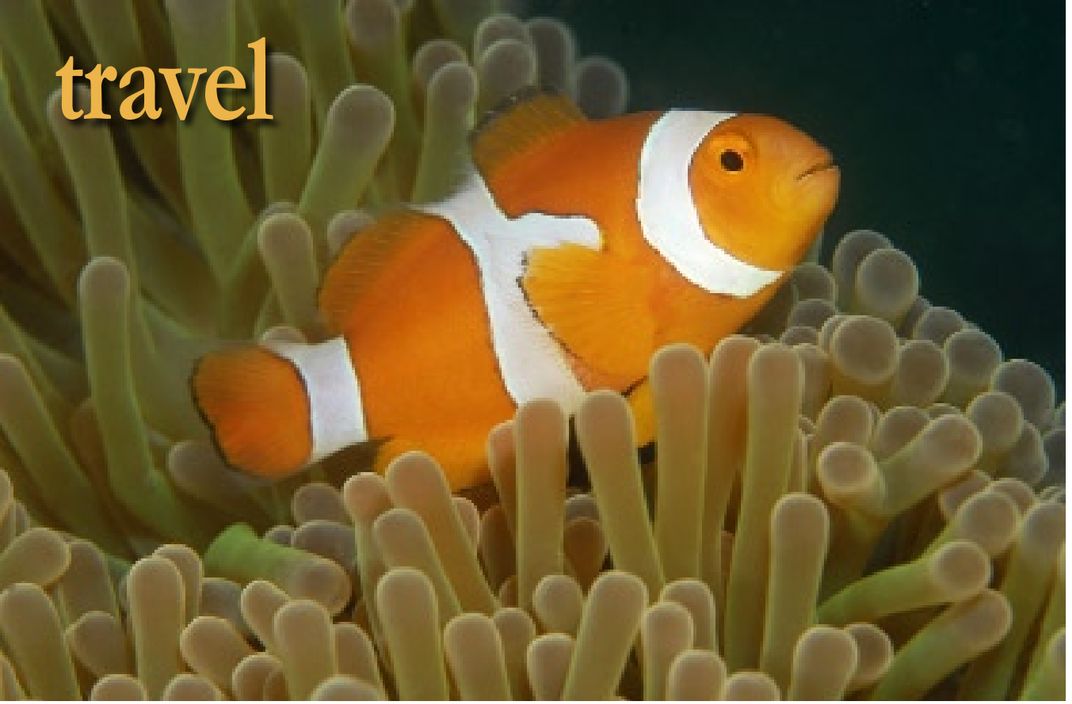
Observing the proceedings from a bare branch high above, a patient brahminy kite sat waiting for some scraps. Peter tossed a chicken bone aloft, which the raptor deftly snatched from midair with its razor-sharp talons.

For our final dive, I abandoned my wide-angle set-up to concentrate solely on macro. Here, on the western side of the island, the reef slopes downward amidst a patchwork of loosely connected coral bommies. While the slope descended to 32 metres, my flight the following morning the next day necessitated a shallow dive.

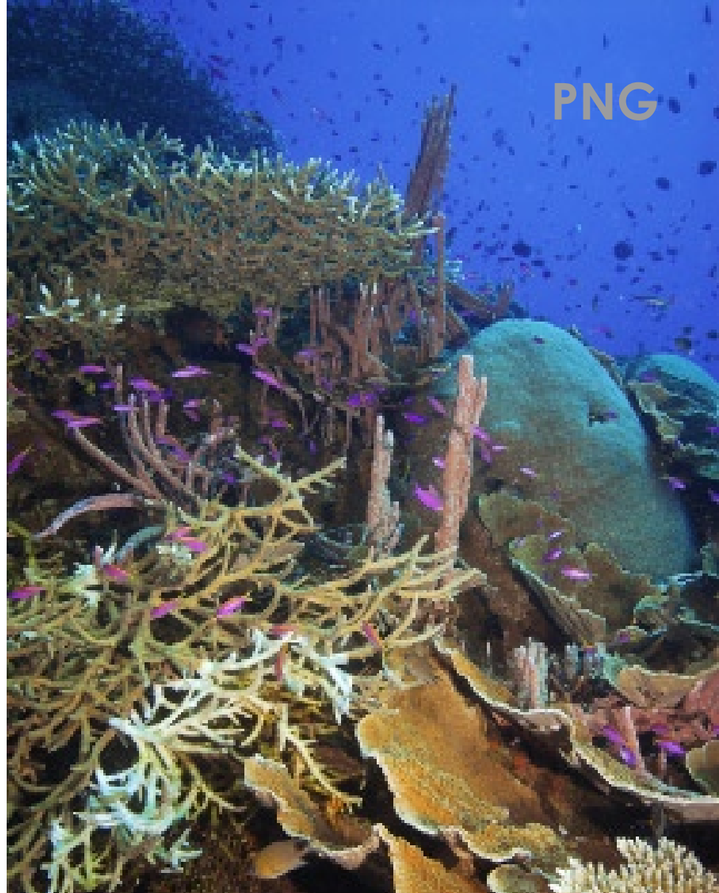
Sandy areas linking the island and the reef were home to large congregations of garden eels. Maddeningly shy, they immediately ducked for cover the moment my camera got anywhere with-

Commensal Shrimp

Corals and anemones



CLOCKWISE: Clown anemonefish; Spinecheek anemonefish; Hard corals and purple anthias; Early morning at Kimbe Bay



in range. Far more cooperative were numerous gobies, each diligently standing guard as their attendant partner shrimps bulldozed unwanted debris from the confines of their communal burrows.

Moving on, the bommies were home to loads of reef fish, morays, nudibranchs and a colourful Christmas tree worms. Numerous anemones housed colonies of spinecheek anemonefish, pink anemonefish and clownfish.

The highlight was a white dwarf scorpionfish, sitting immobile and practically invisible on the sandy bottom. I was so engrossed photographing it that I almost knelt on a much smaller second individual sitting nearby!

Unfortunately, all good things must end, and soon it was time to head back to the resort. The next morning, I sadly bid my generous hosts farewell. Despite my all-too-brief stay, the incredible diving was already making me think about a return trip.

But onwards! More diving adventures lay in wait at my second destination, Loloata Island Resort.

Trip to Loloata Island

On the drive back to the airport, a roadside sign caught my attention. Reading the caption "Leukeut", I was confused to its meaning until I sounded it out phonetically—"Lookout"!

I then realized it was written in Pidgin, one of PNG's official languages. Tok Pisin, more commonly known as Pidgin, has evolved as the medium through which the nation's multitude of cultural groups is able to communicate with one another.

We arrived at Hoskins airport with time to spare before the flight. As it turned out, PLENTY of time to spare. My original flight the day before had been cancelled, thus bumping everyone onto mine. The next flight wasn't until late afternoon, giving me a five-hour layover. To put a positive spin on things, it gave me some much-needed photo editing time on my laptop.

I finally arrived in Port Moresby around 6:00pm. Patiently waiting outside my terminal was my driver from Loloata. The drive to the jetty was a mere 15 minutes, followed by a brief ten-minute boat transfer to the island by water taxi.

With the waning rays of the setting sun giving way to a twilight canvas of purple, we arrived at the resort jetty around 6:30. It was one seriously long jetty too, necessitated by the very shallow waters at low tide. My late arrival ensured my night diving ambitions had been derailed once again. I was

Chelidonura nudibranch

CLOCKWISE FROM TOP LEFT: One of the impressive carvings on display at Loloata Resort; View from Loloata Island; Fish soup at Suzie's Bommie, Loloata; Pair of common lionfish hang out in the current; Loloata Island

beginning to sense a pattern here…

However, I did arrive just in time for dinner, served buffet style in the open-air ding area decorated with a plethora of amazing carved wooden masks. The cooling breezes coming off the ocean provided a welcome reprieve from the relentless humidity on the mainland.

After dinner, I sauntered down the long paved walkway to my room, which paralled the mangrove-fringed shoreline. At reception, I was told to watch out for banded sea kraits along the path. At night, the venomous reptiles slither up from the shore to spend the evening curled up on the warm pavement. Fortunately, my stroll proved to be snake-free, and I made it back to the room without incident. Upon completion of my nightly camera assembly and battery charging duties, I fell unconscious moments after hitting the pillow.

Loloata Island Resort

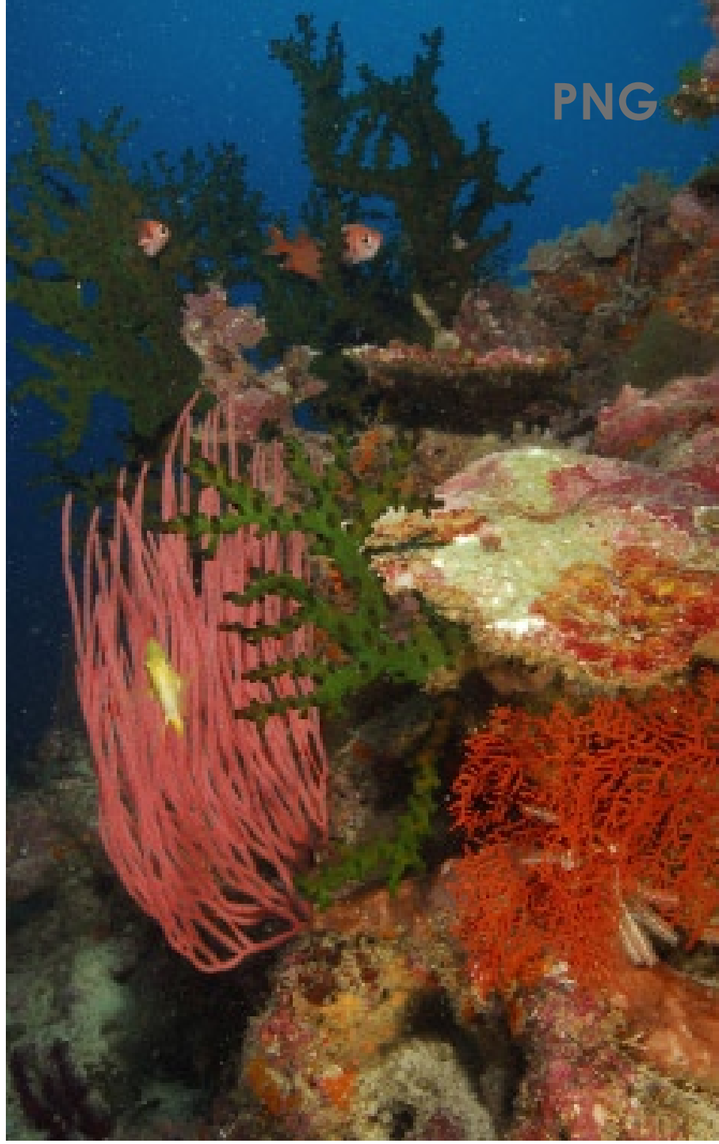
The name Loloata is derived from two Motu words, "loloa" and "ta" which mean "hill" and "one". The main house was established as a private residence in the early 60's and by 1970, Loloata was established as a weekend retreat. By 1978, it was a bona fide resort catering to holidaymakers, diving enthusiasts and conference groups. Longtime manager, Dik Knight, is a true diving pioneer in the region and has personally discovered a number of the area's dive sites.

Mingling with the frequent guests is a number of island residents, albeit non-native. Some years ago, wallabies were introduced to the island and have since multiplied, becoming the Loloata equivalent of pigeons. There are also pigeons, but of the decidedly jumbo variety. Wandering amid the grounds is a trio of Queen Victoria pigeons, the world's largest species. The size of a small turkey, they sport impressive headdress of lacy feathers resembling a blue-grey afro.

In contrast to Walindi's lush tropical surroundings, the drier environs of Bootless Bay are more reminiscent of Australia. Rolling hills dotted with eucalyptus trees fringed the shoreline, while rugged blue silhouettes of mountains rose in the distance. Most surprising was the not-so-distant skyline of Port Moresby.

With its close proximity to the airport, Loloata Island Resort is also a preferred overnight stopover for visitors with connecting flights as well as expats seeking a weekend respite from the nation's rough and tumble capitol.

Just like the above water topography, Loloata's undersea environs are noticeably different than Walindi's,



CLOCKWISE: Pumkin Patch; Leaf scorpionfish; Loloata reef scene; Oblique-Banded Sweetlips; Franco, dive guide extraordinaire

boasting a plethora of different environments and species. However, it was one specific denizen that had piqued my interest.

Over the last few years, Loloata has gained fame as one of THE places in the world to observe the lacy scorpionfish, the Holy Grail of the underwater photographer. This gaudily attired member of the scorpionfish family is predictably found on several of Loloata's dive sites, and it was right at the top of my photo wish list!

Strolling to the dive shop after breakfast the next morning, I met Franco, who was to be my guide for the next two days. Boasting big dreadlocks and an even bigger smile, he inquired if there was anything specific that I wanted to photograph. I knew immediately where I wanted to go!

Several days before I departed Australia, I had met a diver who had just come from Loloata. During her stay, she had observed no less than three of my sought-after scorpionfish at a site called The Pumpkin Patch. Due to its location, however, Franco suggested we save it for the next day and do a few dives closer to home. Sensing my disappointment, he assured me he had something special in mind.

Suzie's Bommie

Under a glorious clear blue sky, we set out across Bootless Bay for the 20-minute boat ride to Suzie's Bommie. As on my second day at Walindi, I assembled both housings to maximize image potential. Little did I know of the wonders that lay ahead!

Upon arrival, our entourage of three photographers and two guides quickly entered the water and headed straight to the bottom at 30m. Beneath me, I spied what appeared to be the graceful contour of a large moray eel undulating above the sandy bottom. Upon closer inspection, my eyes widened as I realized this was no eel, but an enormous olive sea snake! Just as I was getting into position to take a shot, it propelled itself to the surface for a breath of air. (And I wasn't about to get in its way!)

Moving on, we approached the site's massive bommie and slowly started to work our way around its perimeter. Moments later, Franco pointed out a trio of leaf scorpionfish, two purple and one white. However, the best was yet to come.

Approaching the end of the bommie, I was greeted by a panorama of sheer spectacle. Hovering above the current-swept point was a swirling maelstrom of fish. Dominating the proceedings was an immense school of oblique-lined sweetlips. Intermingling amongst them was a cornucopia of yellowtail fusiliers, harlequin sweetlips, anthias, coral trout and a couple of camera-shy Napoleon wrasse.

On the reef top below, an incredible profusion of tubastrea, fan and soft cor-

als created a rich tableau, their polyps extended to capture passing morsels swept in by the strong currents.

While gaping at the extravaganza before me, I felt a finger tapping my shoulder, which then gestured to a large fissure in the rock less than a metre away. It took a few moments of careful scrutiny to realize I was staring at a massive stonefish! Attired in a patchwork of pink, orange, white and green hues, its unsightly countenance blended seamlessly with its vibrant surroundings. Colourful, but deadly.

PNG

CLOCKWISE THIS PAGE: Weedy scorpionfish; Porcelain crab; Leaf scorpionfish portrait; A Pegasus seamoth creeps across the substrate

Di's Delight

After the adrenaline rush of Suzie's Bommie, the next two dives proved to be equally spellbinding. Di's Delight featured three coral bommies separated by four-metre clefts jam-packed with Gorgonians. Upon descending the mooring line, it was a short swim across a sandy area to the reef tops at depths of 10-13m.

Franco gestured for me to follow him to the middle bommie. Sitting on a rocky outcrop was an orange weedy scorpionfish. Okay, it wasn't a lacy, but hey, who's complaining! I spent the majority of the dive happily photographing it from every conceivable angle.

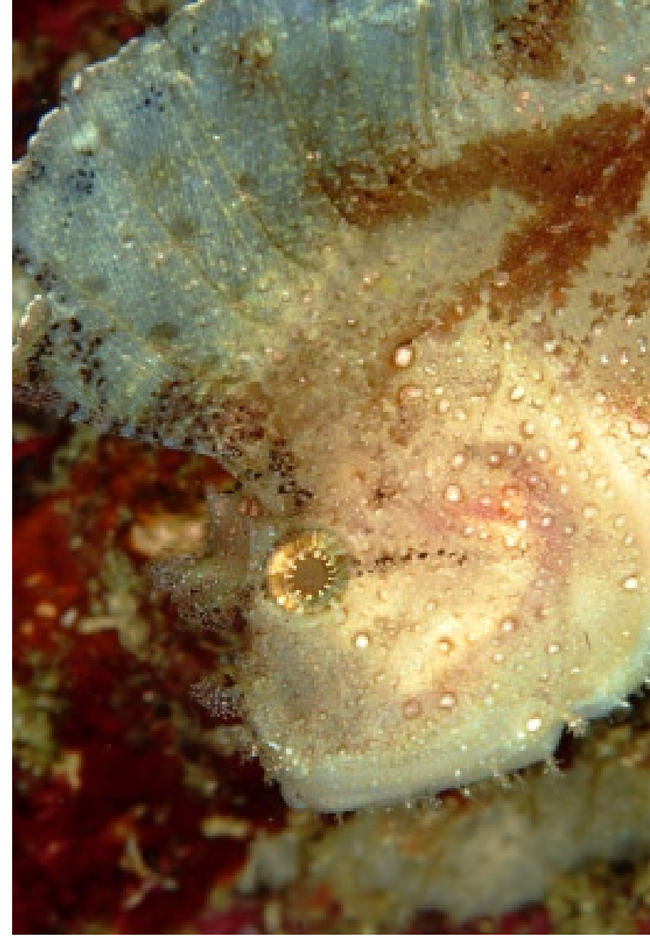
Quayle's Reef

Equally impressive was Quayle's Reef. A tiny fan coral at 18m was home to a miniscule bargibanti pygmy seahorse, while further exploration of the reef revealed an abundance of nudibranchs. Especially impressive were a pair of spectacular long-cirri phyllodesmium, or "solar-power" nudibranchs.

Lion Island

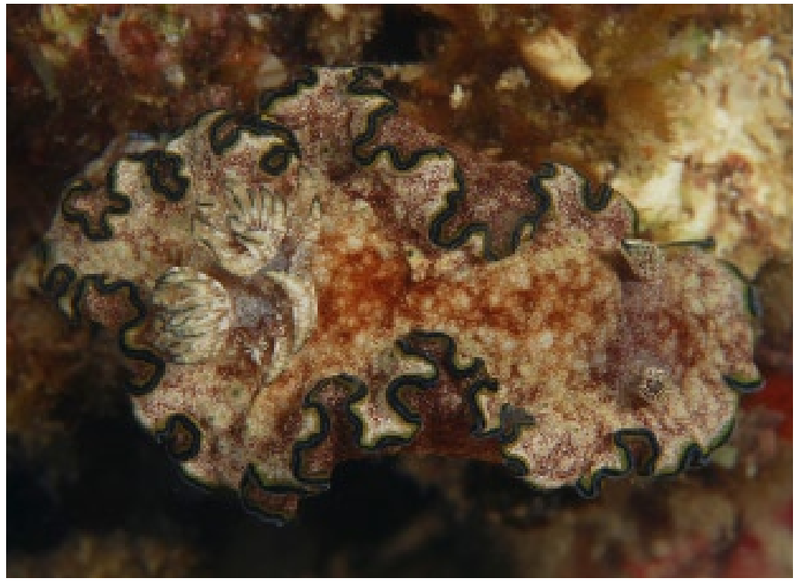
Still game for one more dive, we set out that evening for neighbouring Lion Island for a night dive. Descending to three meters, the bottom was carpeted with extensive beds of seagrass, while further down, a slope of sand prevails.

A small wreck at a depth of 12m revealed several species of nudi-



WORLD WAR II

During the latter part of World War II, New Britain was the scene of heavy fighting between Allied and Japanese forces. Between December 1943 and August 1945, more than 100,000 Japanese military and civilian personnel were stationed on New Britain and nearby New Ireland. The majority of these were based in the capitol of Rabaul, a key base for the Japanese campaigns in New Guinea and the Solomon Islands. The New Britain Campaign was a major assault conducted by Allied forces to route Japanese forces entrenched in the region. By the end of the war, the Japanese forces were restricted to Rabaul and the adjacent Gazelle Peninsula. The Rabaul base was abandoned entirely in August 1945, prior to the surrender by Japanese forces the following month. As a result, the waters encircling New Britain are strewn with a cornucopia of wrecks, both navy & air force. Each year, new wrecks are discovered as dive sites are explored further, making the the region a must for World War II history buffs. ■



LEFT TO RIGHT: Lacy Scorpionfish portrait; Gird-led Glossodoris; The Holy Grail: my first lacy scorpionfish. INSET: Queen Victoria pigeon

branchs. The highlight of the evening was a pair of Pegasus seamoths. Resembling a pair of squashed seahorses, they meandered along the sandy bottom, totally oblivious to our presence.

Nearby, a large anemone was like an undersea apartment complex, housing Clark's anemonefish, porcelain crabs, glass shrimps and three-spot damsels.

After a pleasant 60+ minutes dive, we surfaced under a clear starry sky, accented by sporadic lashes of lightning over the mainland. We arrived back at the resort just in time to see the conclusion of a sing-sing, a traditional Melanesian musical performance put on by the hotel staff dressed in flamboyant traditional finery.

Halameda ghost pipefish pair
FAR RIGHT: Soft coral

Baldwin's Bommie

The next morning, I awoke early for my last diving day. It felt like I had just arrived (actually, I had!) With plenty of dive sites and little time, it was hard to decide where to go. Franco suggested somewhere different: Baldwin's Bommie. As it turned out, he hadn't even been there for 18 months. Not knowing what we'd find made the prospect exciting, so off we went.

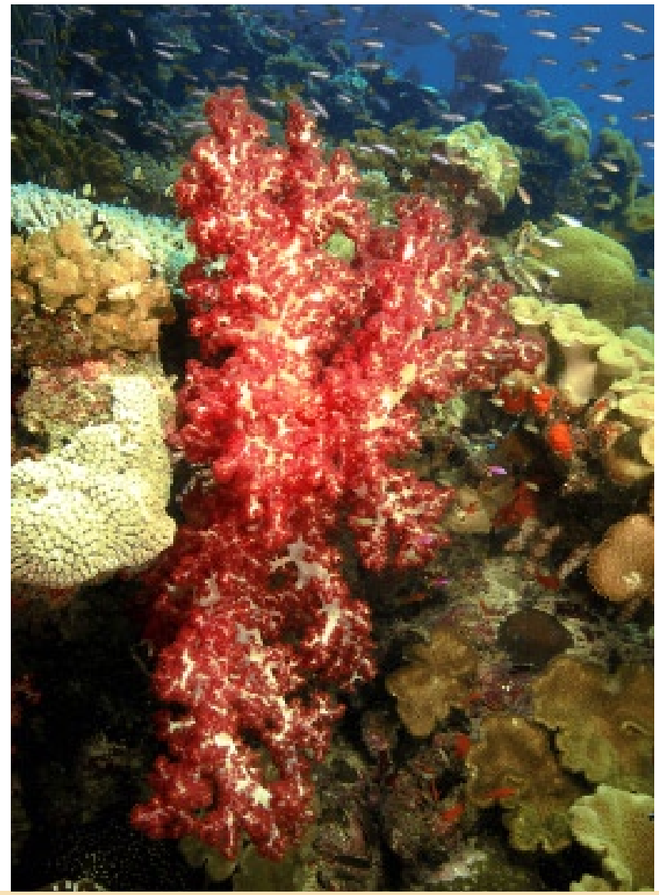
We descended the mooring line to a finger of reef jutting outwards from the main section. Swimming along a saddle at 25m led to an isolated bommie rising to within 14m from the surface.

