



GLOBAL EDITION
October 2008
Number 26



British Columbia
Thetis Island

330m Deep
**Pascal
Bernabé**

India
**Bangaram
Island**

Portfolio
**Stéphane
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Night
Photography
Kurt Amsler

DOMINICA • ST LUCIA • ST VINCENT

Caribbean Islands



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DIRECTORY

X-RAY MAG is published by AquaScope Media ApS
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**PUBLISHER
& EDITOR-IN-CHIEF**
Peter Symes
Editor@xray-mag.com

SENIOR EDITOR
Michael Symes
science@xray-mag.com

**PUBLISHER / EDITOR
& CREATIVE DIRECTOR**
Gunild Symes
Gunild@xray-mag.com

SECTION EDITORS
Andrey Bizyukin, PhD - *Features*
Arnold Weisz - *News, Features*
Catherine Lim - *News, Books*
Simon Kong - *News, Books*
Mathias Carvalho - *Wrecks*
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Fiona Ayerst - *Sharks*
Michael Arvedlund, PhD - *Ecology*

**ASSOCIATE EDITORS
& REPRESENTATIVES:**
Americas:
Arnold Weisz
Arnold@xray-mag.com

Russia Editors & Reps:
Andrey Bizyukin PhD, Moscow
Andrey@xray-mag.com

CORRESPONDENTS
Robert Aston - CA, USA
Enrico Cappeletti - Italy
John Collins - Ireland
Marcelo Mammana - Argentina
Nonoy Tan - The Philippines

Svetlana Murashkina PhD, Moscow
Svetlana@xray-mag.com

South East Asia Editor & Rep:
Catherine GS Lim, Singapore
Cat@xray-mag.com

CONTRIBUTORS THIS ISSUE

**ASSISTANT EDITORS
& REPRESENTATIVES:**
Malaysia Editor & Rep:
Simon Kong, Kuala Lumpur
Simon@xray-mag.com

Kurt Amsler
Fiona Ayerst
Bill Battan
Scott Bennett
Pascal Bernabé
Andrey Bizyukin, PhD
Stéphane Braud
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Francois Brun
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Michel Ribera
Cindy Ross
Barb Roy
Charles Stirling
Gunild Symes
Michael Symes
Peter Symes
Cedric Verdier
Arnold Weisz

Canada/PNW Editor & Rep:
Barb Roy, Vancouver
Barb@xray-mag.com

GirlDiver Editor & PNW Rep:
Cindy Ross, Tacoma, USA
Cindy@xray-mag.com

ADVERTISING
International sales rep:
Arnold Weisz
Sales@xray-mag.com

Asia-Pacific rep:
Simon Kong (Malaysia)
Simon@xray-mag.com

French speaking territories:
Mathias Carvalho
Mathias@xray-mag.com

MARKETING MANAGER:
Yann Saint-Yves
marketing@xray-mag.com

Canada
Wendy Jankovic
Wendy@xray-mag.com

Further information: **contacts page** at www.xray-mag.com

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COVER PHOTO: *Manta Ray*, recently photographed in Komodo by Kurt Amsler who said it was the most beautiful manta he had ever seen, Photosub.com (CONTINUED ON PAGE 4)



Join Kurt Amsler's efforts to save Indonesia's endangered sea turtles
Sign the petition & donate to the cause at: www.sos-seaturtles.ch

contents

Diver inspects reef coral and sponges, Dominica, Caribbean. Photo by Steve Jones



27
CARIBBEAN ISLANDS:
DOMINICA, ST LUCIA,
& ST VINCENT
BY STEVE JONES

47
BANGARAM ISLAND
INDIA
BY CHARLES STIRLING

56
CONSERVATION:
PAY & PLAY
BY ARNOLD WEISZ

61
THETIS ISLAND
BRITISH COLUMBIA
BY BARB ROY

79
DECONSTRUCTING A 300M
WORLD RECORD DIVE
BY PASCAL BERNABÉ

plus...
EDITORIAL 4
NEWS 6
WRECK RAP 18
EQUIPMENT 44
TURTLE TALES 71
BOOKS & MEDIA 59
BUSINESS DIRECTORY 90

columns...

41
GIRLDIVER:
GIRLS ON SPEED
—SCOOTER DIVE
BY CINDY ROSS

74
SHARK TALES:
BITS & BITES
EDITED BY PETER SYMES

84
UW PHOTO & VIDEO:
NIGHT PHOTOGRAPHY
BY KURT AMSLER

91
PORTFOLIO:
STÉPHANE BRAUD
EDITED BY GUNILD SYMES

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When is 'safe' safe?

So, this is the level diver certifications has sunk to: An aquarium diver c-card. What's next? Jacuzzi skindiver? C'mon...

I appreciate that recreational diving should not be made any more complicated or inaccessible than a reasonable level of safety dictates. It is not rocket science, but a recreational pastime.

Yet, it is not completely without risk, as the current trends in dive marketing seem to ignore.

These latest c-card level, and some of the statements made in the Be A Diver campaign, cause me great concern. Proclaiming that diving is as safe as bowling is like comparing apples to oranges. Or have I missed something—can bowling also lead serious injury and even death?

Stating that one does not have to be fit in order to dive and directing unfit divers to consult with their local dive instructors and retailers is reckless. Excuse me, but what kind of medical qualifications do these good hard-working people possess?

Glazing over the sometimes inconvenient truth that accidents do happen and sweeping it in under the marketing rug for the sake of raking in the last marginal

groups to make another dollar is doing this great sport a huge disfavor.

Don't get me wrong... I do not long for the days when even the entry level diver certification was like going through military bootcamp, and the instructor was just out to get you to see if you could stand up to the pressure. When I took my advanced course (CMAS*** actually) 20 years ago, I had to perform a complete equipment swap in near-freezing

down that it now virtually lies flat on the ground is taking the process of debunking old diving myths too far.

The great irony is—considering that this is all about marketing—that over the years, these efforts have also made diving look so ordinary and non-challenging, that diving ultimately became un-cool and boringly old-folksy.

We all know that we can break a leg going skiing, and we have to stay alert in traffic, if we take our car for a spin. We accept this and take our precautions. So, in our daily lives, we are no strangers to managing risk and acting within limits of safety according to what (hopefully) we were taught.

So, why do we go about diving in a different way? Diving is indeed a quite safe recreational activity—and, to a large degree, we can thank the steady improvements in diver training for that—but if we fail to instill a proper appreciation and recognition of the inherent risk elements in new divers by

luring them through marketing that is borderline misleading, they could be lulled into a false sense of security, ultimately putting them at real risk.

Diving is accessible for most people, but not everyone should dive. ■

— Peter Symes
Editor-in-Chief



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waters on a silty bottom of an industrial harbour with three-inch viz. It was extremely uncomfortable, very challenging and, in hindsight, quite dangerous. That was way over the top, and I am only glad that the bar has been lowered significantly, and that far more people can enjoy diving.

But lowering that bar so far



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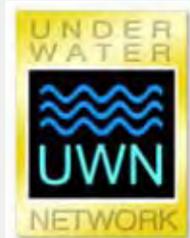
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X-RAY MAG is a member of Diving Equipment & Marketing Association: **Dema.org**

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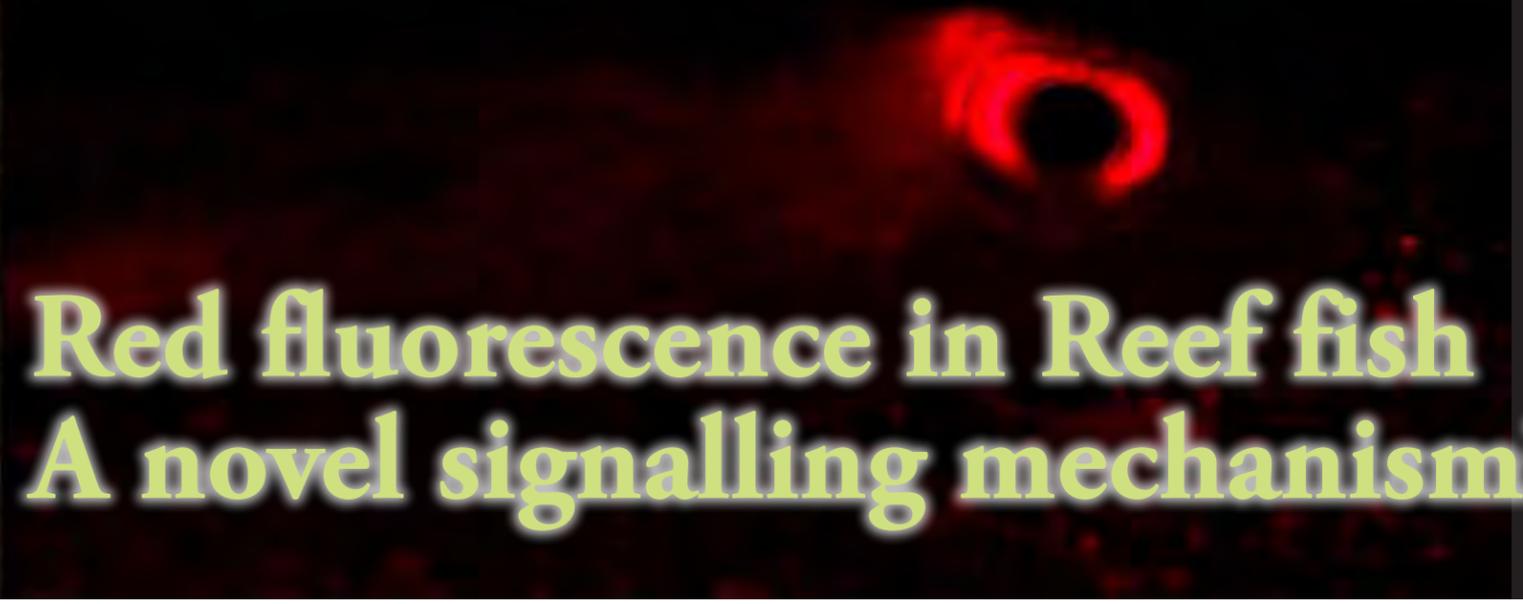


News edited by Peter Symes & Arnold Weisz

NEWS



Red fluorescence in Reef fish A novel signalling mechanism?



At depths below 10m, reefs are dominated by blue-green light because seawater selectively absorbs the longer, 'red' wavelengths beyond 600nm from the down-welling sunlight. Consequently, the visual pigments of many reef fish are matched to shorter wavelengths, which are transmitted better by water. Combining the typically poor long-wavelength sensitivity of fish eyes with the presumed lack of ambient red light, red light is currently considered irrelevant for reef fish. However, previous studies ignore the fact that several marine organisms, including deep sea fish, produce their own red luminescence and are capable of seeing it.

It has been reported recently, in BMC Ecology 2008, 8:16, however, that at least 32 reef fishes from 16 genera and five families show pronounced red fluorescence under natural, daytime conditions at depths where down-welling red light is virtually absent. Fluorescence was confirmed by extensive spectrometry in the laboratory. In most cases, peak emission was around 600nm and fluorescence was associated with guanine crystals, which thus far, were known for their light reflecting properties only.

The purpose of the study was to see "with our own eyes" whether there is indeed a lack of red light at depth in the euphotic zone during daytime and to identify the observed sources of natural red fluorescence in fish in particular. This work combines results from several studies carried out on coral reefs in the Red Sea and the Great Barrier Reef and has

been supplemented by observations and measurements on fish in the laboratory.

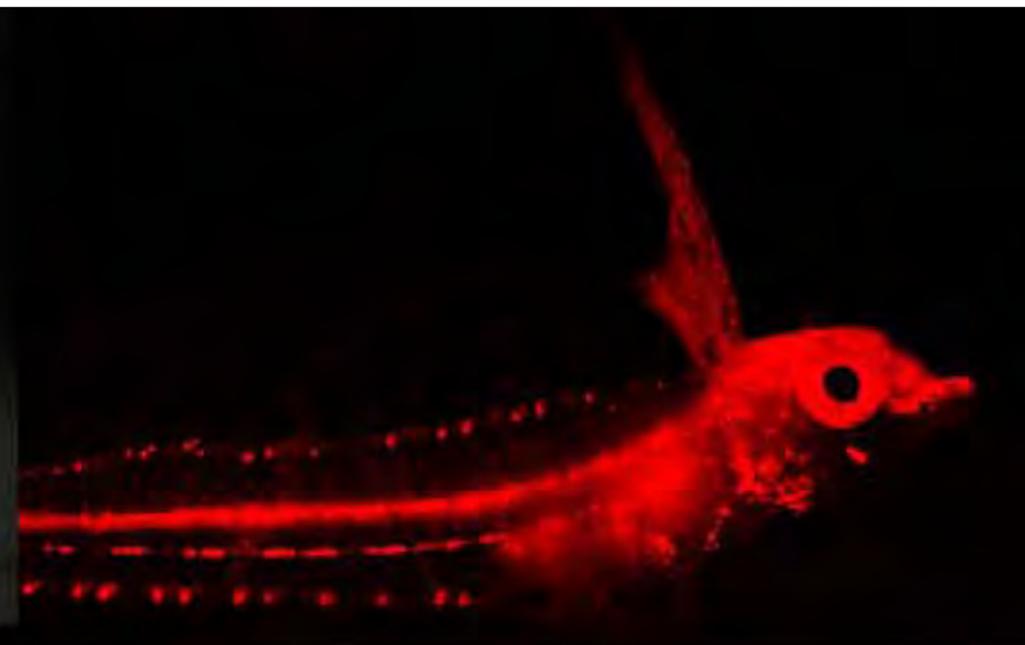
The data indicate that red fluorescence may function in a context of intra-specific communication. Fluorescence patterns were typically associated with the eyes or the head, varying substantially even between species of the same genus. Moreover red fluorescence was particularly strong in fins that are involved in intra-specific signalling. Finally, micro-

spectrometry in one fluorescent goby, *Eviota pellucida*, showed a long-wave sensitivity that overlapped with its own red fluorescence, indicating that this species is capable of seeing its own fluorescence.

It is shown that red fluorescence is widespread among marine fishes. Many features indicate that it is used as a private communication mechanism in small, benthic, pair or group-living fishes.

Many of these species show quite cryptic colouration in other parts of the visible spectrum. High inter-specific variation in red fluorescence and its association with structures used in intra-specific signalling further corroborate this view.

These findings challenge the notion that red light is of no importance to marine fish, calling for a reassessment of its role in fish visual ecology in subsurface marine environments. ■



Sustainable Sushi Guide

How to pick Ocean-Friendly Sushi

Blue Ocean Institute, Environmental Defense Fund, and Monterey Bay Aquarium collaborate to promote ocean-friendly selections.

On October 22, three leading ocean conservation organizations—Blue Ocean Institute, Environmental Defense Fund and the Monterey Bay Aquarium—will make available to the public, color-coded consumer guides ranking popular sushi selections based on whether they are prepared using seafood that are

caught or farmed in ways that harm the ocean or pose a health risk to people.

“For the first time, sushi lovers have tools that enable them to join the growing movement of those making ocean-friendly choices that protect life in the seas now and for generations to come,” said Julie Pareles, executive director of Blue Ocean Institute.

“These new guides not only enable sushi lovers to choose fish that are caught or farmed responsibly, they also highlight selections that

are healthy for them and their families,” said Tim Fitzgerald, marine scientist for Environmental Defense Fund. “The reality is quite simple,” said Sheila Bowman, Seafood Watch outreach manager at the Monterey Bay Aquarium. “If you care about the future of the oceans, you’ll avoid red-listed sushi.”

No-nos

For sushi aficionados, that means both pleasant surprises and some disappointments. Popular items like Bluefin tuna (hon maguro/kuro maguro) and freshwater eel (unagi) are firmly on the “red” list, as is farmed salmon (sake). These species are either overfished, farmed with aquaculture methods that pollute the ocean, or caught using methods that destroy ocean habitats or kill large amounts of other sea life.

OK

Items like wild-caught Alaska salmon (sake), farmed scallops (hotate) and Pacific halibut (hirame) are more sustainable choices, in part because they

come from abundant, well-managed fisheries or—in the case of scallops—are raised using sustainable aquaculture methods. All three guides offer a substantially consistent message about the best selections, as well as the fish to avoid when choosing sushi.

“While we consider similar factors in assessing each fishery, we each tabulate the environmental information in slightly different ways,” said Kate McLaughlin, Blue Ocean Institute’s Seafood Program Director. “That results in subtle variations for a handful of rankings.”

“The differences are minor,” Bowman said. “Regardless of which sushi guide people rely on, everyone from chefs

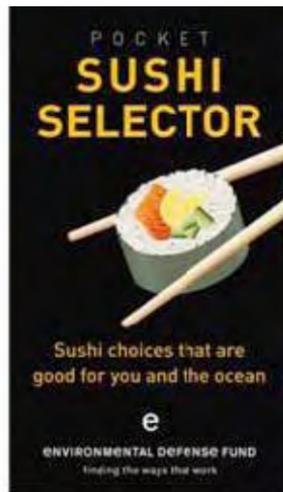
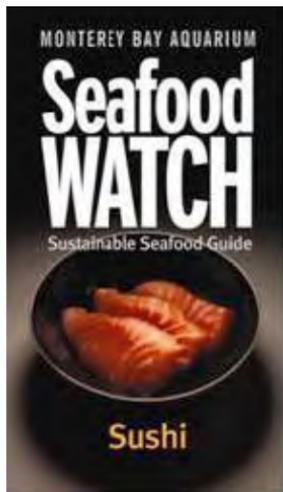
to consumers now has a very clear picture of what one’s sushi choices mean for ocean wildlife.”

All three guides incorporate human health recommendations from Environmental Defense Fund, and fish that contain levels of mercury or PCBs that may pose a health risk to adults or children are flagged. Fisheries researchers from the Blue Ocean Institute and Monterey Bay Aquarium evaluated the seafood species included on the guides. The Monterey Bay Aquarium seafood rankings are the basis for items selected by Environmental Defense

Fund for inclusion in its sushi guide. ■

Sushi choices by individual consumers have an impact on the future of the ocean.

Avoid red-listed Sushi



Marine scientists filming in one of the world’s deepest ocean trenches have found groups of highly sociable fish swarming 7,700 metres beneath the surface.

“More fish than we or anyone in the world would ever have thought possible at these depths.”
—Dr Alan Jamieson

Scientists filming in one of the world’s deepest ocean trenches have found groups of highly sociable snailfish swarming over their bait, nearly five miles (7700 metres) beneath the surface

of the Pacific Ocean. This is the first time cameras have been sent to this depth.

“We got some absolutely amazing footage from 7,700 metres. More fish than we or anyone in the world would ever have thought possible at these depths,” says project leader Dr Alan Jamieson of the University of Aberdeen’s Oceanlab, on board the Japanese research ship the Hakuho-Maru.

“It’s incredible. These videos vastly exceed all our expectations from this research. We thought the deepest fishes would be motionless, solitary, fragile individuals eking out an existence in a food-sparse environment,” said Professor Monty Priede, director of Oceanlab.

“But these fish aren’t loners. The images show groups that are sociable and active—possibly even families—feeding on little shrimp, yet living in one of the most extreme environments on Earth. ■



Read the full story and watch the video on our website



Snapping shrimp

Explorers find hundreds of undescribed species on Australian reefs

The Census of Marine Life.

This is a global network of researchers in more than 80 nations engaged in a ten-year initiative to assess and explain the diversity, distribution, and abundance of marine life in the oceans—past, present, and future. The network will release the first Census of Marine Life in 2010. However, some initial results and stunning images from their landmark four-year effort to record the diversity of life in and around Australia's renowned reefs have recently been released. See also www.coml.org.

Hundreds of un-described corals and other species have been found on familiar Australian Reefs, for example, tongue-eating isopod parasites on fish. These new kinds of animal species surprised international researchers systematically exploring waters off two islands on the Great Barrier Reef and a reef off northwestern Australia.

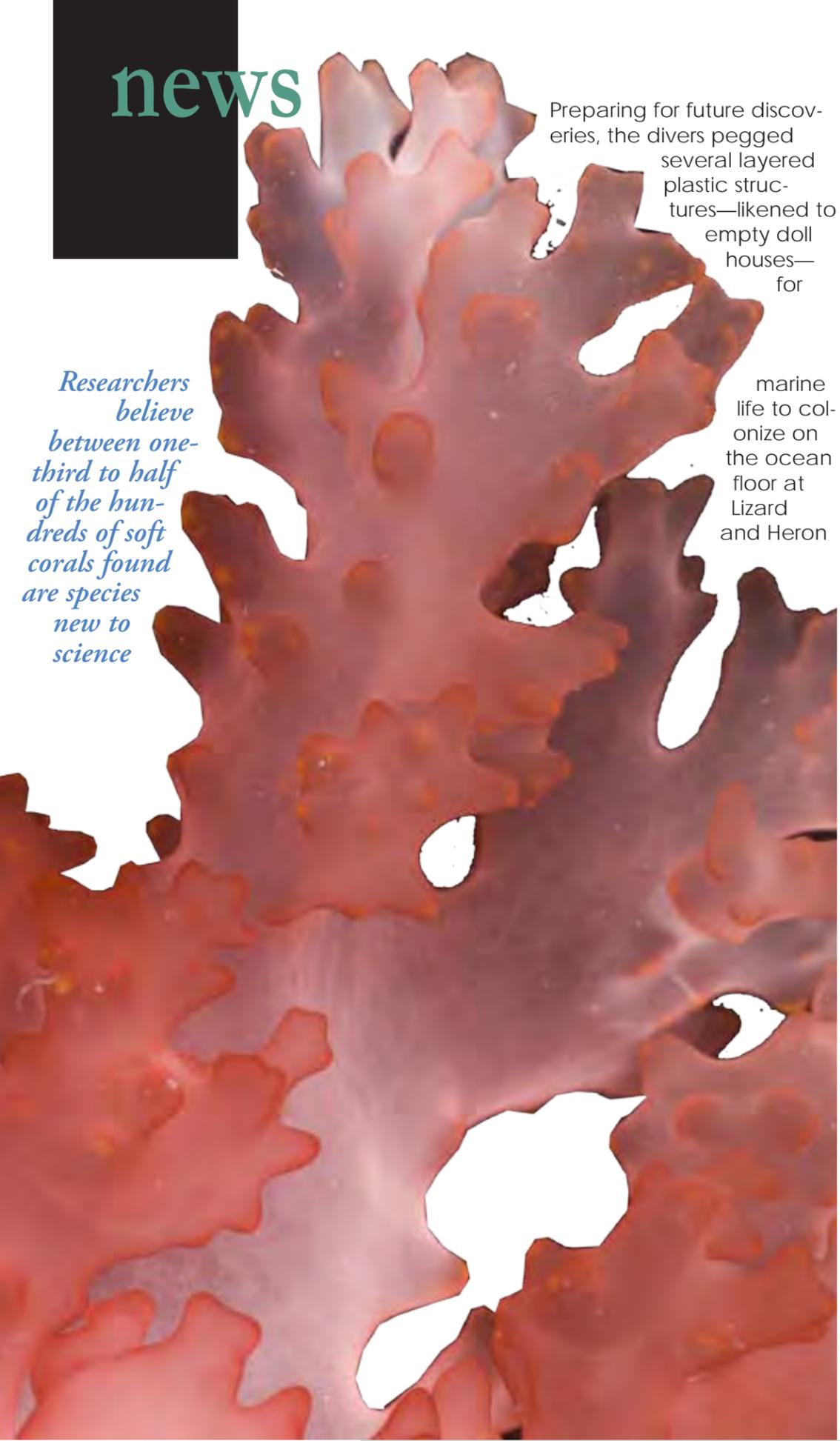
The expeditions, affiliated with the global Census of Marine Life, help mark the International Year of the Reef and included the first systematic scientific inventory of spectacular soft corals, named octocorals for the eight tentacles that fringe each polyp.

Discoveries at Lizard and Heron Islands (part of the Great Barrier Reef), and Ningaloo Reef in northwestern Australia, included:

- About 300 soft coral species, up to half of them thought to be new to science;
- Dozens of small crustacean species—and potentially one or more families of species—likewise thought unknown to science;
- A rarely sampled amphipod of the family *Maxillipiidae*, featuring a bizarre whip-like back leg about three times the size of its body. Only a few species are recorded worldwide;
- New species of tanaid crustaceans, shrimp-like animals, some with claws longer than their bodies;
- The beautiful, rare *Cassiopeia* jellyfish, photographed upside down on the ocean floor, tentacles waving in the water column—a posture that enables symbiotic algae living in its tentacles to capture sunlight for photosynthesis;
- Scores of tiny amphipod crustaceans—insects of the marine world—of which an estimated 40 to 60 percent will be formally described for the first time.



Researchers believe between one-third to half of the hundreds of soft corals found are species new to science



Preparing for future discoveries, the divers pegged several layered plastic structures—likened to empty doll houses—for

marine life to colonize on the ocean floor at Lizard and Heron

Islands. Creatures that move into these Autonomous Reef Monitoring Structures (ARMS), which provide shelter designed to appeal to a variety of sea life, will be collected over the next one to three years.

Previous studies have uncovered large differences in the biodiversity at the Great Barrier Reef's Lizard Island and, further south, Heron Island, which had 30 percent more hard corals and 40 percent more fishes. Ningaloo Reef appears to be the least biodiverse of the three sites studied, which may be related to its comparative isolation from other reef systems. The cause of such gradients in species diversity is poorly understood, but species richness in the region tends to decrease with distance from the equator.

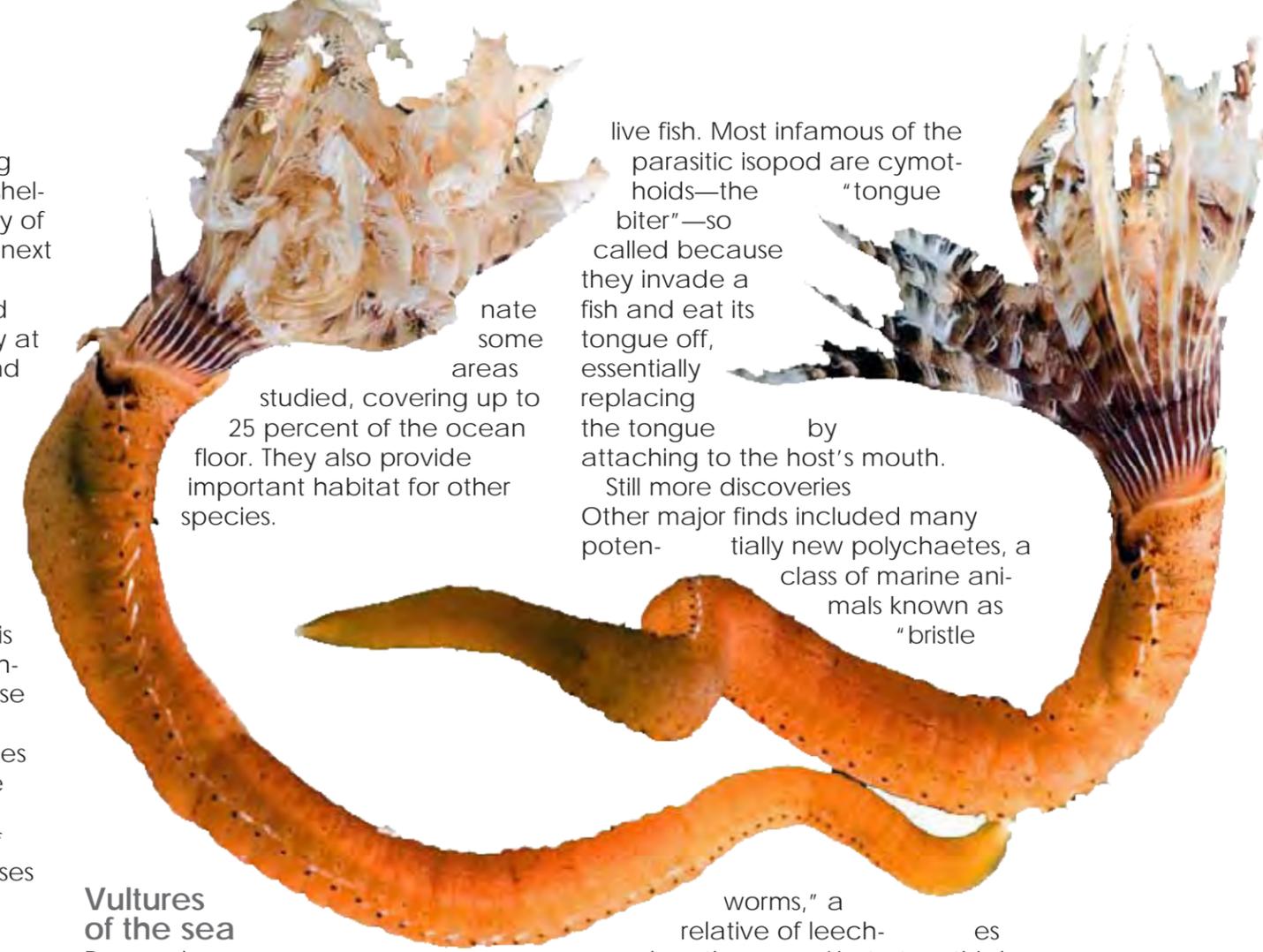
Expeditions to the same three sites will be repeated annually over the next three years to continue their inventory and measure impacts of climate change and other processes over time.