Soft corals, whip corals, innumerable purple anthias and scores of angelfish painted a rich canvas with photo opportunities at every turn. Nudibranchs were also common, including an exquisite spotted hypselodoris, it's slender red frame accented with spots of purple. The star attraction was a pair of white halameda ghost pipefish that obligingly posed for endless photos.

Pumkin Patch

For the final dive, it was finally time to visit the Pumpkin Patch in search of the elusive lacy scorpionfish. To ensure success in locating our quarry, no less than three dive guides came along for the ride.

Located just under 10km from Loloata, Pumpkin Patch consists of seven bommies connected to the main reef via a ridge cloaked with staghorn corals. While the reef was stunning, I paid little



CLOCKWISE: A view across Bootless Bay looking towards the mainland; The Loloata staff perform a traditional Sing-Sing for the guests: Spotted Hypselodoris

injury, my computer was on the verge of going into deco.

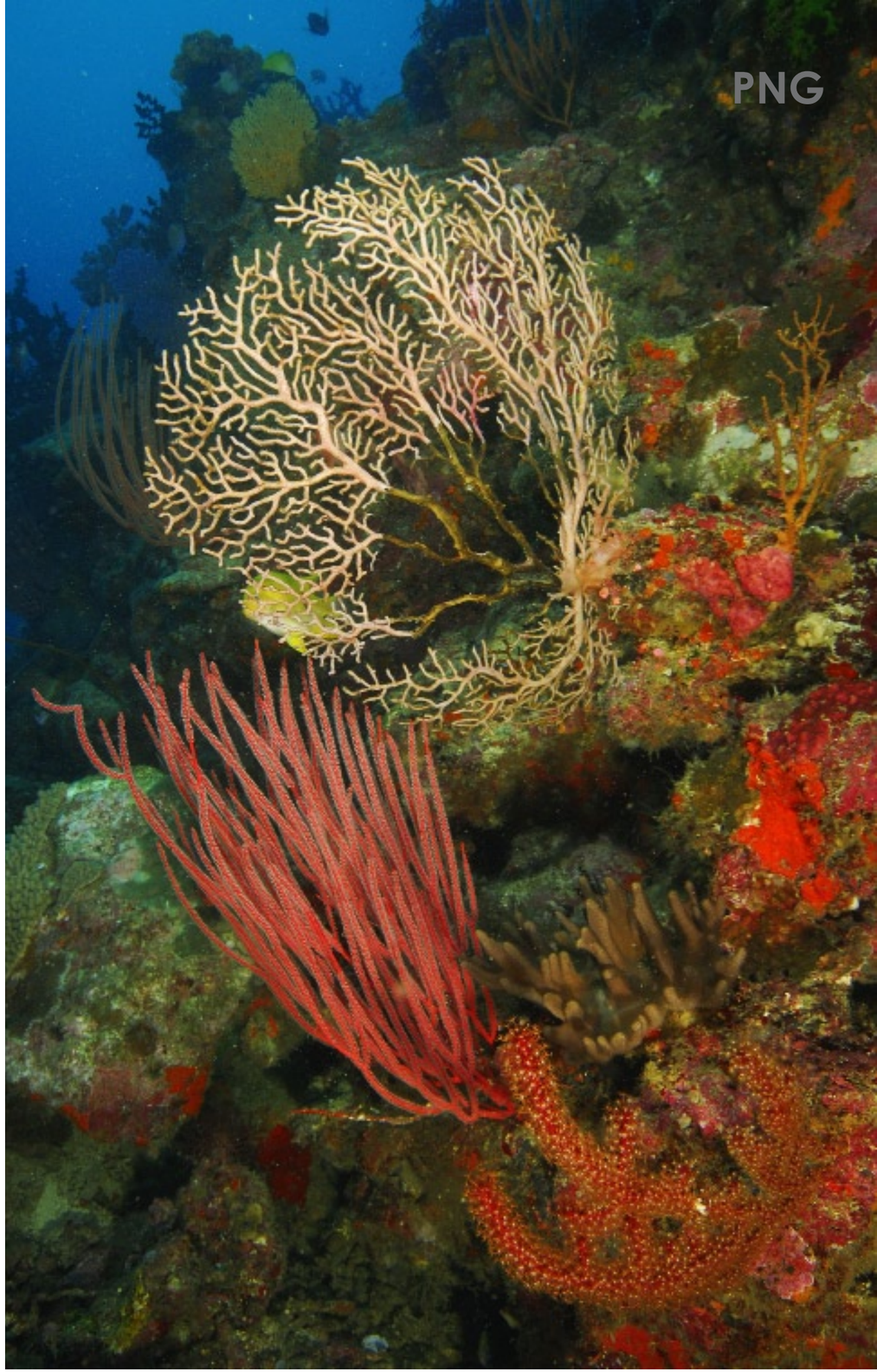
Firing away at a rapid pace, I was soon interrupted by Franco. Incredulously, he had found ANOTHER one a scant few metres away. This one was pink and positioned in an even more inaccessible position. Undaunted, I managed to fire off a few shots before the cursed "beep beep beep" of heed, for I was on a Grail Quest!

Thirty minutes into the dive, I was starting to get nervous. The scorpionfish were conspicuously absent, and time was starting to run out. I was beginning to resign myself to the possibility that we may not find them, so I concentrated my efforts on shooting some wide-angle images of the luxuriant coral growth.

Moments later, Franco came at me like a torpedo. Wildly gesturing for me to follow, we swam to the neighbouring bommie and descended to 20m. There, perched on an outcrop, was a black lacy scorpionfish.

Getting close to photograph it proved easier said than done. A strong current coupled with a number of obstructing coral spires, made photography difficult. To add insult to my computer indicated I'd gone into deco. After squeezing in a final few shots, I happily ascended to our safety stop. Mission accomplished.

A short, yet eventful week finally had finally drawn to a close. In my short visit, I'd barely scratched the tip of the iceberg in terms of PNG's wealth of undersea attractions. After all the wayward luggage and missed days, was it worth it? Absolutely! Would I return? In a heartbeat... Well, maybe with a tad less luggage. ■



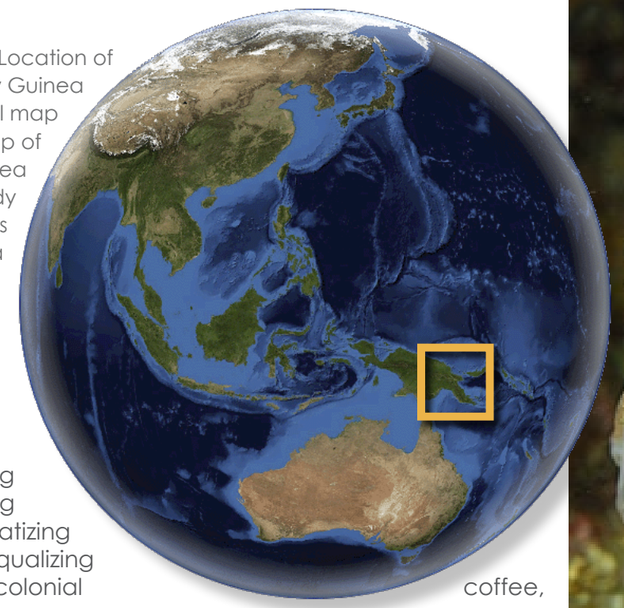
A variety of corals create a rich tableaux at Loloata's reefs

fact file

Papua New Guinea

SOURCE: CIA.GOV WORLD FACTBOOK

RIGHT: Location of Papua New Guinea on global map
BELOW: Map of Papua New Guinea
FAR RIGHT: Weedy scorpionfish yawns for the camera



History In 1885, the eastern half of the island of New Guinea, which is the second largest in the world, was divided between Germany which held the north and the United Kingdom which held the south. In 1902, the latter area was transferred to Australia. During WWI, Australia occupied the northern portion and continued to govern the combined areas until independence in 1975. A secessionist revolt on the island of Bougainville ended in 1997 after nine years of violence that claimed some 20,000 lives. Papua New Guinea's indigenous population is one of the most heterogeneous in the world. The country has several thousand separate communities, a majority with only a few hundred people. Over millennia, some of these communities divided by language, customs, and tradition, have engaged in local tribal conflict with their neighbors, which has been magnified in large part by the advent of modern weapons and modern migrants into urban areas. Government: Constitutional parliamentary democracy and a Commonwealth realm. Capital: Port Moresby

Geography Papua New Guinea is located in Oceania, a group of islands including the eastern half of the island of New Guinea between the South Pacific Ocean and the Coral Sea, east of Indonesia. Coastline: 5,152km. Its terrain is mountainous, with rolling foothills and lowlands along the coast. Lowest point: Pacific Ocean 0m. Highest point: Mount Wilhelm 4,509m. The country shares the island of New Guinea with Indonesia. Along the southwest coast, PNG has one of world's largest swamps

Climate Tropical. The northwest monsoon occurs December to March, the southeast monsoon, May to October. Slight variations of temperature are seasonal. Natural hazards: situated along the Pacific "Ring of Fire", PNG has active volcanism and experiences frequent and sometimes severe earthquakes, mud slides, and tsunamis.

Economy Richly endowed with natural resources, exploitation of these resources in PNG has been challenged by rugged terrain and expensive development of infrastructure. Three-quarters of the population rely on agriculture providing a subsistence livelihood. Two-thirds of export earnings come from mineral deposits, including copper, gold, and oil. Led by Prime Minister Somare—first to serve a full five-year term—much of the government's time has been aimed at just staying in power. The government's expenditure control has brought stability to the national budget, largely however, they eased spending constraints in 2006 and 2007 prior to elections.

Challenges include rejuvinating investor confidence, strengthening state institutions' integrity, nurturing economic efficiency through privatizing moribund state institutions, and equalizing relations with Australia, its former colonial ruler. The country faces an HIV/AIDS epidemic, which threatens to upend the economy. Nearly 20 percent of its national budget is supplied by Australia. Natural resources: gold, copper, silver, natural gas, timber, oil, fisheries. Agriculture: coffee, cocoa, copra, palm kernels, tea, sugar, rubber, sweet potatoes, fruit, vegetables, vanilla; shell fish, poultry, pork. Industries: copra crushing, palm oil processing, plywood production, wood chip production; mining of gold, silver, and copper; crude oil production, petroleum refining; construction, tourism

One of Loloata's resident wallabies

Environment Growing commercial demand for tropical timber is leading to deforestation of PNG's rain forests. There is pollution from mining projects and severe drought. PNG is party to: the Antarctic Treaty, Biodiversity, Climate Change, Climate Change-Kyoto Protocol, Desertification, Endangered Species, Environmental Modification, Hazardous Wastes, Law of the Sea, Marine Dumping, Ozone Layer Protection, Ship Pollution, Tropical Timber 83, Tropical Timber 94, Wetlands

Population 6,057,263 (July 2009 est.) Ethnic groups: Melanesian, Papuan, Negrito, Micronesian, Polynesian. Religions Roman Catholic 27%, Evangelical Lutheran 19.5%, United Church 11.5%, Seventh-Day Adventist 10%, Pentecostal 8.6%, Evangelical Alliance 5.2%, Anglican 3.2%, Baptist 2.5%, other Protestant 8.9%, Bahai 0.3%, indigenous beliefs and other groups 3.3% (2000 census). Internet users: 120,000 (2008)

Language Tok Pisin, English, and Hiri Motu (official languages). In PNG, some 860 indigenous languages spoken, over one-tenth of all languages. Note: A creole language, Tok Pisin, is widely used and understood. English is spoken by 1%-2%; Hiri Motu is spoken by less than 2%

Health There is a very high degree of risk for food or waterborne diseases such as bacterial diarrhea, hepatitis A, and typhoid fever; as well as vectorborne diseases such as dengue fever and malaria (2009)

Currency Kina (PGK). Exchange rates: 1USD=2.74PGK; 1EUR=3.84PGK; 1GBP=4.45PGK; 1AUD=2.47PGK; 1SGD=1.95PGK

Time Zone UTC+10

Websites
Papua New Guinea Tourism
www.pngtourism.org.pg ■

media

Edited by
Catherine G S Lim

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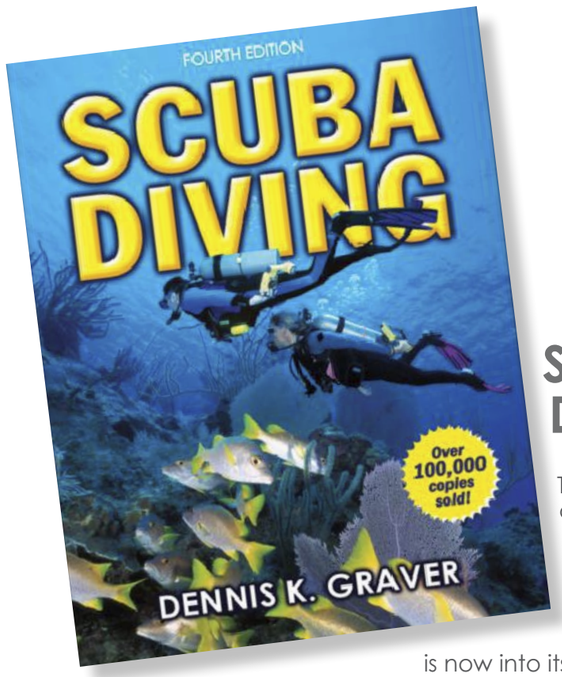


Scuba Diving

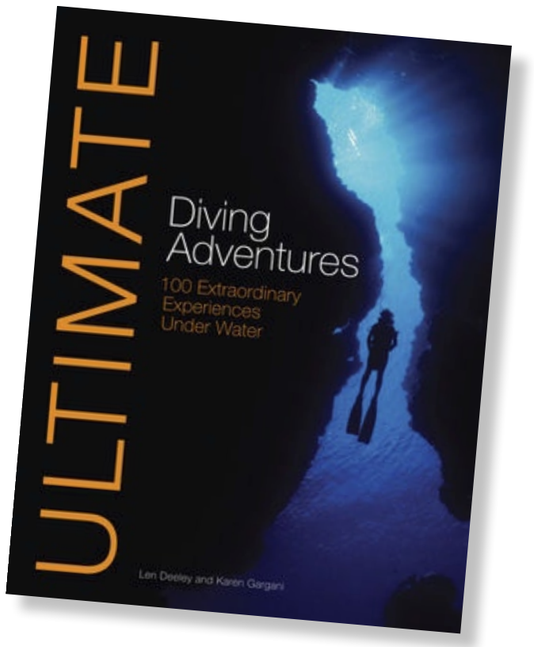
This book offers a comprehensive coverage into the sport of scuba diving. The fact that it is now into its fourth edition is testament into its timeless relevance to divers at all levels, be it beginner or experienced. Readers are guided by colour photos and illustrations as they delve into chapters covering dive science, equipment, skills, techniques and other facets of the sport. This new edition includes recommendations on the top diving spots worldwide, as well as topics like gas laws and the physiology of diving.

Written by Dennis K Graver. Published by Human Kinetics. November 2009. Paperback, 248 pages. ISBN-13: 9780736079006

Ultimate Diving Adventures

Once maneuvering through the water becomes second nature to you, what's next? If you're at a loss as to where to go for your next dive expedition, pick up this book for 100 suggestions for your next big adventure. Choose amongst tropical reefs, temperate waters, wreck dives, shark-inhabited reefs, whales and other mammals and exotic species. Be guided by stunning photos, an animated writing style, and the knowledge of two experienced divers to arrive at the your ultimate diving adventure for 2010.

Written by Len Deeley and Karen Gargani. Published by Wiley. Paperback, 218 pages. ISBN-10: 0470744928. ISBN-13: 978-0470744925

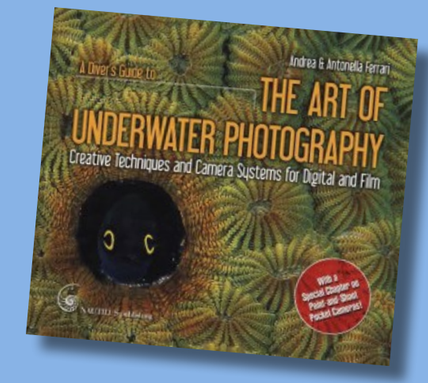


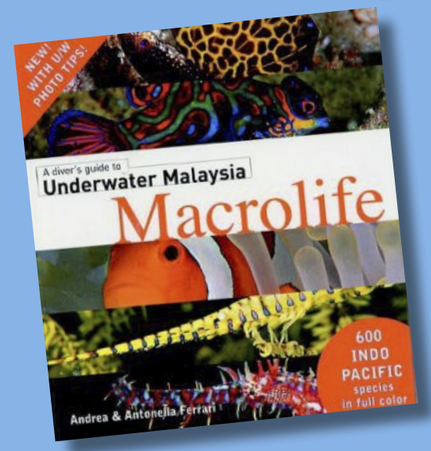
Oceans

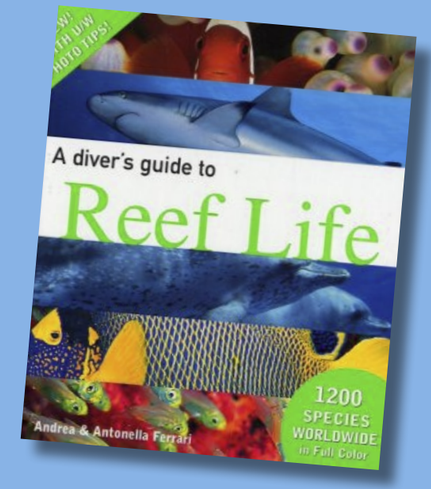
You're seen the series, now read the book. Oceans is the companion volume to the Disney feature documentary of the same name. Besides its main focus on the oceans and the creatures that dwell within, the book also chronicles the challenges and dangers faced by the film crew during the production. The diving crew had at times swam unprotected amongst great white sharks, and technical crew even custoomised innovative devices like streamlined camera pods as well as a microscopic lens to capture on film plankton, algae, coral and tiny fish eggs. Pick up this book for a peek behind the scenes into the creation of a Jacque Perrin nature documentary.

Written by Francois Sarano and Stephane Duran. Published by National Geographic. March 2010. Hardcover, 320 pages. ISBN-10: 1426206267 ISBN-13: 978-1426206269

Get Dive Guides by Andrea & Antonella Ferrari







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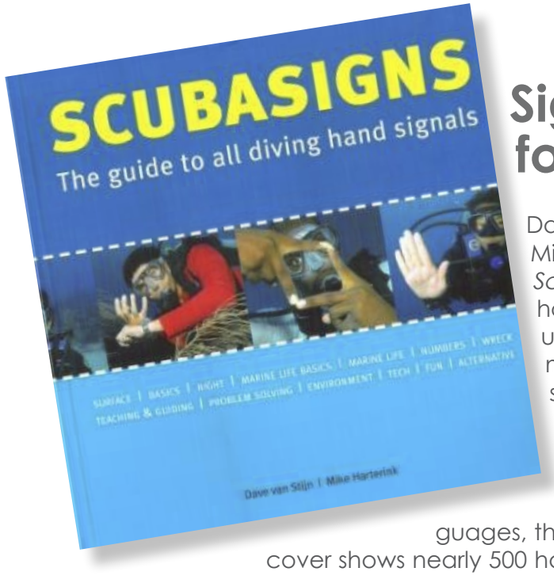
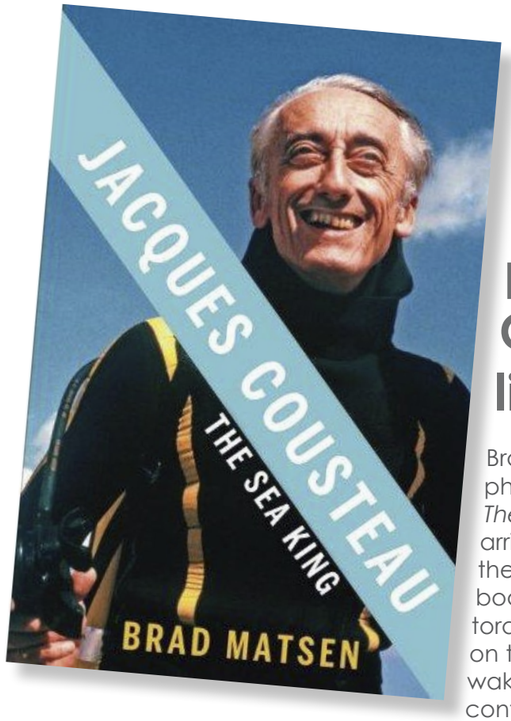


Sign up for diving

Dave van Stijn's and Mike Harterink's *Scubasigns* is a handy guide to underwater communication. Unlike some hand-signal guides that attempt to create new extensive hand-signal languages, the 288-page soft cover shows nearly 500 hand signals that are regularly used by divers. The new authors are diving professionals who have trained instructors and divers at resorts around the world, so their first book is essentially a documentation of signals that they learned in the field. The book is divided into 13 chapters on the surface, basics, night, marine life, numbers, teaching, problem solving, environment, wreck, tech, fun and alternative communications. More than 800 full-color photos illustrate the signals, which are accompanied with short verbal descriptions that often show a bit of humor. A complete index helps readers quickly find signs for specific occasions or species of marine life. The book was printed by and helps to support the Scubasigns Foundation, a charity that contributes to the training of residents in undeveloped areas as dive professionals. The goal is to promote diving and conservation to get natives involved in keeping marine life healthy. ISBN: 978-90-9024-165-4. **www.scubasigns.com**

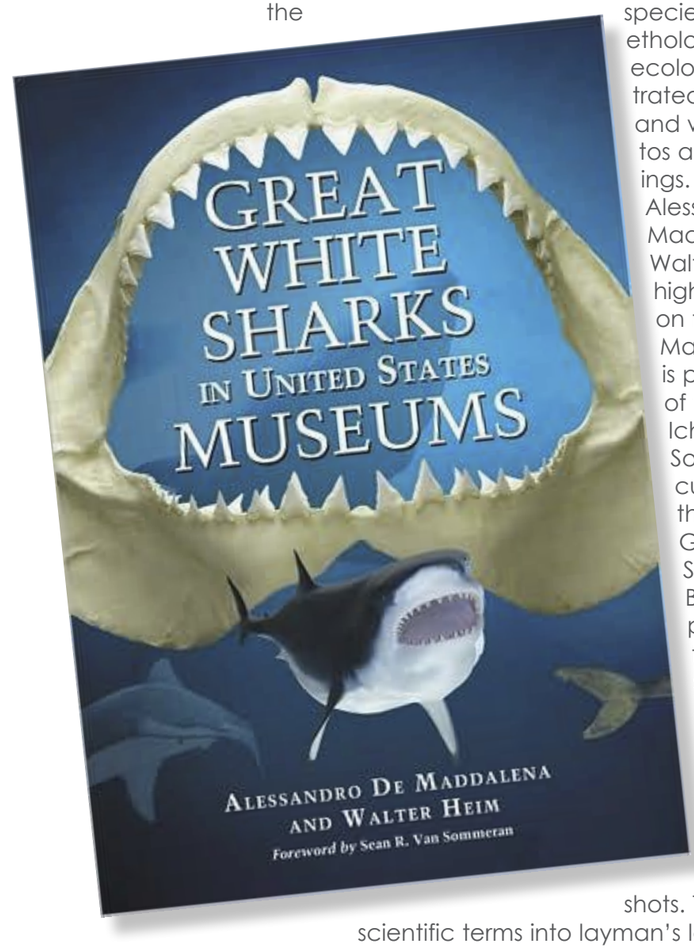


Dive into Cousteau's life

Brad Matsen's biography *Jacques Cousteau: The Sea King* is a timely arrival at bookstores as the adventurer's beloved boat *Calypso* is nearing restoration and thoughts are on the environment in the wake of the Copenhagen conference late last year. The 320-page hardcover from Random House's Pantheon division traces the explorer, inventor, ecologist and filmmaker from his birth in 1911 up to the family feud that continues to this day. While being respectful of Cousteau's legacy, Matsen provides a good look at his rakish side of the tireless ladies man whose secret second family emerged to control the Cousteau estate. Between the tabloid-worthy exploits, however, Cousteau was a genius who advanced science and filmmaking with little formal training in the fields. His derring-do as a spy for the French resistance helped the Allies in World War II. Divers owe a debt to his many inventions from the two-stage Aqualung to cameras that became the Nikonos line, lights, protection suits and many accessories. Only now are we learning the urgency of his conservation message. Matsen, who also wrote *The Titanic's Last Secrets* and for leading environmental publications, strikes a masterful balance in presenting the life story of a very complex man. Accompanying the text are photos, many from family members and some that have never been published. ISBN: 978-03-7542-413-7.
www.randomhouse.com

Dry diving for white sharks

Divers who find local waters too bracing this time of year can get the background for good local virtual diving by picking up *Great White Sharks In United States Museums*. The 214-page soft cover from McFarland press has the details on the 160 shark items on display in 26 institutions throughout the country. These items range from teeth and vertebrae to entirely preserved specimens. Those interested in museum matters will enjoy the descriptions of various ways to preserve organic material. The authors also document the few instances of white sharks being kept in captivity at aquaria. They also present, of course details on the species' biology, ethology and ecology, all illustrated with black and white photos and drawings. Co-authors Alessandro de Maddalena and Walter Heim are highly qualified on the topic. Maddalena is president of the Italian Ichthyological Society and curator of the Italian Great White Shark Data Bank. He's produced thousands of shark drawings. Heim is a leading underwater photographer who specializes in shark shots. The translate scientific terms into layman's language for easy reading. ISBN: 978-0-7864-4183-9.
www.alessandro-de-maddalena.webs.com



Edited by
Catherine G S Lim

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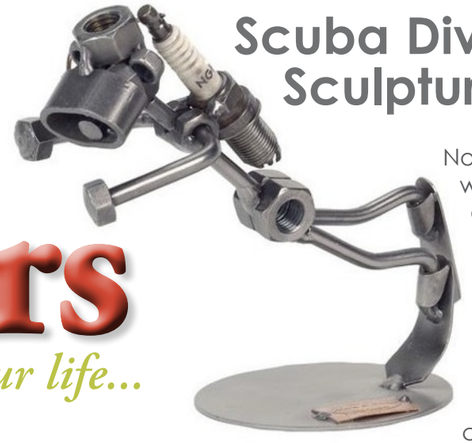
Gifts for Sea Lovers

For that special diver in your life...

Scuba Diver Sculpture



Now this is what we would call a work of art! This metal sculpture is the perfect gift for the weekend diver to place on his or her office desk to proclaim one's true calling. Made from recycled steel and copper, it comes complete with oxygen tank, mask and flippers. **www.metalimagination.com**

Muff Diver Socks

Okay, we know that it's past Christmas, but there's no reason to pass on these delightful socks as gifts for your loved ones. They may be a little quirky, but any diver worth his salt would relish the thought of wearing a pair of these socks on the dive boat at bedtime. We know we do! **www.blushingbuyer.co.uk**

Diver & Stingray Sculpture

Coming face to face with a stingray isn't an experience most people (even divers) would have very often. So, when that happens, commemorate ita with this special sculpture. Then, whenever the days start getting longer and the weather weirder, this unique keepsake can trigger a memory of that special moment in time. **www.metalimagination.com**

Diving Bottle Holder

Spice up an evening with this whimsical wine bottle holder.Besides its functionality, it also serves as a conversation piece and (for some people) a work of art. Made from recycled steel and copper, it is guaranteed toliven up the atmosphere on any dive boat. Just be sure to pop that corkonly AFTER your dives. **www.metalimagination.com**

Silver Diver Cufflinks

No, we're not suggesting that you wear these cufflinks during your dives, but consider wearing them when you chill out during a night on the town. Manufactured and designed by renowned firm Murry Ward, this pair is sure to dazzle, especially when worn next to your dive computer! **www.1stchoicecufflinks.com**

Diving Helmet

Note that we're not advocating wearing a diving helmet on any of your dives. We just feel that it's a tasteful reminder to those exciting pioneering days when wearing one was a necessity (forgive the nostalgia,but we're still a little high on the eggnog). Made of brass metal and consisting of four glass ports, this helmet stands at 17 inches tall and measures 16 inches wide. **www.romanticgiftsboutique.com**

Sea Lovers ...Gifts

Scuba diving for two

Forget chocolates. Give your loved one the experience of a lifetime! Introduce your partner to the thrills of (yes, you've guessed it!) scuba diving! Held in a group setting in the UK, this two-hour session is led by a qualified PADI instructor who will first introduce the basic skills and equipment. Then, it's time to take the plunge with your partner - and perhaps into a new activity that you both can enjoy together for a long time to come. **www.find-me-a-gift.co.uk**

Between Sky & Sea

Entre Ciel & Mer by Belgian composer Eric Bettens is music for the soul from the depths of the ocean to the heights of the heavens. Evoking romantic vistas, the huge expanse of the oceans and glorious horizons, this CD is sure to please sea lovers of all ages. Released in 2009 by Westland Inc. ASIN: B002U672KI **www.amazon.com**

Dolphin Circle

Beauty and symmetry are embodied in this 14k gold dolphin pendant. Two playful dolphins embrace in a circle, their tails and fins forming four symmetrical points around the circle topped with a very sturdy gold loop through which to thread a chain to hang the pendant from. Measures 3 x 2.4 cm. **www.dolphinjewelry.com**

Mystic Seahorse

This bronze seahorse necklace with black garnet beads was handcrafed by artisan Silvia Peluso, who says that black garnet, or Andradite, stimulates creativity and promotes growth and development in one's relationships. Resonating with the sign of Aries, Andradite supports the male qualities of courage, stamina, and strength and realigns the magnetic fields of the body, cleansing and expanding the aura, while opening psychic visions. Size: 15 inches long with two-inch extention. **silviapeluso.wordpress.com**

Manatee Door Mat

Greet your house guest with this quaint door mat, featuring a mother manatee and her cub. Measuring 40 by 18 inches, this endearing scene presents a warm welcome to anyone entering your home! **www.deepsixintl.com**

Diving Dolphins Message Bottle

Now, there's no need to head for the beach to find a message in a bottle! These unique bottle are the perfect gift for Valentine's Day, as your personal message addressed to your significant other can be imprinted and inserted into the bottle. Even comes with faux sand and real seashells neatly contained within the bottle. **www.amessagebottle.com**

Shark Diving for Dummies

Text and photos
by Andy Murch

Last summer, I was asked to join a week long shark tagging expedition in the Gulf of Mexico. The primary purpose of the trip was to find, photograph and satellite tag an illusive aggregation of whale sharks.

It sounded like an interesting project but the actual work was slow and monotonous. We spent most of our time staring at endless blue water while chugging along looking for shark fins. After a few days, we were all tired of getting cooked by the hot Louisiana sun, so we took a break and tied up to an oil rig to chum up some silky sharks.

Being an experienced shark diver, I happily donned my gear and slid into the circling sharks to start framing pictures. My partner Claire followed soon after and together we casually swam back and forth through the excited sharks as we have done so many times before.

At first, the sharks were inquisitive but it didn't take long for them to figure out that the black skinned animals (us) holding the small flashing animals (our cameras) were obviously not food and probably not dangerous. Once the sharks relaxed we were able to weave between them, pushing them away with gloved hands when they came too close to photograph.

Lemon shark. The surface is a dangerous place to hang around

Touching a passing shark (especially on its snout) is a great way to get bitten

Shark Diving

The incredulous fishermen that we were working with, continued to drop fish scraps into the water and the photogenic ball of sharks slowly grew into a respectable sized swarm.
All was going well until, with a loud splash, the expedition videographer (Ulf) jumped into the fray wearing just a pair of shorts and a colorful T-shirt. All of the sharks immediately swam in his direction and he began back peddling frantically to try to get out of their way.

I wandered over and politely suggested that he climb back on deck and return once he was dressed appropriately. This he did and the rest of the shoot went swimmingly.

Ulf 's naïve entrance seemed funny at the time but it could have ended badly. It got me thinking that there are some diving skills that develop naturally but when it comes to shark diving you can't just pick it up as you go along.

Unfortunately, there is no Shark Diving for Dummies book so I've compiled a list of ten things that every budding shark diver should consider before jumping in with a school of sharks:

1. Do your homework.
Just because you don't have first hand experience doesn't mean that you can't take advantage of other people's. If you're heading out with a professional shark diving operator then you can probably rely on their guidance. If you're planning to motor out into the blue with a bucket of dead fish and a prayer then make sure you at least know what species you're likely to encounter. Talk to local fishermen. Ask divers if they see sharks and ask them how aggressive they are. Ideally, talk to local spear fishermen. They get harassed by sharks more often than other divers do, so their advice will be invaluable. And, as melodramatic as it sounds, ask locals whether anyone has been attacked by a shark in that area. Solid information is your first line of defense.

2. Dress the part.
You don't have to wear a black ninja costume to avoid a shark attack but at least get rid of obvious flashes of color or anything shiny that isn't essential. The idea is to make it easy for the sharks to tell the difference between you and the bait. You'd be amazed how often sharks will swim up the chum slick and completely ignore the bait because something else caught their eye.

Wearing a dark suit may be best in most situations (e.g. around tropical reef sharks) but remember that the big boys are partial to marine mammals. If you think you may encounter white sharks then try not to look like a wounded fur seal. To this end, I usually wear a black wetsuit in the tropics and a bright blue drysuit when I'm chumming in areas where great whites might show up for dinner.

One of the most important shark diving accessories is a pair of dark gloves. No matter how good your diving skills are, when you're dodging excited sharks, you sometimes have to use your hands. You don't want to be waving around exposed fingers or be wearing light colored gloves that look like pieces of fish. Fins are also prime targets. Lately, there has been a push for brighter and more elaborate fins by dive manufacturers. Some companies are even selling fins that have fish-tail shapes on the ends. If they help you swim more efficiently I'm all for them, but they may generate more interest than you bargained for. Simple fins work just fine and don't buy the white ones unless you want to show

If you feel the need to bring a weapon, go cage diving instead; Do your homework before jumping into a school of hungry sharks

THIS PAGE: Diver with Silky sharks. Just because curious sharks come to investigate you, doesn't mean they intend to bite you

the teeth marks to your friends after the dive. The moral of the story is: if it moves, wiggles or shakes; try to tone it down.

3. Avoid erratic movements.
Its common knowledge that sharks possess a sixth (electrical) sense. Beyond this, they also have many more subtle ways to interpret their surroundings including a row of tiny hairs in a raised canal running laterally along their flanks. The sensitive hairs register tiny movements in the shark's environment. The more abrupt the movement, the more likely they are to investigate it. Unless you want to be closely checked out, use slow, rhythmic fin strokes. Good buoyancy is also important. Crashing into the reef or struggling to stay down could generate aggression or it may work in reverse and scare away a shark that you were hoping would stick around.

4. Look but don't touch.
The best way to get bitten by a shark is to touch one. It sounds obvious but a surprising amount of divers decide to break this golden rule. We are tactile creatures. It is natural for us to want to experience how things feel but it is important to resist the urge to prod, stroke or grab a passing shark. Mostly they will just move away but occasionally they react violently and reef sharks can turn on a dime no matter how rigid they look.

This goes for sleeping nurse sharks too. They can spin around and latch onto an intrusive hand so fast that the recipient wont register that it has happened until it is too late.

On the other hand, sharks sometimes like to touch too. Getting nuzzled by a gang of beefy sharks can be rather frightening until you get used to it. Sharks don't have hands so they frequently use their sensitive snouts to feel their surroundings. Getting nudged or grazed will really get your heart pounding but this behavior doesn't necessarily mean that you're in immediate danger. The key is to pay attention to the rest of the shark's behavior. If they begin to speed up or move in exaggerated ways then you should probably retreat to a safe distance. The difference between curiosity and animosity is subtle. When in doubt, assume the worst and leave the water.

Ulf, finally in a wetsuit but still with no gloves!

5. Stay out of the chum slick.
When hunting, sharks use their senses in a specific order. Over long distances, they use their famous sense of smell and their finely tuned ability to pick up on vibrations and audible sound. Once they are close enough their eyes take over but when they are almost upon the bait they roll their eyes back or raise their nictitating eyelid to protect their sensitive eyes from harm. During the final dash they rely on their electrical sense to home in on their prey. If you're positioned right in their path you can't blame them (while their eyes are shut) for mistaking your arm for a fish.

Also, if you've been holding onto the bait you will undoubtedly have picked up its scent so keep well away from the feeding event.

6. Don't play dead
From a shark's perspective, any animal that floats at the surface is either resting, sick or dead. As sharks invariably pick on the weak and also eat carrion, they are programmed to investigate objects on the surface that may represent an easy meal. To avoid looking like a dead animal get underwater as soon as you can and stay there.

Generally, I only snorkel with sharks if they are too shy to approach while diving. If they're so skittish that they won't come near your bubbles then you're probably fine anyway.

7. Scan, scan, scan
Now that you're underwater, upstream from the chum and dressed in your featureless black wetsuit, this isn't the time to become complacent. Keep slowly rotating so that you're sure that no animals are approaching you from behind. Just like big cats, most sharks are stealth hunters. They are much less likely to try to sneak in for an inquisitive nip if they know that you have seen them.

8. Watch for changes in body language
Some attacks come with no warning at all but sharks often signal their intentions to avoid confrontations. Any shark that starts to swim fast or erratically has something on its mind. Exaggerated movements indicate that a shark feels threatened or aggravated. Among reef sharks, lowered pectoral fins, arched back and tight swimming patterns are well documented pre-attack postures. Maybe you're crowding the bait, maybe the shark is just having a bad day, either way the best course of action is to retreat.

9. Cameras create tunnel vision
Of course you want to bring your camera; who wouldn't? But try not to become so obsessed with what is going on inside your viewfinder that you forget about all the other things I've discussed.

Remember that your depth perception changes as your lens gets wider. Don't swim so close with your fisheye that you invade the shark's personal space. Your huge dome port looks a lot like a giant eyeball. You could be intimidating your subject without even knowing it.

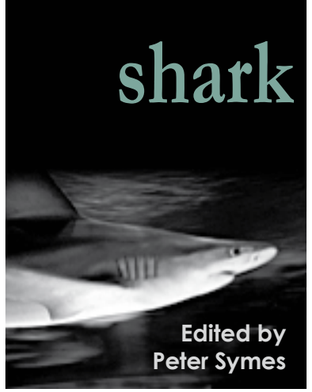
Also, because of the electrical fields that surround them, camera strobes always get a lot of attention. Be prepared to get your strobes bitten if you're shooting in close quarters to an excited shark. And, if a shark starts posturing DO NOT FIRE YOUR STROBES! Many shooters have incited an attack by ignoring a shark's warning signals. Don't learn that lesson the hard way.

10. Sharks are NEVER expendable
If you feel that the only way to safely encounter a particular species is to bring along a powerhead (bang stick) or other weapon, you should not be in the water. There is no justification for killing or wounding a shark just because you want to have a fun dive. If you think that it is too dangerous to dive without a weapon then don't do it. There are cage diving operations all over the globe that can safely bring you nose to nose with the ocean's top predators.

One final thought, over the last decade I have photographed more than 60 species of sharks and dove with many more without being harmed. I take every available precaution to stay safe partly because the repercussions of a shark bite don't end when you get to the ER.

Before you take chances with your own safety consider the inevitable media frenzy that accompanies every scratch inflicted by a shark and how that effects the public's perception of sharks in general. Many species are teetering on the brink of extinction. The last thing sharks need right now is more negative press.

Find out how you can help to protect sharks by visiting elasmodiver.com: ***elasmodiver.com/protectingsharks.htm*** ■



Shark SMS

Tracking system texts lifeguards if killer sharks get near beaches.

More than 70 Great White sharks have been electronically tagged by scientists in Western Australia in a world first trial that will send beach lifesavers a text message when one of the predators swims close to the Perth shoreline.

As the sharks approach shallower waters, the signal they emit will be picked up by a satellite receiver.

Minutes later, a text message or email is sent out to scientists, wildlife officials and lifeguards. The text messages will be triggered less than two minutes after a shark swims over any one of 18 acoustic seabed receivers.

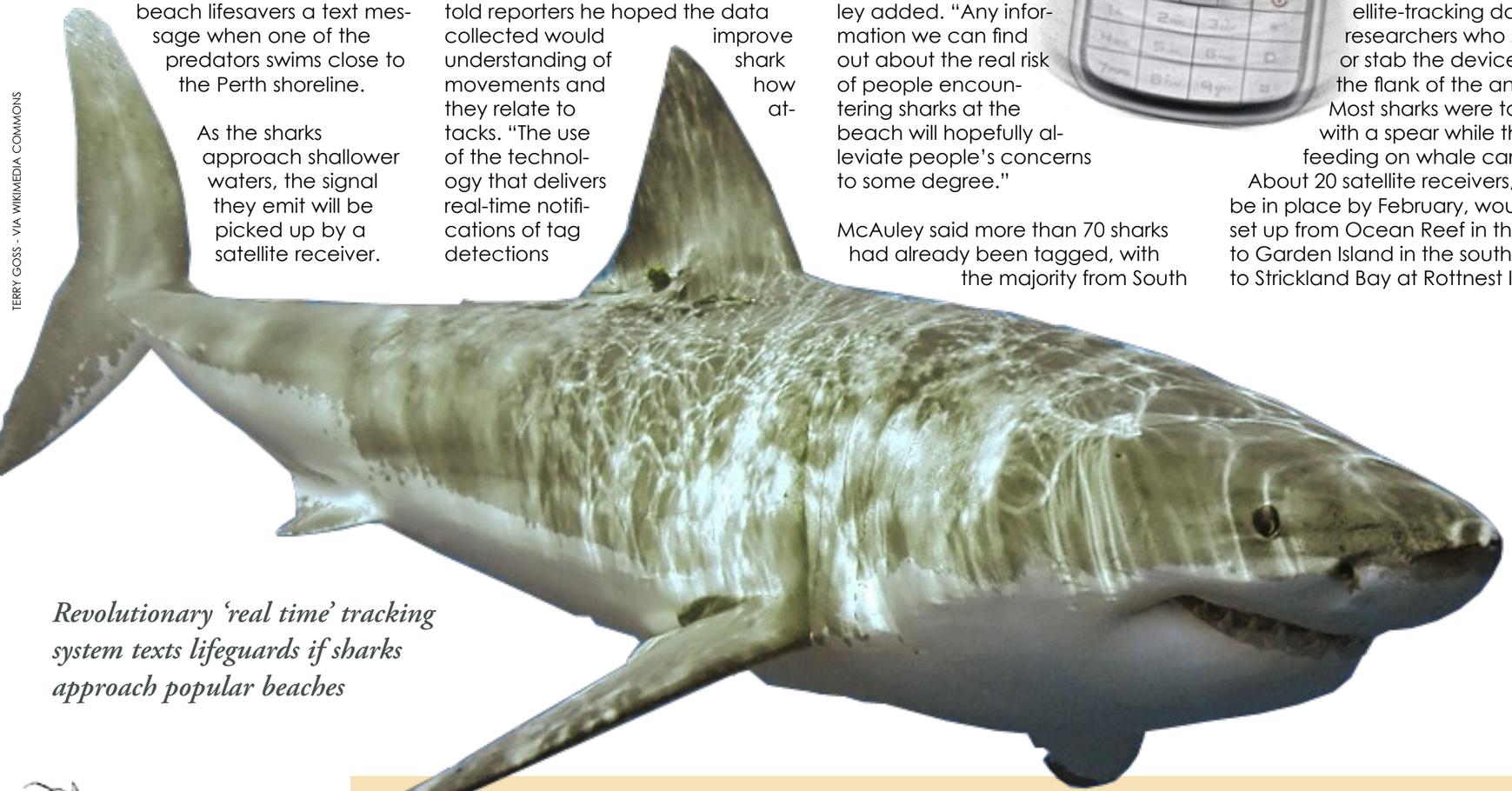
WA Department of Fisheries senior research scientist, Dr Rory McAuley, told reporters he hoped the data collected would improve understanding of shark movements and how they relate to attacks. "The use of the technology that delivers real-time notifications of tag detections hasn't been used in an operational sense anywhere else in the world," he said.

"I think the public's fear of sharks stems largely from a fear of the unknown," McAuley added. "Any information we can find out about the real risk of people encountering sharks at the beach will hopefully alleviate people's concerns to some degree."

McAuley said more than 70 sharks had already been tagged, with the majority from South Australia, due to the reliability of sharks off the coast.

In all, researchers hope to tag 100 sharks over the next two years. The sharks are fitted with the satellite-tracking darts by researchers who shoot or stab the devices into the flank of the animals. Most sharks were tagged with a spear while they were feeding on whale carcasses.

About 20 satellite receivers, due to be in place by February, would be set up from Ocean Reef in the north to Garden Island in the south and out to Strickland Bay at Rottnest Island. ■



TERRY GOSS - VIA WIKIMEDIA COMMONS

Revolutionary 'real time' tracking system texts lifeguards if sharks approach popular beaches

Basking sharks mate off Scottish west coast

Scottish Natural Heritage (SNH) has pinpointed a region along the west coast of Scotland as a key area for amorous basking sharks, looking for a mate.

Two spots—Gunna Sound, between Coll and Tiree, and the seas around Canna—had four-times as many basking sharks than anywhere else in the United Kingdom, during a survey between 2002 and 2006. Displays of shark courtship, such as breaching, where the shark leaps out of the water, suggests that both Inner Hebridean areas are key for the species when mating.

During courtship, the huge sharks—the second largest fish in the world—swim in a trance-like state, at the surface of the water, making them vulnerable. "It is excellent news that these giant sharks seem to be finally making a comeback, and that Scotland has clearly become so important to them for feeding and mating," Dr Rebecca Boyd, marine policy officer with the Scottish Wildlife Trust, told BBC.