Soft corals on Barrier Reef

The expedition marks the first census of soft corals, named octocorals for the eight tentacles that fringe each polyp. The addition of perhaps as many as 150 new species to the global inventory of soft corals is a major addition to the knowledge of this group which, despite its high distribution worldwide, remains one of the most poorly understood groups. Researchers believe between one-third to half of the hundreds of soft corals found are species new to science.

While these animals are not reef builders, they domi-

nate some areas studied, covering up to 25 percent of the ocean floor. They also provide important habitat for other species.



live fish. Most infamous of the parasitic isopod are cymatohoids—the “tongue biter”—so called because they invade a fish and eat its tongue off, essentially replacing the tongue by attaching to the host's mouth.

Still more discoveries Other major finds included many potentially new polychaetes, a class of marine animals known as “bristle

Vultures of the sea

Researchers were intrigued as well by discoveries of various isopods, often referred to as vultures of the sea, because some feed on dead fish. Of the many isopod species collected during

the first two expeditions, approximately 100 are not yet described in the scientific literature.

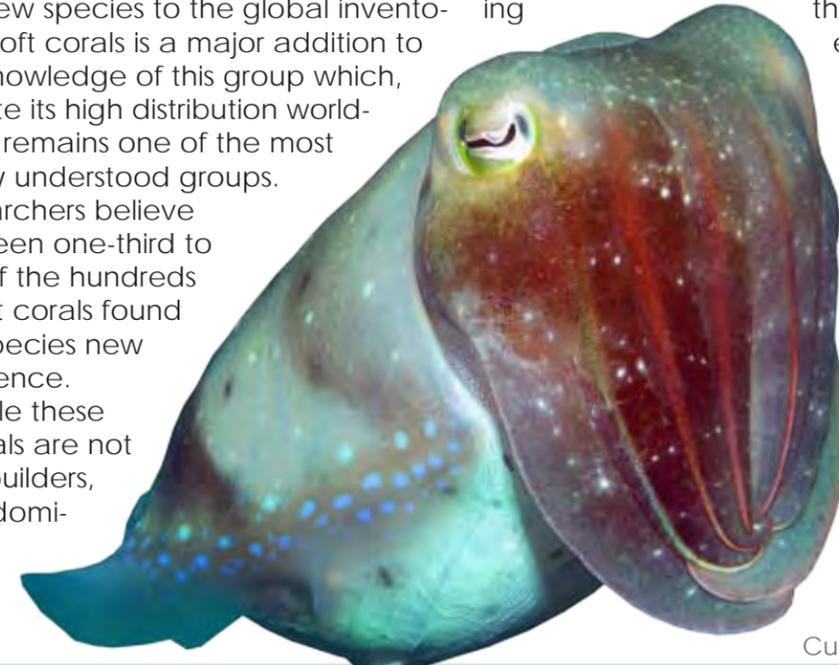
Some isopods are parasitic and burrow into the flesh of

worms,” a relative of leeches and earth worms. Up to two-thirds of species found at Lizard Island alone are thought to be undescribed.

The scientists' studies also included seaweeds, urchins, and lace corals. More formally known as Bryozoans, lace coral colonies consist of asexually budded (and therefore genetically identical) individuals. Colonies form large intricate structures that bear no resemblance to the structure of the individual.

The new

Australian expeditions reveal how far we are from



Cuttlefish

Pseudocodium



knowing how many species live in coral reefs around the globe. Estimates span the huge range from one to nine million. Even at the low end of this range, we must wonder why nature has evolved such prolific diversity on coral reefs. While they are icons of diversity, the processes that have generated and maintained coral reef biodiversity are still unknown.

**CoML
Census
of Coral
Reef
Ecosystems**
(www.creefs.org)

Coral reefs are highly threatened repositories of extraordinary biodiversity and therefore have been called "the rainforests of the sea," but little is known about the ocean's diversity as compared to its terrestrial counterpart. The Australian expedition is just one part of an unprecedented global census of coral reefs, CReefs, one of 17 Census of Marine Life projects.

CReefs aims to census life in coral reef ecosystems, to consolidate and improve access to coral reef ecosystem information

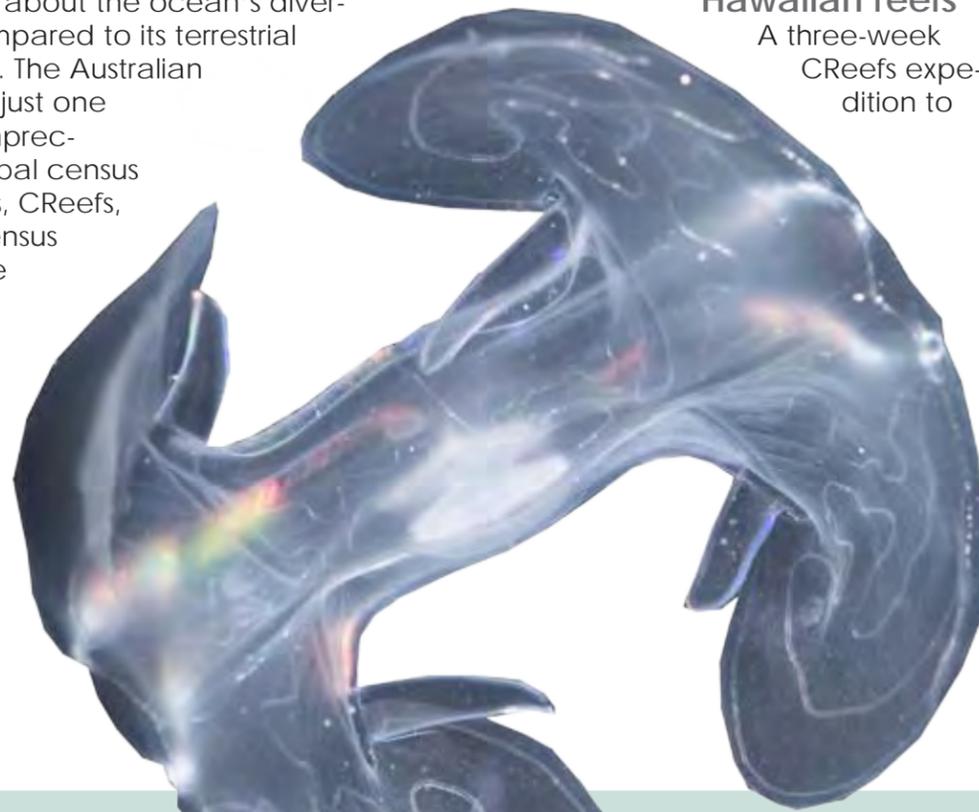
scattered throughout the world, and to strengthen tropical taxonomic expertise.

Researchers adapted sampling methods and applied these in a wide range of habitats, including sampling diversity in dead coral heads—the skeleton of a coral emptied of the fleshy animal that once lived inside. Samples were obtained by enveloping small dead coral heads in a bag and carefully chiseling off the base to capture all of the animals inside. A single dead coral head can yield more than 150 individual crustaceans, molluscs, and echinoderms. Worldwide, these dead coral heads host many thousands of species and their use is emerging as an important tool for assessing coral reef biodiversity.

The biodiversity data generated will be made publicly available through the Ocean Biogeographic Information System (OBIS) (www.iobis.org), an initiative of the Census of Marine Life.

Hawaiian reefs

A three-week CReefs expedition to



Hawaii's French Frigate Shoals in 2006 discovered more than 100 potential new species and/or location records and advanced understanding of marine biodiversity in the Hawaiian



Archipelago. An international team of taxonomists and crew collected and photographed several potentially new species of crabs, corals, sea cucumbers, sea quirts, worms, sea stars, snails, and clams. Many other species familiar in other ocean areas had never been recorded around Hawaii.

Elsewhere

Meanwhile, US and Mexican researchers have chronicled a century of research on 46 named coral reefs of the southern Gulf of Mexico. The chronicle links to GulfBase (www.gulfbase.org), a database listing species inhabiting southern Gulf reefs (2057 species) and islands (298

species), reflecting greater-than-expected biodiversity there.

The chronicle (www.tamu.edu/upress/BOOKS/2007/tunnell.htm) reveals that reef condition is better further offshore, away from population centers, and in areas of low rainfall and runoff. ■



Inverted solitude was created by Jason Taylor (below) using cement, fibre-glass, and steel plate. Dimensions: 2500mm x 700mm. Depth: 2.5m



UK artist-diver sinks more sculpture

Inverted solitude by Jason Taylor is a lone figure hanging upside-down underneath a floating platform in The National Diving & Activities Centre, Chepstow, UK. With depths of over 80m, the site—located in what was once a stone quarry—is the deepest inland body of water in the UK. The sculpture is permanently fixed to a pontoon currently used for national free diving competitions and training.

The sculpture, which is constructed from cement and fibreglass, was cast from BBC presenter Mike Fishetti and filmed for the BBC network as part of a production for SMART Art. Due to be aired early next year, the programme documents the creation of the

sculpture from initial casting to installation.

When the sculpture is viewed from below, a figure is seen standing on the platform staring down into the deep. A mirror image of the figure is reflected onto the surface of the water.

Taylor said in a press release: "*Inverted Solitude* aims to explore reflection, space, isolation and extended being... The inverted and lonely demeanour of the figure also shows a man distanced from society. Arms folded resolutely, he is left to reflect on a life in which pride and self obsession have created an impenetrable barrier."

Taylor gained international recognition for the creation of the world's first underwater sculpture park in Grenada, West Indies. Designed to create artificial reefs for marine life to colonise and inhabit, his underwater sculptures embrace the transformations that result from ecological processes, celebrating the regenerative powers of nature and the potentially positive effects of human intervention. ■



Jason Taylor

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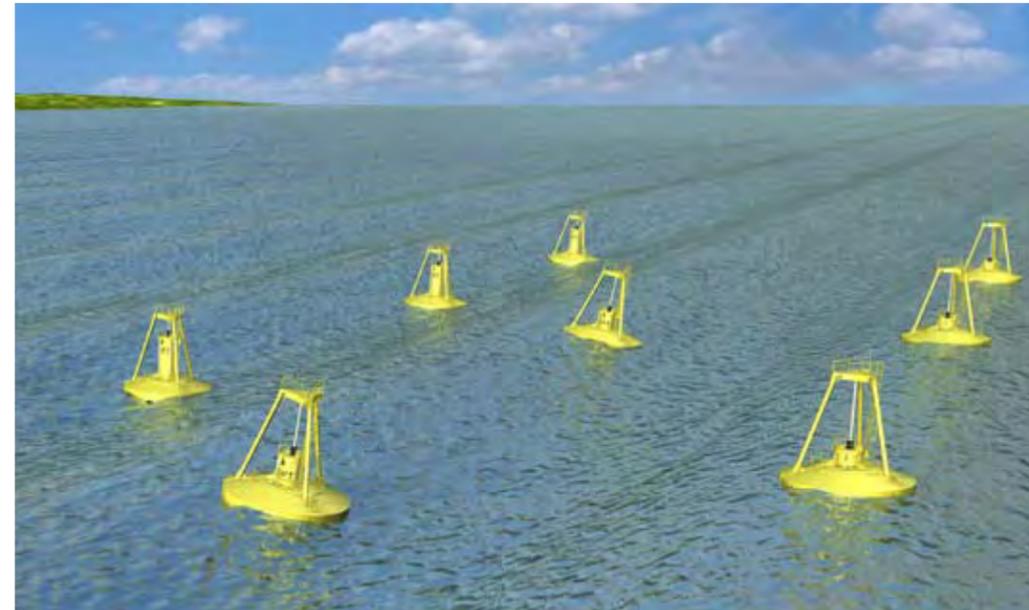
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Ocean buoys could provide 10 percent of US energy



Ocean Power Technologies PowerBuoy wave generation system uses a "smart", ocean-going buoy to capture and convert wave energy into low-cost, clean electricity. A 10-Megawatt OPT power station would occupy only approximately 30 acres of ocean space

Ocean energy is "probably the last of the large natural resources not yet investigated for producing electricity in the United States," according to a report from the nonprofit Electric Power Research Institute.

Roger Bedard, the EPR institute's ocean energy expert, believes that the potential for hydro electricity generation is "significant." In fact, he believes it could generate up to 10 percent of America's power needs, accounting all current inefficiencies and practicalities. Perhaps, in the future, that 10 percent could grow as power grids change and adapt to handle the sometimes irregular influx of power generated from wind, solar and water. Europe is already well ahead of the US in terms of ocean technology. Only recently did a wave farm begin operations in Portugal, and a giant underwater turbine is currently under installation off the Scottish coast. ■

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How the jellyfish got its sting

Jellyfish may thank a humble bacterium for their ability to sting. Scientists have found that bacteria have gene similar to the one responsible for the jellyfish sting. This suggests the ancestors of jellyfish picked up the gene from microbes. The research is published this week in *Current Biology*.

The find came as a great surprise to research team lead by developmental biologist Nicolas Rabet. This is an example of what is called horizontal gene transfer. Unlike vertical gene transfer from parent to offspring,

the horizontal variety happens between organisms, or even between different species.

Common in microbes, it has only been

described a few times in animals.

"This mechanism is often neglected, and could sometimes be more important than we thought" said Nicolas Rabet.

The gene in question appears in all known genomes of creatures from the phylum cnidaria, which includes jellyfish, anemones and corals. Rabet and his colleagues found that the cnidarian gene fits well into the bacterial family tree. They also showed that the gene turns on in at least one jellyfish, *Clytia hemisphaerica*.

The same gene pops up in certain sponges, worms and fungi, suggesting it jumped between species more than once, the scientists say. It is not yet clear how the transfer might have occurred, or why this particular gene

would be so well-travelled.

Scientists are finding that horizontal gene transfer, once thought to be the domain of single-celled critters, is not uncommon in the animal world, says Michael Syvanen, who studies comparative genomics at the University of California, Davis. "Horizontal gene transfer with the animals is going to turn out to be more widespread than anybody believes now. When that realization comes down, it will definitely change the way people think about evolution." ■



This is how jellyfish, mice and bacteria got all mixed up

Aequorea victoria

Jellyfish research leads to Nobel prize

For isolating and developing the green fluorescent protein from a jellyfish, the 2008 Nobel prize for chemistry has been awarded jointly to two Americans and one Japanese scientist.

Jellyfish will glow under blue and ultraviolet light because of this protein, referred to as GFP, in their tissues.

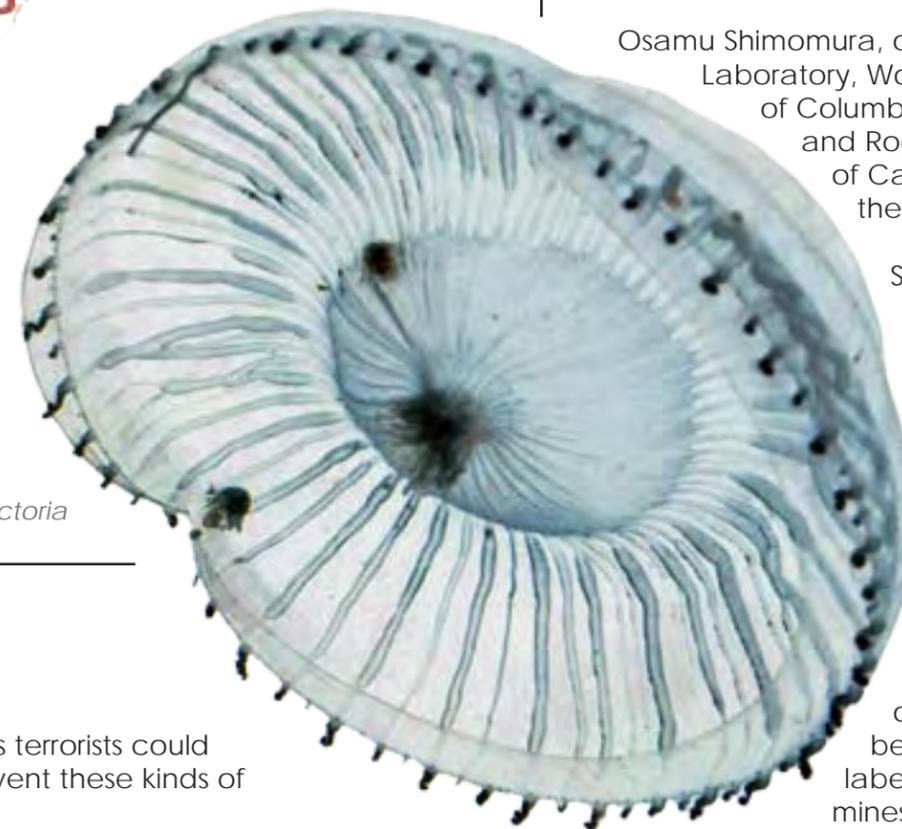
The protein fluoresces green when exposed to blue light, and the gene that makes it has been added to organisms as diverse as bacteria, yeast, insects and even humans, to prove that "alien" genes can be inserted, expressed and passed on.

Osamu Shimomura, of the Marine Biological Laboratory, Woods Hole, Martin Chalfie of Columbia University, New York, and Roger Tsien of the University of California, San Diego, share the prize.

Shimomura made the first critical step, isolating GFP from a jellyfish (*Aequorea victoria*) found off the west coast of North America in 1962. He made the connection also with ultraviolet light.

Chalfie routinely receives letters describing potential uses of GFP, one of the most bizarre being a way of using GFP-labelled bacteria to locate mines in minefields.

GFP has been used in dozens of applications, from searching for a cure for deafness, to making ANDi, the first genetically modified primate, now being used to develop treatments for Huntington's disease. ■



Jellyfish Help Fight Terrorism Too

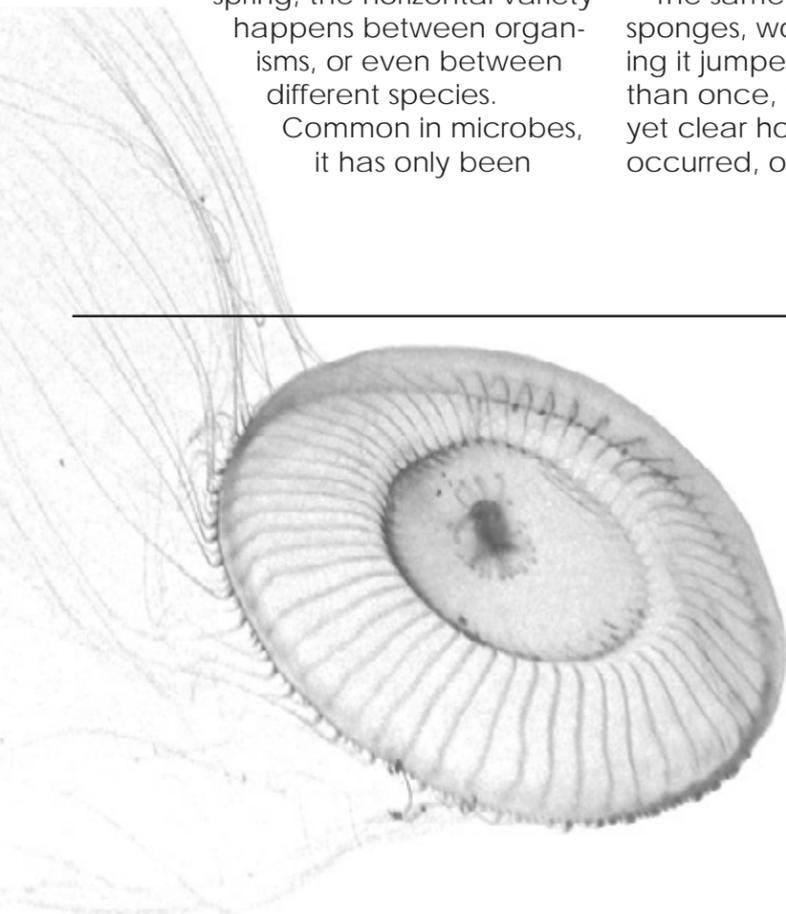
Anthrax, plague and small pox are some of the possible pathogens terrorists could use against us; but now, researchers say jellyfish are helping to prevent these kinds of attacks.

An innovative biosensor, which is currently under development by scientists and engineers at Massachusetts Institute of Technology, will be able to identify harmful bacteria or viruses in the air in less than two minutes by using jellyfish DNA inserted into mouse cells. The presence of a targeted pathogen makes the mouse cell glow. A device called the Panther containing 16 chambers pulls air through the disk to collect and test any pathogen that might be in the air. If a dangerous pathogen is detected, a sensor looking for the emitted light goes off—alerting anyone who could be in harm's way. ■



Mouse with GFP gene from jellyfish glows green. Click on mouse to watch movie

SAMUEL LUNENFELD RESEARCH INSTITUTE



French sea-architect and visionary Jacques Rougerie receives prestigious award

Twenty years after Cousteau, another underwater hero is honoured under the dome of the French Institute.



The French Institute Fine Arts Academy has elected French sea-architect Jacques Rougerie under its dome on the 25th of June. This award honours the work of the architect himself, as it also reflects onto the entire community of sea and underwater world passionate for which he has so often dedicated his work.

Born in 1945, Rougerie graduated with a degree in architecture and oceanography. An architect in 1972, he started his own company and initiated marine architecture projects as he began with the great

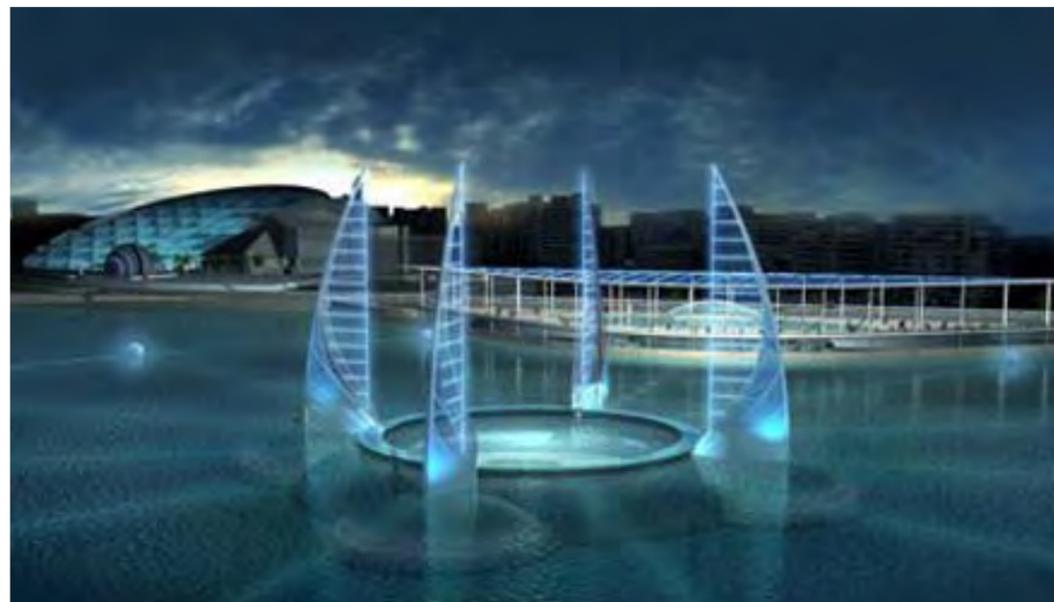
adventure of underwater habitats. In 1974, he created the Centre for Sea and Space Architecture, later labelled Space and Sea Association.

He specifically worked on technical and scientific projects that would lead him to his first underwater houses (Galathee in 1977, Hippocampe, Aquabulle, Aqualab, etc) and under-sea observation boats and vessels (Aquaspace, Aquascope, etc).

An experienced diver, he is much involved with children and education and considers teaching about the wonders of the underwater world a key to building tomorrow's society. He is therefore the architect of the main Sea Centres in France (Nausicaa in Boulogne sur Mer, Oceanopolis in Brest) as well as the Culture and Science Museum abroad (Sea Pavilion in Osaka).

Nowadays, Rougerie still spends a lot of time creating sea-related projects. He is currently working on the Underwater Archaeological Museum of Alexandria (Egypt) and on the City in The Ocean project in Abu Dhabi, a marine city with underwater park and housing.

Still much involved with space adventure, he participates in the underwater training program for NASA astronauts (Neemo) with his friend Bill Todd. A synthesis of all his work and experience, the SeaOrbiter project combines underwater observation, scientific monitoring of the ocean and human and scientific adventure through the main oceans of our planet. ■



Rougerie's vision for an Underwater Museum in Alexandria gets the go-ahead from United Nations

Cleopatra's palace sank long ago into the Mediterranean in the harbour of Alexandria, Egypt, but visitors may eventually view the complex's remnants via the world's first underwater museum which the UN plan to establish in the port.

The proposed underwater museum in Alexandria, Egypt, came closer to reality in September 2008, when the UN established a committee to

aid the design process with the Egyptian government.

If built, the museum could display treasures and monuments of her palace, which once stood on an island in one of the largest human-made bays in the world but were submerged by earthquakes from the fourth century A.D. onward.

Cleopatra's palace was built on an island in one of the largest human-made bays in the world. Earthquakes unfortunately submerged her opulent lair until the 1990s when archaeologist-divers found the thousands of precious objects. ■

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Have website, will dive

PADI has been around for a certain number of years now, and so has their website—the same old one, I mean. Okay, perhaps I am not being fair. It is a fairly good website, but in today's lightning-paced online rat race where everything you see today is gone the next moment you glance back, it took us a while to see their new and improved online face. But it finally did happen.

PADI will launch its new and improved version on October 22, and I was given the preview tour on a web-based seminar this last week.

Among its new features, the new PADI website will be easier to navigate, have more online information regarding training—for those who ask themselves, "Okay, I'm certified, now what?"—equipment selection, online courses (the Advanced OWD course is now available online on their eLearning® area), travel tips, how and who to "Go Pro!" with, news and events, and so on.

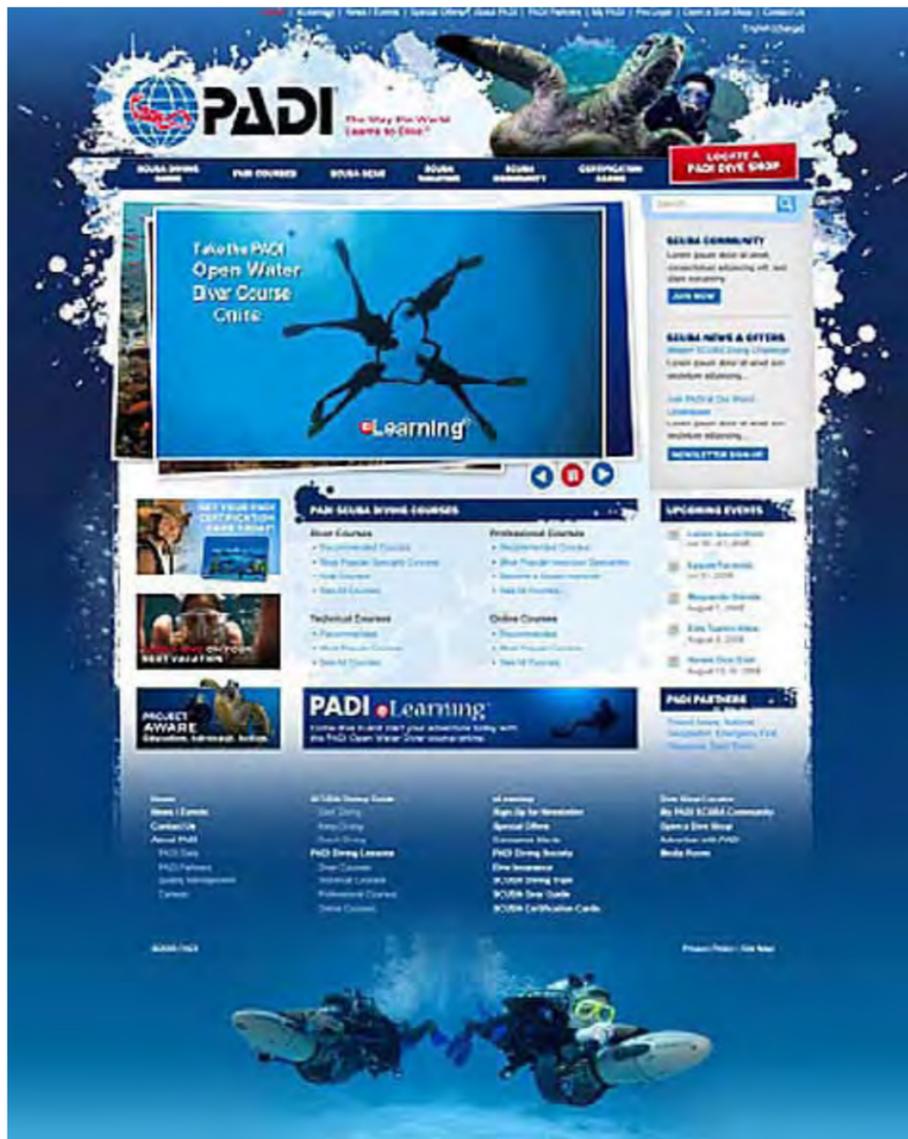
In their current version, PADI had made an earlier effort to give it's website a "2.0" feel, with the "My PADI" area (Wow, I haven't been there in a while myself).

Unfortunately, it came on too early, when online budding wasn't an issue yet and, later on when it was a big deal, it didn't evolve in the same manner as today's better known online communities. I see more divers exhibiting (and actually using) their online profiles in several popular online community websites, such as MySpace, Orkut, Facebook and LinkedIn, than on PADI's. Again, I am not being fair, I don't think PADI could ever beat them; no other dive agency could—the best strategy would be to join them.

But the feature that I believe will make the difference is the new "Dive Shop Locator". More often than not, divers need help on what ever diving issue crushes their soul, and the dive shop is their promised land. Divers regard the dive shop as a haven for information, a truly reliable source for training, equipment and travel options—or simply an opportunity for good ol' chat-tin' with your friendly neighborhood dive pro. Even dive travelers need to feel welcome as strangers in a strange land and, with the internet

doing what it does best, only the very alienated won't at least try to Google their destination beforehand.

This time, PADI did work out a keen strategy by using Google's best geo-locator tool, Google Maps, as a way for divers to pinpoint PADI dive centers across the globe. As almost everyone now uses Google Maps to locate places and dig up information, this could not be more user-friendly. If enough PADI stores and schools take the time to update their profiles on the website, maybe the world will indeed become smaller and cozier. ■



PADI in a Bottle

New certification: Open Water

Diver – Controlled Environment
Controlled environment diving is sometimes the only option presented to many divers located in areas where access to the sea isn't at hand. Those man-made structures may include aquatic parks, specially designed oversized swimming pools, massive indoor tanks and large-scale aquariums. While not quite giving the same experience provided by open water dives, these environments do offer good visibility, interesting and often original features, and constant warm water conditions, something that some divers prize above all others.

Thousands of new divers begin their scuba training in these controlled sites, many becoming certified as PADI Scuba Divers. It means that, while certified for open water conditions, they can only dive under the direct supervision of a PADI professional.

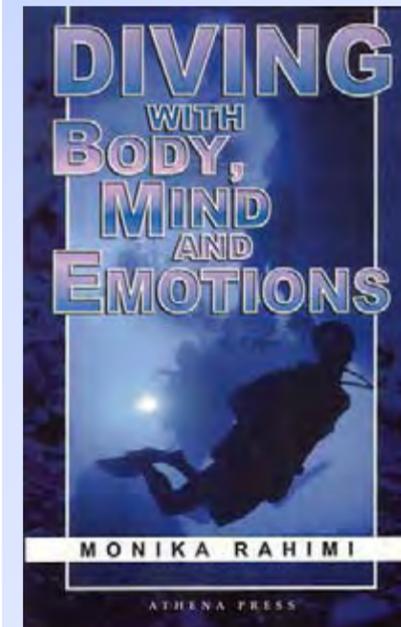
PADI now offers a new certification: Open Water Diver – Controlled Environment, that allows for unsupervised dives within the confines of controlled environments.

While much larger than standard swimming pools, controlled environments should not have the same unpredictable variables that exist in open water sites, even bodies of water other than the sea (such as quarries, lakes and so on). That way, divers won't need to consider these factors in their dive planning, a characteristic of PADI's standard Open Water Diver course. ■



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CO₂ makes oceans noisier

Sound now travels further through the ocean thanks to carbon emissions that have made oceans more acidic.

It is now common knowledge that oceans are becoming more acidic because of rising levels of CO₂ in the atmosphere, which dissolves in seawater to form carbonic acid. Less known is it that acidity can influence how far sound travels in seawater. For example, whales' calls, for example, travel further in the north Pacific than in the north Atlantic, due to differences in pH.

Exactly how the process works is unclear, especially at frequencies below one kilohertz, which include whale calls, crashing waves and noise from shipping. "At these frequencies, the exact molecular mechanism is still a bit fuzzy," said Peter Brewer of the Monterey Bay Aquarium Research Institute in California.

It has been hypothesised that ion pairs of carbonate, bicarbonate, boric acid and borate are tuned to absorb sound wave energy of 1 kHz and below. The acidity of the water affects the balance between these chemicals.

The predicted drop in ocean pH by an average of 0.3 before the end of this century would cause a 40 percent decrease in the absorption of sounds below 1 kHz. "The ocean will have higher levels of ambient noise, marine mammals will communicate at greater range, and military or industrial sounds will travel further," Brewer said. ■ SOURCE: GEOPHYSICAL RESEARCH LETTERS



Climate zones shift south as Australia's northern oceans warm

Since the 1950s, average sea surface temperatures in northeast and northwest tropical Australian waters have increased steadily, causing a 200km shift southwards of climate zones along the northeast coast and an expansion in the area that can be designated "the tropics".

According to senior AIMS scientist and climate change team leader, Dr Janice Lough, who has published her findings in the journal

Geophysical Research Letters*, if current trends continue, annual sea surface temperatures in northern Australian tropical waters could be around half a degree warmer, and those of more southern parts, about two degrees warmer within the next 100 years, with dire consequences for our coral reefs, particularly those in the more southerly areas. ■

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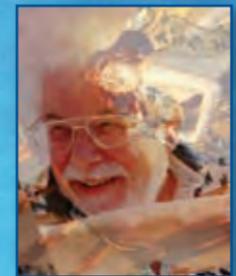
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Seaweeds stunt coral growth

Seaweeds resort to chemical warfare to beat corals for the sweet spots on a reef surface.

Chemicals released by the algae into the water can have a significant impact on the success of coral recovery after damage. Following damage to a reef, algae nearly always beat the corals in the race to resettle the devastated area. Researchers have proved that some seaweeds or algae produce toxic chemical signals that deter coral larvae from settling on reefs devastated by bleaching, storms or other impacts. Meanwhile, coral larvae may also use algal chemicals to find a place to settle.

"Seaweeds produce a wide range of chemicals, some of which encourage coral larvae to settle and some of which repel them," said Laurence McCook of ARC Centre of Excellence for Coral Reef Studies.

These chemical mechanisms may have important implications for the long-term survival of coral reefs globally and their ability to regenerate after damage from coral bleaching, which is expected to become more frequent and devastating under climate warming, he said.

A lot then depends on which algae dominate the new system, and whether there are enough fish, turtles and other herbivores around to 'mow' the weeds and give the corals a chance to re-establish.

The researchers looked at three kinds of seaweeds and found that a green seaweed called Turtle Weed had a powerful deterrent effect on coral larvae, which refused to settle and

appeared stressed. Larvae had difficulty settling with a second seaweed, and a third produced chemicals that actually encouraged coral settlement.

"On the Great Barrier Reef, we have been relatively lucky, but elsewhere, we have seen a number of instances where seaweeds simply took over the reef, completely preventing the corals from coming back," said McCook.

"The greatest threat seems to be when we get thick mats of algae combined with sediment runoff, which smother the reef and stop corals gaining a foothold—a serious problem for our coastal reefs," he added. ■



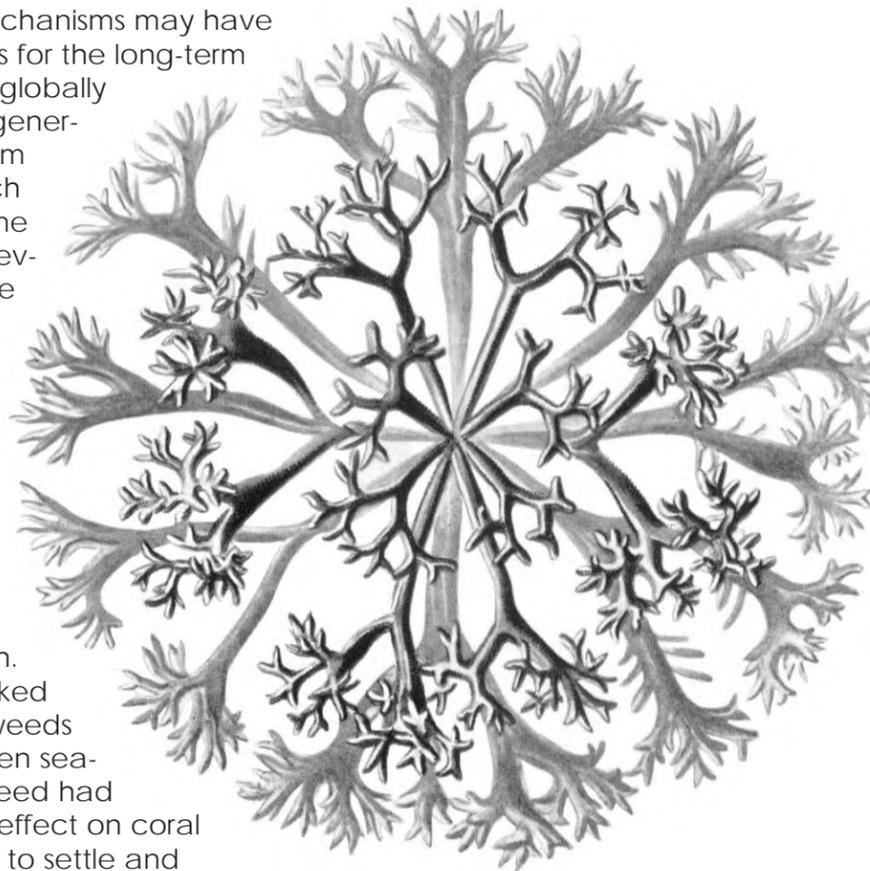
How corals react to night and day

Researchers have uncovered a gene in corals that responds to day and night cycles. This could lead to a better understand of how symbiotic corals work together with the algae they are hosting.

Shallow water corals have developed symbiotic relationships with photosynthetic dinoflagellates, which they harbour in their organisms. The dinoflagellates use sunlight to produce energy for the coral, which in turn use that energy to construct mineralized skeletons for protection. This process, coral calcification, is synchronized with the diurnal cycle through molecular mechanism, which remains unclear.

Aurelie Moya and colleagues have now characterized the first coral gene that responds to the light cycle. The gene makes an enzyme that converts carbon dioxide to bicarbonate, and it is suggested that it becomes more active at night to cope with acid buildup during the night.

The calcification process requires many hydrogen atoms, which during the day, can be removed by photosynthesis. At night, however, hydrogen accumulates, which increases the acidity of the coral, and therefore, the enzyme creates extra bicarbonate as a buffer to prevent acid damage. ■



Irish moss, *Chondrus crispus*, a red algae that might encourage coral settlement

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16th-century Portuguese treasure wreck found in Namibian sand

Off the Namibian coast, geologists prospecting for diamonds stumbled upon a very well preserved 16th century shipwreck laden with treasure. Namibia's Information Ministry announced that the wreck is of a 16th century Portuguese vessel, which was bound for Asia. The cargo included 2,000 gold coins, copper ingots and 1.4 kilograms in silver coins.

A trident-like seal indented on the ingots reveals that they were supplied by German merchant Jakob Fugger, a known supplier to the Portuguese crown during the Habsburg dynasty.

The shipwreck is located near Oranjemund, about 160km south of a small diamond mine. Its good condition is attributed to being buried in sand, which preserves wood.

This is an important archeological find, since navigational instruments were also identified among the remains of the vessel. Cannons and elephant tusks also found scattered on the seabed. This find will provide scientists with a rare insight into the heyday of seafaring explorations between Europe and the Orient.

There has been some initial specula-



tion about the vessel been linked to Portuguese explorer Bartholomew Dias, the first European to round Africa's Cape of Good Hope. This was quickly dismissed by archaeologists, as some of the gold coins found were dated October 1525, 25 years after Dias went missing.

Researchers believe that this might be the oldest shipwreck ever discovered off the coasts of sub-Saharan Africa.

A team of archaeologists and geologists from Namibia, the United States, Portugal, South Africa and Zimbabwe is working on the site. As keeping the sea at bay while the excavations are taking place is very costly, there is great pressure for the work's completion by early October. ■



Amazing finds on the bottom of the Thames



Screenshot of *HMS London* from BBC documentary on Thames shipwrecks. *London* was accidentally blown up in 1665 and sank in the Thames Estuary. Image released into the public domain by the BBC

Shipwrecks found at the Thames riverbed

A joint operation between The Port of London Authority (PLA), which regulates the river, and Wessex Archaeology, is documenting and clearing up seven shipwrecks from the Thames Estuary. These are only a few, as trade and war caused roughly 1,100 vessels to go down over the centuries.

Wessex Archaeology has been advising the PLA, since 2003, on the safeguard of archaeological and historical interest of these channels' shipwrecks. The project, part of major expansion plans that include new dredging in the existing channels, also has practical objectives, as jagged metal and debris may pose a serious threat, especially to large cargo ships that can skim within half a meter of the riverbed.

Among the wrecks located, researchers found a warship that was blown up in 1665, the trading ship *Dovenby*, a yacht converted to a Second World War gunboat, an unidentified vessel in which divers found a personalized gin bottle and an amazingly well-preserved shipwreck of the *HMS London*, the oldest find of the lot. Over a dozen divers used 3D survey equipment to locate the wrecks in near-zero visibility.

The British Broadcast Company "BBC2" aired a two-episode documentary titled "Thames shipwrecks: a race against time", relating the history behind the struggle over the Thames estuary and the Empire's busiest trading and shipping river. ■



Diva shipwreck may have been found

Nancy shipwreck of 1784 is finally located off Scilly islands

The loss of the *Nancy* has been one of the most intriguing shipwrecks to date, and a tale that seems to include all elements of a romantic drama: a beautiful actress, a tragic shipwreck and a lost fortune. Now this fabled wreck may have been found by British divers, Todd Stevens and Ed Cumming, who spent a year searching for her.

Still showing inconclusive results, the evidence recovered so far leads them to believe it is *The Nancy*, a packet ship from India that, in 1784, wrecked on the rocks off Cornwall, dooming 49 pas-

sengers and Ann Cargill, an internationally renowned actress and opera singer who was returning to England.

18th century superstar

The 23-year-old star, a celebrity with the same caliber as an 18th Century Madonna (she was as renowned for her scandalous love-life as for her talent), had been performing in Calcutta, where her latest lover was stationed with the British East India Company.

The star was adored worldwide by the late 1700s theatre audiences and charged 'astonishing' fees to play in the top London theatres. Besides amassing huge fame and riches, she had also collected a series of lovers, and there were rumors she had given birth to an illegitimate child. Not unlike many of today's superstars, her business cunning made her extremely rich, as she often took a share of the profits on top of her payment. Her vast personal fortune—cases of valuable jewels—supposedly sank with the vessel. According to official logs in India, the wreck might contain more than £200,000 worth of jewels and gifts from her various scandalous lovers.

Following the accident, bodies were recovered by searching parties, including a woman clutching her

Ann Cargill (born Ann Brown) (1760 - March 4, 1784) was a British opera diva and celebrated beauty whose life and death were a sensation in London at the close of the 18th century. On a return voyage from India, her ship wrecked and sank off the Isles of Scilly in February of 1784. Her body was found, dressed in a chemise, with an infant clutched in her arms.

dead baby, whom rescuers were unaware was Ann Cargill's. She was afterwards buried in a pauper's grave. Only when her paperwork was sent to London, did officials realize who she was. Soon after that, her body was exhumed and reburied in the Sicily's St Mary's Basilica.

As English newspapers published the tragic account of Cargill's death and her 'floating in her shift and her infant in her arms' tale, it all grew into local legend. It tells of her lonely spirit, which still haunts the spot where she perished, singing a ghostly lullaby to her child.

Searches in the wrong place

Since the 18th century, divers have been trying to locate the wreck, but they may have simply been looking in the wrong place. Cumming said that a contemporary record of the tragedy had the ship mistaken for its survivor's lifeboat: "It had been written that they 'were driven' onto Rosevear Island by the stormy sea, and most people took it to mean *The Nancy*."

Stevens added, "Doing this has been so rewarding. We are still trying to piece together the human stories around the wreck, but it has been a real thrill. This kind of discovery is what you go diving for." They have "adopted" the wreck through the Nautical Archaeology Society (www.nasportsmouth.org.uk), and any treasure will have to be logged and reported to the Receiver of Wreck at the Maritime and Coastguard Agency.

Scattered over at least 300 square meters, it makes diving on the site difficult and possible only under certain weather conditions. The two British divers, who have now written a book called *The Ghosts Of Rosevear*, have yet to discover any treasure on board, but plan to hand all materials over to the Isles of Sicily Museum. ■



Aikoku Maru is one of many shipwrecks in Chuuk lagoon stemming from one of the biggest naval battles during WWII. On 17 February 1944, the *Aikoku Maru* was attacked by *Avenger* dive bombers. She was hit by two bombs in the front part of the ship, causing the *Aikoku Maru* to explode violently

Chuuk Lagoon at risk from oil leaking from WWII wrecks

Filled with shipwrecks, what used to be known as "The Pacific Theater of Operations" in World War II, is today a much valued destination for all sorts of diving enthusiasts, ranging from wreck aficionados to coral and marine life photo amateurs. Chuuk Lagoon evokes clear blue waters, colorful corals and an exuberant underwater life. But many of the corroding Japanese and American planes, tankers and submarines are now starting to leak toxic fuel and oil; scientists estimate that the millions of liters still contained in the wrecks could lay waste to the area's entire ecosystem.

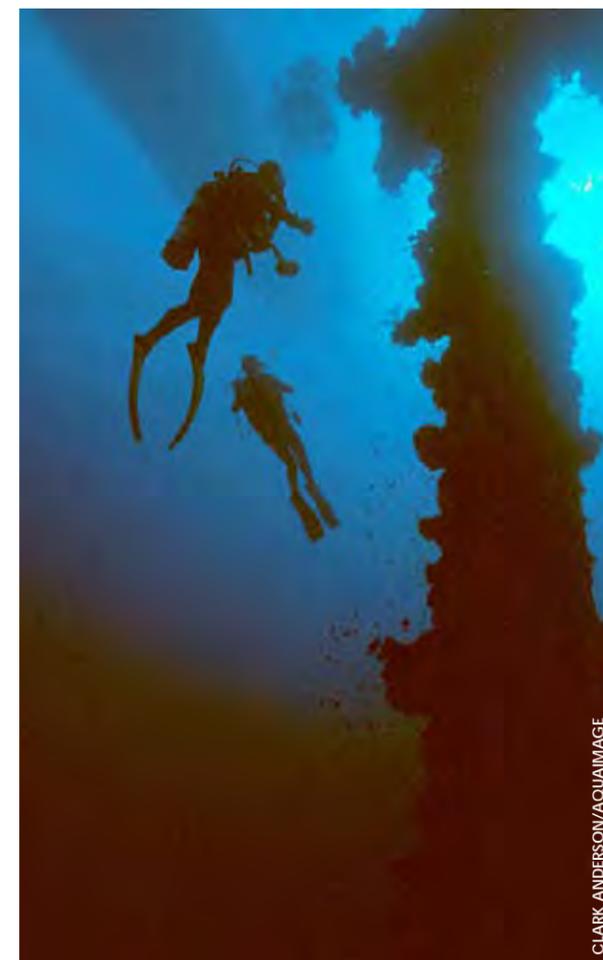
The Federated States of Micronesia, a four-island state archipelago to which Chuuk belongs, has tourism as its main source of income, particularly for its diving and fishing industry. An oil leakage on a scale as predicted could create havoc to its delicate economy, a grim perspective to the population of more than 50,000 residing in around 200 islands.

Three sunk tankers alone have a combined capacity of roughly three quarters of the Exxon Valdez catastrophe. Dr Bill Jeffery, from James Cook University, believes that most will be released in the next five to ten years, a certain loss to the environment

Divers next to the mast of the another wreck in Truk Lagoon, the *Unkai Maru*

and everyone concerned with it. However, what is less clear is who will take responsibility for cleaning it up.

Japanese and American authorities still claim ownership or interest in their sunken military vessels, as draining the oil from the wrecks may cost millions but the cargo is also still worth a lot more. ■



CLARK ANDERSON/AQUAIMAGE



Text by Millis Keegan

A Symbol of Power

When a lion figurehead was found imbedded in the bottom sediment next to the sensational well-preserved 17th century wreck that was discovered in the archipelago of Stockholm a few years back, the archeologists of the Maritime Museums of Sweden had one more clue to the mystery of the ship's origin.

During the 17th century, the lion was a symbol for power. A lion figurehead sent a message about its owner's position in society. This find, plus the fact that a canon

and an escutcheon belonging to a noble family in England was found aboard, could mean that the ship was used for more than trading. A lot of information could

come from examining the figurehead more closely, but since the figurehead was halfway buried and eroded, it was difficult to investigate it under water. A decision was made to salvage it for further documentation, but only for a few days. Then, it would be returned to the site.

Monday, 30 September 2008, the figurehead was salvaged from the deep. During the dive, a couple of planks were salvaged as well, which will undergo dendrochronological tests, to see

how old the wood is. The following week, the archeologists were busy working with the figurehead.

The lion was measured during the days with an optical scanner to create a 3D computer model. At night, it was resting in an inflatable pool to keep it from drying out. Thursday, 2 October, the figurehead was returned to the wreck. The sculpture will now be compared to *Vasa's* sculptures, and there will be tests made to see if it has been painted.

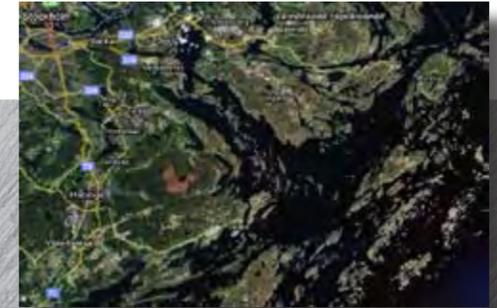
Why return the figurehead?

The opinion of the Maritime Museum is clear: "The wreck site is a magical, unique imprint of the past, and should remain as untouched as possible, as part of a fantastic underwater museum," said Andreas Olsson of the Maritime Museums of Sweden.

Underwater museum

When the well-preserved wreck from the 17th century was found in 2003, the researchers were really excited. Finds indicated that the wreck could be more

important historically than even the world famous *Vasa* ship itself. The Maritime Museums of Sweden has, since the find, worked towards creating a one-of-a-kind Historical Wreck Park. Their vision is to offer guided tours to wrecks in the region spanning an era of 400 years. That might take some time, since the wrecks are protected by law, and diving is not allowed, but progress is being made. ■



Niklas Eriksson

NE 07



Virtual dives on Europe's sunken wrecks

Underwater archeological sites and wrecks are commonly threatened by erosion, deep-sea trawling and looting. Now archaeologists from 11 different institutions across Europe have teamed up with computer experts to develop 3D models of underwater sites in an effort to preserve and share this knowledge with other scientists and the general public.

Emulating the cockpit view of a virtual submarine, researchers using the software will be able to explore the sites and decide about future excavations without going out to sea, a usually time-consuming and costly venture.

The Venus Project (Virtual Exploration of Underwater Sites) has, so far, developed a digital representation of two shipwrecks: 200 AD Roman ship, located off the island of Pianosa, in Tuscany, and the *Barco da Telha* ("roof tile boat"), an early 18th century vessel that sank off Sessimbra, Portugal. A second Roman wreck, located off Marseilles, is due next.

Another advantage of the simulator is that researchers can add in elements that are no longer

available, in order to clarify the site's details and improve on the whole viewing experience.

All elements presented in the simulations are in precisely the same arrangement as on the sites. For accuracy's sake, researchers conducted sonar surveys from the surface and obtained information from a robotic submarine. This provided more detailed sonar data, as well as clear images of the wreck itself. The simulator is currently on display at the Deep aquarium, in Hull, England.

By early 2009, the simulator's software should be made available at the project's official website www.venus-project.eu and will run on standard personal computers. link: piccard.esil.univmed.fr ■



Re-sinking the *USS Spiegel Grove*

The *USS Spiegel Grove* is a Landing Ship Dock (LSD 32), which has been sunk to create an artificial reef in Key Largo

ScubaBoard and DiveNav are announcing collaboration with two premier dive shops in the Florida Keys to develop a virtual dive site of the *USS Spiegel Grove*.

"At the time of its sinking, the *Spiegel Grove* was the largest ship ever intentionally sunk to create a new reef for divers," said Captain Slate, owner of the Atlantis Dive Center, "and as of today, she remains one of the largest ships in the world ever scuttled for that purpose," he continued.

The *USS Spiegel Grove* is a Landing Ship Dock (LSD 32); she is 510 feet in length and 84 feet wide, and she now rests at a depth of 134 ft near Dixie Shoals in Key Largo.

ally visit real locations.

"The Upper Florida Keys is one of the top destinations in the country for divers and snorkelers," said Captain Gary, owner of the Conch Republic Divers. "By offering a virtual tour of the *USS Spiegel Grove*, you will be able to see this massive artificial reef and how the abundant sea life have now made it their home," he continued.

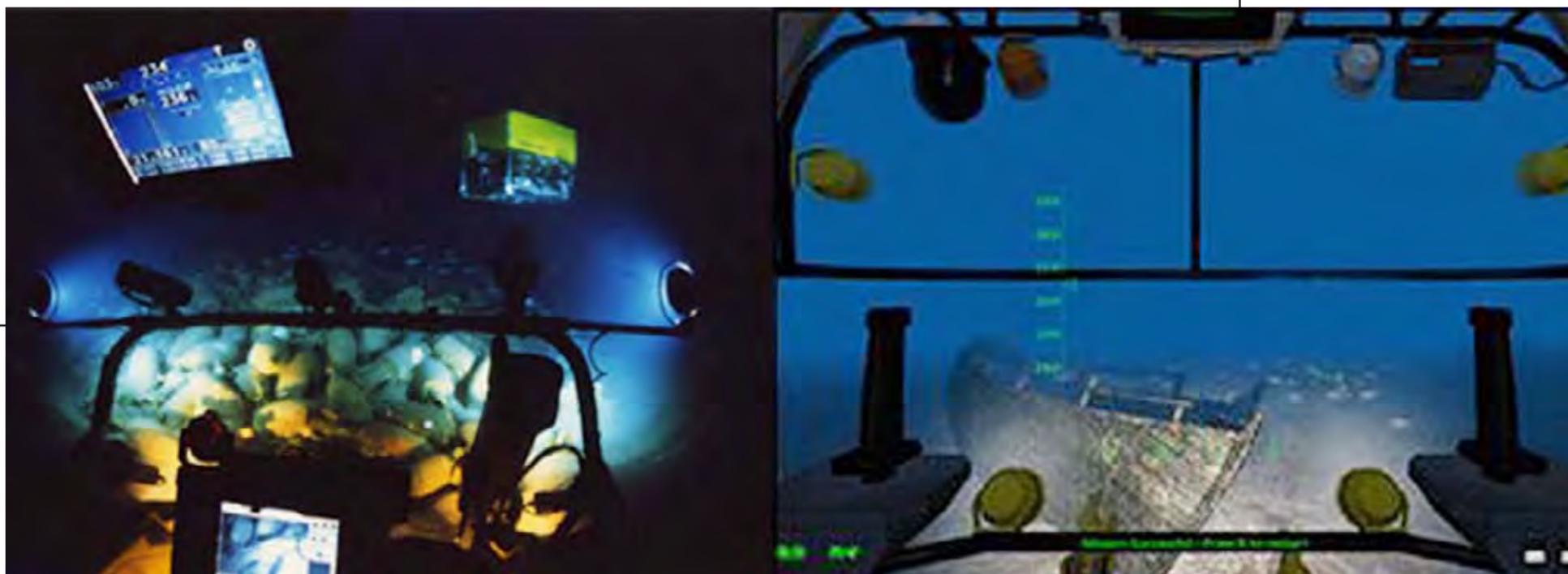
"We are glad to collaborate with ScubaBoard and with local experts such as Captain Slate and Captain Gary," said Alberto Mantovani, president and CEO of DiveNav. "We are calling upon the Florida's diving community and upon ScubaBoard's members to contribute their expertise to this project, so we can make the *USS Spiegel Grove* accessible to a wider audience," he added.

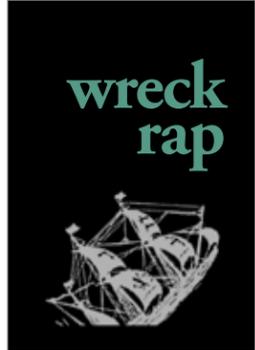
Please check with Atlantis Dive Center or Conch Republic Divers to see how you can become a part of this exciting project.