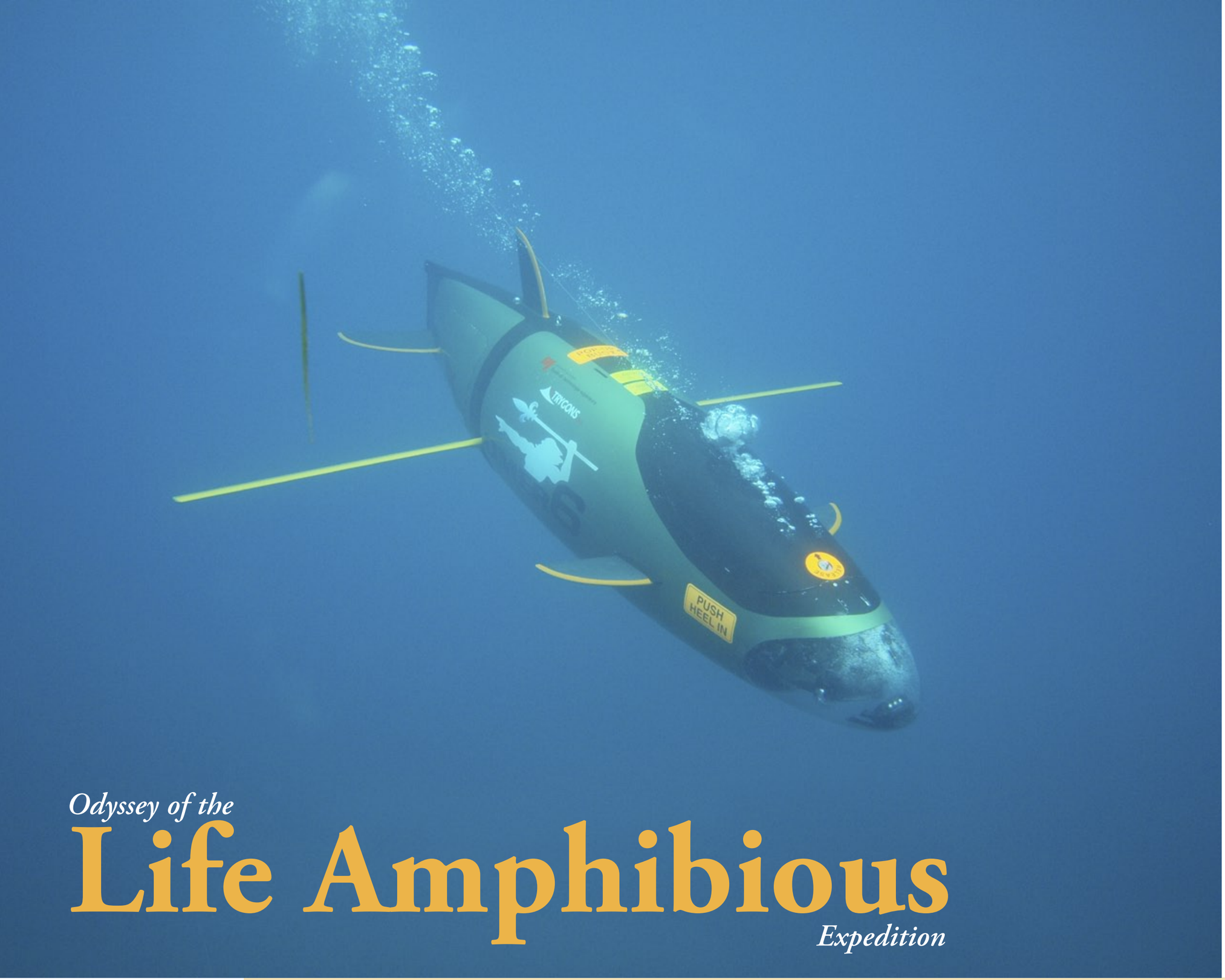
SNH said they are asking local boat users to help protect the fish.

"We must give them every chance to thrive, safe from accidents with boat traffic and fishing gear." ■

Whale sharks' mating ground slated for world heritage status

A major stretch of the Western Australian coastline is being put forward as the 18th Australian site on the World Heritage List after a deal between state and federal governments was struck to protect the Ningaloo Coast. Ningaloo is a virtually untouched barrier reef stretching 260 kilometres on the north-west cape, an area that includes Coral Bay and Exmouth. The site is home to the largest fish in the world, the whale shark.

Over 700,000 hectares of the oceanic wilderness will get special protection if the United Nations agrees to the nomination, which follows a campaign stretching through most of the decade. ■



Odyssey of the Life Amphibious *Expedition*

life amphibious

Text by Lloyd Godson
Photos courtesy of the
Life Amphibious Expedition

We were headed for the island of Kefalonia off the western coast of mainland Greece. This would be the starting point of the "Life Amphibious" underwater odyssey. The plan was to pedal a human-powered submarine 15 nautical miles (28 kilometres) through the Ionian Sea to mythical Ithaca, the home of Ulysses. In the spirit of Homer's epic and Jules Verne's Captain Nemo, we would soon begin our own grand voyage to Ithaca.

Andreas Petalas allowed us to use Fiskardo's Nautical and Environmental Club as our base. When we arrived, a strong southerly wind was blowing and the sea was a mess of waves and whitecaps. Omer 6, our human-powered submarine, had arrived from Canada in time and was being unloaded from a truck. The brains behind this machine, four Omer submarine engineers, were on their way from Canada's École de technologie supérieure in Montreal.

Lloyd Godson pilots the Omer 6 human-powered submarine off the Ithacan coastline, Greece. Lloyd pedalled Omer 6 for five nautical miles in total and maintained an average speed of approximately four knots. At a cruising depth of five meters he could stay submerged for 1.5 hours

LEFT & RIGHT: Having clipped his cycling shoes into the pedals, Lloyd Godson is ready to begin his Omer 6 pilot training in a swimming pool close to the expedition base at Fiskardo 's Nautical and Environmental Club on Kefalonia

Meanwhile, we had been dealt a serious blow by the Ministry of Commercial Shipping's Port Police Management. At the eleventh hour, they rejected our request for permission to place Omer 6 in the sea.

My wife, Carolina Sarasiti, was glued to her phone as Andreas studied his maritime law books desperately trying to find a solution to our dilemma. It didn't look good. The weather continued to deteriorate and all flights in and out of Kefalonia were cancelled. The Omer submarine team was stuck in Athens. The bad weather and unexpected red tape had already delayed us by a day.

I took a leisurely walk with my father-in-law and Greek engineer, Vageli Sarasiti, in an attempt to clear my head. We came across a large catamaran getting smashed against jagged rocks and scrambled on board to help. The waves were relentless. We managed to free the boat from the rocks but one of the engines was jammed solid. Vageli and I grabbed a mask, knife and torch and dived into the murky water. It was like being in a washing machine but we eventually managed to cut through the rope that was wrapped around the propeller shaft.

After sailing for 29 days across the Atlantic Ocean, we were also left wondering where the calm, warm, sparkling blue water was of which the Ionian Islands were so famous for. At least my head was clear.

When the Omer team arrived we celebrated in true Greek fashion. The project remained blocked, but their high spirits helped us forget the bad news for a while. Surprisingly, after almost two years of planning the world's first human-powered submarine expedition we had never met before this day. They were happy that I really existed and the whole thing wasn't just some strange prank played out by a guy in his basement!

Later in the day, continual bad weather and red tape still prevented us from testing Omer 6 in the sea. We desperately needed to get the sub in the water so I could begin my pilot training. With no time to lose, I found a nearby resort that was willing to help us out. When I returned with the good news, drills were screeching as the engineers assemble the submarine.

Into the pool

We carred Omer 6 up the near-vertical stairs and placed it beside the resort pool. A very intrigued crowd started to gather, mostly English tourists, who decided to hang around and watch the spectacle unfold before them. Some looked shocked and some were laughing as the Canadians took turns at splashing them, unintentionally of course, with their elegant pool entries. I'm quite nervous as it was my very fist time inside the wet, free-flooding submarine. It was a good thing I was not claustrophobic as there was not an inch to spare. I clipped my cycling shoes into the pedals and pushed my head fully forward inside the clear polycarbonate window. The door latch was locked into position and my training began.

We spend the next two hours going through safety procedures and trimming the buoyancy as I piloted the submarine from one side of the pool to the other. I finished the day off by pedalling flat-out for half an hour against the pool wall. Based on my gas consumption on the surface, we calculated that I would have about 1.5 hours of air at an average cruising depth of five meters before needing to surface and refill my cylinders. So, apart from the one small detail that we still didn't have permission to start, the day was a success. The resort crowd applauded our efforts.

Our next challenge was to prepare our support boat, *Neptune 3*, for the launching and retrieving of Omer 6. Since the boat was on loan to us by Fiskardo's Nautical and Environmental Centre, we were unable to make any permanent modifications. So, the Omer team had

The Omer submarine team from the Université du Québec's École de technologie supérieure in Montreal, Canada, trim the buoyancy of Omer 6 as Lloyd pedals the submarine from one side of the pool to the other

Lloyd Godson enters Omer 6—the human-powered submarine he used for the Life Amphibious expedition. Omer 6 is what's known as a "wet" submarine, meaning it's completely filled with water.

built what we affectionately refered to as 'the medieval structure'.

It's not pretty, but it seems to work. The chain pulley block slides smoothly along the recycled timber and steel beam which juts out several meters from the boat's stern.

I trusted the engineers that it could handle Omer 6's fully laden weight of 150 kilograms. It definitely attracted a lot of attention, especially from the local port police who had been watching us like hawks. They were well aware that we still didn't have permission to start and were suspicious about our constant hive of activity. Perhaps we were overly optimistic.

Getting the green light

Good news at last! It's been five days since we arrived on Kefalonia and our persistence finally paid off. The weather was clearing and the Port Police Management reversed their decision, freeing us to go.

We triumphantly carried Omer 6 through the streets of Fiskardo and loaded it onto *Neptune 3*. To make up for lost time, we skipped the deep channel crossing that separated the two islands and headed directly to Frikes in the north east of Ithaca.

In a protected cove, Tommy Gagnon lowered Omer 6 into the sea for the very first time. Omer Team Leader Jacques Boivin also made his first saltwater dive and laid a rope on the seafloor parallel to a small pebbly beach. Today was a good chance to identify any problems before we ventured into the open sea. It was also the first chance we'd had to test out the surface maker buoy which indicated my position underwater and limited my depth to seven meters.

Assistant Professor Simon Joncas explained some basic hand signals to me before I descended and started making 50 meter sea trials above the rope. Safety divers caught me at either end, spun me around and gave me the signal to pedal again. I could hear them grunt as I ploughed into them at about four knots with a submarine full of almost one ton of water!

Cars were stopping on the road above to see what on earth this shark-like thing was in the water. Amongst them was the mayor of Ithaca who swam out to *Neptune 3* for a while and a small boy who could be heard yelling, "Wow, it's like a speeding

Amphibious

bullet!"

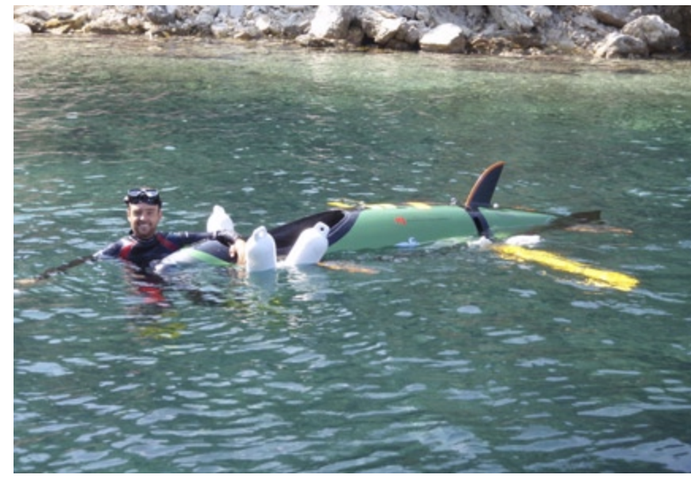
I mastered the art of steering quite quickly, so was presented with my final and most demanding challenge; to steer in deep blue water where I couldn't see the bottom. I set a bearing on my digital compass, perpendicular to the beach, and attempted to follow it out to sea. With no visual reference point this task seemed impossible. The rest of the team trailed my surface marker buoy as it zigzaged towards the rocky coastline. It wass back to the drawing board at our next destination; the small port of Kioni.

Kioni

We were greeted by screaming kids running to see the submarine. Made almost entirely from carbon fibre it looked like something straight out of a James Bond movie. Adults were equally amazed by this world-class machine. Our aim was to inspire environmental awareness by using technological innovation in an adventurous way. We were trying to get young people excited about science and engineering.

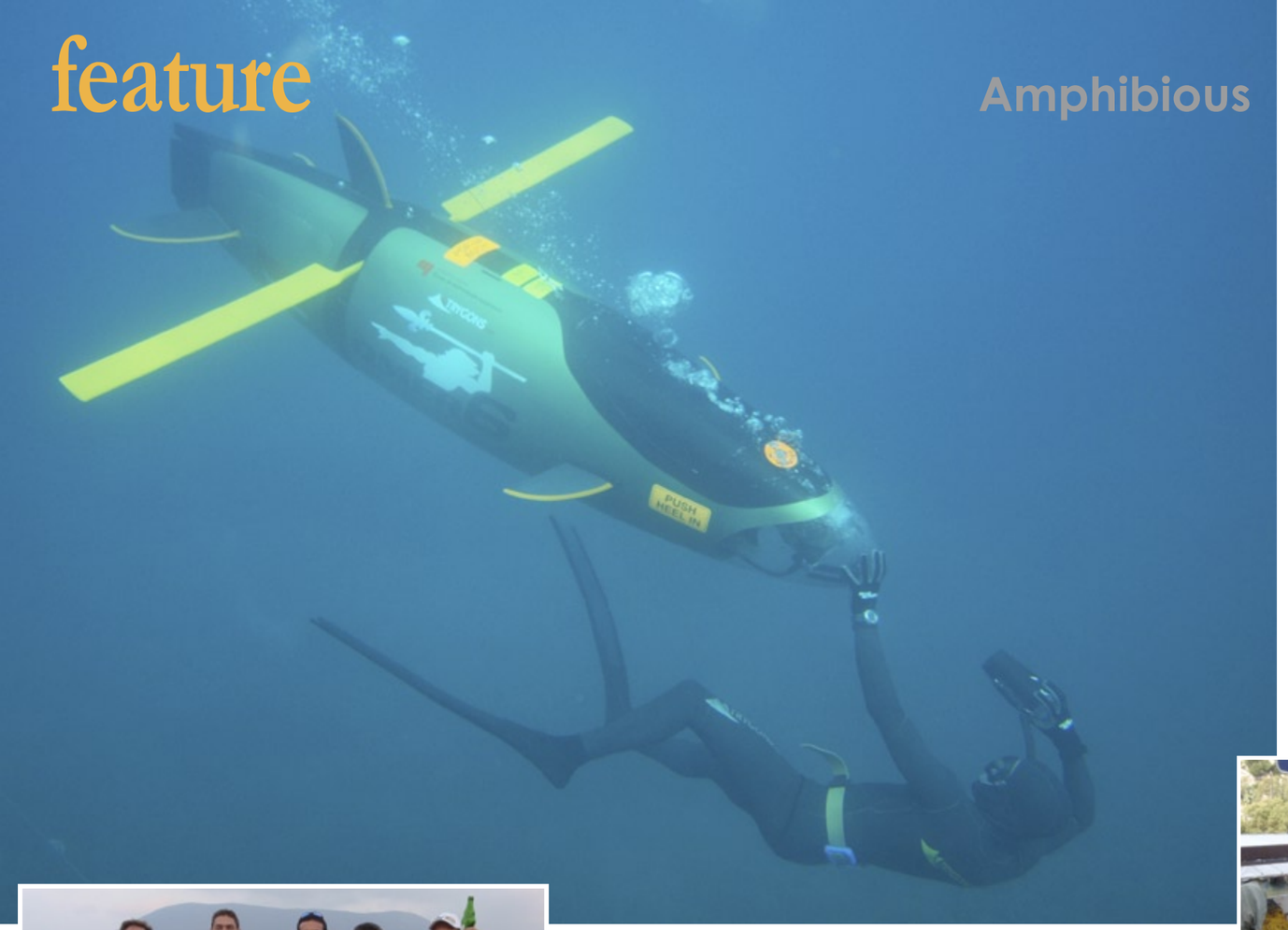
"BioSUB Boy's Race Track" was drawn on the back of some sandpaper and providee the perfect solution to our last remaining problem. Using a combination of ropes, weights and flags, we started working on our underwater highway. Several pieces of rope were tied together and Vageli's white t-shirt was sacrificed to make the flags.

We left Kioni and submerged the "race track" which would lead me to Vathy, the capital and main harbour of Ithaca. Terry Savard, also referred to as 'Princess', lathers himself in sunscreen. Having travelled from northern Canada where the daily maximum temperature is well below freezing, he opted for the sundrenched job of 'observer'. The Omer engineers have done their hard



Lloyd Godson and the Life Amphibious team prepare to put Omer 6 through some small 50 m sea trials in a protected cove near Kioni, Ithaca. It is the first time the submarine has been in the sea

Amphibious



Lloyd Godson is a modern-day underwater pioneer with a passion for delivering innovative educational projects. In April 2007, the Australian aquanaut and marine scientist successfully completed "The BioSUB Project" (www.biosub.com.au) for which he was named the 2007 Australian Geographic Adventurer of the Year. In this wacky scientific experiment, Lloyd lived for 12 days in the world's first underwater habitat incorporating a plant-based life support system. The project was the winning entry in the Australian Geographic $50,000 "Live Your Dream" Wildest Adventure Competition. You can keep up-to-date with all of his "Life Amphibious" activities here: www.lifeamphibious.com

Lloyd Godson and Carolina Sarasiti thank the John S. Latsis Public Benefit Foundation, the Australian Geographic Society, Université du Québec École de technologie supérieure (ÉTS), the Australian Embassy in Athens, Fiskardo's Nautical and Environmental Centre, Yannick Jago, Evangelos Sarasitis, SCUBAPRO / UWATEC, Bauer Kompressoren, Submersible Systems, Inc., MEDASSET (Mediterranean Association to Save the Sea Turtles), Samies Girl, polka dot design, Timmissartok Foundation, Trygons Designs, Olympus Europa, the Municipality of Ithaca and the Kefalonia and Ithaca Prefecture.

Lloyd Godson wearing his SCUBAPRO EverFlex neoprene steamer. Lying face down and pedaling for 1.5 hours at a time, Lloyd needed a wetsuit that stretched naturally with his body during the cycling motion

MEDASSET, the Mediterranean Association to Save the Sea Turtle, helps the Life Amphibious team spread the environmental message with their educational 'Small Garbage Leaflets'. Carolina Sarasiti and Lloyd Godson explain to school children from Vathy, Ithaca, the devastating effects that "Small Garbage" have on the marine environment. Entanglement and ingestion of small pieces of personal waste, discarded on beaches or directly into the sea, accounts for over 100,000 sea mammal and sea turtle deaths globally each year

The team celebrates. LEFT TO RIGHT: Carolina Sarasiti, Lloyd Godson, Terry Savard, Simon Joncas, Tommy Gagnon and Jack Boivin

Alexander Sarasitis of Trygons Designs films Lloyd Godson piloting Omer 6 off the Ithacan coastline. Lloyd pedalled Omer 6 for five nautical miles in total and maintained an average speed of approximately four knots. At a cruising depth of five meters, he could stay submerged for 1.5 hours. With a top speed of almost five knots, Omer 6 is the fastest submarine of its type in the world

work, now it was up to me to do mine.

The flag system worked beautifully and led me due south towards Vathy. A GPS clocked my speed at 3.5 to 4.5 knots (6.5 to 8.5 km/hr), which was pretty impressive for a one-seater human-powered submarine without a propeller. It was no wonder that Omer 6 had the world speed record of almost 5 knots (9 km/hr), recorded at the International Submarine Races. It was also obvious why the Omer team captured the Smooth Operator award at the same competition.

My computer was beeping and alerting me of an 'Increased workload'. At a depth of five meters it estimated my gas consumption at a whopping 60 liters per minute.

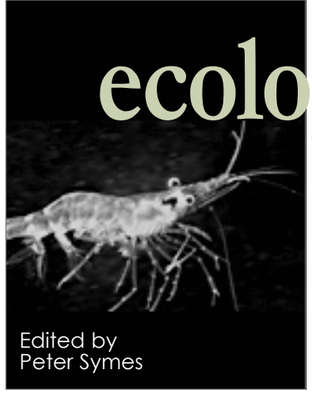
With its unorthodox propulsion system, consisting of two large wings following an oscillatory movement, Omer 6 is the ultimate exercise machine.

Regardless, I couldn't help but chuckle into my regulator as I pedaled this man-sized submarine in 300 meter deep water among the Greek isles under my own propulsive power. It felt like I was "flying" through the water, free, like a dolphin. Sadly though, the feeling was short-lived, as strong winds and torrential rain prevented me from reaching my final destination.

Afterthougths

Greek poet Constantine Kavafis wrote, "When you start on your journey to Ithaca, pray that the road is long, full of adventure, full of knowledge." Our road to Ithaca had certainly been all of these things. We solved all of our problems and managed to travel about 5.5 nautical miles (ten kilometres) in total with no major mechanical breakdowns. That was a feat in itself when you consider this was the first saltwater test of technology that had previously been limited to 100-meter sprints in a freshwater basin.

Now we're all primed and ready for the second phase of the "Life Amphibious" in the summer of 2010: 100 nautical miles (185 kilometres) from Corfu to Ithaca using Omer 7, the latest generation of two-seater non-propeller submarine. I just need to find a co-pilot crazy enough to join me. ■



Coral Gardening

A new profession for resorts?

Text by Austin Bowden-Kerby, PhD
Photos courtesy of Counterpart International's Coral Gardens Initiative

The plight of corals reefs has become regular headlines. Hardly a day goes by without being confronted with ominous news about degradation and loss of coral reefs in some part of the world. On a grand scale, global warming is increasingly subjecting corals to bleaching, while a whole range of other anthropogenic factors are stressing corals on local levels. But it is not all gloom and doom as the Coral Garden Initiative has demonstrated.

Observing how the villagers and children on Fiji take a keen interest marks a paradigm shift in the ways we see our coral reefs. For centuries, corals were not much more than cheap and abundant raw materials, and reefs were subjected to utilization and destruction for centuries. Corals were harvested for use in construction and landfills or for lime used in production of cement. Reefs were not regarded as being of any particular value and were ravaged by fishing gear, smashed by anchors, or simply trampled on.