ScubaBoard and DiveNav are planning to demonstrate virtual diving on the *USS Spiegel Grove* at the DEMA Show, booths number 2409 and 4951, respectively. ■

"Once this project is completed, anyone with a computer and access to the Internet will be able to virtually dive the *USS Spiegel Grove* using eDiving," said Peter Murray, president of ScubaBoard. "The *USS Spiegel Grove* is one of the best dive sites in Florida," he added.

eDiving, developed by DiveNav, is the virtual underwater world that allows divers, snorkelers and marine enthusiasts to virtu-

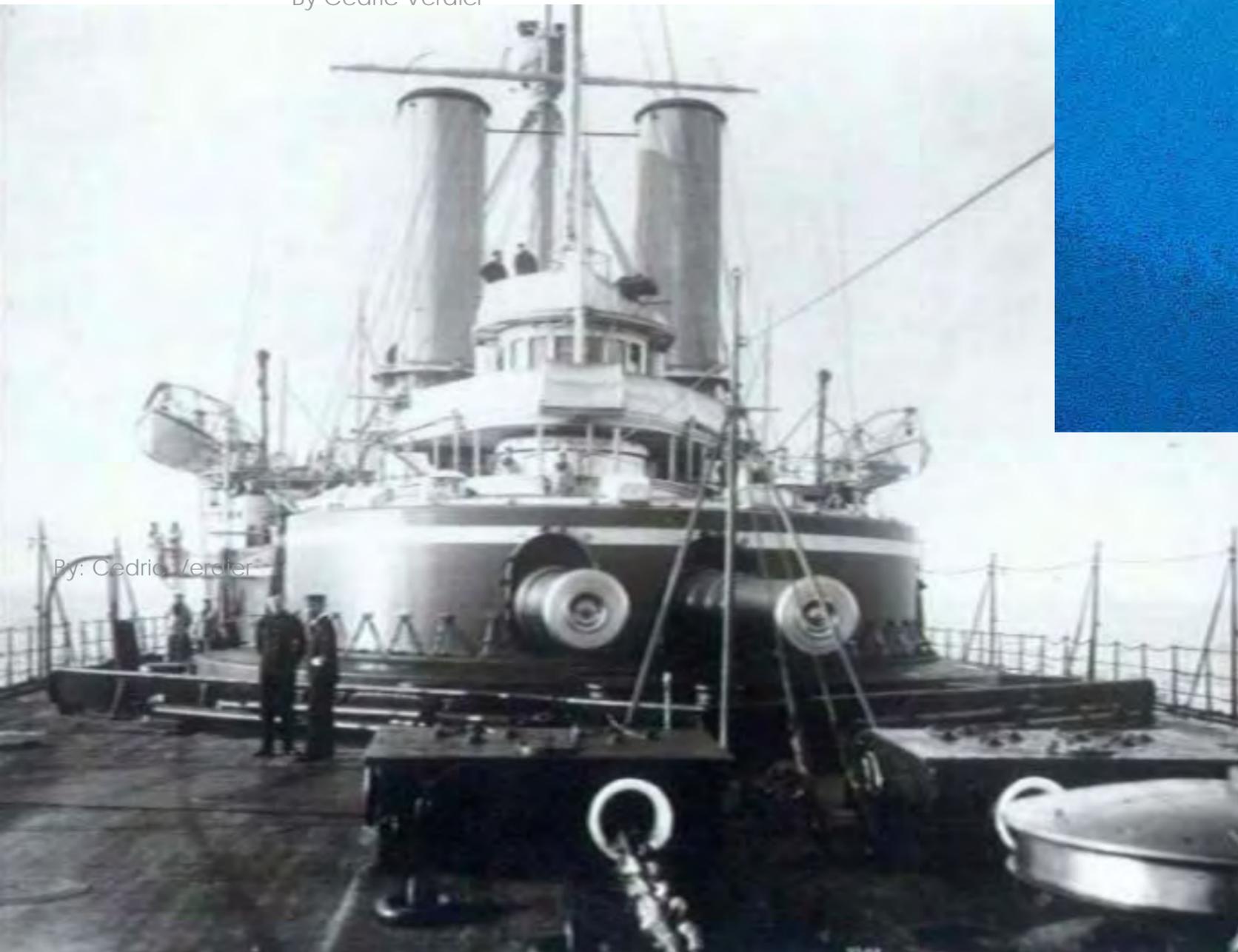
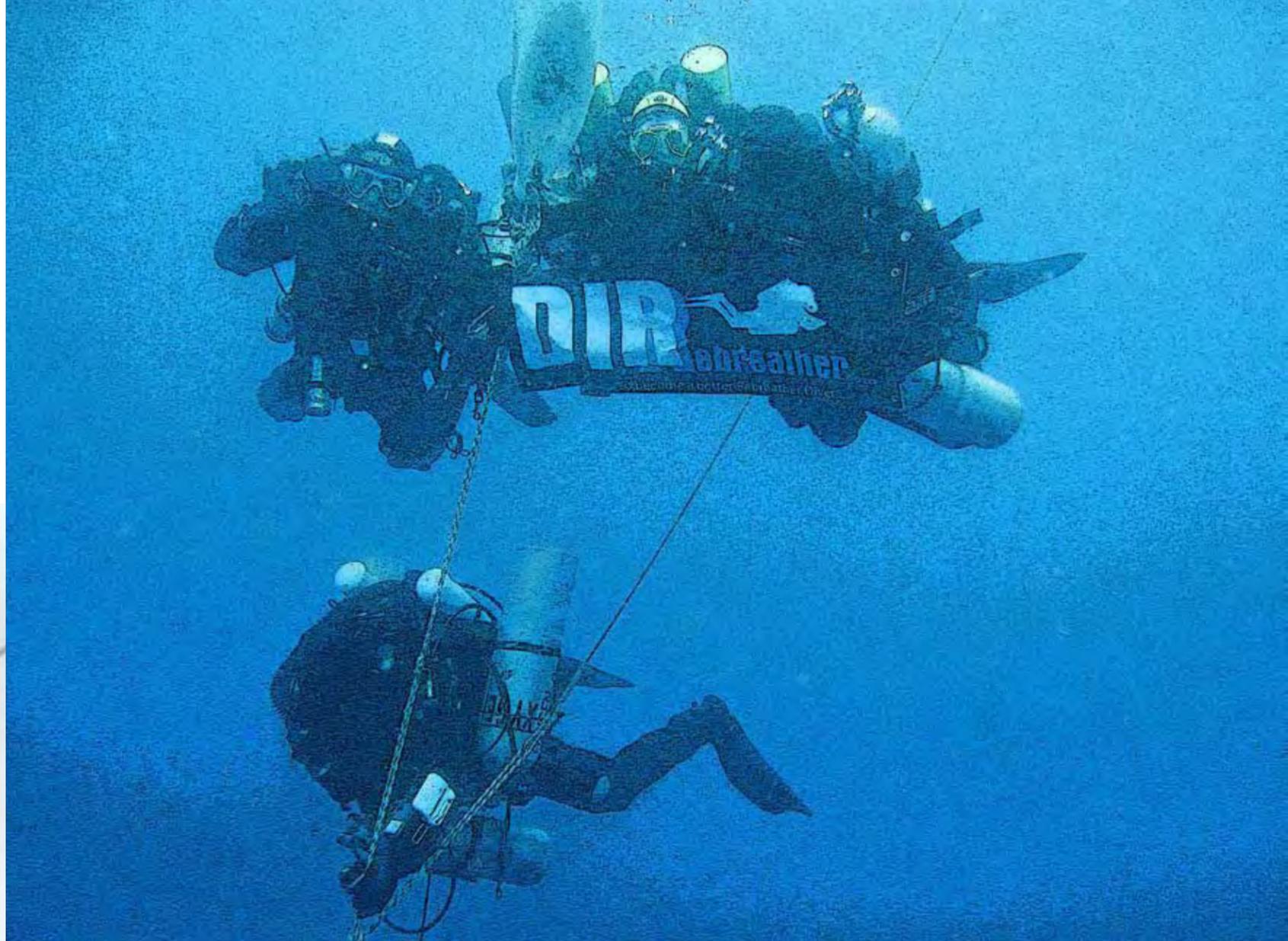




No Secret for *Victoria!*

What does a fish exporter from Norway, a Chief Information Officer and diving instructor living in the Netherlands, a renowned lawyer based in Cyprus, a Project Manager working in Sweden, and an expat French Technical Diving Instructor have in common?

By Cedric Verdier



HMS Victoria was one of two Victoria-class battle-ships of the Royal Navy. On 22 June 1893 she collided with HMS Camperdown near Tripoli, Lebanon during manoeuvres and quickly sank, taking 358 crew with her, including the commander of the British Mediterranean Fleet, Vice-Admiral Sir George Tryon. She was the first battleship to be propelled by triple expansion steam engines and also the first Royal Navy ship to be equipped with a steam turbine, which was used to power a dynamo.

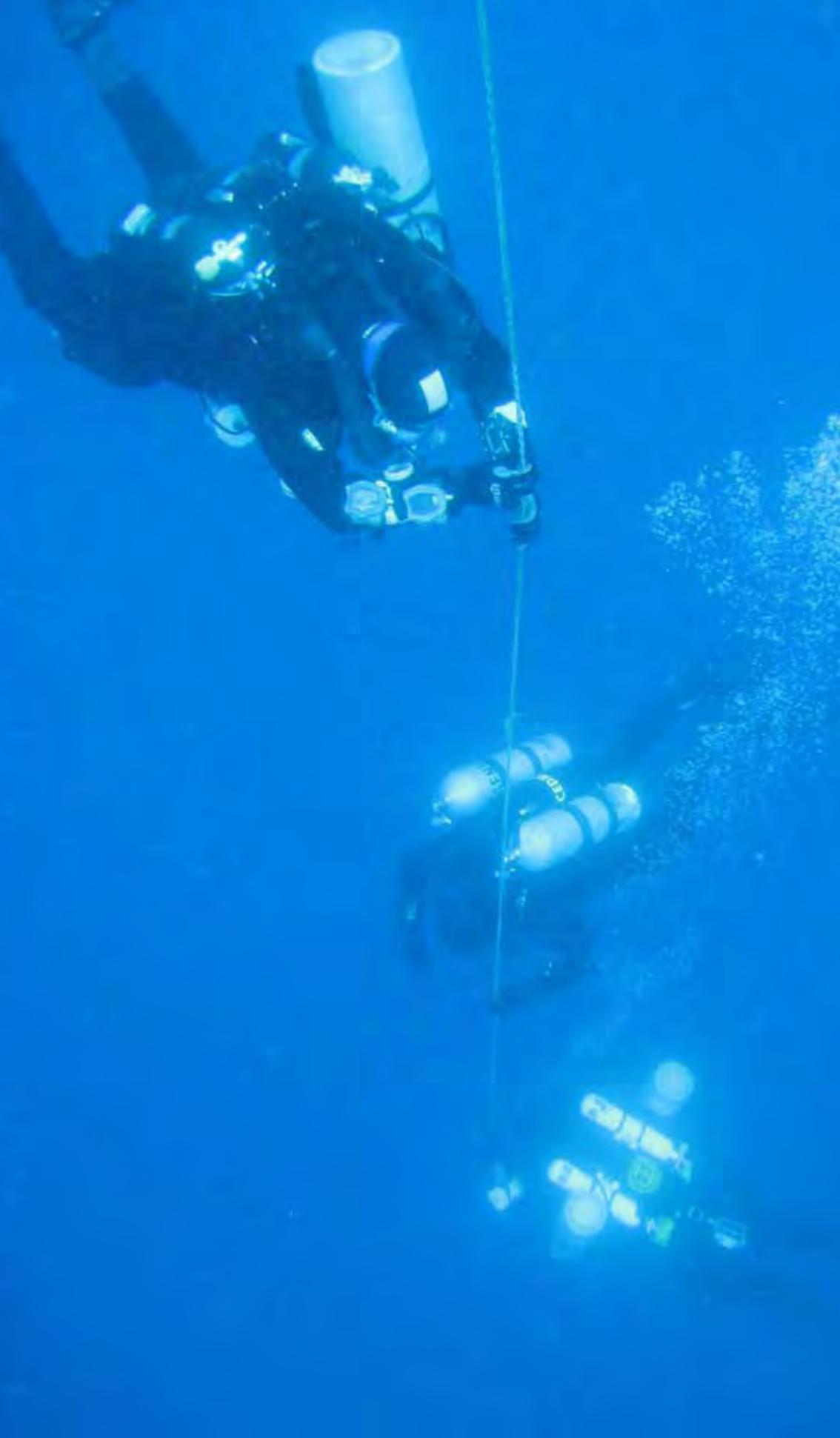
Apparently nothing—except their love for underwater wrecks and their desire to explore some of the most famous ones all over the world.

A few months ago, Per Bjorn Rakvag, Pim van der Horst, Spyros Spyrou, Henrik Enckell and Cedric Verdier decided to go on a wreck expedition to Lebanon. The purpose was to explore the *HMS Victoria*, a British battleship that went down in 1893 and now lies a few miles off Tripoli, between Beirut and the Syrian border, resting at 140m (460ft). The divers were equipped for the challenge ahead with Megalodon Closed-

Circuit Rebreathers and diving according to the principles set forth in the DIRrebreather diving standards.

Spyrou and Verdier had been discussing diving the *HMS Victoria* since the summer of 2007. The impressive wreck is quite unusual in the sense that it stands up vertically rising up from 140m to 77m with her bow deeply embedded in the thick layer of sediment. Spyrou contacted ambassadors and officials from Cyprus and Lebanon to obtain all the necessary permissions. Soon he came in touch with Christian Francis, owner of Lebanon Divers who first





Lebanon!?

When you mention to someone that you are going to Lebanon, you get this same strange expression back—a delicate mix of surprise and worry. Lebanon is anything but the usual, off-the-shelf diving destination. After so many years of civil wars, conflicts with the neighbouring countries, and military actions against extremist groups, Lebanon is not any more the coveted and classy tourist destination that it once was.

The southern border is still quite “active”, and Beirut International Airport has been closed repeatedly in the recent years. But one has to admit that Lebanon is a beautiful country, and it is well known for its surprising nightlife, its extremely rich archaeological heritage, and the warm hospitality of its inhabitants. Lebanese

located the wreck.

During that time, thanks to the DIRrebreather forum and its members, Verdier spoke with several experienced rebreather divers who wanted to participate in this interesting project, and before long, a team was formed.

However, it takes a good deal more than dedication and tenacity to get a project like this off the ground. You also need experience, and above all, financing.

The plan was for the team to first gather in Cyprus a few days before the trip to Beirut, but airlines sometimes work in mysterious ways, and as a consequence of multiple delays, some of the participants had to go directly to Lebanon. Some of them even used a Rolls-Royce as a taxi to the airport!





In 2004 the wreck of the *Victoria* was discovered by diver Christian Francis. She was found in 140 metres of water.

The most amazing aspect of the wreck is that unlike all others she sits vertically with about two thirds of her above the sea bed.

people, most of whom are multi-lingual, have also learnt to live with war and enjoy peaceful moments in their stunning landscapes.

Once very westernized in their tastes, religion and manners, Lebanese people enjoyed close ties to France and the UK. That is also the reason why a fleet from the Royal Navy went to anchor off Tripoli, a couple of hours north of Beirut. According to the Naval Historical Collectors and Research Association (Review Autumn 2007): "The tragic sinking of the 10,470-ton



Blad of one of the giant propellers

HMS Victoria remains the Royal Navy's biggest peacetime disaster ... On 22 June 1893, 22 officers and 334 of her crew were drowned after the *HMS Camperdown* accidentally rammed the Mediterranean flagship in an elaborate and ill-judged fleet manoeuvre ordered by Vice-Admiral Sir George Tryon KCB."

Within only 13 minutes, during which most of the crew managed to abandon ship, the proud battleship was pulled downward by the weight of 111 tons of her two forward-mounted main guns in their huge turret, while still being driven forward by her churning propellers.

After reading about a very epic court martial of the main officers involved at that time, and the many documented attempts to find the wreck, Christian Francis, a local Dive Centre owner, finally found her resting place, exactly where the battleship was last spot-

ted by the nearby Tower of Lions.

Why was the wreck so difficult to find? Simply because the wreck of *HMS Victoria* stands up vertically, which her bow deeply buried in a thick layer of mud, making searches with a depth sounder very difficult.

Diving *Victoria*

If you ask the five DIRrebreather members who explored this wreck in April what impressed them most about this wreck, you'll get five different answers.

Spyrou will tell you that "this wreck is clearly like no other, as it's so weird and disturbing to go down along what you are used to see horizontal". Van der Horst and Rakvag will speak about the pictures they took of the two impressive propellers pointing toward the surface. Enckell will maybe mention the artefacts and portholes, the fishing nets, and the huge

rear gun he looked at for a few minutes. Verdier couldn't help but explaining how a wreck of this kind could accommodate any level of Trimix Divers, ranging from the comfortable tour of the stern at 77m/250ft to the extreme exploration of the wreckage at 140m/460ft. In other words, it looks like *Victoria's* got something for everyone!

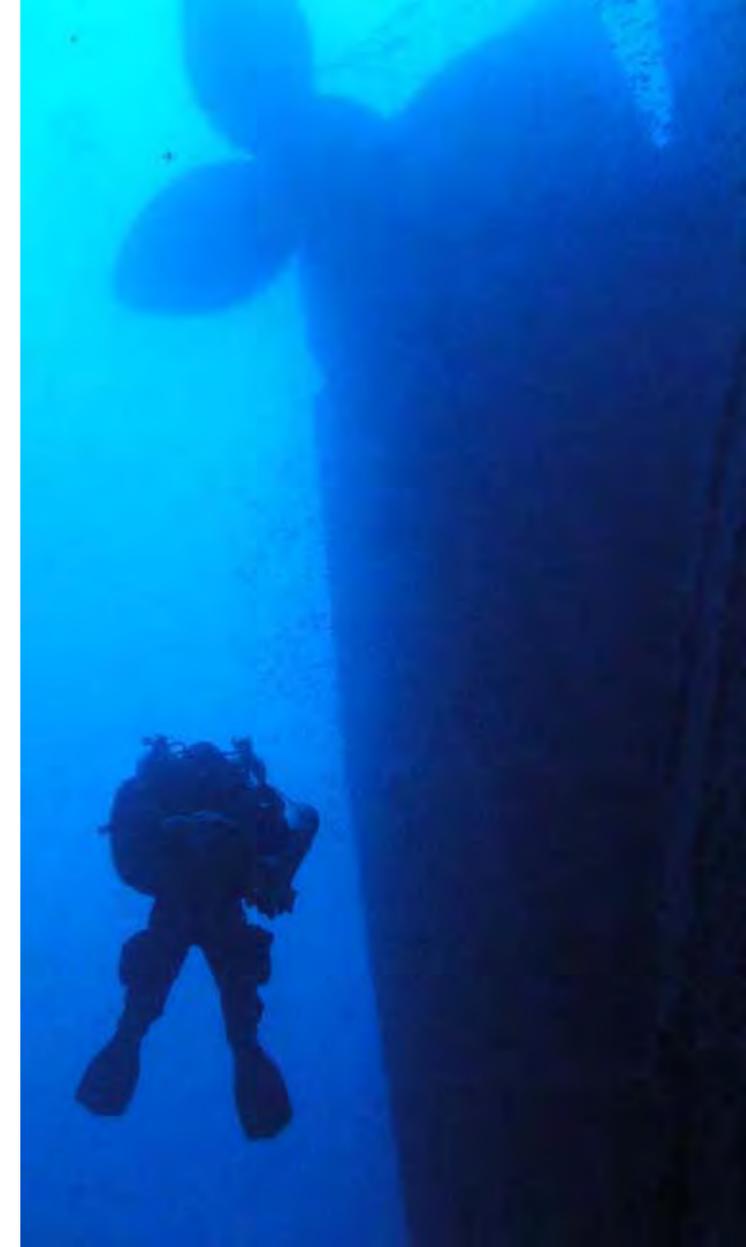
These five rebreather divers were so fortunate to arrive during perfect weather conditions to explore the whole wreck. They shot pictures and videos, paying their price at the end of the end with long decompression stops in 18° C (64F) cold water.

Thanks to the robustness of their Megalodon rebreathers, they didn't experience any sin-

gle equipment failure during their expedition in Lebanon. All the dives were done according to strict DIRrebreather team procedures, using standards mixes, set-points and decompression schedules.

None of the participants suffered from any sign of decompression sickness, which is an absolute requirement bearing in mind the remoteness of the location and the relative lack of state-of-the-art recompression chamber.

Apart from the trouble eating the local corned beef, everyone participated in a safe and extremely enjoyable deep rebreather diving expedition. ■



Edited by
Scott Bennett



Global credit crunch has detrimental effect on the diving tourism industry

The global credit crunch, coupled with soaring fuel costs and global economic instability, has forced one Australian tour operator to cease day trips to the Great Barrier Reef. As of October 12, Townsville's Sunsea Cruises will cease trips to Kelso Reef in the Great Barrier Reef Marine Park. General manager Darin McDonald says the service is no longer viable, and cancelling it was a difficult decision. "We've spoken to the Members of Parliament to try and cough up some money to try and make this thing happen," said McDonald. "We've looked at other options of how we can save this business and make a go of it, but realistically we can't see any other option but to have to close the doors." ■



Maldives Nature Trail

Shangri-La's Villingili Resort and Spa, Maldives, opening in the fourth quarter of 2008 in the Addu Atoll, will feature the first "Underwater Nature Trail" in the Maldives, as well as a snorkeling garden "seascaped" with transplanted corals. As part of the resort's marine initiatives, guests will also be invited to help track some of the archipelago's largest manta rays found in the Addu Atoll waters.

The Underwater Nature Trail, designed by the resort's marine specialist, will lead out to the resort's house reef on the northern end of Villingili Island. Submerged signage will identify resident marine life along the way, including branching corals,

sea anemones, Maldives anemonefish, clams, moray eels and the colourful juvenile Oriental Sweetlips. The marine specialist has also created snorkel gardens close to the southwest shoreline of the resort. In addition to offering a marine adventure for less experienced swimmers, the shallow-water snorkel gardens will provide a nursery for corals and reef fish.

Experienced divers will be invited to participate in the tracking of manta rays. Addu Atoll is one of the few places in the Maldives where giant manta rays with wingspans of more than five metres can be found year-round. Divers will be encouraged to photograph

manta rays and contribute to the photo database that will be shared with other such centres around the world to help monitor the movement and population of these sea creatures. The resort will also set up a programme to educate and encourage guests to sponsor the satellite tagging of sea turtles and support organisations working on conservation on a larger scale.

This will be the first resort in the Maldives to offer nature trails—both above and below water. With lush vegetation providing the backdrop for trails through the coconut trees and ancient Banyan trees on the three-kilometre-long island, guests will be able to enjoy all the natural wonders of Villingili Island, on land and sea.

Shangri-La's Villingili Resort and Spa is Addu Atoll's first luxury resort. Currently under development, the resort will boast 142 villas offering views of the ocean or the island's lush native vegetation. The Maldives' second international airport, Gan International Airport, is an eight-minute boat ride away while Male International Airport is 70 minutes by air. ■

Yoga and Diving Make for a Winning Combination in the Maldives



Located in a secluded nook of the Maldives' South Ari Atoll, the luxurious Conrad Maldives Rangali Island is encircled by some of the world's best dive sites. In order to embellish the underwater experiences of its guests, the resort has teamed up with Yoga guru Katy Appleton to offer unique Dive and Yoga Bliss packages from 20-30 October 2008.

As a keen diver herself, Katy has long recognized the benefits of yoga as a tool to enhance the quality of her diving experiences. In conjunction with the resort's Sub Aqua Dive Centre, guests will have a choice of two options: Discover Scuba/Yoga for beginners or Yoga Scuba for experienced and certified divers.

The beginners' course will commence with 90 minutes practicing specific yoga techniques focusing on breathing, meditation and relaxation techniques to assist with underwater relaxation. A diving programme in the resort's own reef, accompanied

by Katy and Sub Aqua Manager Alexis Vincent, will follow. Experienced divers can join Katy for 60 minutes of Yoga practice, followed by a boat dive enabling participants to practice their newly acquired breathing skills.

In addition, guests can choose from a variety of Retreat options, from spa treatments, fitness and yoga classes and consultations with visiting practitioners as well as the resort's own naturopath. A Dive and Yoga Bliss session costs US\$200/GB£115.

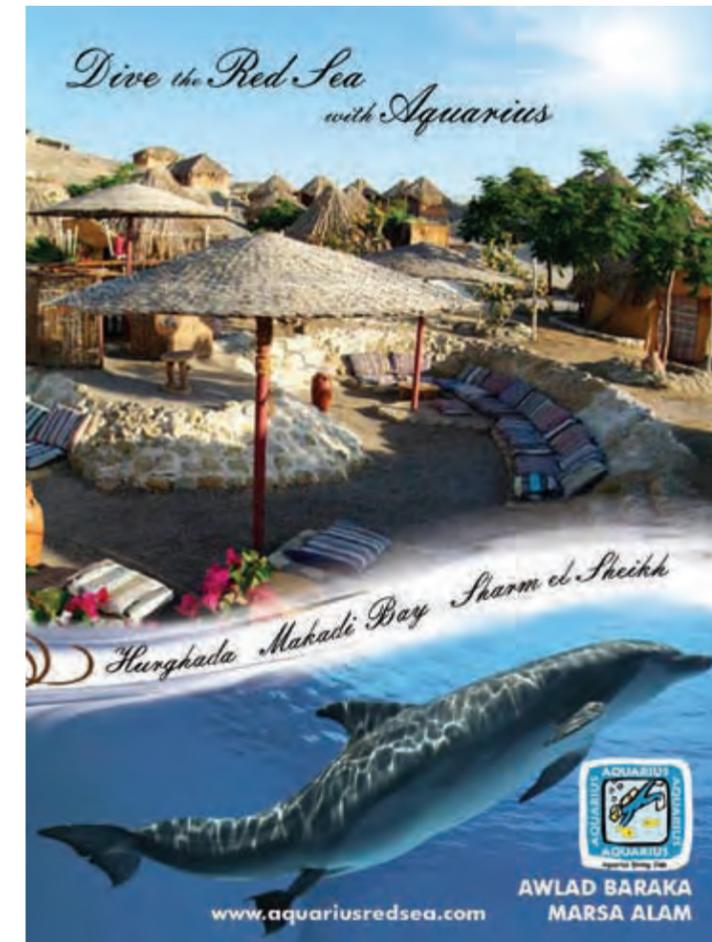
For additional information, visit Katy Appleton's website at: www.appleyoga.com. ■

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Edited by
Scott Bennett

Increased dive tourism is threatening reefs in the Red Sea

In a report to be soon published in the *Marine Pollution Bulletin*, a study conducted by Hasler and Ott have revealed sites with intensive diving activities bore significantly lower coral cover than un-dived areas. Studies were conducted on the reefs of Dahab in Egypt's South Sinai region, some of which receive over 30,000 dives annually.

Compared to areas with little or no dive traffic, findings indicated that reefs with intensive diving activities suffered considerably increased levels of coral damage. Corals situated on reef crests were considerably more affected than those sites encompassing reef slopes, with 95 percent of the branching corals broken. Some sites also bore the effects of sedimentation, an indication that heavy diver traffic was stirring up debris on the seabed. While fish life didn't appear affected, a reduction in coral cover may have serious repercussions in future.

In order for the reefs to recuperate, Hasler and Ott have recommended the implementation of ecologically sustainable dive practices, including a reduction in the number of dives allowed per site on a yearly basis. Also emphasized was increased education of dive guides and divers alike to help understand and maintain the integrity of the reef's delicate ecosystem. ■



Sabah Resort Says No to Sharkfins

At least one Sabah resort has taken steps to prevent sharks from being cruelly mutilated for their fins. Gayana Eco Resort will now refrain from serving shark fin soup at its recently refurbished Alu Alu Seafood Restaurant. By doing so, it has become the first tourism establishment in the state, and perhaps all of Malaysia, to implement a federal minister's call to cease serving shark fin soup at government functions. "Killing sharks and throwing them away just for their fins is a despicable and shameful practice that must be stopped," said Nilakrisna James, spokesperson and public relations consultant for the resort.

Gayana Eco Resort is situated on Gaya Island, just off



the Borneo coast near the city of Kota Kinabalu. Gaya Island is one of the five coral reef islands that make up the Tunku Abdul Rahman Marine Park.

Of the world's estimated 2,000 sharks and ray species, Sabah's waters are believed to be home to 36 species of sharks and 42 species of stingray. It is estimated that 100 million sharks are killed annually for their fins. ■

Atlantis Hotel Dubai

Opening in late September, Dubai's latest exercise in opulence sits atop an immense man-made island in the shape of a palm tree. Opening in late September, the \$US1.5 billion resort, features two hotel towers linked by an arch and boasts 1,539 rooms, 17 restaurants, spa and waterpark.

Situated in the main hotel, the resort's centerpiece is the sprawling Ambassador Lagoon. Holding a staggering 11 million litres of water, the world's third largest aquarium is home to 65,000 fish. The tank's star attraction, however, is Sheika, a four-metre long Whale shark. Stranded in too shallow waters in the Persian Gulf, the exhausted fish would have surely died had it not been rescued by a local fisherman.

Brought to Atlantis, it received treatment at the aquarium's own hospital and was eventually released in its new home. In addition, a sister attraction called the Lost Chambers is home to 21 additional tanks, which harbor a dizzying array of sea life ranging from jellyfish to an enormous giant grouper. ■

Odyssea's Cocotinos Resort commences construction

After months of preparations, Odyssea Divers has announced construction of their new Cocotinos Resort has commenced on the island of Lombok. The new resort will feature a total of 28 rooms comprising of one two-story bungalow with private roof top bathing and sun tanning facilities, two suites with private splash pools, four water's-edge villa rooms, 18 garden villa rooms and three Terrace Rooms. Although the official opening date is not finalized, the new resort is expected to open for business in the final quarter of 2009. ■

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Dominica, St Lucia & St Vincent

Caribbean Islands

It's not by chance that the producers of the Pirates of the Caribbean series of Hollywood movies chose St Vincent and Dominica as locations. They both offer the rustic charm and unspoiled richness of environment that can, with little effort, take you back hundreds of years. Add in a third island, St Lucia, which lies between the two, and you have destinations that provide three very different experiences for the tourist and diver. St Lucia is a maturing package tourist destination, with well established dive schools

offering multi-lingual instruction and guidance for both beginner and experienced divers; Dominica is a nature tourist's idyllic location offering more adventurous dives and above water scenery that is equally as spectacular as that below water; St Vincent, on the other hand, has become known as the "muck diving critter capital of the Caribbean"—a

photographer's dream offering a diversity of species that rivals Lembeh Straights in Indonesia, but with one difference: these are Caribbean species, and many cannot be found in the Indo Pacific.