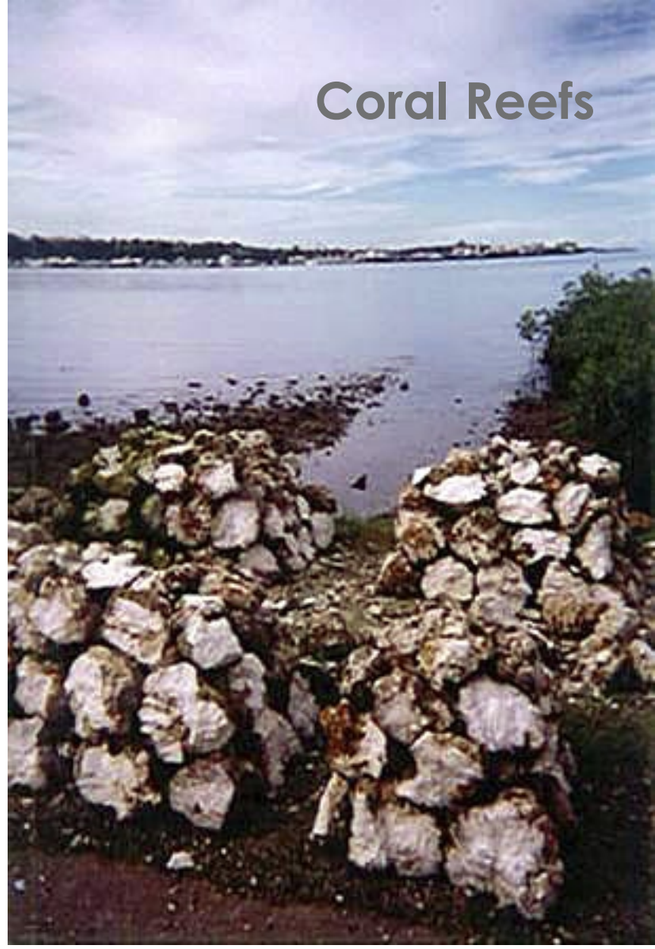
The industrialization of our societies have subjected coral reefs to nutrient enrichment from sewage and agricultural run-off, siltation stemming from deforestation, dredging and agricultural activities. In addition, the widespread overfishing has caused a range of ecological imbalances and changes that have also adversely affected the corals by subjecting them to increased competition (i.e. algae growth) and predation (i.e. crown-of-thorns infestations). Destructive fishing practices such as dynamite and cyanide fishing, which kills corals in swathes, continue to be a significant problem in certain regions.

Corals and coral reefs are vital to national and local economies!

By comparison, harvesting coral for export for the curio and aquarium

ecology

Man stands in front of mounds of dead coral (left) considered a raw building material for use in walls or roadside construction (right)



trades is a relatively minor problem, but it receives a disproportionate amount of the negative attention and bad press. Why? Because of tourism, which has become one of the most important sectors in terms of economy. And since coral harvesting removes the most colourful juvenile corals from the reef, there is direct and obvious conflict. As coral harvesting is a highly visible activity that takes place in plain sight, it stands out in a manner that is provocative to many whereas many of the more significant chronic causes of reef decline works on a diffuse and, to many, a less observable level, basically because it is out of sight under the surface.

Farmed bleached and painted curio corals could possibly raise funds for conservation

- Coral harvesting is more highly visible than chronic causes of reef decline and touches a nerve with conservationists.

- Coral harvesting sends the wrong message to communities about caring for coral reefs.

In any case, while coral harvesting may not be the most significant threat to reefs worldwide, it generally sends a wrong message about caring for reefs. In this regard, it may be tempting to outright ban all trade in corals as the next logical step, but as so often is the case, in reality, there is no simple answer to complex

Dynamite and cyanide fishing practices in recent years have desimated corals, which are often trampled

Replanting corals destroyed by coral harvesting and dynamite fishing Solomon Islands

Establishment of community-supported Marine Protected Areas on Fiji

problems, and such a step could prove counter-productive.

Banning a trade in corals could deprive poor communities of vital income forcing them to take other and more desperate measures to survive and could ultimately lead to the creation of illicit trade and smuggling that would be much harder to combat. At the opposite end of the supply chain, a ban may also convey a false impression that major progress to combat reef decline has been made. There is a better solution: Cultivation!

Is banning coral trade helpful?

Banning the trade may give a false sense that major progress to combat reef decline is being made. A ban could also make things worse by depriving poor communities of vital income, forcing them into more desperate measures to make ends meet.

Rather than outright banning trade in wild coral, these trades should rather be transformed into sustainable second-generation mariculture enterprises, or commercial coral nurseries, if you like.

These coral farms can ideally be managed by local communities and tied into restoration of coral reefs. This will also allow the indigenous communities to benefit directly from improvements in local biodiversity that follows. As cultivation will replace greenhouse culture overseas, there will also be an overall reduction in CO_2-emissions.

Putting things into perspective

Crown-of-thorns starfish (COTS), which prey on coral, tend to target the colorful coral species, leaving behind drab Porites and Montipora. As one single Crown-of-thorns starfish can kill one fist-sized coral per day, removing COTS is a far more efficient restoration strategy than replanting corals for many reef systems.

For example, the aquarium trade out of Fiji represents less than 200,000 corals per year, which means that it only takes removing 650 COTS per year to save more corals than banning the trade. The global aquarium trade

Local communities are recruited to manage coral farms as a means to rejuvinate reefs and improve local biodiversity

ecology

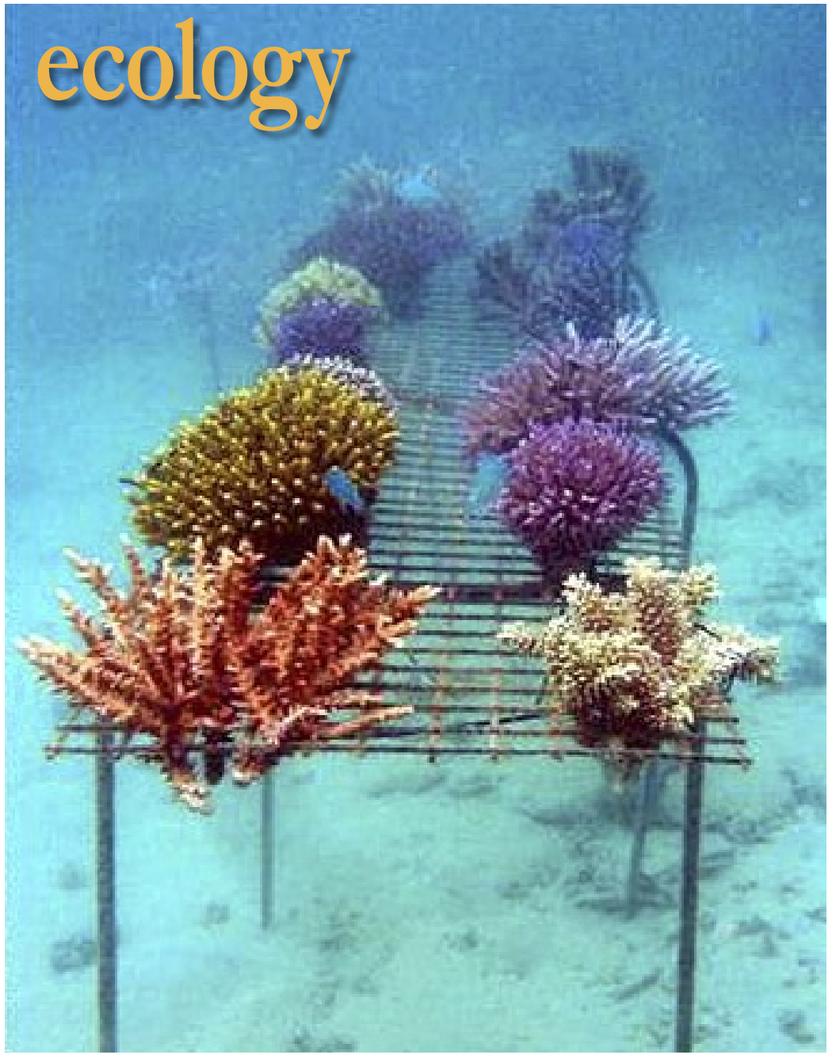
THIS PAGE: Hands-on activities to accelerate reef recovery including coral predator removal to create pockets of coral health

The tourism industry is attracted to coral farming and is receptive to hiring trained "coral gardeners". The biggest problem by far is interference by well-meaning scientists who misunderstand the program!

represents some 2,000,000 corals per year, which is roughly the equivalent to the damage from about 7,000 COTS. By comparison, we removed 5,000 COTS in one year from Cuvu District alone.

Coral farming as a stand-alone activity does not address the root causes of coral and reef decline worldwide but is an important step in the right direction. Coral farming

Local youth in action



Trimming rates depend on species and mother coral size. A single coral like those pictured above can produce dozens of seed fragments per year

is also a very powerful way of raising awareness. Fishermen who can barely eke out a living on catching fish can now earn additional income from transplanting coral reefs as well as improving their local habitats. Several projects have been started in Indonesia engaging whole fishing villages in coral cultivation. The same trend has taken a foothold on several pacific island nations.

As many developing countries are increasingly dependant on attracting tourism, this is bound to change. By building partnerships for coral reef management, involving fishermen, teachers, youth, and dive shops in the active restoration of corals can give local communities a more sustainable income.

Local communities involved in coral cultivation also tend to show an increased appreciation of the local ecosystems as a whole and also get involved in

Culturing Mother Colonies

Selection of mother corals for color, skeletal strength, growth form, and survivability

Colonies crowd each other on the table if not trimmed often enough

SECOND GENERATION CORAL CULTURE

Trimming rates depend on species and mother coral size. A single coral like those pictured above can produce dozens of seed fragments per year

ecology

At planting

At six months ready for market

At 14 months, some are ready to become second gerneration mothers

other aspects of restoring reefs such as planting corals on reefs which are not recovering by themselves after extensive coral harvesting or dynamite fishing.

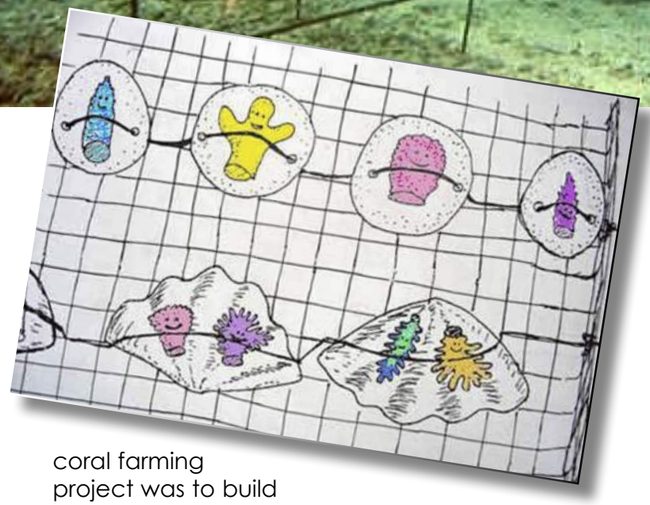
In other instances, as we saw in Honduras, sons of fishermen were building fish houses out of concrete to improve the local habitat. Cultured corals were then transplanted onto these fish houses.

The main objective of the

Corals are planted on fish houses to increase awareness, reef conservation, enhance guest experience, and provide community employment

Hands-on involvement of the youth—sons of fishermen making fish houses, Honduras, 2005

Coral Reefs



coral farming project was to build partnerships for managing coral reefs by educating local communities and tourism operators and involving fishermen, teachers, youth, and dive shops in the active restoration of Acropora corals.

Coral Cookie Method: Cement disk, monofilament line, woven onto a heavy wire mesh tray

Coral Gardeners: A new profession for resorts?

Cookie anyone?

Coral Reefs

Caribbean staghorn corals like to be planted upright only!

Locating frames on sand prevents most predation

Trays placed directly on rubble

Location, location

Not all sites work well for coral nurseries or transplants and it important to understand which factors come into play. For example coral may preyed on and placing coral frames or suspending fragments from ropes prevents against most predation. Not only does it place them out of reach of any crown-of-thorn starfish but also from fireworms. Meanwhile corals are also sensitive to silt and sediment.

Weeding is required

Regular site maintenance is required in coral farming. Weeding of seaweeds and removal of coral-killing snails and fire worms is critical.

Lesson learned

While coral farming as a stand-alone activity does not address the root causes of coral and reef decline, it is a very powerful awareness raising activity. In order to set up commercial or restorative coral farming projects, full educational programs are a prerequisite. Coral farming as a sustainable livelihood must also be tied to coral reef management and restoration. Corals can be grown relatively easy in some sites, marketable sizes in four to six months for aquarium, nine to 14 months for curios.

Coral Reefs

Weeding of seaweeds and removal of coral-killing snails and fire worms

Plugging in trimmed second-generation coral fragments into cleaned dead reef rock

Recommendations for community-based coral farming

- Begin caral farming as part of the wider management planning process to support awareness and restoration.
- Begin with hands-on community involvement in small-scale coral farming experiments at several promising sites.
- Involve the government from the beginning.
- Support second generation culture—mother corals grown to produce sustainable coral seed.
- Don't raise the expectations of communities for commercial production unless and until markets are secured. ■

Edited by Nick Bostic

Cold weather means more time for marketing

Text by Nick Bostic

Feeling a bit too cold to stay underwater as long as usual? Use the winter months to prepare your business for a hot, profitable spring.

With travel agents being put out of business by online travel brokers and security requirements at airports increasing daily, consumers are doing more research online for their vacation travel plans. If your online presence is dated, incomplete or completely nonexistent, you are potentially missing out on a significant amount of business.

Online marketing may appear to be a daunting task for many small business owners, but some basic, free tools can help increase your exposure in very little time.

Online social networking

An excellent place to start your research is at IBM's Many Eyes data visualization site (bit.ly/6syRE7). Looking at their December 2009 global map of the primary online social networking site by country, it appears as though Facebook (www.facebook.com) is the dominant online social network throughout North America, much of Europe and most of Australasia. It is important, however, to identify the tools your customers are using and focus your energies there.

It is important to read the terms of service and privacy policies of any social networks you intent to join. As examples, Facebook does not allow "direct commercial activity" in personal profiles, but does on business pages. Vimeo will not allow commercial video, but Viddler will.

This dive cartoon by Ralph Hagen was created especially for *X-RAY MAG* and is available on organic t-shirts at **www.cafepress.com/xraymag**. A percent of all sales goes to ocean conservation!

Web site versus social networks

Online social networking is only one aspect of a successful internet marketing program. To be very successful, it must be combined with an excellent web site.

Your web site is your home and an opportunity to be unique. Social networks are a tool to help you connect with potential consumers. All social network activity should be designed to eventually drive customers back to your web site where you are able to effectively convert an online shopper into a buyer.

I strongly encourage all members of the dive industry to consider using a Content Management System (CMS) as their web site. A CMS will allow any member of your team, with minimal training, to be able to provide input and edit content as needed. Examples of popular CMS systems include Wordpress, Joomla and Drupal.

According to a May 2009 poll on ProBlogger.net, 56 percent of respondents use Wordpress in one form or another (www.problogger.net/archives/2009/05/31/what-blogging-platforms-do-we-use-poll-results/). Google's head of Webspam, Matt Cutts, says if you want to do better in Google "Wordpress takes care of 80-90% of the mechanics of search engine optimization" (www.mattcutts.com/blog/seo-for-bloggers/, Slide 12). I personally use Wordpress, *X-RAY MAG* has chosen Drupal.

Online social networking and a professional, interactive web site are two of the most critical tools to attracting customers locally and abroad. When used effectively, they can take a minor amount of time to maintain yet provide incredible results in online business.

Nick Bostic is the founder of New SCUBA Marketing. He has been helping small business owners market their business online for over 15 years. He has also been a SCUBA instructor for over ten years and has experience working for dive centers, liveaboards and running large college programs. Visit his blog at: ***j.mp/73aYKT*** ■

Women Divers of Jeju

The Mermaids called *Haenyeo*

Text and photos by Bonnie McKenna

The island of Jeju, Korea, is an island of myths, gods and goddesses. It is also the birthplace of the women divers of Jeju. Although the women divers of Jeju are not the goddesses of myths, they are real alive mermaid goddesses.

The women divers of Jeju have been diving—diving without breathing equipment for centuries. It is not exactly known when the first women divers appeared, but ancient shrines honoring women divers indicate that they began gathering food from the sea prior to the Common Era. Historical documents from the Three Kingdoms period, which lasted between the 4th and 7th century, mention the women divers of Jeju.

The name for these women divers, in Korean, is *haenyeo*. It literally means 'women of the sea'. Traditionally, the women wore only a simple home-sewn white linen combination of pants and a top with lead weighted vests where they tucked the specialized tools of their trade.

Precise rituals ensure the women's survival as they free dive in all kinds of weather searching for shell fish and special seaweeds. The divers stay submerged for two to three minutes at depths of 10 to 30 meters with only a float, or *taewak,* to mark their position. A bag, or *mangsiri,* that attaches to the float holds the day's catch. Although the diving tradition continues today, the women now take advantage of modern wetsuits, fins and goggles.

When the divers surface, they make a unique shrill, high-pitched whistling sound that is their way of expelling carbon dioxide from their lungs and breathing in the fresh air.

The women divers usually work in groups. During breaks and at the end of the day, they retire to their *bulteok*. Although the word means 'bonfire' in Korean, a bulteok serves as much more than that. It is a term which signifies an open-air dressing room. It also serves as a place where the women meet to exchange information, opinions and foster the diving profession.

Diving is still an excellent source of income, and as a consequence, the women divers enjoy more freedom, independence and self-respect than other Korean women.

There is a special ranking among the women divers. Group A are the most able divers. Groups B and C are divided based on experience, character and capability. The groups determine who dives from shore, from boats (to 15 meters) and those who specialize in deep diving (more than 20 meters).

As the women gather around the bonfire, their seating position in the bulteok reflects their position within their group. When a diver is upgraded, her seating position is changed.

Although the working environment of the women divers has not changed appreciably over time, the bulteok has changed. Along with improved diving gear, they have updated their dressing rooms to permanent structures with modern heating. However, the hierarchy of the bulteok is still in practice.

When a diver loses her life, the women stop diving for a while. If they find the body, they have a funeral, but if they fail to find the body, a shaman is invited to soothe the soul of the body and send it to heaven. The shaman also performs an exorcism to prevent evil spirits from preventing further disasters.

Poster of a haenyeo, a woman diver of Jeju. It hangs in the Haenyeo Museum in Jeju

Painting of the haenyeos coming from the sea. Painting hangs in the Haenyeo Museum in Jeju

Mermaids

LEFT TO RIGHT:
An historical photograph illustrating the different dress styles of the women divers; Teawaks made of gourds and polystyrene carved into balls. This represents the evolution of the symbol of the women divers; Display of spear guns

1500 women divers went to Japan every year. Instead of using the traditional taewak, they used a *dampu,* which is similar to a drum with a small net pocket, or they used a board. The Japanese often referred to the divers as *itaama* or 'board women.'

In Xingdao, China, after being introduced to brown seaweed by a Korean businessman, there was a need for the women divers. In China, the women were called 'dragon women' (dragons were a symbol of water and rain and were said to live below the earth). The women worked from May to August making good money.

A number of women went to the frigid waters of Russia to harvest kelp that was too large to harvest from the surface. Because whales often shook the ships they were working, they were asked by the person in charge to dive silently.

During the Japanese occupation of Korea from 1910 to 1945, the women divers of Jeju rose up against atrocities of the Japanese to fight for their rights. They led anti-Japanese campaigns that allowed them to boycott Japanese-run businesses and establish cooperatives to preserve marine resources after the Japanese governor ran up the price of shellfish.

Expanding business

In their determination to support their families the women divers began diving outside Jeju, according to Japanese history, it may have been before the 5th century. In many cases the women were fearful of a new experience in foreign lands, but they packed up their diving tools and set off with determination.

According to the 1937 issue of the Jeju Handbook, the business for brown seaweed increased in the late 19th century first in the Busan area, then gradually extended to other cities and countries. The women were often exploited, but because the salary was good they had little choice; they needed the money for their families.

The Jeju women divers began diving, in earnest, in Japan in the early half of the 19th century. Approximately,

DIVING TOOLS

EYES
The goggles worn by the women divers are called 'eyes' in Jeju dialect and have gone by that name since the 19th century. There are two types of goggles: 'small eyes' akin to swimmers goggles and 'big eyes' masks with one large lens. The women could choose between *guet* eyes, a fragile frame with a wide lens that stood up better in deep dives, and the smaller *umjang-e* eyes. The frames were made of metal before the widespread use of rubber.

TAEWAK
The taewak is a symbol of the women divers. The taewak used to be made from a gourd, but today they are polystyrene. The taewak is used as a floatation device while swimming, and from it is hung the mangsiri, a large net. The divers also use the taewak as a guide to the surface when diving deep.

MANGSIRI
The mangsiri is a loosely woven bag that attaches to the taewak to store the diver's catch. The mangsiri is a round net approximately 40-50cm in diameter at the top and 7cm in length. The lower section is wider at the bottom. Modern mangsiri are made of nylon.

BITCHANG
This is an iron tool 30cm in length used to pick abalone off the rocks.

JUNGGAE WEEDING HOE
The hoe, resembling a sickle, is used to cut and gather seaweed.

GONGJAEGI
A tool used to hook a *gamtae* (a sea plant) that has been pushed to the shore by the wind.

RAKE
This tool is used when the diver is gathering wide brown seaweed on a boat.

GAKJI
Similar to the weeding hoe, this tool is used to pick up shellfish and baby abalone from cracks in the rocks. ■

Mermaids

TOP TO BOTTOM: Tools used by the haenyeos to harvest seaweeds and shellfish, including implements such as the Junggae (bottom left of photo) and the Gakji, bitchang, and gongjaegi (top left to right of photo); Tool used to cut brown seaweed; Haenyeo wearing a traditional diving costume

accurately reflects the importance of women as the backbone of the Jeju family.

Island girls start diving by the age of 10 or 15. At that time, they are ready to earn a living.

A decline in mermaids

The number of women divers has decreased dramatically in recent years. More job opportunities, education and mothers do not want their daughters to follow in their strenuous and dangerous profession. In 2006, there were only 5,406 women divers, and those over 60 years old accounted for 65.8 percent (3,557); those between 50 and 59 just over 24.6 percent (1,331); those between 30 and 49 only 9.6 percent (518); and those below age 30 number only two. In contrast, in 1970, the number of women divers over the age of 60 was only 4.6 percent.

Due to the rapid decline in the number of women divers and their aging population, the Haenyeo Museum was established in Jeju to honor the mermaids. The museum is located in the village of Hado-ri where many haenjeos have traditionally lived. The museum has many exhibits showing the haenjeo's way of life, working tools, diving dress and models of their homes.

William Logan the UNESCO Chair of Heritage and Urbanism said Jeju women divers represent a unique legacy that deserves nomination for the UNESCO Intangible Cultural Heritage.

Logan said, "The point of the intangible cultural heritage is to draw attention of the international community to the threats to this particular heritage around the world and support Korea in finding ways to maintain these skills from donors and educators."