Text and photos by Steve Jones

Various species of sponge festoon a St Lucian Reef. TOP RIGHT: Lucia's most famous landmark, the twin peaks or "pitons", can be found in the southwest of the island amongst the best diving areas



LEFT TO RIGHT: A trumpetfish swimming amongst sea fans; A crinoid makes home in a barrel sponge; giant barrel sponges are a common sight in St Lucian waters

every island to be found in this sea. Having chosen to settle on St Lucia over ten years ago says something about what this place may offer.

In recent years, St Lucia has undergone extensive development and is becoming a popular package tour destination, supported by an international airport in the south of the island. Many international hotel chains now have established luxury resorts on the island, mainly based in the north near the capital Castries. Nevertheless, the island is far from over developed, and it only takes a short trip away from the tourist areas to see the rural nature of the island and the many picturesque fishing villages.

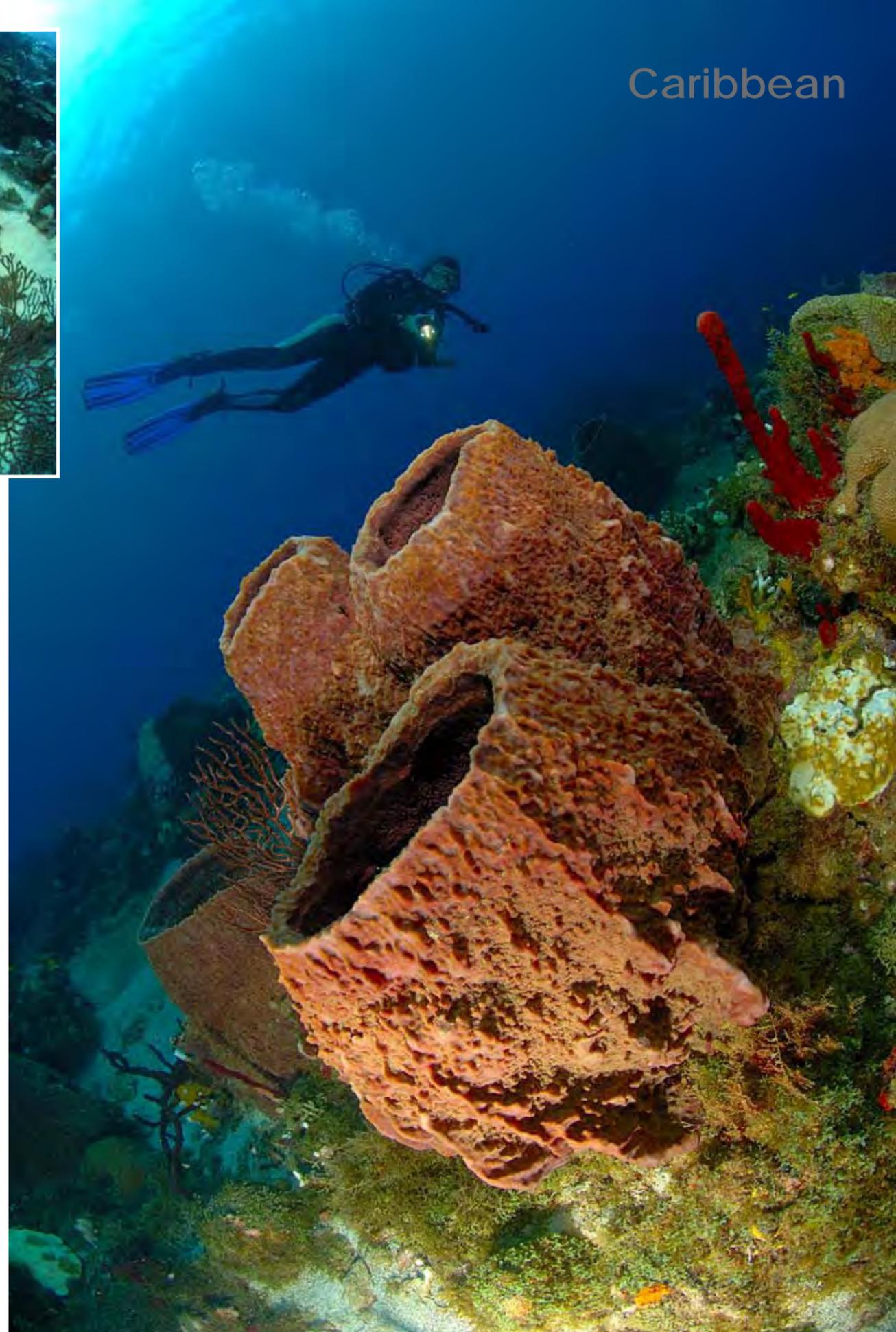
St Lucia is a mountainous green island with a coastline pocketed with quiet bays. The most scenic area is in the south near the town of Soufriere. It is here that the most photographed landmarks on St Lucia exist: the "pitons"—twin peaks that reach into the skies almost vertically from the sea. It is here also that the Anse Chastanet marine park and resort resides, which promises the best diving St Lucia can offer from a location conveniently located in a stunning setting.

St Lucia

"European divers have been spoiled on the Red Sea and the Maldives," explains Bernd, a long serving diving instructor with Scuba St Lucia. "For sure, the Caribbean is a younger tropical sea, but you can see things here you cannot see anywhere else. You can see things on St Lucia that you can't see on many other islands, and if you travel 30 km to St Vincent, you can see things there that you can't see here.

Most people don't appreciate the true variety of marine life that exists in the Caribbean," he maintains.

I'm inclined to agree, for having spent countless hours underwater in the aforementioned Indian Ocean destinations and knowing the marine life intimately, I always find the Caribbean refreshingly "different". Bernd is certainly a good authority on these matters, having left his native Germany in 1990 for the Caribbean, he has dived nearly





ABOVE: Scorpionfish can be found on Anse Chastanets house reef.

TOP LEFT TO RIGHT: St Lucian seascapes

Anse Chastanet resort is set in a secluded and private cove, and landscaped sympathetically to the lush jungle that surrounds it. The area is blessed with having a house reef that many

dive operators on the island travel for miles to visit.

Conveniently, Scuba St Lucia is based right on the shore, and after kitting up, you can walk down the gently sloping sandy beach either following the sand out to the drop off or taking a route that follows the shoreline closely, allowing the caves and overhangs to be explored. Once the drop off is reached, you can work your way around the headland. The reef drops away well below safe diving depth—there are no offshore sites on this island since St Lucia’s seascape falls away underwater as rapidly as the landscape rises above the water.

The house reef allows a gentle dive, although you must always be wary of the presence of any currents as you make your way further around the coastline. The rich biodiversity on St Lucia is immediately apparent—scorpionfish, morays, pufferfish and various species of shrimp are in abundance.

Following the reef along to the left, we pass over a series of coral gullies where large barrel sponges are seen

and schools of Jack skirt over the reef, preying on the reef fish. Small shallow caves provide homes to a great variety of life. Resident schools of Wrasse, Needlefish and Chromis seemed used to our presence.

The marine diversity is possibly the result of nutrient rich waters that surround St Lucia, due to the volcanic nature of the island. Indeed, during the journey from the airport to the resort, we passed “The World’s Only Drive-in Volcano”—and the smell of sulphur during the trip serves to emphasise the volcanic heritage of the island, although there hasn’t been an eruption since 1766.

The high quality shore diving is not the only attraction here—taking a short boat journey around the headland from the resort’s bay affords a view that is simply breathtaking—Petit Piton and Gros Piton, the twin volcanic spires eminently soaring out of the sea, dominate the view of the landscape. Designated as world heritage sites by UNESCO, it is easy to see how this area was deemed to be an outstanding

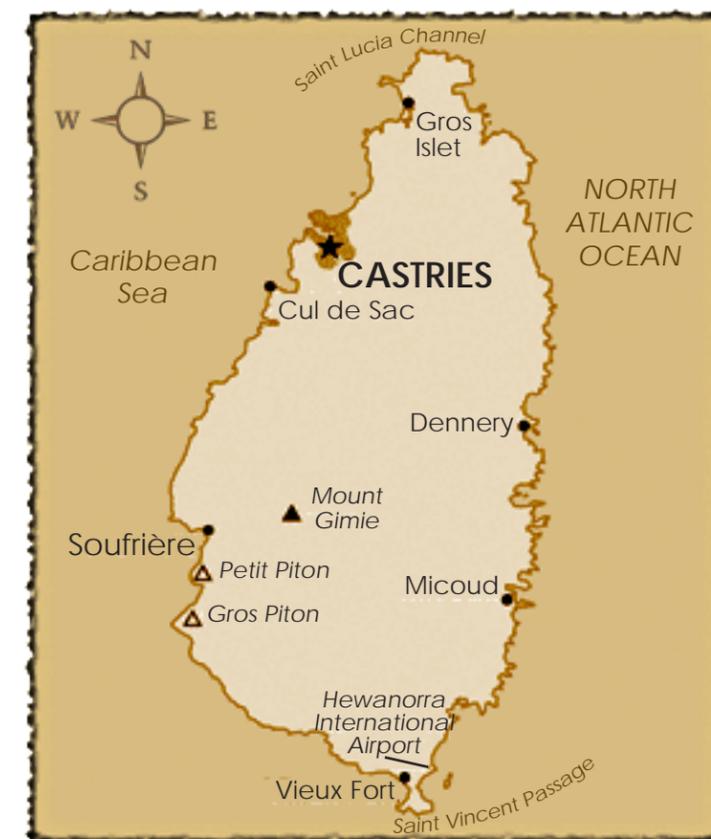
example of cultural and natural heritage when they awarded this coveted title in 2004.

You can dive at various locations around the base of the pitons—most are best done as drift dives. “Superman’s Flight” gained its name after being used as a set during the filming of “Superman II” and offers an excellent dive. Large sea whips drift lazily in the current, and hawksbill turtles can be spotted making their way along the reef.

The huge fish schools that are common in the Indian Ocean will not be found, rather, the beauty of the diving is the variety of smaller life and richness of the reefs, all set in majestic surroundings above water.

St Lucia is teardrop in shape, and during its history, it alternated between British and French colonial occupation. Now independent, English remains the national language, although a local French based dialect (“Patois”) can often be heard being spoken.

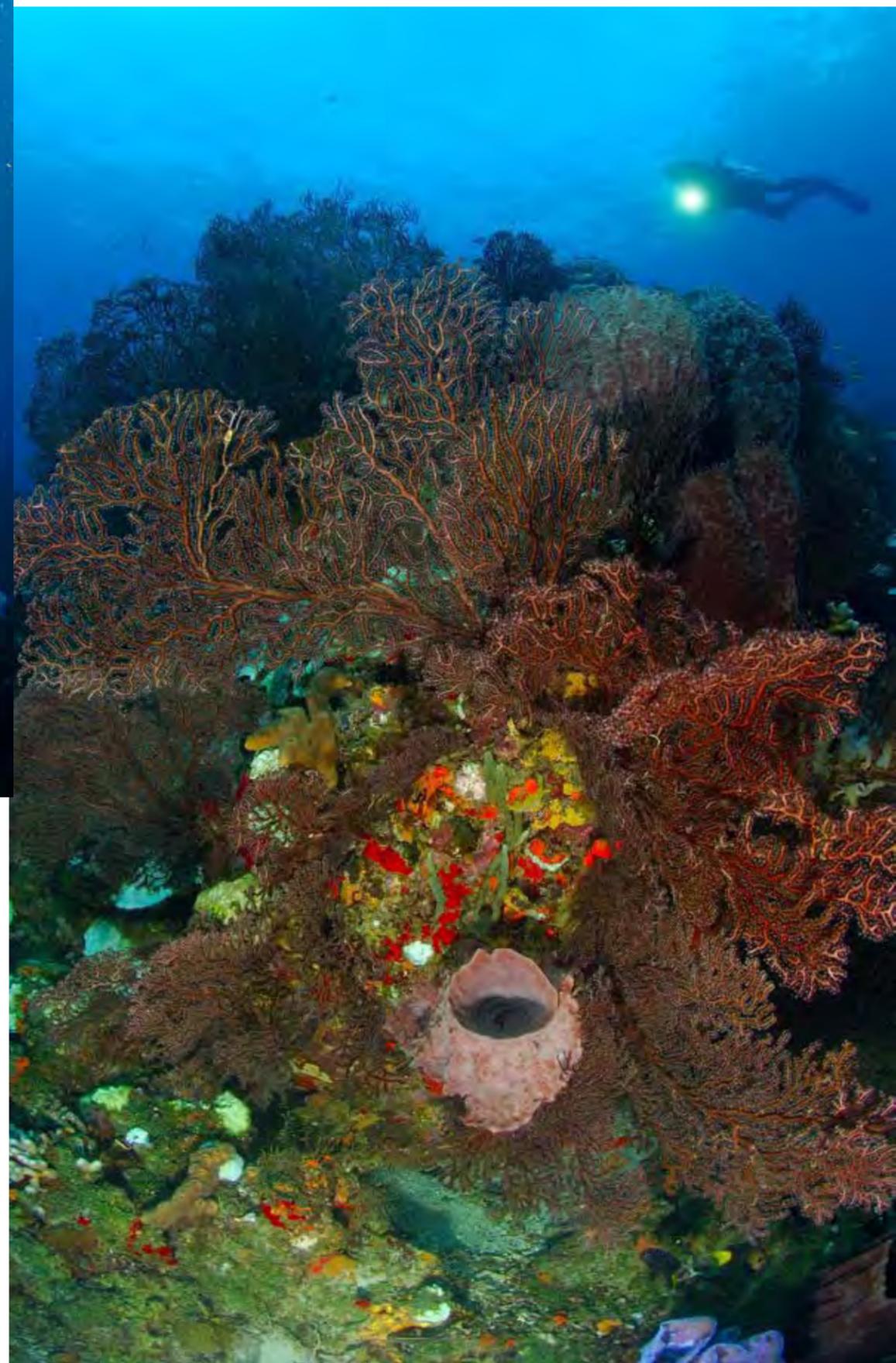
Aside from diving, you will also find that hiking, mountain biking and horse-



Map of the island of Saint Lucia



LEFT: A Giant barrel sponge at "Fairyland"
BELOW: Sea fans at "the Pinnacles" dive site



back riding are popular activities here, owing to the largely mountainous interior.

Across the bay from the pitons, the pinnacles represent a stunning dive. With four seamounts that nearly kiss the surface after rising over 300 metres from the seabed of Soufriere Bay, the reef is richly blanketed in a variety of species of soft coral and sponges. Trumpetfish and filefish can be seen dancing between the colourful gorgonians. Large basket sponges rise from the reef itself, often providing home to shrimp or goby.

Scuba St Lucia offers diving tuition in English as well as other

languages, certifying to various international bodies including PADI and SSI. The quiet, private nature of the bay and the wonderful surroundings, teamed up with attractive nearby reefs make this an ideal location for beginners and more experienced divers looking for something very different to the more popular Red Sea and Indian Ocean destinations.

Top Spots for St Lucia

Anse Chastanet Reef

This reef is just a short walk from the dive centre. It comprises of a plateau running down to eight metres before dropping off into deep water. The reef is covered

in gorgonians, soft corals and sponges. A good site for macro photography, the reef is home to over 150 different species of fish including morays, parrotfish, needlefish and scorpionfish.

Fairyland

Continuing on from the Anse Chastanet reef, this area is covered profusely in corals and sponges. Best done a drift dive, the reef slopes gently from 12 to 18 metres before dropping off into deep water. Turtles can be seen occasionally at this colourful site.

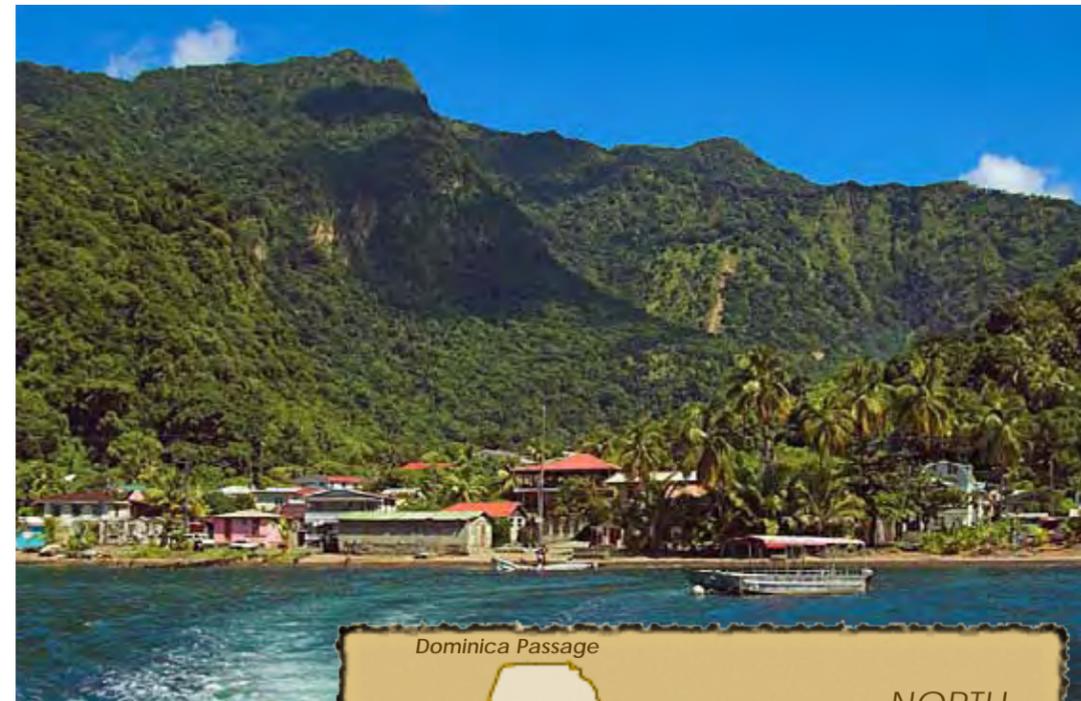
Pinnacles

A stunning dive on four coral

pinnacles that rise abruptly from the depths to within a few metres from the surface. Swimming between these pinnacles, trumpetfish, filefish and seahorses can be seen amongst the whip corals and gorgonians.

Superman's Flight

This site is located at the base of the Petit Piton. The cliff face was used in the filming of the movie "Superman II". It offers a great drift dive along a steep slope that is covered in colourful coral life. Surfacing from the dive you are greeted by truly spectacular scenery.



over the sea before a final run through an emerald comb towards Melville Hall airport.

Over the years, Dominica has become known as the 'Nature Island', an eco-tourist's dream destination. Volcanoes, boiling lakes, rainforest hikes, over 160 species of birds, towering waterfalls, whale watching and spectacular under-

water scenery—Dominica has them all. Despite these reasons to visit, Dominica has remained relatively unknown and most definitely off the beaten track, largely due to the lack of an international airport. One of the windward islands of the Caribbean, the country is only 46 km long and lies between Martinique and Guadeloupe. It's not to be confused with the Dominican Republic, the much larger package tour destination in the Northern Caribbean.

Melville Hall airport lies in the North East of the island. Choosing a self drive in order to explore with freedom, I picked up a hired 4x4, which I had prearranged to be waiting for me. My destination was the capital Roseau, which lies

CLOCKWISE FROM BOTTOM LEFT: Sunset over Scott's head; The emerald pool is one of many of Dominica's natural attractions; The quiet village of Soufriere lies in the heart of a national marine reserve; Map of the island of Dominica

some 35 km away in the South West. Despite the relatively short distance, the journey took over 75 minutes. The trip took me on tight winding roads through rich rainforest, banana planta-

Dominica

Legend has it that when Christopher Columbus returned to Spain from the New World, he was asked to describe the island of Dominica. His response was to crumple up a piece of paper and throw it on the table, replying "that's Dominica!", the paper showing all the sharp edges and folds that are so apparent in this country.

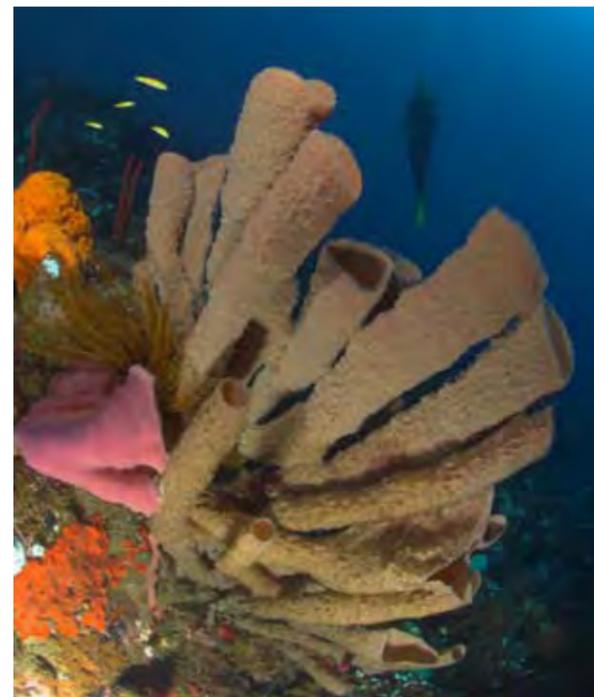
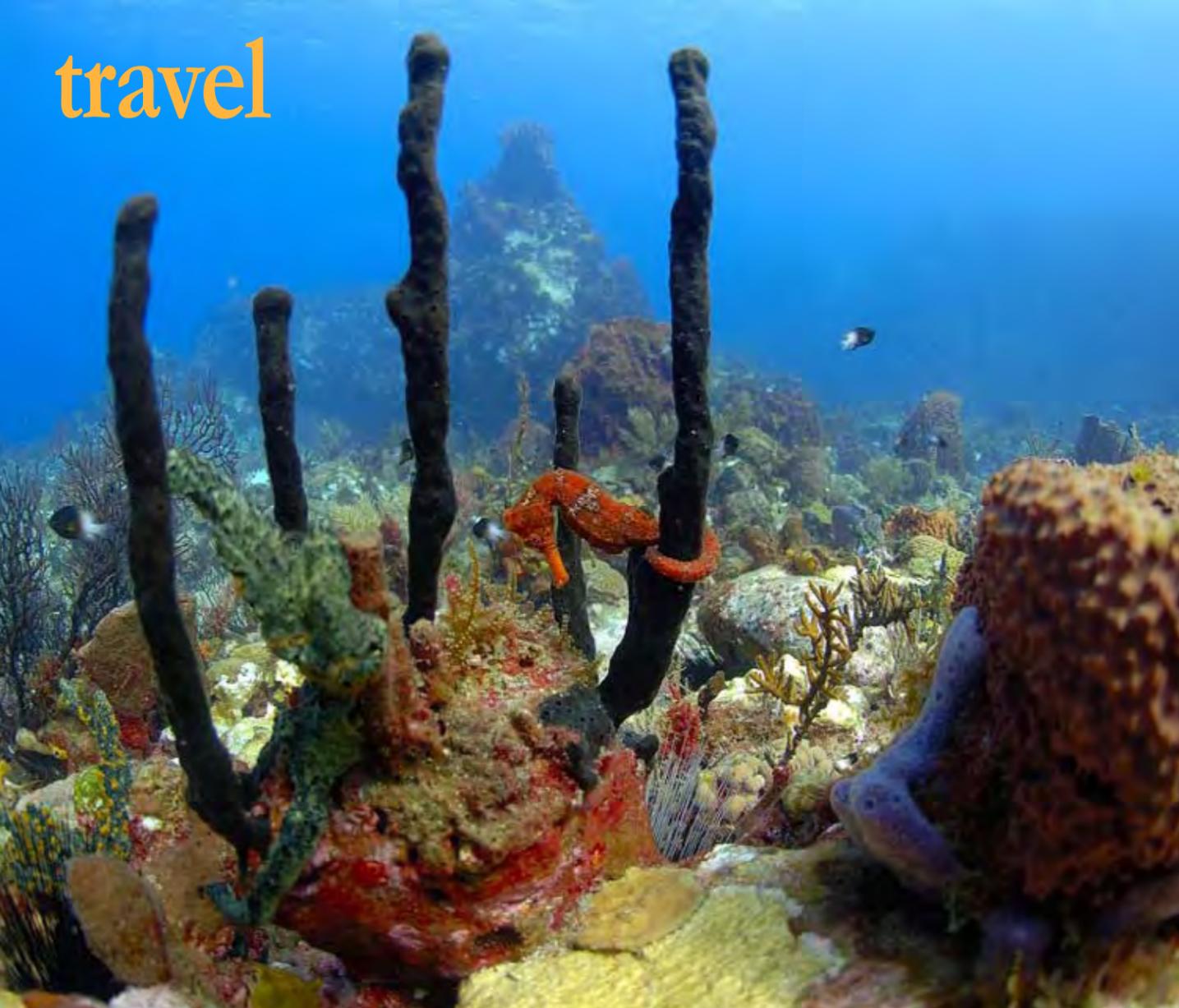
This image stays in my mind as the island appears on the horizon—it is spectacular, looming like no other in the Caribbean. The island is mountainous, covered in rich green forest. Steep ridges rise from the coast, which then give way to lush river valleys. Adventure beckons from this place as our light aircraft banks steeply



travel

Caribbean





PREVIOUS PAGE: Soldierfish gather in a swim-through at “Scott’s head pinnacles”. ABOVE LEFT TO RIGHT: Seahorses are a common sight in Dominica; Northern Dominica’s reefs; Arrow crab; Trafalgar falls are another of Dominica’s famous landmarks

tions and the territory of the one the last settlements of the original inhabitants of the Caribbean, the Carib Indians, who maintain their culture on the island. It was apparent throughout the whole trip just how unspoilt the island is. I arrived in Roseau with a smile on my face.

Roseau is a colourful town bursting with character and traditionally West Indian. I felt I had taken a step back in time as I passed through its streets. They are lined with old stone and wood buildings and despite it being a relatively poor area, it is well kept and the locals are friendly and welcom-

ing. Dive operations on the island are well established, however you will not find resorts on Dominica on the scale that you will on St Lucia—accommodation is in the form of small hotels, guest houses and Inns. I based myself at the Castle Comfort Lodge, which benefits from being 30 seconds walk from one of the island’s longest established dive centres, Dive Dominica. This is a centre that is equipped to cope with large groups of divers, having multiple purpose built dive boats.

My first dive in Dominican waters exceeded all my expectations—

proving to be one of the most spectacular dives I have done in the Caribbean. Scott’s Head pinnacles lies at the South West tip of the island, near a peninsula where the Caribbean Sea meets the Atlantic Ocean. Such nutrient rich waters have developed a stunning reef, which comprises a series of pinnacles, along with swim throughs that are filled with Soldierfish. The water was remarkably clear with visibility exceeding 30 metres, and the variety of reef life was rich—frogfish, mantis shrimp and seahorses can all be seen here. The pinnacles stand on

a plateau, and in the distance, the edge of the drop off can be seen. As with St Lucia, Dominica plummets into the abyss; the sea bed lies hundreds of metres below.

Diving in Dominica is arranged in a way that allows you time to explore the delights that she also possesses above water. Boat trips are arranged so that two 60-minute morning dives are completed by around 13:00. This leaves the afternoon free for other activities, although for those that prefer spending as much time as possible underwater, the jetty at Dive



Giant Barrel sponges are a common site on Danglebens pinnacles



THIS PAGE: Sperm Whales are resident off the coast of Dominica, where they feed on the giant squid that lives in the depths below

Caribbean

Dominica provides an excellent shore dive any time of the day. Stunning scenic attractions such as the Emerald Pool and Trafalgar falls are within half an hour's car drive of Roseau and are easy to reach by foot from the car parks. Dominica also boasts the world's second largest actively boiling lake.

Already providing many attractions for the serious nature lover, Dominica has also earned a reputation as being one of the finest whale watching destinations in the Caribbean. Its extremely deep waters provide a home to the giant squid, which live over a thousand metres down. This, in turn, has attracted a permanent residence of Sperm whales.

Whale watching is an activity not to be missed, and with skilful boat captains and knowledgeable watch leaders, the experience is both exciting and informative. In the space of three hours, we encountered four different Sperm whales at close range and schools of hundreds of dolphins. Orcas, false killer whales and pilot whales can also be seen here, and in winter, Baleen whales such as the Humpback can

sometimes be seen passing through.

A 20-minute car journey down the narrow coastal road south will take you even further back in time. The village of Soufriere (named after the French word for sulphur) lies in a bay that was formed when the walls of a volcano crater collapsed into the sea.

The whole area around the bay is now a marine reserve, managed by a friendly Londoner known to his friends as Izzy, a well travelled gentleman who seems to know just about everyone in the diving industry. When not in the Caribbean, he spends his time diving the Egyptian Red Sea. He is an instructor and qualified marine biologist.

It was comforting to see that Dominica takes the management of its natural heritage very seriously—this is a country that holds its environment in very high regard. Many more developed countries, in addition to some of our favourite diving destinations, could take a valuable lesson from their approach.

Dominican diving

It is in a sleepy village, domi-

nated by a picturesque church, where Nature Island Dive can be found. It is run by Simon Walsh, president of the Dominican Watersports Association (www.dominicawatersports.com). This well organised federation is made up of all the dive centres on the island, and working together, they provide a voice to the government and fisheries to ensure that different users of the sea remain harmonious, safety standards are defined and enforced and marine reserves governed and respected. Again, this is yet more evidence of a well-managed and responsible approach to tourism on this island. Ever helpful, they represent a good first point of contact for anyone wishing to visit the island.

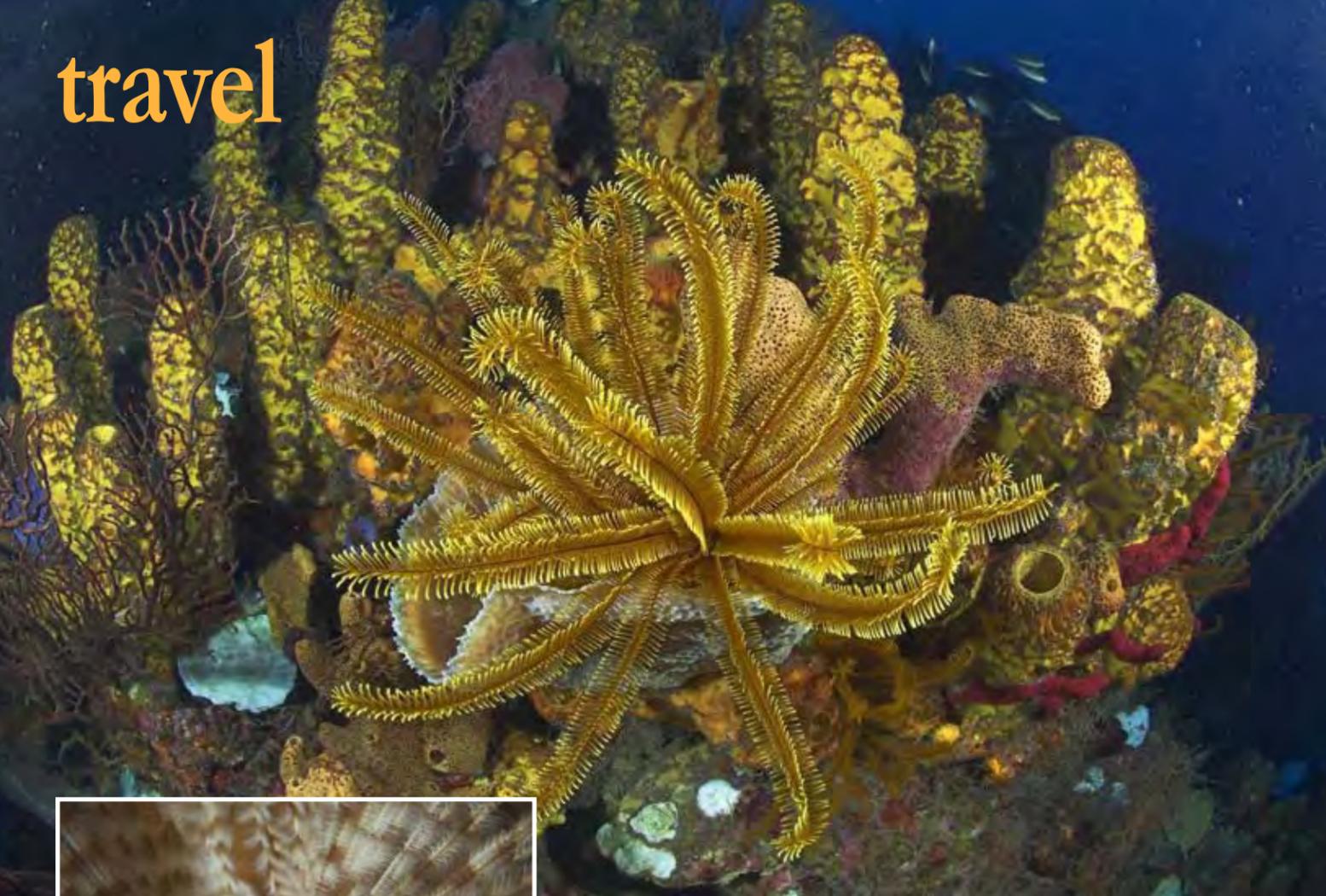
Nature Island Dive is conveniently located right in the centre of the Soufriere bay marine reserve, and the whole experience of diving with them was a very laid back affair, which mirrored the quiet and relaxed

pace of the village itself. Simon is an expert photographer and having hosted some of the world's best image makers, he knows exactly how to find what photographers look for when exploring Dominica and goes to great lengths to ensure they get what they need.

After only a 10-minute boat journey, we descended onto "Danglebens Pinnacles". Upon dropping to the bottom of the buoy line, I came across one of the largest barrel sponges I had ever seen. It's interesting to note that the marine fauna of Dominica also possesses that "spectacular" element that describes so many other attributes of this island.

The journey back from Soufriere allows one to take in some of the set of the film *Pirates of the Caribbean II*. One of its main themes involving a cannibal village was filmed on the headland and Cannibal huts still dot the hill. Many of the diving guides I met had been commissioned





CLOCKWISE FROM LEFT: Featherduster worm; Crinoid featherstar amongst sponges; Dominica's reefs are encrusted with corals and sponges; longsnout seahorse

spring with sand almost too hot to touch, reminded me of the truly volcanic nature of Dominica. Cabrits' owners, Helen and Peter Hepp informed me they even venture round to the rarely explored Atlantic side of the island, offering the chance to dive in unexplored territory.

Dominica's highlights are its diving and hiking, both of which are world class. Mountain biking, canoeing the many rivers, and bird and whale watching also feature high on the list. It offers a raw beauty with wonderful scenery both above and below water. I left with a definite feeling that I had seen a special place, which has been totally unspoiled by industry and tourism. For anybody looking to experience tropical Caribbean nature at its purest, you need look no further than Dominica.

Top Spots on Dominica

Scott's Head Pinnacle

In the south of the island, Scott's Head Pinnacle is arguably one of the island's most famous dive sites. The dive begins on a large rock formation before one enters a large swim through that is filled with Soldierfish. The Soldierfish part like a curtain to allow you to swim through before you emerge on a large plain of coral encrusted outcrops. This leads you to the pinnacle itself. A swim through cuts the pinnacle in two, and on the other side a spectacular drop off to well below diving depth, looms before you. Soldierfish and lobster intermingle amongst the sea fans as the reef drops away.

Crater's Edge

Continuing from Scott's Head Pinnacle in a northwesterly direction is a volcanic ridge that leads out to the site known as Crater's Edge. Looking out into the blue, masses of predatory fish, including tuna

and snapper, can be observed swooping in on their prey. Barracuda also prowl this area. The pinnacle itself is covered in colourful corals and can be easily circumnavigated in one dive.

Dangleben's Pinnacles

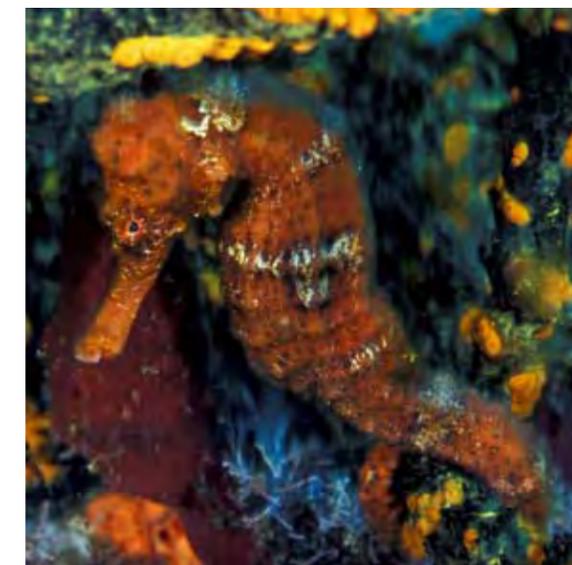
A series of five pinnacles ranging in depths from 12 to 25 metres, this site is notable for its enormous barrel sponges. The pinnacles themselves are encrusted with a variety of colourful coral species and during the winter months, large schools of jacks, can be seen hunting. A spectacular dive and a favourite of many of the local guides.

Champagne Reef

This reef lies in the northern area of the Soufriere Marine Reserve and is a much talked about site by anyone who has visited. In around five metres of water, a sub-aquatic hot spring jets out hot water, and bubbles can be seen rising from the reef in the surrounding area, hence its name.

Toucari Caves

This site lies in the north of the island and can be dived from Cabrits dive centre. A beautiful, healthy reef, the high point of the dive is swimming through a cave and archway abound with lobster. The whole area is rich in fish life and ranging in depth from 10 – 30 metres, it is suitable for both beginner and advanced diver.



as extras for the film, which bought huge benefits for the local economy.

An hours drive north up to Portsmouth shows even more of the underwater diversity that Dominica has to offer. Cabrits dive centre is a very well equipped centre geared towards teaching. The underwater scenery is very different here, lacking the huge abyssal drop offs of the South, but containing gentle coral covered slopes with schooling fish. Finding a bubbling underwater



CLOCKWISE: Young Island resort; sunset over the jetty on Young Island; Peacock Flounder; Map of the island of Saint Vincent and the Grenadines; Longsnout seahorse are commonplace on St Vincents reefs

St Vincent

An intimate knowledge and genuine enthusiasm for marine life are attributes that define some of the best dive guides. With these qualities, they are able to turn an hour underwater into a whole learning experience. Bill Tewes, proprietor of Dive St Vincent, takes that experience to another level altogether. He has placed St Vincent on the map as being amongst the premier locations for critter diving in the Caribbean.

Bill is a weather-worn Texan, full of energy and anecdotes. "I'll dive every day until I die. Hell, there's nothing else to do, is there?" he quipped in his strong Texan twang as the huge twin engines of the dive boat roar into life.

Bill moved to St Vincent 24 years ago. Previously he was

in Papua New Guinea, one of the pioneers of diving in that area. Given the enormous marine biodiversity that exists in PNG, Bill can certainly speak with authority and experience. "I decided to leave New Guinea," he said, "and I saw a guy who was selling a dive centre in St Vincent, so I thought, what the hell, seems like a nice place, but I had no idea just how special it really was."

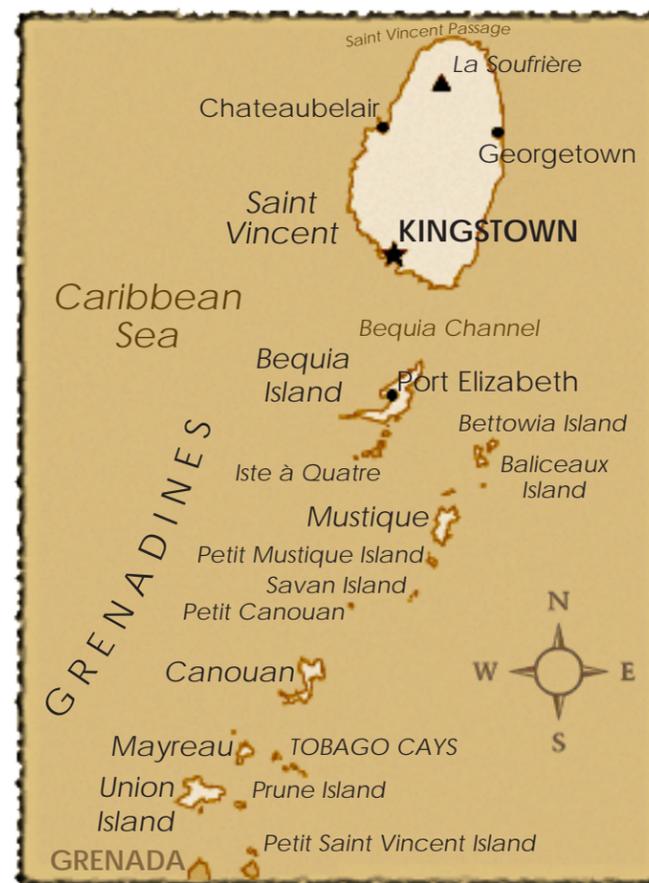
The discovery of St Vincent's true underwater treasures did not come instantly though. For years St Vincent was regarded as typical Caribbean diving. It had nice reefs but was without the special attractions to bring divers in from over the world.

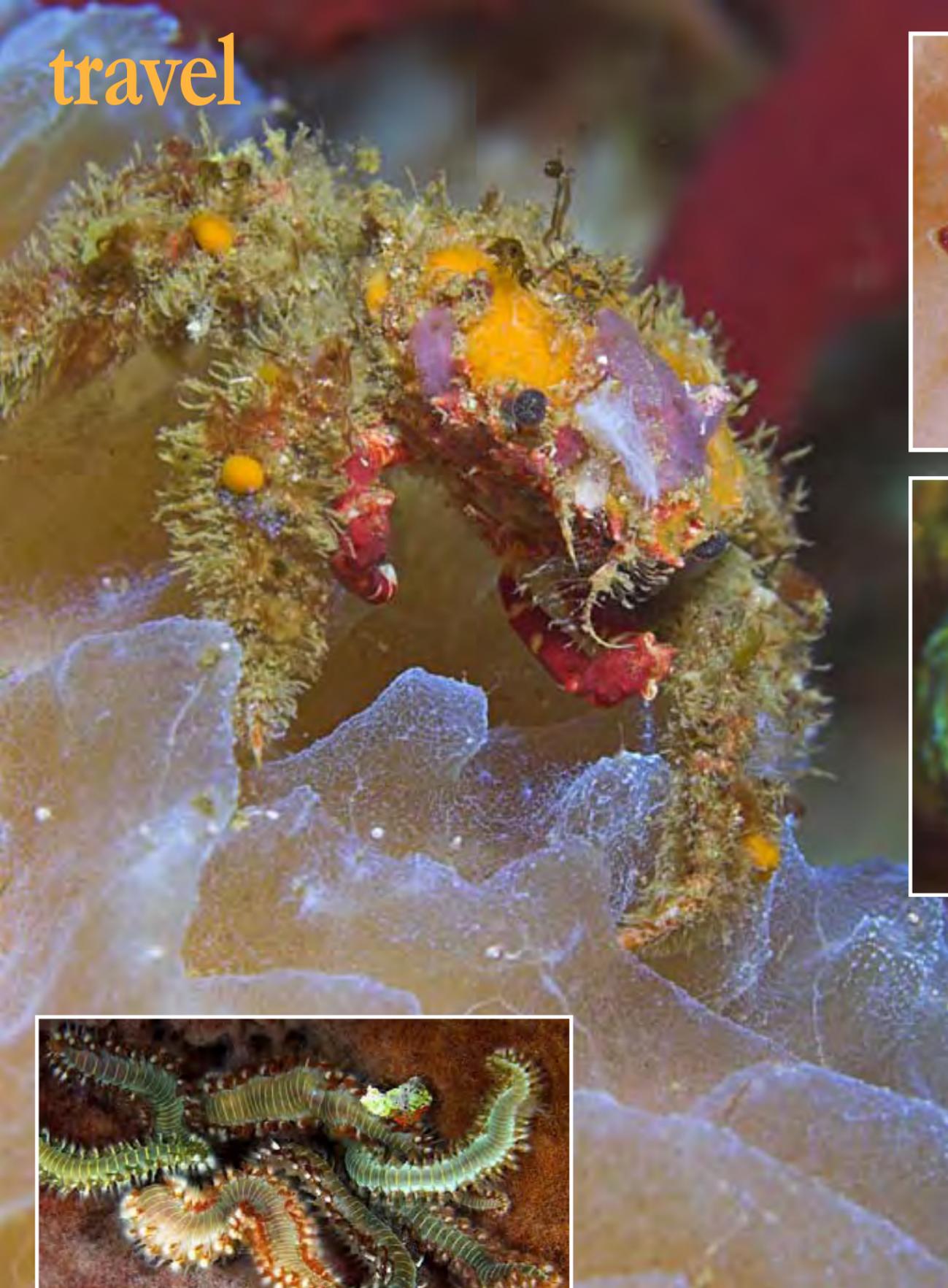
It isn't that St Vincent has changed, but rather that Bill has used his time well focuss-

ing on a more unique aspect of what the island has to offer in the waters that surround.

Entering the old shack that forms the dive centre, one is bombarded with a plethora of colour. Images of the weird and wonderful—some animals of which I'd never seen before—adorn the entry porch to the dive hut. The images were produced by some well-known photographers. My own attention was immediately focussed.

Pointing out any one of the animals portrayed in the images, Bill replies with a description of the animal and where it was taken. "I can show you that," he said and goes on describing every animal to me, like a living encyclopaedia. I can't help but feel eager to get in the water; his enthusiasm is infectious.





CLOCKWISE FROM LEFT: Some of St Vincent's weird and wonderful marine inhabitants: Fireworms (inset); Decorator crab; Southern teardrop crab; Snapping shrimp; Secretary Blenny

Diving St Vincent

The dive boat leaves at a respectable 9:30am, allowing time for a relaxed breakfast. His boats are fast, so we're at our first dive destination known simply as "The Steps" in no time at all. Tanks are filled only to 175 bar, but at an average dive depth of ten metres, this is enough for an hour or more.

The diving is slow and relaxed, mimicking the pace of life above water. The aim is not to cover ground, but to find the unusual, weird and wonderful. Good buoyancy control is a must; it's all too

easy to stir up the sediment and ruin visibility.

Much of the time we spend moving along the sand or mud flats, which at first appear as no more than a barren moonscape, but it is here that some of the most unusual critters can be found. It seems every square

metre of this underwater realm contains life, some of it more obscure than I had ever witnessed. Bill and his guides identify each creature and use waterproof writing pads to name what they have found—it was akin to diving with an active guide book.

Indeed, after only one dive here, it is clear that the marine fauna of St Vincent is unusually rich. I wonder if the other dive destinations are equally as rich, and it's really down to the guide's abilities to find the unusual that make this place seem so special. Bill has a theory on this. "I believe

it's the nutrient rich currents that run from the Atlantic through the channel between our neighbour Bequia and us that have made St Vincent what it is. When I first came here, I didn't realise that this place had the treasures it has. But over the years, I've come to realise that it is a truly special place," Bill told me. Special, it most certainly is.

The divers that visit Bill were certainly not what I'd call casual divers. Keen photographers and critter enthusiasts equipped with an array of animal identification books, these were serious divers, and some I spoke to visit several times a year—such is the attraction of this relatively unknown place.

Some world leading marine life experts have also recognised the uniqueness of what Bill has discovered. The chances of discovering the undiscovered is high, and Bill himself found an undocu-

mented species whilst I was diving with him. "My enthusiasm for diving has never been greater," Bill informed me. "I just never know what I'm going to find even on reefs I've visited countless times before."

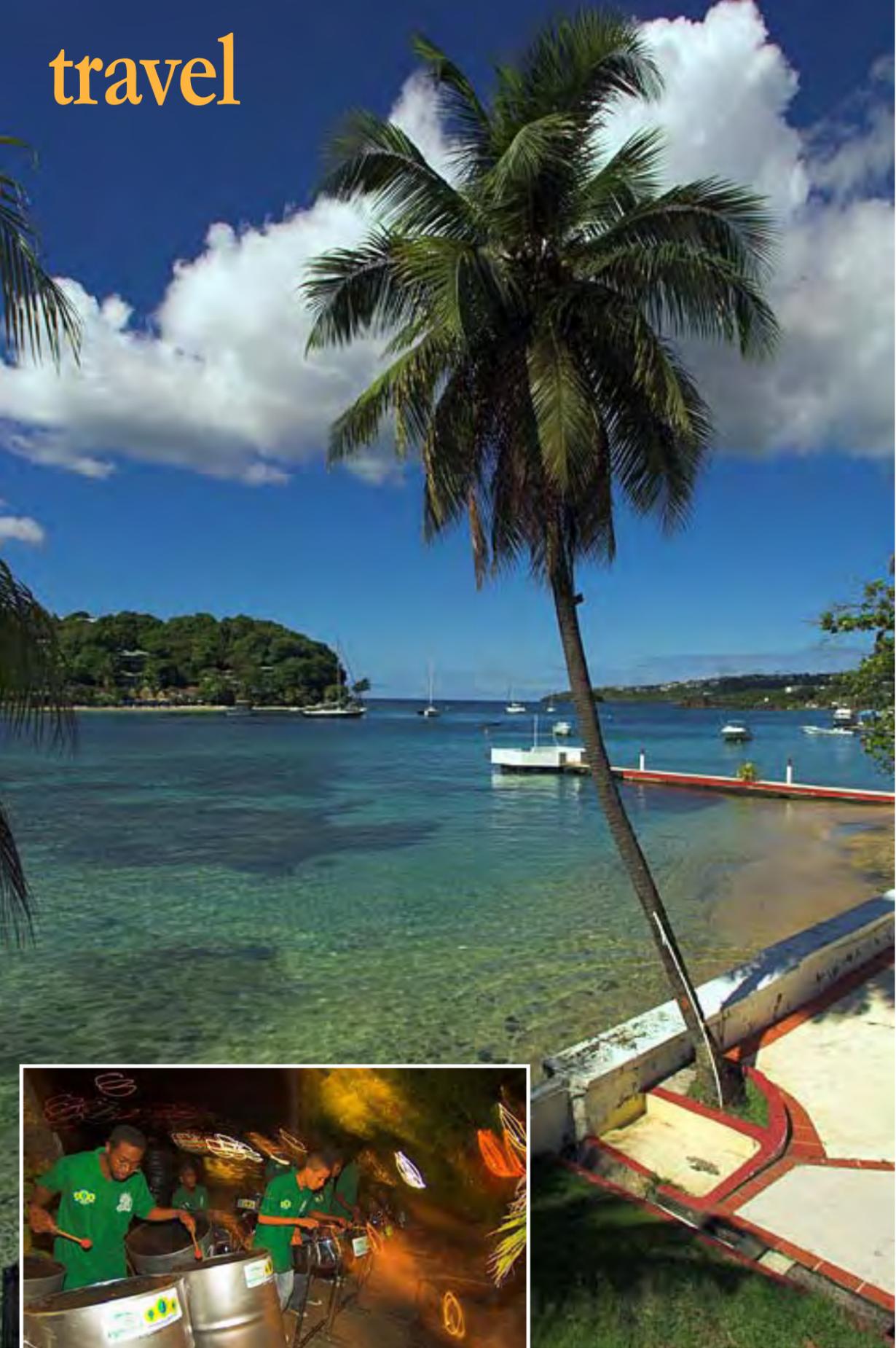
The island

St Vincent itself lies about 35 km from St Lucia, its nearest neighbour to the north. It's a small island, only 29 km long by 18 km wide, and its interior is a tangle of lush vegetation, distinctly mountainous with deep valleys.

The Grenadines group of islands run 75 km south all the way to Grenada, and include such islands as Mustique and Bequia—popular with the rich and famous and known for their white sandy beaches. It's also a popular sailing destination.

St Vincent is much like Dominica in that it has shied away from becoming a package destination, hav-





The location used as the "pirates treasure cave" for the first of the *Pirates of the Caribbean*

movies

used as the "Treasure Cave" set for the first *Pirates of the Caribbean* movie.

As we descend beneath the

ing no international airport. Its period charm is evident in my choice of accommodation; The Mariners Hotel is styled in typical Caribbean architecture—fresh, clean colours and full of character—it boasts a superb restaurant and lies only a few minutes walk from Dive St Vincent's jetty. Together they lie on the edge of a small stretch of water that runs between the mainland and the more exclusive Young Island Resort. St Vincent therefore offers good accommodation within easy reach of the best diving spots.

It is off the shores of the aforementioned Young Island, only two minutes' boat journey from the dive centre, where

I had one of the most bizarre of dives. For having moored on an anchor buoy, I was to take around 20 minutes to reach the seabed, which lay only eight metres below. The reason lies in testament to Bill's theory on the nutrient rich waters—I found that the entire buoy rope was in itself an oasis of marine life. I never have before seen a rope so encrusted with corals and sponges with a whole variety of creatures making this place their home. I daren't have touched the rope itself, for fear of the absolute destruction I would have caused to this fragile mini ecosystem. The remainder of the dive was no less interesting—burrowing starfish, deco-

rator crabs, jawfish, the rare golden coral shrimp, all found on a flat, seemingly featureless sandy bottom.

St Vincent's coastline itself is no less absorbing than the undersea environment. It is pocketed with coves and hidden bays, whilst various species of sea bird nest on the steep cliffs. It fuels the imagination.

"You may recognise this place," Bill said as our boat snaked around the headland. Indeed, our dive site this day was Orca Point, the bay

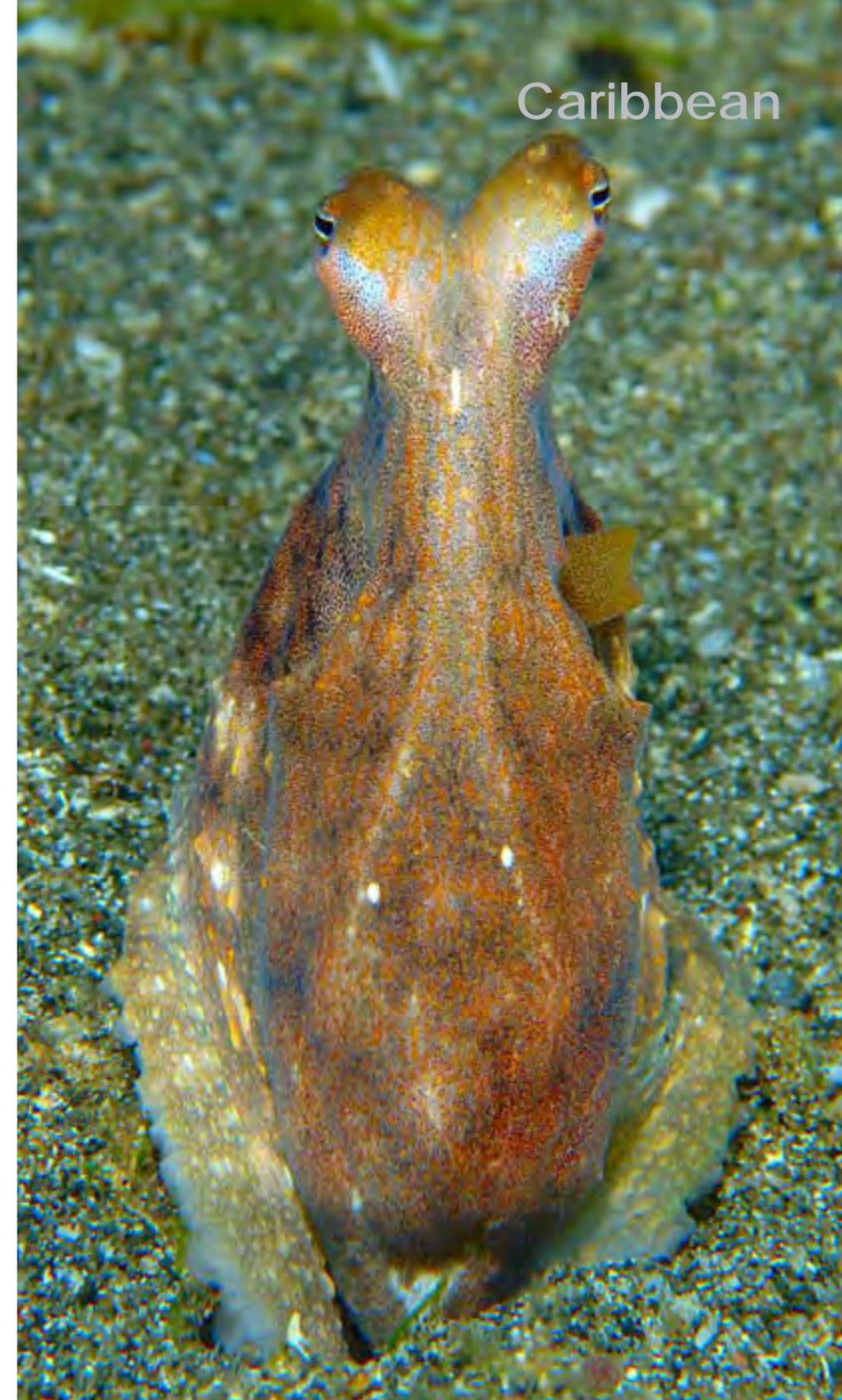
boat, we quickly discovered our own undersea treasures, far more beautiful than any man-made creation. The rare magnificent urchin greets us with a plethora of colour, reds richer than I have ever seen.

I look on in wonder as I observe that these animals are actually capable of walking at some speed. I wonder if they



ABOVE: View from the Mariners hotel
LEFT: local entertainment





FROM LEFT: Secretary blenny; Juvenile Magnificent urchin, rarely seen at sport diving depths; Longarm octopus

know where they are going, as one heads off in the same direction as the other, clearly with intent. Not satisfied with such a wonderful find, Bill was keen to point out the miniscule shrimp that live amongst the spines of this rarely seen animal.

Our attention turned now to the green vegetation that blankets the seabed. Perseverance paid off as we spotted the tiny Bumblebee shrimp—no less special than our earlier find. Smaller than my little finger nail, we

tracked it as it darted amongst the seaweed, ever eager to escape our prying eyes.

Every dive on St Vincent ends with one wanting more, and every dive begins with the excitement of not knowing what one will find, but a feeling that one will certainly find many things, most of which will be new.

Despite the slow pace of life on St Vincent, the time there ends too quickly. I now recall my visit to St Lucia when the dive

guide, Bernd, made a statement about how different the diving can be from one island to the next in the Caribbean—how right he was.