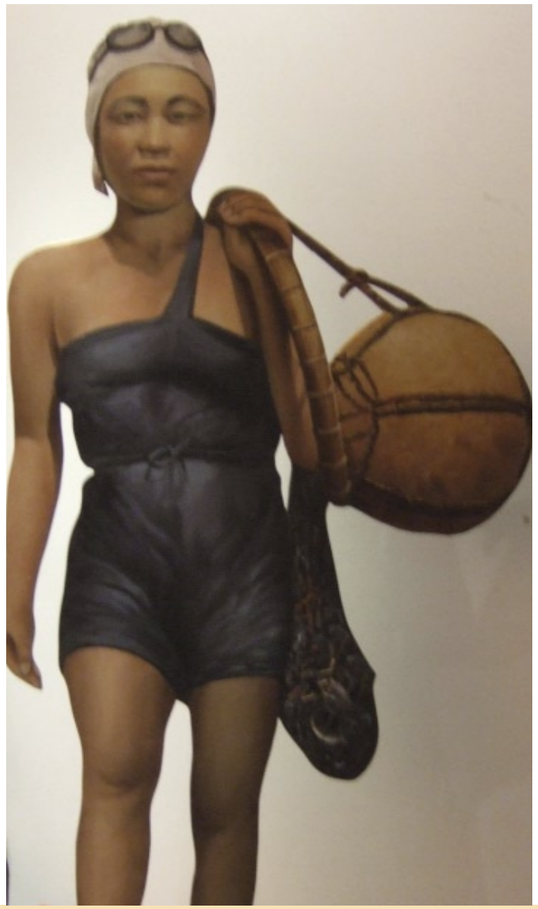
Today, most of the women divers are over the age of 60, some are widowed, and some are still the sole economic source for their families. The haenyeo divers continue to survive through their wits and the strength of their communities. They are incredibly strong and remain healthy, fit and beautiful.

Dutch sailor Hendrick Hammel, a survivor of the 1653 shipwreck on Jeju, recorded in his logbook that "real mermaids" existed on Jeju.

Bonnie McKenna is an internationally known fine art photographer specializing in the beauty of life under the sea and the nature of the great outdoors. She is a PADI certified Master Scuba Diver Trainer. She has written for several publications including D-Log—an interactive dive log for the islands of Palau—Houston Community Newspapers and The Houston Chronicle. ■

Girls over boys

Most Koreans aspire to have baby boys, but on Jeju it is different; the birth of a baby girl is valued. There is an old saying in Jeju, "When you have a baby girl, butcher a pig and have a party. If it is a boy, just kick him in the butt." The saying



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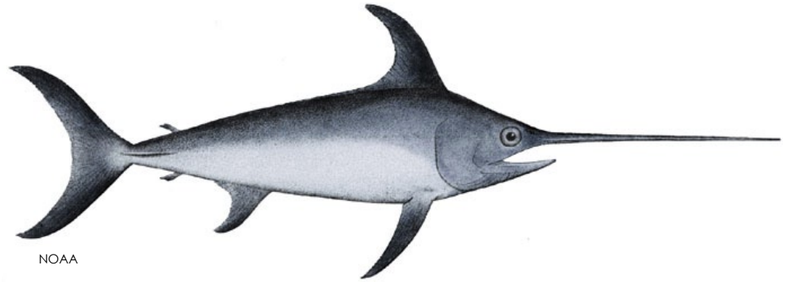
turtle tales

Edited by
Bonnie McKenna



NOAA

GFDL

Loggerheads hatched on Zakynthos

Laganas Bay on the Ionian island of Zakynthos became once again the starting point for thousands of endangered *Caretta caretta* (Loggerhead) turtles.

Approximately 60,000 sea turtle eggs hatched in 763 of the 857 nests made in the 2009 nesting season despite adverse weather conditions characterized by unseasonable low temperatures in the mating period.

Laganas Bay is one of the last remaining natural habitats of the Loggerhead turtle in the Mediterranean. In the summer, about 2000 turtles lay their eggs on the sand beaches. ■

Hawaii swordfish fishery expansion jeopardizes turtle survival

Three conservation groups are taking the National Marine Fisheries Service to federal court in Honolulu to challenge a new rule removing all limits on fishing effort in the Hawaii-based longline swordfish fishery. The group contends that the new rule allows the longline fleet to catch nearly three times as many endangered sea turtles as previously permitted.

The current law requires the Fisheries Service to minimize harm to sea turtles and prohibits harm to albatross, both of which are being driven to extinction mainly because of irresponsible fishing practices.

The new rule, unless the courts intervene, is due to take effect 11 January 2010. The Hawaii longline fleet may not hook or entangle more than 46 loggerhead turtles or 16 leatherback turtles each year. The Fisheries Service say the populations of Pacific sea turtles will not be jeopardized under this action.

The Fisheries Service has admitted that the loggerhead and leatherback sea turtles in the Pacific face a significant risk of extinction unless the number of sea turtles killed is reduced.

"Unfortunately, rather than take action to better protect sea turtles, the agency is proposing measures that would actually increase the number of turtles killed," said Andrea Treece, an attorney with the Center for Biological Diversity in San Francisco. ■

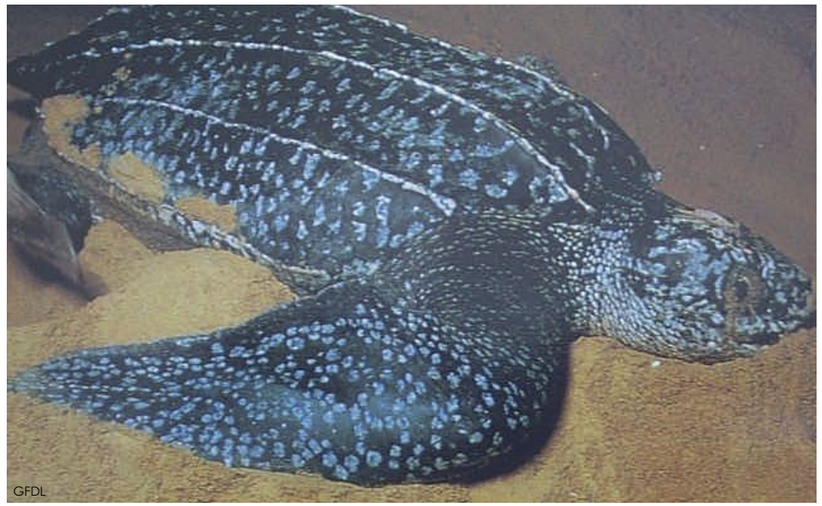
Leatherback turtles are right-flippered

According to a study in the journal of *Behavioral Brain Research*, a species of turtle has been found to prefer one limb over another.

Across a population studied by scientists, more turtles preferred to use their right rear flipper rather than the left flipper when laying eggs. Such preference is known as 'lateralized functional behavior', and it usually indicates that an animal's brain functions are also lateralized.

The Drexel University team investigated whether such a similiar preference occurs across a large wild population of leatherback turtles. The scientists observed 361 females laying eggs at the Playa Grande rookery in Costa Rica. Over five years, they watched females laying eggs on 1,889 occasions. Overall, the turtles preferred to use their right flipper 54 percent of the time.

Although the preference is subtle it is statistically significant, revealing a bias in flipper use. ■



GFDL

Remotely Operated Vehicles (ROVs) and satellite tags aid turtle studies

Researchers from Woods Hole in Massachusetts are using ROVs and satellite tags to learn more about turtle behavior in commercial fishing areas and develop new ways to avoid catching turtles in fishing gear. This is the first study to use ROVs to follow turtles in the wild to learn about their behavior and how they interact within their habitat.

Two juvenile loggerheads have been followed since their capture in August. The tags continually record water temperature, depth, location and time of day.

The current project is being funded by NOAA and the Atlantic scallop fishing industry. The results of the study will develop new technologies to reduce the number of turtles caught in scallop dredges.

Approximately 50 turtles have been located and followed with the ROVs. Researchers are studying their behavior, including their feeding, swimming and interaction with the ocean bottom and each other. ■

Loggerhead sea turtle, *Caretta caretta*

Turtle's journey tracked by scientists

The journey's of two leatherback turtles is available to view online thanks to a new research project by the University of Exeter.

Noelle and Darwinia are two adult leatherback females that nest in Gabon, Western Central Africa.

The two turtles are members of the world's largest nesting population of leatherback turtles, but their environment is threatened. The waters around Gabon are increasingly subject to industrial fishing and oil exploration.

The scope of the research is to determine where the turtles go after they leave the nesting beach. By understanding their migration patterns and their use of the nearshore habitat around their nesting beaches is a key component to the turtle's survival. The progress of Noelle and Darwinia can be viewed online at: www.seaturtle.org/tracking. ■

Sea turtle washed up on Stinson Beach in California

A rare and endangered Olive Ridley sea turtle washed up on SeaDrift Beach in Stinson Beach. Stinson Beach is north of San Francisco, USA.

The turtle was a sub-adult female weighing approximately 60 pounds and its carapace measured about two feet.

She was cold-stunned when found and transported to the Marine Mammal Center in Marin County where she was stabilized with fluids, vitamins and antibiotics.

This turtle was only the third time live Olive Ridley turtles have been found so far north of their normal range in Mexico. ■

Researchers brave Cape Cod storms to rescue endangered turtles

During the last week of November frigid waves tossed 35 sea turtles ashore in the Cape Cod area of Massachusetts; more came ashore through the first week of December.

Four were green turtles and the others Kemp's ridley turtles. Fortunately, the turtles were not alone; nearly 40 volunteers from the Mass Audubon's Wellfleet Bay Wildlife Sanctuary's beach patrol.

The turtles get caught in the relatively warm water of Cape Cod Bay, and if they do not slip through the Cape Cod Canal or swim around the Provincetown tip, the cold-blooded turtles get cold-stunned and wash helplessly ashore. ■

Olive Ridley sea turtle (*Lepidochelys olivacea*)

Silver Aniversary

The Caribbean Conservation Corporation celebrates 50 years of successful sea turtle conservation

Fifty years ago, Dr Archie Carr stood on a remote Caribbean shore awaiting the arrival of the legendary fleets of green turtles that he was told return every year to nest at Tortuguero, Costa Rica. Large numbers of green turtles nested, but the numbers were dwindling fast at the hands of turtle hunters who took nearly every turtle that arrived on the beach that night.

Carr wrote about his finding in a book titled *The Windward Road*, which alerted the world to the plight of sea turtles. The book inspired the formation of the Caribbean Conservation Corporation (CCC) in 1959.

The CCC has maintained the longest continuous data bas for sea turtles in the world, trained generations of sea turtle biologists and conservationists.

At Chiriqui Beach in Panama, CCC collects nesting data and works to reduce threats to sea turtles. In just a few years, leatherback and hawksbill nesting his increased, nest survivorship has improved and illegal turtle fishing had declined.

The CCC remains actively engaged in the most critical issues affecting sea turtles. Educational programs are creative, fun and inspire people to learn and care about sea turtles.

Carr said, "You cannot argue the case for saving any wilderness on the grounds of practicality alone. If this difficult saving is to be done, it will be because man is the creature who preserves things that stir him. This work will take staunch people."■

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POINT & CLICK
ON BOLD LINKS

Rad Equipment

LED focus

This little back-up or focus 10W LED lamp from leading German manufacturer, Kowalski, comes in different two-colour variation of anodized brushed aluminium. The spot angle is variable from 9°-35°, which is easily adjusted regardless of water pressure. Comes with a high quality desktop charger.
taucherlampen.de

Zeagle Line Cutter

Mounts easily on any BC. Has a serrated stainless steel blade. Bright yellow handle for visibility and is large enough to fit two gloved fingers.
www.zeagle.com

Doesn't fade

Tired of seeing the skirts of your sleek mask slowly turn unsightly yellow and opaque over time? The new Big Eyes Crystal mask from Cressi is made from a new and patent-protected version of medical silicone that will keep its transparency and colour, Cressi insiders just related to us at an recent dive expo.
www.cressi.com

Apeks' Flight

Apeks Flight is lighter than any other comparable regulator and has been designed primarily for the travel diver. Flight is also suitable for diving in waters as cold as 10°C. The area where a normal regulator first stage freezes is protected and insulated, which reduces the freezing effect and this helps prevent freeflows. The insulation effect is also evident in Flight's second stage. Components in both the first and second stages are made from reinforced material specifically developed for the manufacture of technical components. The advanced composite materials are strong, not affected by water or extreme ranges of temperature, has good dimensional stability, an excellent resistance to chemicals, and does not deform. **www.apeks.co.uk** **www.aqualung.com**

Made in Italy

FA&MI's lamp combination of lamp head T-S200 and the Multi-bat accumulator canister is a hard-hitter. The combined output of the 18 LEDs is rated at 200W, and the whole assembly is rated to a depth of 200m. It is part of a whole modular system with interchangeable components. Lamphead reflectors are available in both 12° (standard) or the optional 90° version. The illustrated assembly weighs in at 2.3 kg above water and 1 kg in water.
fa-mi.com

Halo & H-75p from Halcyon

The high performance of the H-75P first stage results from a balanced freeze-resistant piston design that delivers high levels of gas under all conditions and is completely unaffected by changing tank pressure. The rotating swivel provides flexibility and super clean hose routing. It is fitted with two high pressure ports, five High Flow intermediate/low pressure ports. 300 bar DIN connector and compatible with 40% Nitrox. The Halo second stage's balanced, adjustable downstream valve provides smooth performance in all conditions providing unsurpassed performance with enhanced technology. Adjustable control knob refines inhalation resistance. Air Control Vane utilizes vacuum power to reduce work of breathing. Compatible with 40% Nitrox.
halcyon.net

Need to put on weight?

These weight pouches from SeacSub containing lead pellets in Nylon/ Polyurethane bags is not only gentler on your hips but also friendlier to the environment and resistant to salt corrosion.
www.seacsub.com

Wicked Zeagle

The new range from Florida-based Zeagle is slated to see its first distribution through selected dealers by end of March 2010. Their Ranger Construction is available in both male and female styles and comes with tribal artwork and logo and stone washed denim type cordura fabric making for an "aged" appearance. The unique fabric is a designer-styled stone washed "denim type" nylon Cordura material. A "repair" patch has been added to the outside of the utility pocket for style. The webbing has a seasoned appearance. These features give the Wicked BC the look of "experience" and are unique in diving today. **www.zeagle.com**

Electric Gas Boost Pump

This new electric gas booster will work with all types of gases. Provides up to 18 SCFM flow rates and outlet pressure up to 10,000 PSI. Used in industry, fire service, mining rescue, aviation ground service, laboratory applications, etc. Optional accessories available for multiple gas cylinder refilling. Use as electric oxygen pump, electric nitrogen pump electric air pump or for electric gas boost pump. **www.americanairworks.com**

SI Tech regulator

Swedish SI TECH, who are mostly known for their valves that sit on probably about half of the world's drysuits, are also the manufacturer of a range high-quality equipment providing innovative solutions for challenging diving conditions. True to their high standards, SI TECH's new Forever regulator is designed for the most demanding and safety-conscientious divers and is produced and tested during extreme conditions such as deep diving in icy water. It works with a low intermediate pressure to prevent freezing, and large diameter low and high pressure hoses ensure high air flow at extreme depths.
www.sitech.se

Seac Sub Boss

This sister-mask of Iena has nearly all the same technical characteristics, distinguishing itself for its particularly wide field of vision typical of single-lens masks.
www.seacsub.com

Tekwing Lite

The NEW BUDDY Tekwing Lite is a compact and lighter version of the Tekwing built to the same high specs and offering the same upgrade options on a smaller wing. The Tekwing Lite provides 18.26kg of buoyancy. The new element: the backpack and all its advantages of comfort and fit. The harness features two welded stainless steel D-rings (more may be added), which can be moved to the ideal position. Two further D-rings on the wings allow easy attachment of side-mounted stage cylinders, particularly when used with BUDDY Verticlips, which hold the D-ring rigid at a right-angle to the jacket for simple one-handed attachment or release of dog-clips. Waistband slots are fitted on either side of the wing to prevent 'tank-wrap' when used with a single cylinder. Two-band crotch straps are fitted to eliminate ride-up on inflation of the wing. **www.apvalves.com**

Nomad Weight Plate

Formed in the shape of the backplate, the new Nomad Weight Plate lies flat and isn't felt by the diver. Carrying up to 16 pounds of weight in four separate pockets, the Nomad Weight Plate attaches to the back of the Nomad using the existing grommets in the backplate. New, SuperFabric® brand material covers the outside of the plate, protecting it from abrasion, wear and tear.
www.diverite.com

Click Release Pockets

A pair of integrated weight pockets can be added onto any harness. Threads onto 50mm webbing. Each pocket can hold 8kg.

Available in Black, Blue, Red, Yellow or Pink.
www.bowstonediving.com

GearCheck

Edited by
Robert Sterner

These Equipment News is brought to you by Gear Check, *compiled by Robert Sterner of Sterner Editorial Services. Suggest products to review and read earlier* Gear Check *items by product categories at* ***www.sternereditorial.com***

Light clicks with divers

Tektite has teamed up with Moray Dive Gear to market a handy dive light that also serves as an attention-getting noisemaker underwater. The Moray DCT light's single light-emitting diode bulb produces a 150-lumen six-degree beam. It also includes Moray's patented noisemaker. Need your buddy's attention? Just shake the light. Two c-cell batteries can provide a burn time of eight hours. The bulb is rated for 10,000-plus hours of operation. The light, which was introduced at the fall DEMA dive show, is available in two models. The standard version is made with ABS and Lexan, sturdy composite materials that resist corrosion and dive-bag abuse. The pro version is machined from a block of aircraft aluminum and looks rugged enough to drive nails. Both are supplied with a cushioned wrist lanyard and rubber glare guard. **www.moraydivegear.com**

Dive with a personal assistant

Uemis unveiled a computer so sophisticated that the Swiss company dubbed it a Scuba Diver Assistant. The low-profile unit wraps snuggly around the wrist and features a large scratch-resistant quartz crystal display with easy-to-read dive data, including the air pressure in your tank as well as your buddy's, providing your mate has a similar sensor mounted on his first stage. The wrist unit activates automatically in the water and takes temperature as well as depth into account as it projects remaining bottom time, time remaining before entering deco, and deco stops and times. Visual color-coded and audible alarms alert users who exceed depth limits, maximum operating depths, deco, ascent rates, dive times and if the remaining gas is inadequate for safe ascents. Tables are computed for up to three different mixes on the Uemis ZH-L8+ algorithm and the computer logs the data every five seconds. Stored data can be uploaded and stored on a personal computer as well as in the user's personal log at the Uemis web site, from which it can be downloaded via computer anywhere in the world. The sealed unit is virtually flood-proof and has solar cells that recharge the battery during surface intervals. Divers can customize their computers for personal conservative factors and change the face plate to match their dive duds. **www.uemis.com**

A little help for DCS victims

Administering pure oxygen is the best quick first aid for divers who may have decompression sickness symptoms. Although most charter boat operators keep O_2 on board, independent divers might not. The next best gas is enriched air nitrox. RescuEAN is a device to administer nitrox to accident victims, even if they've lost consciousness. Attach the outlet of a low-pressure hose to the small pod-shaped unit and connect the output of the pod to a standard face mask that fits over the victim's nose and mouth. This allows the gas mix to flow at a steady rate of either 15 or 25 liters per minute, pumping air into the victim's lungs without having to inhale. The mask and gas-delivery setup is designed to not interfere with the administration of CPR. When one tank is used up, attach pod to a new bottle of nitrox. The compact pod is made of rugged plastic and adds less than one pound of weight to the dive bag. **www.rescuean.com**

Look for sites on a budget

Side-scan sonar just took a giant step toward affordability for divers du jour with the 450F model from StarFish Seabed Imaging Systems. The system includes a 4.5-pound towfish with 65 feet of cable, allowing the sensing head to be towed at depths to about 25 feet. Data is sent to a top box, which provides power to the towfish and sends the side-scan images to the user's personal laptop computer for storage and to view in real time. The transducer has a 60-degree vertical beam and a 1.7-degree horizontal beam that collects images over a maximum of range of 656 square feet. The cable used to tow the fish has a breaking strength of 330.7 pounds. StarFish also markets a hull-mounted transducer for those who aim to scan shallow waters without fear of losing a towfish. These units are designed to help recreational and public safety dive teams scan the bottom for wrecks and underwater structures that would be interesting dive sites, using the same compressed high-intensity radar pulse technology incorporated in military and top-line commercial sonar systems. **www.starfishsonar.com**

IMAGE COURTESY OF MCGILL UNIVERSITY

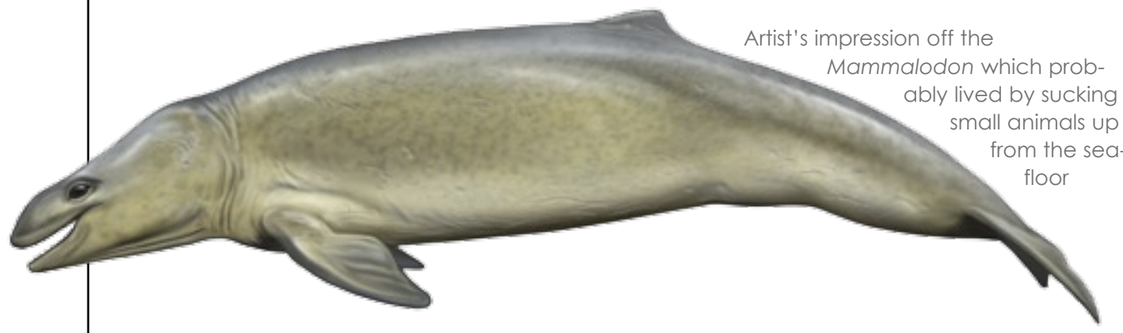
Ancient pygmy sea cow discovered on Madagascar

The discovery of a near complete skull from a hitherto unknown species of extinct pygmy sea cow dating from the Middle Eocene (48.6-37.2 million years ago) is one of the first fossil mammal species found from this era in Madagascar illuminating a virtually unknown period in Madagascar fossil history.

This primitive "dugong" is among the world's first fully-aquatic sea cows, having evolved from terrestrial herbivores that began exploiting coastal waters. Within this ancient genus, the newly discovered species is unusual as it is the first species known from the southern hemisphere (its closest relatives are from Egypt and India), and is extremely primitive in its skull morphology and dental adaptations.

"The fossils of this ancient sea cow are unique in that it has a full set of relatively unspecialized teeth whereas modern sea cows have a reduced dentition specialized for eating sea grass, and most fossil species already show some degree of reduction. It may also be the first fully aquatic sea cow; confirmation will depend on recovering more of the skeleton, especially its limbs," says McGill University professor, Karen Samonds, who found the skull.

The research was published in the *Journal of Vertebrate Paleontology* on December 12. ■



MUSEUM VICTORIA PRESS RELEASE

Artist's impression off the *Mammalodon* which probably lived by sucking small animals up from the seafloor

Early whales sucked

Australian fossil unlocks secrets to the origin of whales

Based on a 25-million-year old fossil found near Torquay in Victoria Museum, Victoria, palaeobiologist Dr Erich Fitzgerald hypothesise that *Mammalodon* was a bottom-feeding mud-sucker that may have used its tongue and short, blunt snout to suck small prey from sand and mud on the seafloor. "This indicates early and varied experimentation in the evolution of baleen whales," explained Fitzgerald.

Fitzgerald's conclusions support Charles Darwin's speculation in *The Origin of Species* that some of the earliest baleen whales may have been suction feeders, and that their mud grubbing served as a precursor to the filter feeding of today's giants of the deep. ■

Amazon manatee mystery solved

The Amazonian manatee (*Trichechus inunguis*) is an elusive large plant-eating mammal that lives in freshwater. The species is only found in the Amazon River basin from the river mouth to the upper reaches of tributaries of Brazil, Colombia, Ecuador, Guyana and Peru.