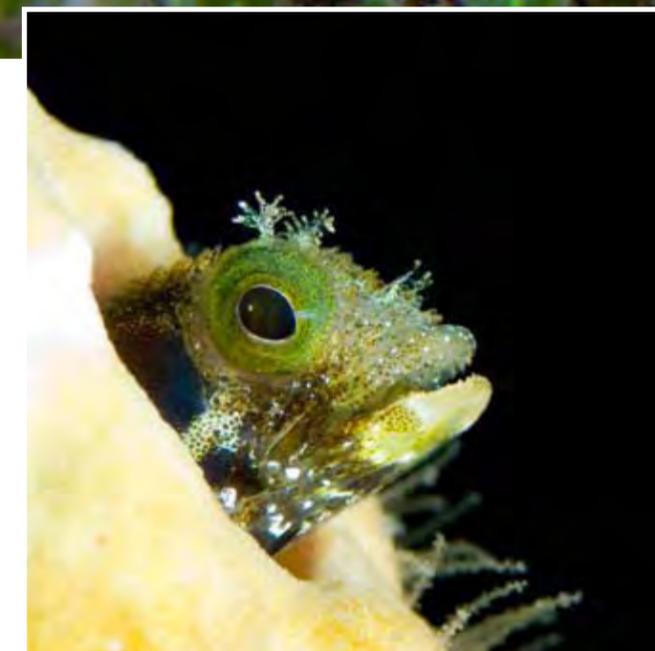
St Vincent's Top Sites

The majority of Dive St. Vincent's sites are on the leeward, or western, side of the island. The journey to the sites by speed boat takes an average of 10 to 15 minutes. There are moorings at the most popular sites, installed to protect the reefs.

The Wall

Beneath the cliffs that protrude into the sea, this reef has a richness of life that rivals the top-side flora and fauna. The wall is full of black corals in an array

of colours. Gorgonians, barrel and vase sponges intersperse the reef. Large populations of Chromis and creole wrasse flow over the seascape.





CLOCKWISE FROM LEFT: Tube Sponges; Christmas tree worms; Blennies of a whole range of species are common in St Vincent

Orca Point

This site is full of critters of all shapes and sizes and also makes an excellent night dive. A wonderful area for macro photography, on a typical dive you will see several types of seahorse, flamingo tongues, frog fish and a whole variety of crustaceans. The site descends from six to 30 metres, and the best way to explore it is to start out on the deep side

and work your way to the shallow boulders with swarming fish.

Orca II

Has the best of both worlds: encompasses a beautiful reef and has an area for muck diving. The reef side is very coral rich, containing an abundance of life. The muck diving side displays many of the critters that St Vincent has become famous for

including flying gurnards, seahorses and a diversity of crustaceans, in addition to pike blennies.

Critter Corner

A photographers dream site, in only eight metres of water you'll be limited by film or the space on your flash card rather than bottom time. Pistol shrimp, cardinal fish, torpedo ray, gurnards, seahorse—all can be seen here.

The buoy line itself is encrusted in coral and sponges; so much life is to be found in this small space.

Getting there

LIAT Airlines (www.liatairline.com) offers extensive inter-island flights running several times a day. The flight time from St Lucia to Dominica is 45 minutes, and St Lucia to St Vincent only 20 minutes. International flights land at

Puerto Rico, Barbados, Antigua and St Lucia, all of which are interconnected by LIAT.

Climate & hurricanes

St Lucia, Dominica and St Vincent all lie in the tropical Caribbean. Therefore, the temperature varies only slightly all year round averaging around 30°C, with minimal variations in the number of hours of daylight.

The rainiest time of year is May through November. Even so, rainfall is heavier on the northeast (windward) side of the islands, with much less on the leeward sides, where the diving operations are based.

Hurricane season starts in June and officially ends at the end of November. This is the low season for tourism to this region. All three islands are at the southern edge of the hurricane belt, so the chances of a "direct hit" are low, although tropical depressions passing by

may produce bad weather during the season.

Water temperature averages 27°C year round, so a 3 or 5mm wetsuit is adequate.

Currency

All three islands use the Eastern Caribbean dollar, with US dollars also widely accepted. Cash is readily available from autobank machines and most popular credit cards are accepted by resorts and dive centres. ■



Text by Cindy Ross
GirlDiver.com
Photos by Bill Battan
and Laura James

Hollywood blockbuster *Mission Impossible III* shows Ving Rhames diving beneath the Vatican on an XScooter DPV to save Tom Cruise from the prison below. Now, GirlDiver takes a look at the XScooter Dive Propulsion Vehicle (DPV) from a gentler perspective. Serious DPV diving for a girl? Is it too big? Too powerful? Too much of a “boy’s toy”? I’m ready to test the toughest, lightweight underwater scooter of the bunch to see how it fits a girl.

In the world of diving, we have necessary gear, and we have fun accessories. The accessories of diving are used to enhance your diving experience, as fashion accessories are used to enhance your clothing selections.

There is a difference in designer handbags, as all women know. You’ve got the limited edition Prada bag versus the Coach purse at the local fine department store. One purse will cost thousands, whereas the other handbag, mere hundreds. And regardless of whether or not you’re a purveyor of costly handbags, you’ve probably got a girlfriend or an office mate who will argue the legitimate value and pricing of their high end purses. There is the attention to detail, the usability, the size and the length of time one would expect the handbag to last with daily wear and of course, the materials of which the bag is made.



Girls on Speed

Dive propulsion vehicles

The scooters of the sea definitely fall into the accessory category. Not needed, but as an enhancement to your diving experience, they can ease the

effort and reduce the amount of air you breathe during a dive, as well as zip you out to a dive site without a lengthy surface swim. You can survey a wreck at depth, flying over the ship like an astro-

naut strapped to a rocket pack in space. Probably not a vehicle you’ll be using on every dive, but one brought out on special occasions to add to the dive event.

Scooter Dive



BILL BATTAN

Cindy Ross and Laura James assemble the DPV prior to the dive. A simple plug from the battery to the motor, and you're off and running

Ready to enter the water to test out the bad boy of underwater dive propulsion vehicles



BILL BATTAN

I was invited by the makers of the XScooter, Ben McGeever and Andrew Georgitsis, to take their super lightweight DPV for a spin.

Already familiar with scooters having a much lower price point, I was excited to try a higher end—“designer”, if you will—DPV.

Was there really a difference? Would the attention to detail, usability, size and length of time one would expect the model to last justify the cost difference? And known more in technical diving circles than recreational, would I, as a recreational GirlDiver, be comfortable on the unit, built for tech divers slinging extra tanks on their sides in addition to the doubles on their backs?

At the manufacturing facility, I was shown the process for making the scooter. A computerized lathe carves the cone from solid bullets of aluminum, to keep the vehicle light, the seams are welded, sanded and sent out for paint. A 60-pound thrust, brushless motor is added, with a variable pitch propeller system, to complete the most powerful machine in its class. To

add to the machine, underwater camera mounts, compass mounts and light mounts can all be incorporated to fit the diver's needs.

Originally, I had thought of trying out the Gavin, the beefiest of sea scooters. Ben offered to let me try the model they owned. However, after trying to lift the 78-pound behemoth, I decided the weight alone would realistically dissuade me from using the DPV very often. I thanked the guys for the offer, but today I would simply try their XScooter. I could carry the 35 lb/15 kg unit to the water myself.

At the beach, technical dive instructor and videographer, Laura James, met me to introduce me to the XScooter. A

small female, she also owns the Gavin, though admits to not using it often, as the weight of the scooter tends to keep it at home when packing for a day of diving.

When Laura started diving her XScooter, the manufacturer had designed a smaller handle for her girly hands, however, she found the standard handle was a good fit as long as you're allowing the harness set up to pull you, not your arm. The DPV is attached to the diver

on a d-ring clip at the waist, so manhandling the single handle was unnecessary.

I tried to allow myself to relax into the scooter, allowing the waist attachment to pull me, although it seemed counter-intuitive to not holding the handle tightly. However, if this is the biggest learning curve, it's easily overcome.

Underwater, the scooter really showed its capabilities. Not only was I able to power out to a site, but I could easily control the depth and wasn't worried about making too quick of an ascent to the surface, as it was absolutely neutral in the

water. When I found something to look at, I simply dropped the scooter from my hands, it turned off and floated beside me. Dangling in the water, the machine was not cumbersome. In fact, I barely noticed it was there while looking at anemone encrusted pilings.

The underwater ballet aspect was the best part of the dive. Hearing the music of a symphony in my head as I turned spirals

and pirouettes in the water. Feeling absolutely free, without a need to kick and really being one with the water and the scooter. I can see the addiction scooter owners have as I moved effortlessly through anemone covered pilings, navigating easily with a movement of the fin or a twist of my arm.

I found having one arm free allowed me to frequently check my gauges, which allows for better safety on the dive. The compass mounted on the DPV also made navigation easy, as we headed out to deeper waters. While we stayed well above the depth limit

With only one handle for guiding the craft, the diver hooks the DPV to a waist harness and allows the DPV to pull from the waist, not from the arms



BILL BATTAN

A series of four o-rings seal the compartments, preventing the water from entering. Flooding the XScooters is almost unheard of



BILL BATTAN



LAURA JAMES

Pulling from the waist, the diver relaxes her arms and enjoys the underwater tour

for recreational divers, the XScooter has a depth rating of 600ft/180m.

As a school of piling perch crossed in front of us, I joined in their flight. The XScooter travels at a top speed of 200ft/60m per minute, so the ability to travel the same speed as the fish gave a new wonderment to swimming in the mass. Imagine swimming with seals, mantas or whale sharks—yet another benefit of the scooter.

At exactly 50 lbs/23 kg, the DPV plus hard rolling case, is within the weight limits for checked baggage on most commercial airlines. This allows the toy to be a part of the next dive holiday, where more

ground can be covered on new dive sites. While the toy will take up one piece of luggage, on holiday, you just need a few pieces of beach clothing, as you'll be enjoying the underwater realm with new found freedoms.

Whether stepping up to a "designer" DPV, or going with a lower priced model, the DPV is definitely a fun accessory to add to your dive locker—maybe not for every dive, but for the ones where you'd like a little more bottom covered, a bit less air used and the exhilaration of effortless speed.

With the lower end scooters, you

should expect less power. They fall into a "diver assist" category. The higher end scooters designed for the technical dive sector are true underwater propulsion vehicles. It's the difference between a land scooter (moped) and a motorcycle. The motorcycle is more of a machine, and when you want the power and the speed, it's worth the extra money.

Is the DPV too big for a girl? No. Today's lightweight and powerful, yet highly maneuverable DPVs are definitely just as suitable to be a girl's toy, as they are boy's. ■

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ON BOLD LINKS



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Out of this world

Gara Professional

Making the CompoFlex blade non-interchangeable and integrated with the foot pocket was a deliberate choice by Cressi to reduce even the tiniest dispersion of effort during kicking. Compared to the other Cressi Gara fins, the new foot of the Gara Professional was designed to fit on the bottom of the actual blade to help reduce the kicking effort and minimize the dispersion of energy during kicking. The shape of the foot was redesigned and improved even further compared to the other Cressi Gara fins. According to the manufacturer, the use of a new particularly flexible elastomer makes them even more comfortable. www.cressi.it



Extra Air Source 3

The environmentally sealed first stage is equipped with on/off valve. The second stage connects via a vertical/horizontal swivel. The available kits include first and second stages, a six cubic-foot tank, Yoke or Station Filler, and a quick release bag. The GPB button gauge is optional. www.h2odysey.com



Neptune Helmet H08

This helmet from Ocean Reef is specifically designed for use with the Neptune Space, Raptor and Predator Ocean REEF masks. It was created to provide impact resistance during adventurous activities where head protection may be needed, such as cave or arctic diving. The GSM G-Power SL may be incorporated into the helmet, which makes it a very unique, lightweight, compact, underwater communication and protective piece of equipment. The helmet has the following features: lightweight, compact and impact resistant, non-water absorbent foam, uniquely shaped for rapid water drainage and maximum comfort, high cut shell for total peripheral vision and extends down over temple and ears for extra protection. www.oceanreefgroup.com



it Worx

The newest submersible from U-Boat Worx to be launched is the brand-new three-person C-Quester 3, which will be followed by the reinvented two-person C-Quester 2. The two-person C-Quester 2, with low storage height and weight, is designed to meet the growing demands from Superyacht industry. With the three-person C-Quester 3, a new range of opportunities is created for high-end resorts and hotels to offer their guests something extraordinarily. The electric C-Questers can dive up to a depth of 100 meters and are the first commercially available submersibles to be equipped with Lithium-Ion Battery technology to extend endurance. The first C-Quester 3 will be launched at the end of this year. Potential customers can expect to roam the subsea in spring 2009, but only after having been successfully trained as submersible pilot. www.uboworx.com

equipment



Potenza

A powerful recreational fin perfect for warm and temperate waters according to Scubapro. Features: duo-compound blade construction for optimized kicking power, underwater mobility and reinforced durability, full-foot pocket, lightweight classic non-vented blade with ribbed middle. The fin will be available in five sizes and three colors.

www.scubapro.com



MB Sub

REVOlution. This new aluminium torch from the Germany comes with these features: 8.4V - 4.8Ah Lithium-Manganese-accumulator, integrated charging electronic, exterior charging (no need to open lamp), charging time approximately three hours, three-step dimming, four-step capacity indication, SOS signal generator, total discharge protection, head with halogen (20W HLX or 30W HLX) or head with 3 x 3W LED with true color dimming, reflector: spot 13° (halogen), optics: 13° or 20° (LED), burning time at maximum power 80 minutes with halogen, burning time at maximum power three hours with LED. Weight: 1.05kg. Drift: 0.4 kg. www.mb-sub.com



Slimline

Dive Rite HID 1000 Slimline packs a powerful 1,000 lumens of illumination, which is 100 percent brighter than a 10W HID. An all-new protective reflector housing is shock-resistant and adjustable, offering the ability to change focus from a wide flood to a tight beam. Powered by a 12V 4500 mA NiMH battery gives 3.5hours of burn time and is depth rated to 500 feet (152m). The Slimline canister holds the battery pack and is machined from a single piece of chloride pipe (PVC). Comes standard with Goodman metal hand mount. Also includes NiMH charger. www.diverite.com



Dogfish

Tom Rein's Dogfish neck knife, made of 3Cr13 stainless steel, has a lanyard hole and bottle opener, 2.25 inch blade with an overall length of 5.25 inches. It has a plain blade with a secure finger choil and friction grooves at the thumb spine and near the butt. Comes complete with a Kydex sheath littleknifeshop.com



Muse & Mito

The Italians have lauched two new jacket style BCDs—Mito for men and Muse for women. Features an outer breathing bag of PU-coated 420 D Nylon, inner breathing bag of PU-coated 420 D Nylon, frog clasps for keeping your knife at hand, expandable pocket, removable jock strap, three dump valves with pull command, D-rings at 5–25mm straight in stainless steel. www.seacsub.it





The Lunocet— Mimicking the dolphin fluke

By Arnold Weisz

Ted Ciamillo, owner and designer at Ciamillo Components in the USA, has designed a new and what looks to be a revolutionary freediving fin. Although Ciamillo first and foremost is known for making the Zero Gravity brake for the cycling industry, he's not a stranger to the ocean.

Passionate about the underwater world, Caimillo is constantly thinking about new ways to propel oneself efficiently through this medium. Back in 1998, Ciamillo created the futuristic looking K-10 Hydro Speeder (battery operated underwater motorcycle). Unfortunately, due to the small size of the scuba industry and the lack of reliable battery packs, the business venture sunk.

Then, Caimillo met a specialist in the swimming behavior of dolphins and whales, Dr Frank Fish of West Chester University in Pennsylvania, and the spark was ignited, it was back to the drawing board for Ciamillo again.

Back in the underwater world, Ciamillo's main goal was to imitate and reproduce mechanically nature's finest way to move through water—a dolphin or whale fluke kick action.

The Lunocet mimics the natural power and efficiency of the dolphin fluke allowing the lunodiver to operate in silent mode. The most important feature

that distinguishes the Lunocet from bifins, or traditional monofins, is that its system of lift-based propulsion provides for thrust on the up and the down stroke.

Another new feature are the foot pockets. According to Ciamillo Inc., the pockets provide for maximum user adjustability and comfort, because the foot is strapped into three different places on the footplate (different foot volumes have a comfortable and precise fit).

The footplates are CNC machined aluminum, with extremely light titanium hardware. The two hydrofoils are made from foam (machined to size), covered with carbon fiber.

"We believe that (varying on the input of the swimmer, experience, and personal fitness), a speed of approximately 8mph may be reached while using the Lunocet," said Ciamillo.

The Lunosapien nation is in pursuit of the complete human breach. Meaning that they are looking to propel a freediver completely out of the water by using the Lunocet fin. For this, Ciamillo is putting together a pro-team of athletes (freedivers, triathletes, etc).

For testing the item, well, how about a one million gallon lagoon! The lagoon has a bio-reactor, which takes care of the oxygenation of the water, while a water garden serves as a bio-filter and uses nutrients to prevent algae bloom.

www.lunocet.com ■



Cool Fusion By Peter Symes

I was forewarned. Yet, I wasn't quite prepared for the odd sensation of donning this remarkable new suit. The shell fabric felt deceptively thin, like a thin windbreaker, and I was rolling it on like a leotard, one limb at a time, while meticulously trying to avoid creases. The Fusion drysuit from Whites is, in most senses, a shell suit, as the thermal insulation is provided by a separate undergarment. But in other respects, it is in a class of its own.

The outer layer is remarkably flexible and stretchy, and it seems to contract a bit over the fluffy undergarment giving a snug fit and a smooth surface, without baggy wrinkles or folds. I felt a bit shrinkwrapped, but not uncomfortable.

In the water, it flew like a dream. It was streamlined. It was flexible. And despite the considerable thickness of the undergarment, I enjoyed a sense of freedom of movement as if I wore only a tropical wetsuit.

Above all, I felt I could move faster. Usually, I pedal like a tugboat to propel my bulk and twin tanks forward through the water masses. Instead, I now felt like I was gliding smoothly.

Reaching out for the first stage behind my neck was easy and unhindered, too. On my regular suit, the seams under the arms make a stretch

like that a real struggle, and worse still, the resulting yank along the seams tends to pull my sleeve cuff out of position and let in water. Do I hate it when that happens? You bet.

In contrast, the Fusion just stretches. I could even clinch my hands behind my back.

A minor detail that I was less happy about was the placement of the shoulder valve, which I found placed too far on the outer side of the arm. It was just out of a reach for a relaxed grasp for it. Wearing undergarments and a BCD, I could only reach it if I also brought my whole right shoulder as far forward as possible and really stretched the whole limb. If I could have it tailor-made, I would have that valve rotated an inch closer to my chest.

zipped models where the zipper usually extends a bit down the shoulders.

I got big shoulders, so getting my second arm contorted down the right sleeve without putting too much strain on the zipper required some delicate moves and nudging.

But these very minor gripes should not ruin the overall impression of a very well thought out and high performing suit that probably will set a new benchmark for drysuits, if it hasn't already.

The suit comes with rock boots, and the fabrication quality and finish felt very reassuring. Where it mattered—in the water—it outperformed any other suit I have tested. ■

www.whitesdiving.com



It's streeeeetchy

Bangaram Island

Diving Tropical India



ABOVE: Relaxation Bangaram style with lagoon steps away. TOP: Bangaram Island and its atoll

Text and photos by Charles Stirling

Dreaming of diving off an uninhabited tropical island? Doing this by liveboard boat is one approach, but here, on Bangaram Island, one can live the island dream while staying on the island itself, which has enough infra-structure to make it comfortable.

The mainly submerged volcanic mountain range of the Chagos-Laccadive Plateau extends from the Indian Ocean into the Arabian Sea. At the southern end are the Chagos group of islands, which are British owned, but part leased to the United States for a secret military base. They are off limits even for the original inhabitants who have been trying to

return for many years.

The middle archipelago of islands, are the Maldives—an island nation well known to divers. At the northern end are the Lakshadweep islands, formerly known as the Laccadives. All of the islands rising out of the sea from this plateau are low lying coral atolls with associated sand banks and other coralline structures.

The coral growth has kept pace with land sinking and sea level rises, which have been happening for thousands of years giving, for divers, sheer vertical walls, shallow inter atoll bridges along with sandy lagoons to enjoy. Of course, the coral doesn't grow above the level of the sea surface; for island formation, storms or earthquake uplift are needed. Storms wash coral debris onto the top of underwater coral, but storms also mean some islands periodically disappear. The Chagos-Maldives-Lakshadweep Archipelagos are in a

dynamic state of flux.

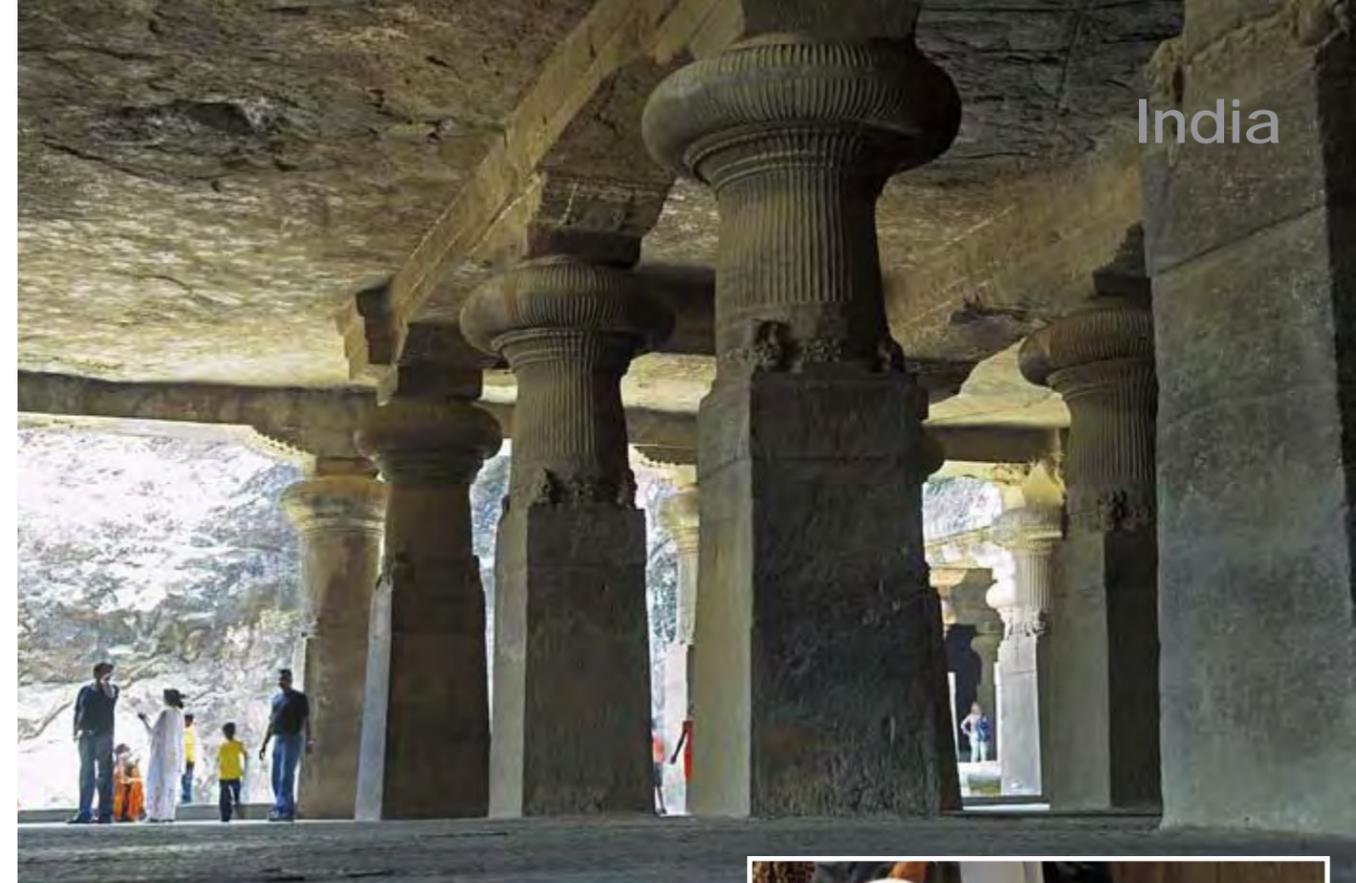
I went diving in the Lakshadweep archipelago on Bangaram Island. India has been very cautious in allowing "outside" influences in this archipelago—firstly, to protect the local native culture, and secondly, to protect the fragile ecosystems.

India—to visit or just dive?

Never having visited India before, I chose to combine the diving trip to Bangaram with a visit to parts of the Indian mainland in one trip. I didn't know exactly what the diving would be like, as it has had little or no coverage. Would I regret not spending all my available time underwater?

I first heard about diving on Bangaram when I talked with two of the owners (Michael and Badu Dominic) of the family-run Indian CGH Earth resort group of environmentally-friendly hotels, and found out they





CLOCKWISE FROM LEFT Chinese fishing nets at Cochin; Mumbai's Elephanta Island is both a religious shrine but also a simple pleasant location that locals visit to unwind from city congestion; Mumbai does have its street sellers; Crowded busy Mumbai



were both divers. The group owns the resort on this little known island. They highly praised the diving, so my excuse to visit India was sealed.

Getting to Bangaram from England

LAKSHADWEEP

Lakshadweep is the smallest union territory of India consisting of 12 atolls, three reefs and five submerged banks, with a total of 32 islands located between 200 and 400 km off the coast of the south west state of Kerala. Until recently, foreign visitors were not allowed. Now, you can visit by obtaining a permit in advance. Likewise, access was limited, first by infrequent ship, then slow ferry, until an airport was built on the island of Agatti, at first served only by a ten-seater aircraft. In 2007, Kingfisher Airlines started daily flights with a 70-seater turboprop plane. So, Bangaram Island is a rather special destination just beginning to open up. ■

involved first a transfer stop in Mumbai, or Bombay, as everyone local still calls it. I booked this with a morning arrival and a next day internal flight to Cochin (or Kochi in other speak) so had a day to visit the city, and did the same on my return.

Mumbai is a crowded, frantic, hectic, busy city that is fantastic. It's way too big and too congested to see more than a tiny fraction of it in two days, but one still can get a taste of the place. The first thing I noticed was the relaxed friendliness of the people, and that most spoke at least some English. Then, I noticed the slow rush of vehicles to get somewhere, as I tried to walk across a road. As a pedestrian, you quickly learn to weave amongst the cars.

With a car and a guide—which is essential—I crammed in visits to the Gandhi museum, the "Gateway to India", various religious shrines including Elephanta Island, a riverside laundry, various street markets and more. Yes, there was poverty. Yes, people were

begging, but it never seemed oppressive —people were generally happy. Yes, some streets were litter strewn, but seldom worse than England could be with our new rubbish "maybe collect" policies. While, on the whole, I was pleasantly surprised how tidy much of the city was. I would love to go back for a longer stay. At least a few days in a big Indian city should be on one's "to do" list.

Cochin is the gateway to the Lakshadweep islands. I went via Mumbai, but direct flights from some European cities, from other eastern countries and other Indian cities do exist. Cochin is famous for its Chinese fishing nets, to be seen in any travel book of the area, and they do still exist and

work. As in Mumbai, I had two nights, one each going and returning. The town is larger than maps seem to show it, and it's spread over several islands. I stayed on the seafront, near Fort Kochi, just a few minutes walk from those nets, so I did manage to get to see them as well as the fish market stretching along the beach front.





ABOVE: Cooking demonstration, a popular pastime. Hammocks meeting their calling on Bangaram

Getting there

Flying to Agatti was on Kingfisher Airlines—an airline reputed to have more reliable service than the ten-seater plane. Those of us going on to Bangaram were escorted out of the small airport to a thatch-roofed, open waiting area for passport and permit checking before seeing our bags manhandled over the beach to a little movable floating dock, which was pulled over to our boat moored just offshore. Following our bags, our group of newly arriving visitors sat back for the hour-long journey to our very own enchanted, tropical island surrounded by a turquoise blue sea.

Bangaram Island is officially classified as uninhabited, with only

CLOCKWISE FROM ABOVE: Bangaram Island seen from the sea; The small bar on the beach at Bangaram; Arrival on the little floating dock with dive boat nearby

the 80 or so resort staff—most of whom come from one of the other islands—and up to 60 visitors at any one time. So, does one really get to claim he or she has spent vacation time on an uninhabited island?

Accommodation is provided in one of 30 double bed chalets, each with shower and toilet, mini-bar fridge and enough space that a cat wouldn't hit its head if you had one to swing, and electrical outlets that maintained power throughout the day and night.

Communal facilities included a library and games room, dining hall used for breakfast and lunch, beach bar, plus the water sports centre and, the all-important, diving centre. No roads, just paths, no motor vehicles, no TV, not even mobile phone coverage—so, it is a location for relaxation.

Dinner was served under the stars, buffet style, with a good variety of entrees always including a choice of two or more fish, chicken, or other meat and various vegetable dishes, plus a couple of types of rice. We had barbecued tiger prawns one evening that were REALLY difficult not to overindulge in.

The food here, as in all the group's offerings, was a little bland for me, probably cooked for the more

normal Western visitors—not one used to cooking his own rather spicy concoctions at home. The food suited my partner just fine.