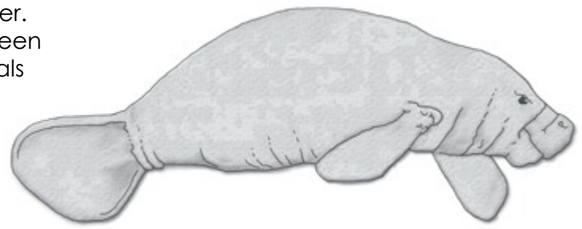
Migration

Only in recent years did scientists discover that the secretive aquatic mammal migrates from shallow to deep water. During the low-water season, between October and November, the animals start to migrate as the water level drops. Their journey to deeper water takes them through long narrow lakes called rias, which are submerged river valleys.

But why?

The question is why the manatees undertook such a perilous journey during the low-water season. They do this because it becomes too dangerous to remain in shallow water, the scientists say.

If the manatees do not move, they become stranded and exposed to hunters such as caimans, jaguars and humans who stalk the water margins. ■

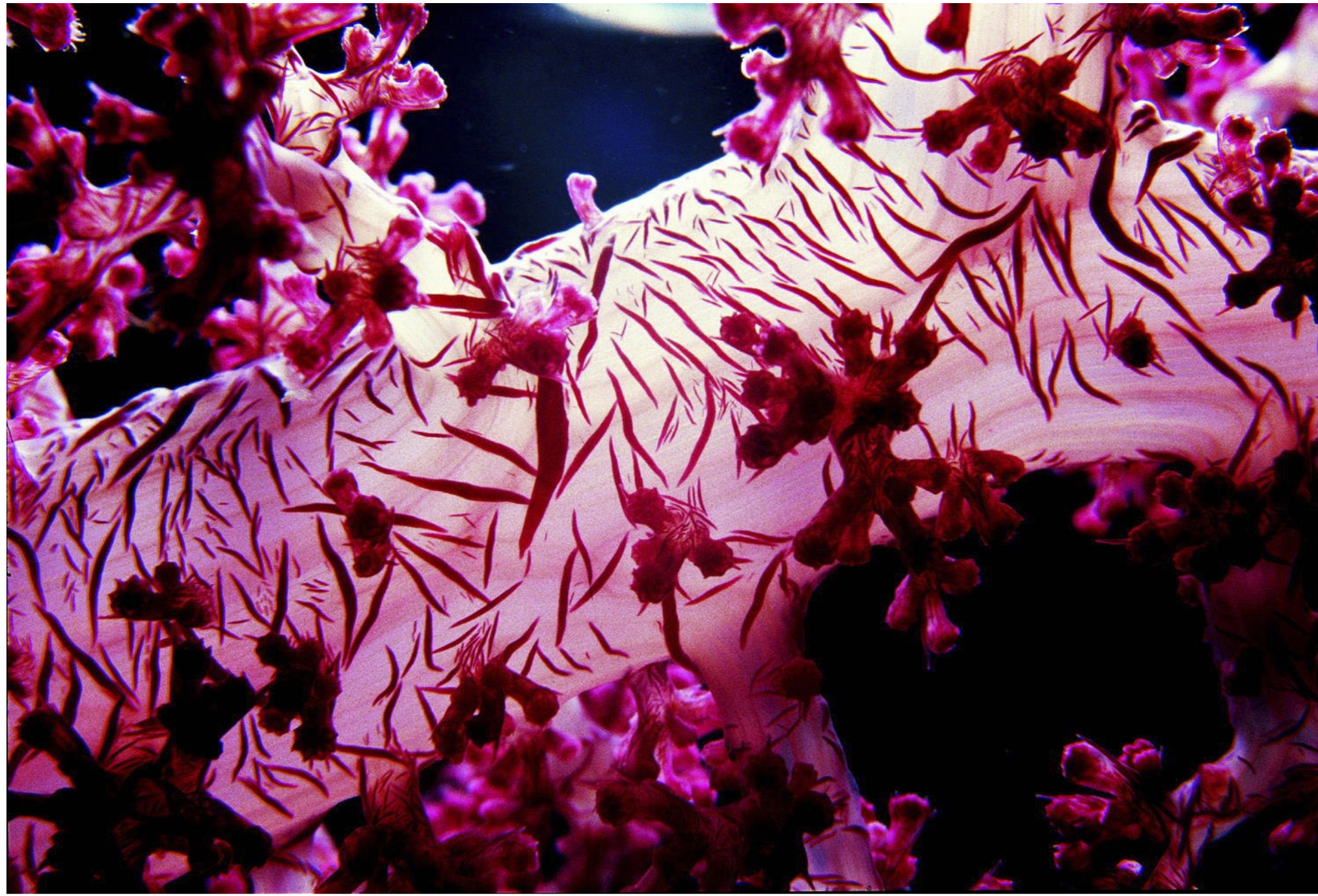


WIKIPEDIA COMMONS — SHARON MOONEY/SIRENIAN EVOLUTION

"Manatees are in greater danger than previously thought because every year they are probably migrating through narrow channels where they are exposed to hunters."

Dr Eduardo Moraes Arraut — National Institute for Space Research, Sao Paulo, Brazil

Edited by
Peter Symes
& Scott Bennett



Backlight reveals the beautiful translucent quality of soft coral

Backlight

Text and photos by Kurt Amsler
Translation by Peter Symes

Impressive backlit images do not necessarily require the use of a flash. Just aim towards the surface and use the sun. Often, that is all there is to it. If you understand how to get the exposure right, that is.

Under most circumstances, underwater photographers balance light from flash with ambient light to create a certain ambiance by adding illumination to the front, above, below or the sides of the subject. But there are a range of subjects that only work if they are taken against the light.

Sunlight

From macro to wide-angle photography, there are plenty of subjects that can be taken against the sun. If the subject covers at least two thirds of the sun, it will stand out as a silhouette. Where the sun is beside and not behind the motif, we speak of backlit subjects. In both cases, since the sun is included in the picture, the photographer must correct the exposure by three to four stops.

Imagine that you have the sun not in front of you but behind you. In this case, your metering may, for example, show that you should expose the image with an aperture of f:5.6 and shutter speed of 1/30 second. But if you turn around and include the sun in the frame, the built-in meter may now show a suggested exposure of aperture f:5.6 and a shutter speed of 1/250 second. In the latter case, you should therefore know how to subtract the effect of the sun shining directly into your camera in order to get the exposure of the foreground right.

In the case of silhouettes (where the subject covers substantial parts of the sun), you would usually have to subtract one or two f-stops. An easy way to get the exposure right is simply to point the camera in the opposite direction, measure the light there, and lock the settings before pointing the camera back towards the subject. Many cameras allow the user to lock the exposure setting—consult with your manual—by holding down a button or switch.

You can also use manual mode and use the readings from the camera as a guide to set the aperture and exposure. In this case, take a reading in another direction away from direct sunlight and set the exposure correspondingly. With this setting, you can now point your camera back towards the subject and make a first shot. In order to make sure it is absolutely right, use *bracketing*—that is, make some additional shots with the exposure set both over and under the first image. In this day and age where memory cards are cheap, taking these extra images shouldn't be an issue of having enough storage.

Most backlit images are taken without flash. Most of the subjects (such as divers, manta rays or sharks) often work better in high-contrast, black or dark blue silhouette, without additional flashlight.

Using the camera in automatic mode and leaving the calculating of the exposure to the electronic circuits, or an elaborate light meter, is the easiest way, and the result is often okay. The problem is that this approach only works when the sun is behind you and not in front of you.

The automatic system usually bases its

These jellyfish are literally illuminated by the sun. Therefore, not only outline and colour, but also their inner workings are visible

calculations on the brightest areas of the image leaving all the shadows and darker areas hopelessly underexposed as result.

Fill

Using fill flash is often a balancing act and a compromise between background and foreground. The high brightness will often require very fast shutter speeds and small apertures. For example, consider a case where we have a diver appearing next to the sun disc. In this case, the metering system may call for an aperture of f:16 and of 1/60 second shutter speed combination. But the part of the diver facing the photographer won't be lit, so how do we handle this? If the diver is, say, about two meters away, the flash would not often be able to create sufficient output if the aperture setting is f:16.

Since the duration of the flash output is a fixed entity, the answer lies in changing the exposure combination to one with a more open aperture and faster shutter speed. As we open the aperture, the shutter speed must be reduced correspondingly to maintain the same overall exposure.

Note, however, that at shutter speeds faster than 1/125 second, many cameras—especially older ones—will no longer be capable of staying synchronized with the flash. In this regard, digital photographers—who can also enjoy a more direct control and instant feedback—have a distinct advantage over the now diminishing breed of film photographers. Photographers who capture their images on film, should always make use of bracketing.

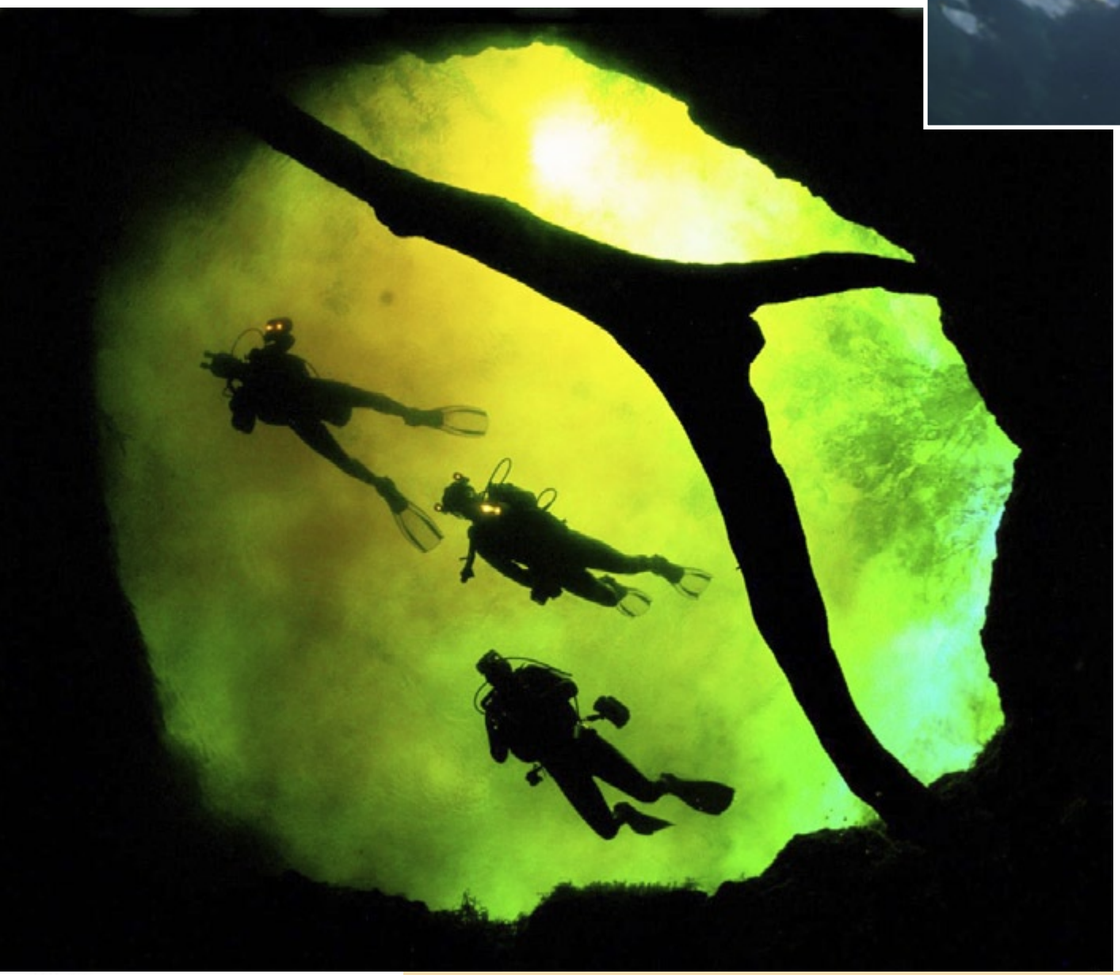
Subjects

The easiest—and, especially at the beginning, most appropriate—subject is the dive buddy. He or she can be positioned without haste to ensure that you get the composition just as you want it. In this regard, make sure that your model's equipment such as pressure gauge, console or belts and hoses are tucked in and worn close to the body. Having them dangling in all directions as many divers do does not look attractive on images.

If you have a little patience, you will often get into situations where the diver starts interacting with approaching wildlife. In these cases, the main challenge is for the photographer to find the right position in relation to the sun. But with some patience, you will succeed not only in getting great shots of jellyfish (see photo above), but also turtles, manta rays, and even sharks and mackerel.

Tips

- As we get used to constantly using flash, we tend to forget about making the best use of ambient light. Keep an eye out for the effect of sunlight!

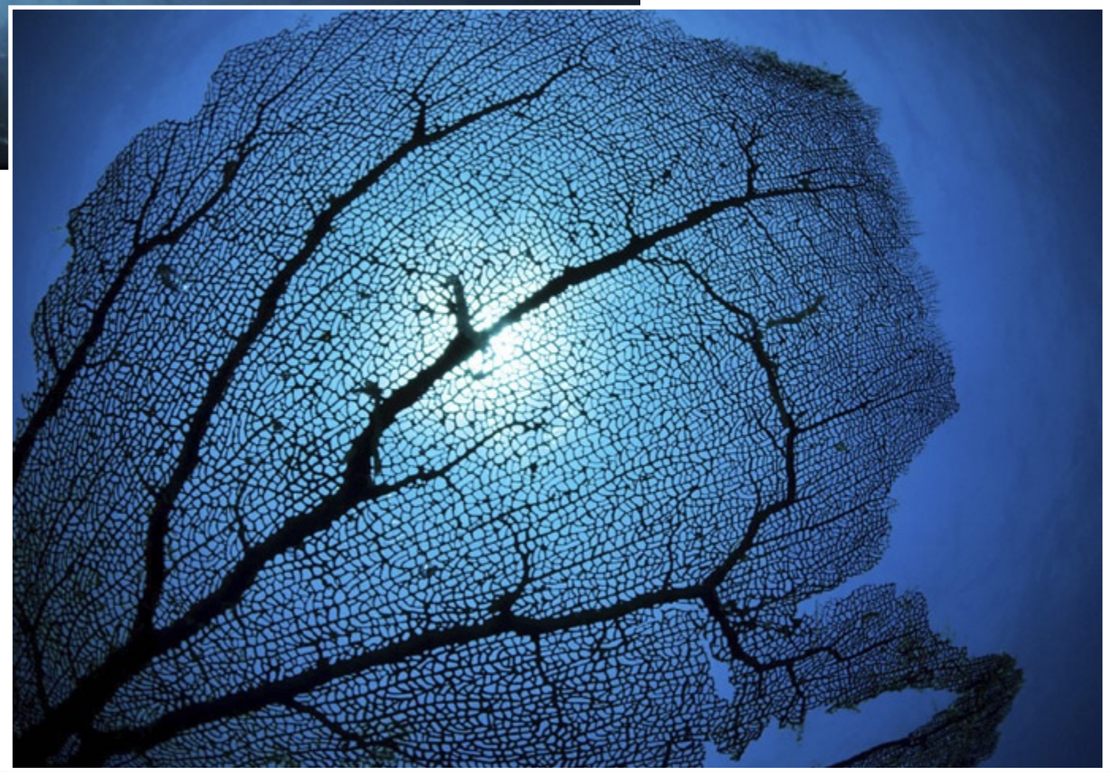


In murky water, backlit photography is often the only way to get the shot desired

Backlight

- Approximately 80 percent of backlit subjects are photographed without a flash. This has the advantage of a wider choice of aperture-shutter speed combinations, and you won't be bothered by backscatter.
- When photographing without a flash, resist the temptation of just setting the camera to automatic exposure mode. The automatic system exposes according to the brightest

CLOCKWISE FROM LEFT: If a synchronized fill flash is used correctly, one sees not only the skyline, but also details. In order to create such a halo around the divers at least two thirds of the sun need be obscured; To bring out the inner structures of this coral, the flash was positioned behind the subject (below); Ambience: A diver in the light of the sun (bottom left)



Backlight

parts of the image and tends to leave the rest too dark.
• The positioning of the model in relation to the sun is very important, so it is of great importance that placement and roles are discussed between the photographer and model before the dive.
• Silhouettes of divers are easy to photograph. The model must cover at least two-thirds of the sun disc.
• For the sun to be properly obscured by the subject, the image should not be taken from too great a distance. The closer the image to the camera moves, the more the sun is covered.
• To capture marine life against the sun, the photographer must act fast. In addition, because the photographer is positioned directly beneath the creatures, they must avoid exhaling prior to the shot, as rising air bubbles don't look good in the image and often cause fish to change direction.
• Backlit shots tend to bring out scratches and dirt in the front glass on the port, especially with dome ports. In these cases cleaning is paramount.
• Balancing backlit images with flashlight requires certain combinations of shutter speeds and aperture settings. There are two factors you need to consider: First, is the flash powerful enough to illuminate the subject at the desired distance to the subject? Secondly, will the camera and flash be synchronized at the chosen shutter speed?
• The method of measuring for exposure in the direct opposite direction but at the same angle to the surface, has proved to be very successful. To make sure that you get a precisely exposed image, use bracketing. ■

Cave entrances (above) are ideal for backlit pictures when the sun is directly above

The main challenge is for the photographer to find the right position in relation to the sun. But with some patience, you will succeed in getting great shots of marine life such as this shark (right)

The U-boat *Rubis* in front of St. Tropez looks great against backlight (far right)

Ikelite Housing for Nikon D-3000 Digital SLR Camera

Molded of corrosion free clear polycarbonate and rated to a depth of 60m, the heavy duty construction provides neutral buoyancy and superb handling underwater. Camera installation is quick and simple with conveniently placed controls at your fingertips. Everything is kept water tight with Ikelite pioneered Quad-Ring® seal glands. Release Handles allow easy attachment and removal of SubStrobe mounting arms at the touch of a button. Port attachment is quick and easy with a simple locking system, and the port o-ring seal is clearly viewed through the housing. A full range of dome and flat ports accommodate most macro, wide angle and zoom lenses. All housings come with Ikelite's standard one-year warranty against manufacturer defect along with unrivaled commitment to after-purchase support and service. Suggested retail price: US$1,400.00. **www.ikelite.com**

Keldan LUNA 8 LA-V

Lightweight and powerful, Kelvan's LUNA 8 LA-V uses a rechargeable Li-Ion batterypack. Offering a much higher power density and less weight than NiMH batteries, the Li-Ion batterypack also offers better performance in cold water conditions. The unique optical design with diffuser and dome lens results in a very soft and wide beam of 90° on land as well as in water. There is no need for special mountings for the battery canister. The included bracket allows easy mounting on standard arm systems like the Ultra Light arms. The wall adapter accepts 110V to 240V AC. Exchangeable adapter plugs allow worldwide use. **www.keldan.ch**

Memory Kick

Backup your photos in the field quickly and securely with Hugyfot's MemoryKick Si. With the fastest transfer speed on the market, transfer any type of file (photos, videos, music, etc.) from memory cards at blazing fast speeds up to 40MB/s. The MemoryKick Si's 3.5" VGA LCD color screen is ideal for vivid, detailed viewing of photos and videos. As many as three memory cards and one USB device can be connected simultaneously, transferring data directly from memory card to memory card, USB device, or computer hard drive. Connect to an LCD flat panel monitor or television to view photos and watch video. **www.hugyfot.com**

MINI C-MARK

Back by popular demand, Ikelite has re-released The Mini C-Mark. Emitting brilliant flashes of light visible for several miles at the surface, it's an ideal location marker or emergency beacon for night and limited visibility use. Utilizing a pair of C-Cell alkaline batteries (not included), the adjustable flash rate runs eight to 20 continuous hours, depending on the flash rate selected. The bright yellow body provides visability even in poor conditions and features a unique folding switch to assure against accidentally being turned-on. The lens is secured by a screw-on cap that is guaranteed unbreakable. The Mini C-Mark can be converted to their famous Mini-C flashlight by purchasing the #9073.1 module with bulb. **www.ikelite.com**

Sony announces DSLR-a450

The newest addition to Sony's ever-increasing stable of DSLR's, the new Alpha 450 is a versatile choice for photographers eager to take their craft to the next level. Powerful yet easy to use, the DSLR-A450, boasts a high-resolution 14.2 megapixel sensor delivering highly detailed, ultra-low noise images. Sensitivity extends right up to ISO 12800, allowing the capture of handheld images in low light without flash. Creative options are enhanced with Auto HDR mode that accommodates bright highlights and dark shadow details in a single frame. Two successive frames shot handheld at different exposure values are merged automatically by the camera, resulting in a detail-packed High Dynamic Range image without image editor software. Slots for Memory Stick PRO-HG Duo and SD/SDHC memory cards are offered to suit users' personal shooting preferences. When using the optical viewfinder, the high-capacity battery allows up to 1,050 shots between charges. The a450 will be available from the beginning of February 2010. **www.presscentre.sony.eu**

Here We Go Again

We all knew it would happen again sooner or later. The Christmas Day terrorist attempt on a Detroit-bound Northwest flight was enough to put government officials on full-fledged panic mode, imposing strict new security measures on US-bound flights. Unfortunately, these kind of restrictions will simply not fade away. What's a travelling dive photographer to do?

As in most situations however, there is always a solution. Try to pack as much into one bag as possible. On a recent trip, I left my somewhat bulky computer bag at home and packed my laptop and accessories into the pouch on my Lowepro camera bag.

Another option is to purchase a photo vest. All of those pockets can hold a number of items, from hard drives, cell phones and iPods to reading material and snacks (providing the latter are still allowed at the time of writing). Careful packing of those in-flight essentials will allow more space in your carry-on for that all-esential photo gear. ■

Nauticam, D90 D700 and D7

Text by DigitalDiving

— An Introduction to Nauticam

Like many users of housings we come to a point when we want to upgrade our system. The usual route is to move to the latest camera housing by our current manufacturer to utilise the investment we have previously made in port and lighting systems.

We wanted to upgrade our two Nikon D200 system to D300. The search was on for the best deals available on both cameras and housings through our network of underwater photographers around the globe.

Our conversations led us to Hong Kong where our friends, Stephen and Takako, considered that we may be interested in talking to Edward Lai, owner of the newly formed Nauticam company, who was completing the final pre-production housings for the Nikon D90 and D300/300s models. Edward and his team have been in the precision mould manufacturing industry for more than 20 years, and now focusing on development and production of underwater photographic equipment.

The introductions were made and after many e-mails over a couple of weeks, Edward kindly sent us a Nikon D90 and Nauticam Housing for us to use on our trip to the Philippines. Such joy and excitement it was to have a generous offer made, and we had nervous anticipation to be experimenting with a new camera model and a new housing —a daunting prospect.

Upon arrival, the quality of the finish and the precision of the engineering was most eye catching. Underwater, the system was very simple to operate and had much easier access to the operating features than we were used to. Additional levers replaced some of the traditional push in rods making regular operations much easier and at one's fingertips. We were able to connect our Inon strobes via optical cables that enabled use without electrical sync cords (a potential point of weakness), and for those that like to use TTL, the need for additional converters is not necessary.

The bonus was that we could use our existing Sea & Sea ports by simply removing the existing locating plates and replacing them with a simple Nauticam bayonet ring—a one-off operation for continued use on the Nauticam housings. The fitting of the ports is simplicity itself through the unique lever/locking feature on the front of the housing—open lever, push in port, close lever!

Existing Zoom Gears—no problem. A well-engineered adapter allows all existing Zoom Lens Gears to be used.

During our trip, we used the system on 50+ dives and only had two minor faults, one of which was due to camera failure and the other, a fixing point which has since been rectified for the production units.

The Enhanced Optical 180° Viewfinder is supplied as an optional extra but has such excellent qualities that once tried would be difficult to return to the standard.

We have now been introduced to a well-engineered housing system that provides easier usage, advanced operating features, lighter weight and is able to use our existing ports and strobes—all for the total expense of purchasing two optical cables.

We will soon take delivery of a Nikon D300 and D300s Nauticam Housing and suggest to anyone interested in a change for the better to look at the Nauticam range as extensions are planned in the near future (including Canon models) before making a final decision. Prices are realistic and extremely competitively priced, which is surprising for such a quality item.

Features and Benefits

- The port mount mechanism provides quick and easy exchange of ports via release/locking lever on the housing.

- Allows use of Sea & Sea ports by replacing rear-locking plates with Nauticam bayonet ring by a simple one-off application to existing ports. Nauticam also produces adapters for Nexus, Aquatica, Subal, Ikelite, etc.

- Provides dual strobe connection via dual optical sensor bulkheads using the cameras built-in flash enabling strobes to be used in TTL or manual mode or through an optional single Nikonos five-pin bulkhead.

- Operating levers are used for the OK, AF, Live View (if featured) and Review operations.

- Moulded grip handles in polycarbonate and rubber for textured, smooth grip—spacers are available to increase width from housing, if required.

- Three-point locking latch housing closure

- Lighter weight housing construction versus competitors

- Moisture audible and visual alarm sensor

- Simple installation of optional Enhanced 180° Viewfinder

For more information, visit: www.nauticam.com or contact: enquiry@nauticam.com

The views and opinions in this article are solely those formed by DigitalDiving—Dive the experience with Nauticam. ■

Nauticam's new underwater housing for Canon EOS 7D

Nauticam USA proudly announces its underwater housing for the groundbreaking 18MP Canon EOS 7D Digital SLR. Engineered from a solid block of seawater resistant aluminum alloy, Nauticam's engineers have created a compact, lightweight design that provides effortless camera control. Video enthusiasts will appreciate the video/still photo mode and video start/stop button and their convenient proximity to the right grip.

Shooters can switch from still photo to video shooting, and start recording a video clip without removing their right hand from the handle. The innovative Nauticam Multi-Selector joystick control pad enables quick changes to focus point, camera menu settings, and the quick control menu. Nauticam is pleased to offer the industry's only locking extension ring system, securely fixing large dome ports even when mounted with an extension ring. A full range of port adapters allowing existing slr housing owners to use their existing ports.

For additional information, go to www.nauticamusa.com ■

Nauticam underwater housing for Canon EOS 7D

Unique Dive Site

Christmas Island


TIM HOCHGREBE

Flying Fish
Cove Beach

Text by Wandy Hochgrebe. Photos by Tim Hochgrebe
Supplemental photos by Justin Gilligan, Linda Cash, Philip Cash, Glen Cowans, Des Hill, Leila Jeffreys, Gunter Noack, Tony Palliser, Chris Surman, Udo Van Dongen courtesy of Christmas Island Tourism

We waved goodbye to the crew from Cocos (Keeling) Islands until our arms hurt. We were a bit sad to leave everybody behind, but also excited about what was going to come. After only an hour the plane started to descend again and we could see Christmas Island. It was very clear straight away that Christmas Island is geologically very different from the Cocos (Keeling) Islands.


TIM HOCHGREBE

Adult Blue Ribbon Eels (*Rhinomuraena quaesita*)

Christmas Island, located 2600km Northwest of Perth and only 360km south of Jakarta, is one big rock that rises more than 300 meters above sea level. This island is almost completely covered in green, and 63 percent of the island has been declared a national park. Its tropical location and climate provides a rich and diverse habitat for flora and fauna.

The island is surrounded by a narrow fringing reef that quite quickly and steeply drops off into an abyss.

Christmas Island is probably most famous for the annual Red Crab migration. These completely harmless, brightly coloured crabs make their way from the forest to the ocean in October-November. During that time some of the roads are blocked, and special crab crossing grids have been put into place to make their journey less impacted on by humans.

The island's main income is currently derived from the sale of stock of the now closed phosphate mines. Most days, large ships come to the wharf to load up. Although initially this might look a bit industrial, it does not in any way demise the incredible diving.

Diving

After being picked up from the airport we were taken to The Sunset resort where we would stay the week. From our spacious balcony, we had a great view over the ocean and part of Flying Fish Cove. When looking out to sea, frigate birds seemed to be everywhere. Their characteristic hooked wings stretched out, the males with a red throat pouch. Different species of Booby birds and Bosuns could be spotted as well.

In the mornings, we would start our diving day at 8am at the dive

TIM HOCHGREBE

Beautiful, healthy reefs at Christmas Island (left); Racoon Butterflyfish, *Chaetodon lunula* (inset)

Dragon Eel at the Chicken Farm

TIM HOCHGREBE

UDO VAN DONGEN

Here Claire, our trusted dive guide, showed us Blue Ribbon eels (*Rhinomuraena quaesita*). There were three adults with their bright blue and yellow colouring and one juvenile, which was almost entirely black. Most of this dive site consisted of a wonderful coral garden with plenty of different reef fish.

Over the following days, we were shown some amazing walls with prolific coral growth. Imagine looking up from 25 to 30 meters, and all you can see is a wall covered with all kinds of different species of healthy coral. We saw plenty of Pink Anemonefish (*Amphiprion perideraion*) darting in and out of their anemone (*Heteractis magnifica*), all kinds of butterflyfish, surgeonfish, angelfish and anthias.

Million Dollar Bommie is one of those dive sites you can't give a miss either. The actual bommie is located on the ridge of the abyss, which means when you swim out there is at least 3000m of nothing underneath you. An unreal feeling!

On your way to the bommie you swim over a very interesting landscape dominated by little bommies divided by sandy patches that harbour Garden eels and Rockmover wrasse. The bommie itself has plenty of nooks and crannies, which offer shelter to Leaf scorpionfish, a Starry moray (*Echidna nebulosa*) with its yellow eyes and nostrils, a Yellow-spotted scorpionfish (*Sebastapistes cyanostigma*) and a spectacular species of nudibranch (*Dermatobranchus ornatus)*. Very nice!

Another dive site we really shop. This meant that we could do two dives and still have most of the afternoon off to explore the topside of the island. Fortunately, The Sunset is just a short stroll from the Indian Ocean Dive Academy, so we could just wander down the road, set up our kit and make our way to Flying Fish Cove where they launch the boat.

Did you say plate corals? We saw some beautiful ones on our very first dive, at 'Rhoda's Wall'. Not only were they massive (three meters in diameter), they were also pretty much intact and looked very healthy. I don't think I have ever seen so many different, healthy plate corals of this size in one spot. We came across them at other sites too, and they did not cease to amaze me.

One of the animals that I had never seen before was the Adhesive Sea Anemone (*Cryptodendrum adhaesivum*). This anemone looks like a little round blanket, has very short tentacles and comes in a variety of colours such as yellow, brown, grey, blue, pink and green depending on the zooxanthellae it harbours. The Clarks Anemonefish is the only anemonefish that has been associated with this particular anemone.

The location of another dive site was pretty much right underneath our bedroom window! 'The Morgue', as it is called, does not lend its name to what you can find underneath, more what is located just above the water; there used to be a morgue right there at the waters edge.

TIM HOCHGREBE

Diver inspects table corals


JUSTIN GILLIGAN

CLOCKWISE FROM LEFT: Underwater photographer takes a shot of the magnificent fan coral on a wall dive; Swimming with a dolphin; Divers explore Thundercliff Cave; The Grotto

Unique Dive


TIM HOCHGREBE


GLEN COWANS


LEILA JEFFREYS

liked was the 'Chicken Farm'. This is where we, for the first time in our lives, saw the elusive Dragon moray (*Enchelycore pardalis*)—and not just one, but three of them, hiding under a table coral! (Admittedly we did have to go back a second time, because I didn't see them the first time around, but I'll spare you the long story that comes with it).

These rather small moray eels have an amazing colour pattern. Claire pointed out a couple of spearing manta shrimps in their burrows. Again, there were so many beautiful corals, including some soft coral trees, that I didn't know where to look first.

Eidsvold wreck

Although I am not a wreck diver as such, I still thought that our visit to the wreck of the *Eidsvold* was a real treat. This Norwegian phosphate freighter was used to transport phosphate until the Japanese sunk it in 1942, and it now lies on the edge of the reef, part of it has toppled down the abyss. The structure is still recognisable, but over the last 60 years, plenty of sessile life has settled, and the wreck has become completely incorporated into the striking coral reef that surrounds it.

A large number of Sergeant Majors were aggregating at the shallower end of the wreck. The swim along the wall towards the *Eidsvold* is spectacular, too, with striking fans, anemones and coral growth all the way from the top to well below where we were swimming.

Due to the conditions, we only dived the northern side of Christmas Island. We did go to the north-westerly point of the island at 'Perpendicular Wall' where we already noticed the significant chop. Fortunately, under the water, it was a very different story, and we hardly noticed anything of the rougher conditions above.

This dive started off with a small garden made up of wonderful fan corals that covered the bottom and the rock wall. There were also plenty of Black-cheek morays, which you can see at most places around the island. Half way through our dive, a manta ray cruised past. On the reef flat at ten meters, we saw parrotfish, loads of anthias, Pyramid butterflyfish and a large barracuda. Again, this reef features more fantastic, pristine corals.

Caves

Besides the reef flats and walls, one of the other diving attractions of Christmas Island are the caves.

The entrance to Thunder Dome is around the ten-meter mark, and there are two chambers. In the second one, there is an air pocket, and when you surface, you can have a look at the stalactites hanging off the ceiling. We could hear the waves pounding on the rocks above us, which was more exciting than scary.

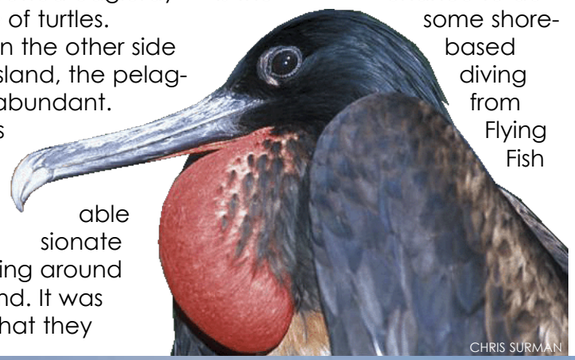
Swimming back, the light coming in was bright neon blue and looked almost artificial. Just at the entrance, there was a huge number of stunning red fans. We finished this dive on the reef flat and were kept company by a school of about 50 Tall-fin batfish that


TIM HOCHGREBE

CLOCKWISE FROM LEFT: Lionfish; Frigate bird (inset); View of Flying Fish Cove from above; Underwater photographer explores reef off Christmas Island; White sandy beaches along the shores

Unique Dive


TIM HOCHGREBE


CHRIS SURMAN


JUSTIN GILLIGAN


TIM HOCHGREBE

White beaches on Christmas Island

es and patiently waiting in the dark resulted in another nice surprise, but you will have to find that one out for yourself...

The air in the cave was very hot and humid, so it was quite refreshing to glide back into the water. The water inside all three chambers was very clear, and it was very safe to go inside because it didn't silt up. Silhouettes of schools of small fish could be made out against the incoming light, but as soon as you switched your torch back on, they scattered rapidly.

Our bottom times were between 60 and 70 minutes, except for our little expedition to Thunder Cliff Cave, which lasted an hour and a half. At no time did we feel we had to hurry to keep up. There was always plenty of time to take photos and to stare at the abundance of life around us.

All week we had a minimum of 30 meters visibility, and the water temperature was a comfortable 28 °C.

Most marine life action was happening on or directly around the reefs, but we did see the occasional reef shark out in the blue. We were also lucky to see a manta ray, a small White-spotted eagleray and a couple of turtles. Apparently, on the other side of Christmas Island, the pelagics are more abundant.

Both Markus and Claire are very knowledgeable and passionate about the diving around Christmas Island. It was great to see that they were so happy to share their secrets with us and still keep some to protect this fragile environment. Their patience seemed limitless.

For people who can't get enough of the diving, there is the chance to do some shore-based diving from Flying Fish were amazingly curious.

Wallscene Thunder Cliff Cave was even more impressive as one actually surfaces within the cave, get out of the water, and after taking off your dive gear, you can go for a short (guided) walk. Markus explained to us the different geological formations in the cave. A closer look at a small pool of water revealed tiny little red and white shrimp swimming around. Although they are apparently almost completely blind since they spend most of their time in pitch-black conditions, using their other senses, these little shrimp noticed our presence and kept hiding as soon as we tried to have a good look at them. Switching off our torch-


GUNTER NOACK

CLOCKWISE FROM LEFT: Divers swim with a whaleshark, which usually visit the island between November and April; Red crabs rest on a rock at dawn; Baby Bosun; Booby


LINDA CASH

Unique Dive


TIM HOCHGREBE

Cove. Again, plenty of corals, an abundance of fish, and people have seen Dragon morays in the cove on many occasions.

We did our last dive at Admiral Wall, which is just inside the cove. Once more we saw more fantastic corals and anemones, Leaf scorpionfish, a White-mouth moray, Midnight snapper out in the blue and some awesome coloured crabs with yellow and black striped legs, red faces and a purple claw. Flying Fish Cove is also a great spot to do some night diving.

From November until April, Whalesharks come past Christmas Island. It is thought that they are the same ones that aggregate at Ningaloo Reef, WA. Their appearance coincides with the mass red crab spawning, as they feed on the crab larvae. During the months of November through to January, there is also an increased chance of seeing Hammerhead sharks.

Topside

We absolutely loved the diving, but we were very much looking forward to the surface intervals, too. It not only gave one the chance to stretch one's sea legs, but also, more importantly devour the lunches, which were arranged through the shop. Markus did an amazing job in surprising us each day by bringing something from the local Asian eateries and finishing it off with some beautiful sweets or fresh fruit. There was always plenty of water available, which is very important in such a tropical destination.

In the afternoons, we had plenty of time to explore some of the drier parts of the island. The whole island is only 135 square kilometres and can be easily explored within a few afternoons. To really enjoy the stunning land-based nature of Christmas Island, it is necessary to have access to a car, preferably a four-wheel drive vehicle. To make sure there are no dramas, it is recommended that you arrange this before you arrive on the island.

There are plenty of tracks to do some bushwalking. There are a number of


PHILLIP CASH

beaches that are worth a visit, and in the south, there are blowholes to check out. We also visited the island's only waterfall at Hugo's Dale.

Christmas Island boasts a number of endemic flora and fauna species including 16 plant species and seven bird species. The endangered Abbott's Booby bird nests on Christmas Island, the only known nesting habitat left in the world for these birds. Other birds that can be easily spotted are the endemic Christmas Island Frigate birds, Brown and Red-footed Booby birds, different species of bosuns and doves. From Lily Beach, there is a walking trail that goes right past a Brown Booby Bird nesting site.

If you like crabs, you are definitely in the right place on Christmas Island. Besides the well-known bright Red Crabs, you will see the Blue Crabs when you go for a bushwalk. And on Dolly Beach, the humongous, colourful Robber Crabs can be spotted too.

JUSTIN GILLIGAN

TONY PALLISER

DES HILL

Sunrise crabs on Ethel Beach; Golden Bosun (inset); Blowholes spout fountains of sea and mist; Red crab

All up there are 20 crab species that make Christmas Island their home.

Dining & sightseeing

Christmas Island has a good supermarket, especially when considering the remoteness of the island, where you can buy most things. There is also a good choice of places to eat. Because of the rich cultural diversity, there are also some good quality Asian restaurants. On Wednesday night, the Sukaramai Restaurant serves a very cheap and tasty diner.

The integration of the different cultures and races on Christmas Island becomes even more obvious when you visit the different temples and cemetries on the island. Throughout the year, there are several religious and cultural festivals.

More information on walking trails, the local flora and fauna, and the island in general can be found at the Christmas Tourism Association.

We would close off our days by floating in the pool at The Sunset before going for a walk to the Golden Bosun, which is the pub just around the corner, or walk a bit further to Rumah Tinggi to watch the sunset from another perspective, sip on a cocktail, and talk to the very friendly locals while we were waiting for our dinner to be served. What a life! The end of our stay on Christmas Island came way too soon.

In summary, Christmas Island is a fantastic destination for your tropical diving holiday and suits all levels of experience. Also non-divers who enjoy and appreciate birdwatching, bushwalking, snorkelling, and nature in general will love Christmas Island. Additional benefits are that the food is safe to eat, and the water is safe to drink. There are no tropical diseases and no hassles with having to change currency or arrange a visa. At all times, we felt very safe, and the locals were extremely friendly and easy to talk to. All this is the same for the Cocos (Keeling) Islands, where there is some more excellent diving waiting for you. The two destinations can be easily combined into one trip, and each has their own unique characteristics: under and over the water.

WIKIPEDIA / GFDL

Map and location of Christmas Island

Travel tips

National Jet flies to Cocos (Keeling) Islands and Christmas Island leaving from Perth twice a week. A little tip: if you book well in advance, it is possible to use Qantas frequent flyer points, and you currently need 30,000 points for the return trip. It is possible to fly to Cocos (Keeling) Islands and Christmas Island from Denpasar, Bali. You can organise your holiday on Cocos and Christmas yourself, but it might work out cheaper when organising it through specialised travel agents.

For more information on Christmas Island, have a look at the following web sites:
Christmas Tourism Association
www.christmas.net.au
The Sunset, offering comfortable rooms all with ensuite
www.thesunset.cx
Indian Ocean Dive Academy
www.ioda.cx;
National Jet Systems
www.nationaljet.com ■

TIM HOCHGREBE

Joe Peters

P O R T F O L I O

portfolio

Joe Peters

Edited by Gunild Symes
All art work by Joe Peters
Photos by Victor Janczar

Master glass maker, Joe Peters of Massachusetts, USA, takes on the sea in no insignificant way. With vivid color and imagination, this artist brings life up from the depths of the ocean to your tabletop with animated, often whimsical, glass figures of colorful sea creatures. *X-RAY MAG* interviewed the artist to find out just what makes him tick.

LEFT: *Crabs*, 3x4 inches each. TOP RIGHT: *Chambered Nautilus*. PREVIOUS PAGE: *Octopi*, 6x6 inches each. All photos this and previous page are of flame work and furnace glass sculptures by Joe Peters

portfolio

CLOCKWISE:
Scuba diver, 8x6 inches; *Anglerfish*, 7x8 inches; *Sea Turtles*, 4x6 inches. All photos this page are of flame work and furnace glass sculptures by Joe Peters

X-RAY MAG: What inspires you about the underwater world?

JP: Color, form and a sense of the constant movement the sea and its creatures fascinates me.

X-RAY MAG: Tell us how the sea inspires your work and why you use themes of the underwater realm.

JP: Animals and plant life in general inspire me to replicate and stylize some of the most intricate details in our world,

X-RAY MAG: Tell us how you became an artist and why you chose the medium you use. Who were your role models or mentors?

JP: I have been involved in art since I was a child, from painting and clay to various other media. When I was an art major in college I took a summer intro course in glassblowing at a local American craft school. It just clicked with me and was by far the most exciting medium I have ever tried. I set up a studio and have been working full time in glass for the past five years. My role models are teachers I have been fortunate to study with, Milon Townsend, Robert Mickelsen, Sally Prasch, and Emilio Santini. Mentors are both artists, like Milon Townsend, who I had an opportunity to apprentice with, and glass collectors and gallery owners who have offered advice and direction.

X-RAY MAG: What inspires you?

JP: Nature and awesome art.

particularly underwater sea life. I feel that my opportunities to dive and see a lot of my subjects up close is a gift. I feel an urge to share what I have seen so people can enjoy the beauty of sea life outside their natural habitat and even in their own homes.

X-RAY MAG: Tell us about your artistic vision and artistic methods, process, techniques, materials, etc.

JP: The process of flame working glass is using a propane/oxygen torch to heat glass rods to their melting point, then manipulate the glass by stretching and twisting thin strands of hot glass together to create patterns of color which are then formed into cane and used in modeling or detailed sculptural forms.

In addition to the torch and kiln I use graphite tools to help shape and flatten the hot glass. My vision is to incorporate color and detail and personality into my work. To push the limits a little when it comes to depicting the beauty of nature and its creatures... As an artist, taking it one step beyond.

X-RAY MAG: Are you a scuba diver? If so, what made you become one and where

Joe Peters

CLOCKWISE:
Two Jellyfish, 6x4 inches; *Submarine,* 5x4 inches; *Wall mounts,* diameters vary from 8 to 14 inches (flame work and furnace glass sculptures by Joe Peters set in furnace worked vessels made by Peter Muller); *Hermit Crabs,* 4x6 inches. All photos this page are of flame work and furnace glass sculptures by Joe Peters

LEFT: *Lobster,* 9x6 inches, flame work and furnace glass sculpture by Joe Peters

ABOVE: *Purple Portal,* 20x8 inches, flame work and furnace glass sculpture by Joe Peters set in furnace worked vessel made by Peter Muller

RIGHT: *Shark Attack,* flame work and furnace glass sculpture by Joe Peters

have you dived?

JP: I followed my father's lead in learning to dive when I had and opportunity to live in Central American. I earned my open-water certification in Roatan and I spent a few months diving in the coral reefs off the coast of Belize and Honduras.

X-RAY MAG: What are your current artistic projects?

JP: My current artistic projects have been in collaboration with Peter Muller, a furnace glassblower. We are combining the two major processes for hot glass manipulation in creating underwater seascapes.

X-RAY MAG: Any future projects in mind? What are they and how do they relate to the sea or ocean conservation?

JP: My hope is to secure funding for public installations of my work drawing attention to both the beauty and fragile nature of our seas and their creatures and plant life.

X-RAY MAG: Why does art matter and how can art help the world?

JP: Art is creative expression and creativity is one of our greatest gifts as human beings. Visual arts inspire us to be creative in other areas of our lives. Our world is in need of creative thinkers, and

portfolio

Joe Peters

creative ideas.

I would encourage everyone who dives to recognize not only the beauty but the fragility of sea life.

X-RAY MAG: How can interested buyers contact you?

JP: I live in Western Massachusetts and guests are welcome to tour my studio by appointment. A large percent of my work is commissioned. A schedule of upcoming shows is included on my website at www.joepetersglass.com. My e-mail address is joe@joepetersglass.com.

For more information or to purchase art work, visit the gallery of Joe Peters Glass at ***www.joepetersglass.com*** *or call 413 537-2259* ■

CLOCKWISE: *Teal Portal,* 18x14 inches (flame work and furnace glass sculptures by Joe Peters set in furnace worked vessel made by Peter Muller); *Pelican,* 5x3 inches; *Angel and Triggerfish,* 4x3 inches each. All photos this page are of flame work and furnace glass sculptures by Joe Peters