The beach bar was the only source of alcohol in the Muslim Lakshadweep islands, where it was illegal otherwise. So, an after-dive beer or wine with dinner was available.

The resort was very environmentally conscious with rainwater collection and storage for most water needs. The used water was treated and reused for watering plants. Electricity was generated





India



with solar cells with battery storage and diesel generation was only used late at night when batteries ran out. Plastics were discouraged, and any that did come to the island were returned to the mainland for recycling.

Equipment matters

Being here for the diving, my partner and I visited the dive centre in the morning after arrival to sort out hire of equipment

as we had only brought wetsuits, masks, camera equipment and dive computers with us. Long flights and weight limits had put constraints on what we could bring with us gear-wise. But bringing our own wetsuits proved sensible as the hired ones were shorties—fine, if you keep swimming, not so good if you take your time, even in the 30°C water.

Bangaram Island is inside a 10 km by 8 km atoll, joined by one other similar sized

uninhabited island, Tinnakara, plus two very small ones, Parali-I and Parali-II.

Looking at local charts, it appeared as if the areas outside the surrounding fringing reef dropped to depths of over 1000 metres on three sides of the reef. In places, these depths reached up to a couple of kilometres offshore. Others were relatively near, but deep depths were generally found only after more gently sloping contours.

On the side facing Agatti, a wide sandy bank bridged the two islands at 11 metres depth. All of this is important for the coral, as you will see later.

I asked Sumer Verma, the dive centre owner, about his diving customers. He said that over half were repeat visitors from many parts of the world. In general, they were vacation divers, often ones wanting to chill out with the island life. Some had bad experiences elsewhere (evidently many from a first experience that went wrong in the Red Sea). Others, such as us, needed to “get wet” while on a wider visit to India.

All the diving took place from a slow hard boat, similar to the one that brought

us to the island. It had bottle storage racks, wooden benches, a proper toilet inside and an insulated sunroof. So, it was comfortable for up to the 12 divers that it could carry, but did not meet the standards, or needs, of Red Sea day boats, which have to cover longer distances. The dive boat did carry an oxygen kit, radio and life vests.

Being a slow boat, it did save on fuel—a positive environmental consideration for this very environmentally aware resort—but it meant that trips to all the dive sites along the outside of the fringing reef took 40 to 80 minutes to reach.

Site selection was made in the morning, dependant on the weather but mostly on the experience levels of those who

turned up. The island life was relaxed; guests might or might not do what they planned the evening before, making for awkward dive planning. This was of little consequence except for photographers

LEFT TO RIGHT: Giant clams of all sizes and colours were common; It wasn't all simple flat terrain; Glass fish; Honeycomb moray eel *Gymnothorax favagineus* with cleaner wrasse and shrimp

Cleaning station for oriental sweetlips



CLOCKWISE FROM LEFT: Divers did see coral; Sharks were found, just not as many on my dives as other weeks; Feather star; The agricultural area of Kerala grows pineapples so fresh pineapple is a common inexpensive food

shipwreck, the Princess Royal, within the lagoon can be found, but in practice, it is coral reef diving that is the primary draw, as the wreck has only a few exposed timbers.

Most chosen sites were in the low 20-metre

a surface meeting to exchange OK signs, and finally the group descent. The dive sites were often on gentle sloping reef faces, so divers started shallow before finning deeper. Dives then meandered back up, giving excellent multilevel profiles for those hour long dives.

The surface interval of 60 to 90 minutes was spent relaxing on the boat with fresh pineapple slices and cakes, which set us up for the second dive that had us back at the resort by 2:30 for lunch.

Afternoons were spent unwinding on the beach, snorkelling, kayaking, going deep sea fishing, getting an ayurvedic treatment or going for a walk—it's a small island with enough to do if you're not expecting a raving disco or late night clubbing.

A number of sharks and a few large rays were seen on Manta Point, but that was the day before my dive. Isn't it always just before or after your dive?

On my dive, marine life was limited to a few hawksbill turtles, fish of the oriental sweetlips variety at cleaning stations, eels popping out of holes, anemone fish doing their thing, and the rest of the expected coral reef fish and invertebrate life hiding in holes.

Shark sightings arose at Entrance Point with a couple of nurse sharks sleeping under a ledge. We saw a ray and a clutch—if that's what you call 15 or more together—of spiny lobster at Bangaram Reef, cushion stars, giant clams, bannerfish, trevally, wrasse, garden eels, butterflyfish, parrotfish and more at many if not all the sites. Yes, fish life is reasonably good. A guide book to the Maldives will work relatively well here with some minor changes.

The big stuff is less common and tends to visit only in November-December with the cooler waters. Manta ray cleaning stations haven't yet been found, and the sightings are few and only made during those cooler months.

who wanted to set up lenses. The boat had no provisions for photographers; not even a rinse tank was available when I was there, let alone a flat dry area for setting up. However, the fact that the dives took place in a relaxed atmosphere with 30°C water, time limits of an hour and a none too frantic pace led by the dive guide made up for this problem.

Remnants of an old wooden

depth range with a few a little less. One site, "The Grand Canyon", was a narrow fissure extending below sport diving limits. Shallower sites were available, and the first steps in training were done within the sheltered lagoon. Looking at the local charts, there should have been some stunning vertical walls to see. However, since they start at about 30 metres, these are not on offer.

All dives started with a back roll, then





India

arriving in Agatti.

None of the islands and nearby seas are really fully explored. It is still relatively virgin territory, with the possibility of good new sites yet to be discovered.

Did I err?

Having come to the end of my stay on Bangaram, could it be said that I erred in choosing to make my first trip to India a mix of diving and visiting some of the mainland? No. The other guests and I enjoyed the dive sites of the island, and the resort was great, but the diving wasn't world class. The trip as a whole was in the world class category and was enhanced by time spent underwater.

Cochin and Mumbai were gateways worth seeing. The remainder of the time was spent

visiting a little of the state of Kerala beyond Cochin.

Kerala

Kerala is coastal— well known for its coconut palms growing along its 1000 plus miles of interconnected lakes, rivers and canals that make up the backwaters. Further afield are long stretches of sandy beach, rugged mountains, tea plantations, agricultural areas, and historic and religious centres of many flavours.

This isn't the article for extensive coverage of all the attractions, but a short mention might show why a combined diving and sightseeing trip is worth considering. I only just scratched the surface of what there is to see in this small green state of India.

The backwaters are on the doorstep of Cochin. I went to Coconut Lagoon, accessible by boat, looking first at what

Since most of the clientèle were vacation divers, the organization of the diving for them adhered to a policy that had the divers following the guide who led the group. Strict safety was emphasised. The chance to stay and watch animal behaviour was limited if the group lost interest, but interesting animals were pointed out during the dive giving everyone an opportunity to see marine life. More experienced divers were provided with their own guide on the same site, if numbers worked out.

Warm waters

The warm, 30°C water made for pleasant diving, but the downside was the presence of coral bleaching, with much of the hard coral dead. Small patches

and stands of good coral were present on every dive and recovery was slowly happening.

The warming effect of the 1998 El Niño affected the whole of the Chagos-Maldives-Lakshadweep submarine mountain range. Recovery seems much slower here at Bangaram. It is possible that the Maldives made a quicker recovery due to stronger, cooler deep ocean currents. The top of the mountain range around Bangaram atoll and Agatti is both large and shallow, so the sun warms the water, while the prevailing currents—being from the west—are possibly pushing the newly warmed water over the reefs slowing regeneration.

Agatti is at the southwestern side and suffered less damage during El Niño.

Recovery seems to be better. We did get below a thermocline at one point and found better coral condition. The poor coral is a deterrent to making the trip, but it shouldn't be a show stopper for an occasional diver, or for anyone making this excursion a part of seeing more of India.

In addition to diving on Bangaram Island, diving is also available on Agatti and Kadmat Islands, which I wasn't able to try. Both of these islands supposedly have less coral bleaching yet somewhat similar coral diving. Accommodation on both of these islands is more basic. Kadmat is a few hours' boat journey after

THIS PAGE: Tea farm in the mountains near Thekkadi; Kettuvallam or houseboat on the Kerala backwaters; Wild elephants at Periyar





interesting environmentally, as much of the adjacent land is below sea level with dykes holding the water back. Sea water is let in seasonally to flood the waterways, which helps to control the water hyacinth invasion.

It's an area undergoing economic changes with coconut palms replacing rice fields in some places. More tourists visit now with the houseboats, and land reclamation is taking place. The area grows a lot of coconuts with local home industries producing coir products, spinning the coconut fibre into twine, weaving traditional door mats, and more.

The region is worth seeing maybe sooner rather than later. There's just too much to see—this is the only real problem.

The beaches in Kerala are—well, beaches—long white sandy places with water at one edge—less crowded, less touristy than Goa just to the north and lacking the wild nightlife. If you want to continue the Bangaram style beach life, it's worth considering coming here, as I did for a moment at Marari Beach. Not being much of a beach bum, I took a three-hour tour by tuk-tuk to see other fishing villages.

Driving inland, coconuts give way to rubber tree plantations and pineapple farms in this agricultural region; then, impressive mountains become apparent as foothills become steeper, valleys spread out

below, and the road switchbacks up sheer cliffs. Near the top, one can find tea plantations sprouting, spices growing, forests and nature reserves.

I made it up to the tropical rainforest and Periyar Tiger Reserve near Thekkadi to visit a tea factory as part of the drive. No tigers were seen at the reserve, not that it was really expected, as only about 12 wild ones are left. I took a long hike in the reserve, then a boat ride on the lake, which shows off the wild elephants, water buffalo, monkeys and deer.

The reserve is doing its thing on the environmental side—converting local tribal people from poachers to game wardens and tourist guides. The park boasts a diverse flora of over 2000 species of flowering plants, many of which are endangered, including many species of orchids, grasses and trees along with the diverse animal life.

I found these explorations great fun as well as educational but wondered what families, and in particular, what kids would think about it all. Was it very much an adult trip? So, I asked a few English families with kids what they thought. I was surprised by the responses, summed up by one ten-year-old, who said that their Kerala trip—not dissimilar to mine—was the best holiday she had ever had. She said, "It has the climate, colour, food, friendly people, things to do, beaches, mountains and animals,"



and she didn't want to ever go home.

Environmentalism

Taking this trip happened slightly by accident following a certain conversation about a hotel's environmental endeavours. The CGH Earth group are proud of what they are trying to do, something beyond the normal. So, what did I find when I visited?

First, conservation happens in the background, something a guest

CLOCKWISE FROM FAR LEFT: Coir, or coconut fiber, being spun into twine in a small cottage industry seen in much of coastal Kerala; Rice fields as seen from a backwaters houseboat cruise; Chinese fishing nets at Cochin; Canoes are the local transport on the backwaters

India has a reputation in some quarters as a country to avoid seemingly due in part to the poverty there and less than great food hygiene. Yes, many are poor, but having stayed in the admittedly tourist-oriented hotels, I found food hygiene up to Western standards. Food outside the hotels also seemed at least reasonable and delightfully spicier. Streets were generally clean (in Kerala, often cleaner than streets I see frequently in England). India is changing. ■





CLOCKWISE FROM ABOVE: Even the local shop arrives by canoe in the backwaters; Bangaram diving; The earthworms seemed to like the concrete homes at Spice Village; Water treatment at Coconut Lagoon

finds out only by asking, and I was asking. Seeing the practice in action was impressive. There were a variety of initiatives at different locations, each hotel looking at its local situation to minimise impact for that location. They were not using a blanket, unthinking “one-fits-all” approach.

All the hotels did substantial recycling. Plastics and metal cans were sent to commercial centres, organics composted using either anaerobic digesters or earthworms—sometimes for fuel—and grey water was used for gardens.

These days, ‘recycling’ is often just a catchword for governments or establishments to duck behind. Here, at Spice Village, it was impressive seeing over 70 good size wormeries lined up taking compostable waste with the output used on the hotel gardens or in mushroom growing bags.

Coconut Lagoon used both worms and heated anaerobic digesters (heated by burning other waste) to produce methane used for cooking stoves. Tree cuttings might be chipped for mulch or composted.

Varied rainwater catchment and storage systems were in use. The reverse osmosis water purification plant was impressive at one hotel. Others used less water, so had simpler smaller systems.

The solar cells on Bangaram with

battery backup were necessary as no supply grid existed. On the mainland, some electricity might be solar cell generated, but grid supply was often used, as this helped to support supply to the local communities who otherwise wouldn’t use enough to justify making it available.

Local materials were used in buildings—indeed, the older buildings had been rescued, moved and rebuilt. Local people filled most of the staff positions. The Kettuvallam boat was commissioned to be built using the traditional practice of stitching planking together with coir twine—a building practice that is now being lost as nailing is cheaper.

The CGH Earth group is doing an excellent job with eco-tourism. It’s almost worth visiting just to see how tourism can turn “green”, and they accept it as an ongoing, evolving practice. ■

Both the India Tourist Office and CGH Earth Group went out of their way to be helpful in organizing this trip. The author and X-RAY MAG would like to thank both. Links:

CGH Earth www.cghearth.com
Government of India Tourist Office www.tourisminindia.com
Ministry of Tourism www.incredibleindia.org

fact file



India



SOURCES: US CIA WORLD FACT BOOK, SCUBADOC.COM

History Around 1500 B.C., Aryan tribes from the northwest moved onto the Indian subcontinent; they integrated with the earlier Dravidian peoples and created the classical Indian culture. In the 4th and 3rd centuries B.C., the Maurya Empire united much of South Asia and reached its height of power under the reign of Ashoka. The Gupta dynasty (4th to 6th centuries A.D.) ushered in the Golden Age when Indian science, art, and culture flourished. In the 8th century, Arab incursions began, then came the Turkic in the 12th century followed by European traders in the late 15th century. By the 19th century, political control of virtually all Indian lands was assumed by Britain. A vital role was played by Indian armed forces in the British army in both World Wars. But not all en-

joyed British colonialism. Nonviolent resistance was led by Mohandas GANDHI and Jawaharlal NEHRU who helped to bring about independence in 1947. A division of the subcontinent led to the establishment of the secular state of India and the smaller Muslim state of Pakistan. In 1971, East Pakistan became the separate nation of Bangladesh after a third war between the two countries. In 1998, India's nuclear weapons testing spurred Pakistan to conduct its own tests later that year. Kashmir is an ongoing dispute between the countries, but tensions have been decreased by discussions and confidence-building measures since 2002. India's impressive gains in economic investment and output is challenged by pressing problems including significant overpopulation and extensive

poverty, ethnic and religious conflicts, and environmental degradation. Government: federal republic
Capital: New Delhi

Geography India is located in Southern Asia. It borders the Arabian Sea and the Bay of Bengal, between Pakistan and Burma. Coastline: 7,000 km.

Wild elephant takes a mud bath at Periyar near Thekkadi



RIGHT: Location of southern India on global map
FAR RIGHT: Location of Bangaram Island on map of India



north. Natural hazards include droughts, flash floods, as well as widespread and destructive flooding from monsoonal rains, severe thunderstorms, and earthquakes.

Environmental issues Tap water is not potable throughout India. There is soil erosion, deforestation, overgrazing, desertification, air pollution from industry and traffic emissions. Water pollution results from raw sewage and agricultural runoff of pesticides.

Population 1,147,995,904 (July 2008 est.) Ethnic groups: Indo-Aryan 72%, Dravidian 25%, Mongoloid and other 3% (2000). Religions: Hindu 80.5%, Muslim 13.4%, Christian 2.3%, Sikh 1.9% (2001 census). Below poverty line: 25% (2007 est.). Internet users: 60 million (2005)

Currency Indian rupee (INR) Exchange rates: 1EUR=63.33INR, 1USD=45.56INR, 1GBP=80.05INR, 1AUD=36.17INR, 1SGD=31.54INR

Language Hindi is the national language. English has an associate status, however, it is used for national, political, and commer-

Terrain: In the south, the upland plain (Deccan Plateau), leads to rolling plain along the Ganges, while deserts lay in the west and the Himalayas in north. Lowest point: Indian Ocean 0m. Highest point: Kanchenjunga 8,598m.

Economy India's economy is made up of traditional village farming, modern agriculture, handicrafts, a broad range of modern industries, and a variety of services. Growth is primarily due to services, which account for more than half of India's output but less than a third of its work force. Most people work in agriculture, so the United Progressive Alliance (UPA) government supports an economic reform program that develops basic infrastructure thereby improving the lives of the rural poor while boosting economic performance. Since 1997, a ten-year average economic growth rate over 7% reduced poverty by about 10%. India has large numbers of well-educated workers skilled in English, so the country has pushed to become a major exporter of software services and software workers. The enormous and growing population is the fundamental social, economic, and environmental problem.

Climate varies from tropical monsoon in south to temperate in

cial communication. In Kerala, Malayalam is spoken, but almost everyone speaks English as a second language. Languages spoken in India: Hindi 41%, Bengali 8.1%, Telugu 7.2%, Marathi 7%, Tamil 5.9%, Urdu 5%, Gujarati 4.5%, Kannada 3.7%, Malayalam 3.2%, Oriya 3.2%, Punjabi 2.8%, Assamese 1.3%, Maithili 1.2%.

Health No compulsory vaccinations are required for Bangaram. It is not in a malaria zone, however, Polio, Tetanus, Typhoid and Hepatitis A vaccination is recommended. Please check with your doctor. In other areas of India, there is a high degree of risk for food or waterborne diseases including bacterial diarrhoea, hepatitis A and E, and typhoid fever as well as vectorborne diseases such as chikungunya, dengue fever, Japanese encephalitis, and malaria. In addition, animal contact diseases such as rabies and highly pathogenic H5N1 avian influenza have been found in India, but pose negligible risk.

Decompression Chambers
Chamber Complex
Indian Naval Hospital Ship Asvini
Colaba, Mumbai 400 005 India
Tel.: 2151666

Diving Season
Bangaram and Kadmat:
October to late April
Agatti: October to early April
The resort on Bangaram is open all year. Monsoons start in May.

Time Zone GMT +5.5
(Look out for that odd half hour)

Travel Air India flies to Mumbai; Indian Air to Cochin; Kingfisher Airlines to Agatti; Air France to Cochin direct from Paris; Oman Air from Gatwick with Muscat as the exchange to Cochin. Some flights go through Dubai to Cochin.

Web sites
Lacadives, Bangaman
www.lacadives.com
Agatti Deline
www.divelineagatti.com ■





Text by Arnold Weisz

The ocean has been regarded as a global commons whose resources are inexhaustible and therefore free for the taking. The need to manage and protect the few valuable resources left in the ocean is requiring an ever increasing financial participation from governments, businesses and the general public.

Management doesn't come for free. In a report by the World Wildlife Foundation (WWF), it revealed that a survey of over 80 Marine Protected Areas (MPA) in 2003, found that a global MPA network covering 30 percent of the world's oceans might cost between US\$7 billion and US\$19 billion annually to run. Total government spending worldwide on protected areas has been estimated to be US\$3.2 billion per year, but there are no statistics available that show how much of these US\$ 3.2 billion were specifically allocated to marine and coastal protected areas.

This huge under funding of the park management around the world has created a map wadded with paper parks. Countries have committed themselves to establishing networks of Marine Protected Areas by 2012 under the Convention on Biological Diversity, but only 0.5 percent of the oceans currently protected is a poor start towards that very essential goal, said Christian Neumann, Conservation Officer for WWF International Centre for Marine Conservation.

Pay & Play

Siete Pecados Marine Park, was established in 2004. Area was subjected to blast and cyanide fishing in the late 90s. With the collaborative efforts of NGOs, FAPs, Local Government Units, and other volunteers, the reefs are recovering and fish recruitment is occurring. It is now one of the tourism destination areas in Coron, Palawan. Philippines



Examples of daily and annual diver park user fees throughout the Caribbean:

Bonaire Marine Park	Pigeon Island Park
Netherlands Antilles: \$ 25	St Lucia: \$5 - \$15
Soufriere Marine Park	Half Moon Cay Belize: \$5
St Lucia: \$4 - \$12	Hoi Chan Belize: \$2
Saba Marine Park	SBWEMP Honduras: \$5
Netherlands Antilles: \$3 per dive	Isla Bastimentos Panama: \$10
Cozumel Marine Park Mexico: \$2	Utila Marine Park Honduras: \$3

Pay & Play

Sea turtles, and other species can be seen around Menai Bay Conservation Area in Zanzibar, Tanzania

Paper parks

If you look at maps, there are a lot of protected areas on the planet. Many more on land than at sea. However, only a very small percentage of these declared protected areas exist in actual

fact. Most are paper parks in which no management occurs. The motivation to establish protected areas is often based on the perception that such areas enhance a country's competitiveness in the tourism sector. The cost of protecting the designated areas are often insurmountable, especially for poorer countries.

I wrote about such an example in X-RAY MAG issue 22, where the local environment protection agency of São Paulo state (Secretario Meio Ambiental SP), Brazil, only received funds in 2005 to buy a boat to patrol the

state's marine parks. The state's marine parks were left virtually unprotected up to then, after the park was created in 1993.

There is a difference between rich and poor countries when it comes to financing of protected areas. Research does show that government resources are the dominant source of funding for MPAs in developed countries, whereas in developing countries, foreign assistance and park entry fees provide a relatively larger part of their revenues.

You can't really blame poorer countries that they choose to maybe spend their revenues on infrastructure or in aiding a struggling population, rather than forking out money on park rangers and patrol boats.

As the whole world is more and more linked together, especially concerning natural resources and the effects of global warming; the burden of environmental management must be shared by us all. Given the limited ability of most governments in the developing world to meet the costs of management, alternative sources of revenue must be explored.

Natural resource

On the other hand, governments can in many cases be persuaded to increase their annual budget allocations for con-

LEFT: Schooling Pennantfish, Pyramid and Millettseed butterflyfish, *Chaetodon miliaris*, at Rapture Reef, French Frigate Shoals, of the Northwestern Hawaiian Island now known as part of the Papahānaumokuākea Marine Monument (inset). It was the world's largest marine protected area when it was established in 2006



servation and sustainable management of marine ecosystems if they can be shown that marine resources generate substantial economic benefits in the short, medium, or longterm.

Just a few decades ago, a natural resource was something you could dig out of the ground or pump up from the bottom of the ocean. In the last few years, many developing countries have seen that eco-tourism also taps into one kind of natural resource—clean and unspoiled oceans.

Existing revenues from fisheries and tourism can dramatically decline if coastal wetlands and coral reef ecosystems are not adequately protected. For a MPA, to succeed in reaching its goals regarding improved water quality, reduction in fishing pressure, and protection of habitat, suitable management methods must be adopted and enforced.

Sadly, this is not always the case; a report by the World Bank admits that only

30 percent of Caribbean and 10 percent of East Asian MPAs have achieved their management goals. A further report reviewing the success of marine parks found that only 9 percent achieved their management objectives. This means that of the world's 361 million km² of ocean, less than 1 percent is covered by MPAs, with 71 percent appearing to have no management scheme at all.

Economic indicators, such as a marine resource's contribution to a country's fiscal revenues or to foreign exchange earnings, can therefore be a great help in making a compelling case for marine conservation. Tourism is the world's largest industry employing 195 million people and contributing over 10 percent of world Gross Domestic Product (GDP) according to the World Travel and Tourism Council. Marine-based tourism cruises, scuba diving, yachting, whale watching, and sun-sand-sea tourism to destination beach resorts generates bil-

PETER SHUNJUA/MARINE PHOTOBANK





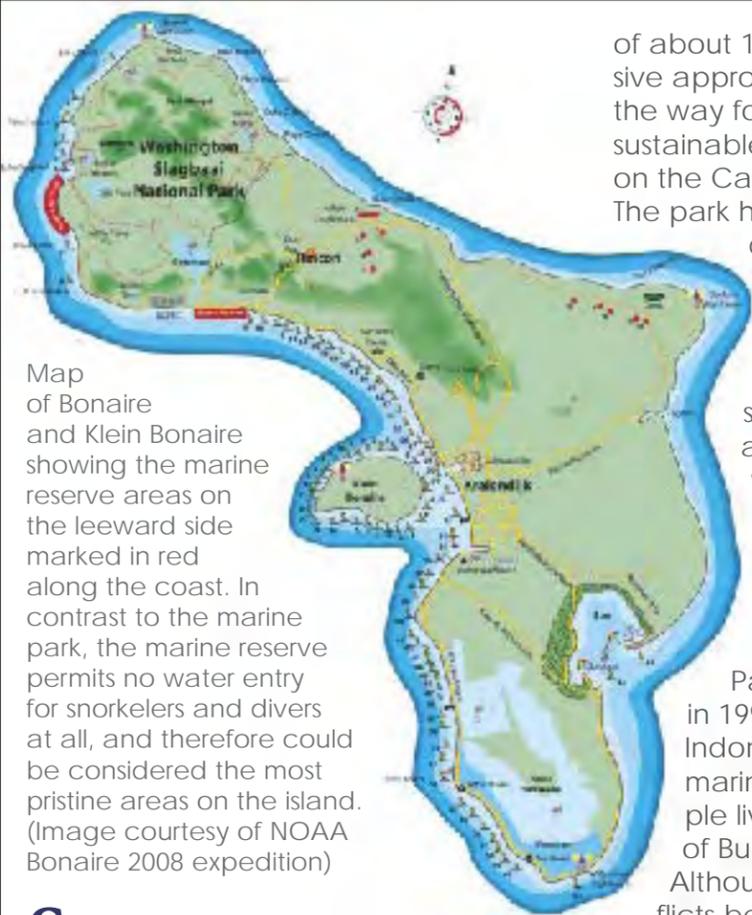
lions of tourist dollars. Often can combined efforts by governments and non-governmental organizations be a good match. The politicians have to put in place legislation and longterm policies. While the management of the parks can be handled by non-governmental agencies. The latter often also provide necessary education tools, which is essential to get the local communities to support the efforts.

My ocean

MPAs have the dual benefits of protecting both the coral reefs and fish populations that make the area more attractive for the user. There is a variety of financing mechanisms that include government subvention, international assistance, personal donations, commercial and bi-lateral debt swaps, trust funds and entrance fees.

The funds necessary to maintain and manage a park can be costly, as even a small park with few staff can have an annual budget exceeding US\$100,000. The most frequent way divers contribute to marine park management is by paying entry fees. This kind of revenue system has been set up in amongst other places, Bonaire, Egyptian Red Sea, Indonesia and Tanzania.

Scuba divers are getting used to this kind of "pay and play", or user oriented, fees when diving in marine parks. Pay per use has been a great success for financing protected areas, and additionally, has had a very positive effect on other aspects of life in several countries. It's becoming as natural as paying to see a movie at the cinema. ■



Map of Bonaire and Klein Bonaire showing the marine reserve areas on the leeward side marked in red along the coast. In contrast to the marine park, the marine reserve permits no water entry for snorkelers and divers at all, and therefore could be considered the most pristine areas on the island. (Image courtesy of NOAA Bonaire 2008 expedition)

Success Stories

Bonaire Marine Park

Since its creation in 1979, the Bonaire Marine Park has firmly put the tiny Caribbean island on the scuba diving map. The marine park extends from the high water mark to a depth of 60 metres/200 feet. It encompasses the entire coast of Bonaire, including Klein Bonaire, occupying about 2,700 hectares. Bonaire Marine Park is managed by a nongovernmental organization through collaborative agreements with government. These extra governmental management arrangements allow greater flexibility in the establishment and administration of revenue generation systems within the framework of enabling government legislation and policy. The park maintains more than 100 public moorings and conducts extensive scientific research. The park has succeeded in becoming an integral part of the island's philosophy, including virtually all of the island's population

of about 12,000. The inclusive approach has paved the way for a healthy and sustainable tourism industry on the Caribbean island. The park has eliminated

destructive fishing practises and discharge of polluted ballast water. The park is solely financed by admission fees. www.bmp.org

Bunaken National Marine Park

The Bunaken National Marine Park was formally established in 1991 and is among the first of Indonesia's growing system of marine parks. Some 20,000 people live on the natural resources of Bunaken National Marine Park. Although there are inevitable conflicts between resource protection and use by people, the Indonesian government is taking a fairly unusual and pragmatic approach to park management. Local communities, government officials, dive resort operators, local nature groups, tourists and scientists have played an active role in developing exclusive zones for diving, wood collection, fishing and other forms of utilization. In Bunaken National Park in Sulawesi, Indonesia, for example, employees in the park's important tourism sector earn US\$144 a month compared to fishermen at only US\$44 a month. Bunaken Marine Park has become an important example of how Sulawesi, and the rest of Indonesia, can work to protect its natural resources. The entrance fee system has been adapted from the



Bunaken Marine Park

well-known Bonaire Marine Park system, and the proceeds from the sales of the entrance tags are managed by the Bunaken National Park Management Advisory Board (BNPMAB), a multi-stakeholder board of which NSWA is a member. The system has been very successful in raising over \$250,000 for conservation programs in the Bunaken Marine Park since its inception in 2001. The funds are controlled by a multi-stakeholder management board comprised of the North Sulawesi Watersports Association, villagers from the 30 villages in the park, local tourism, fisheries and environmental government agencies, and the local university's marine sciences department. This setup ensures that the money collected is directed to the most important programs needed in the park. www.sulawesi-info.com/bunaken.php ■



www.underwater.com.au
underwater

dive in.
explore.
discover.



Tailgating the lone dugong, KAT, on Cocos (Keeling) Islands. Photographed by Karen Willshaw ~ underwater.com.au member

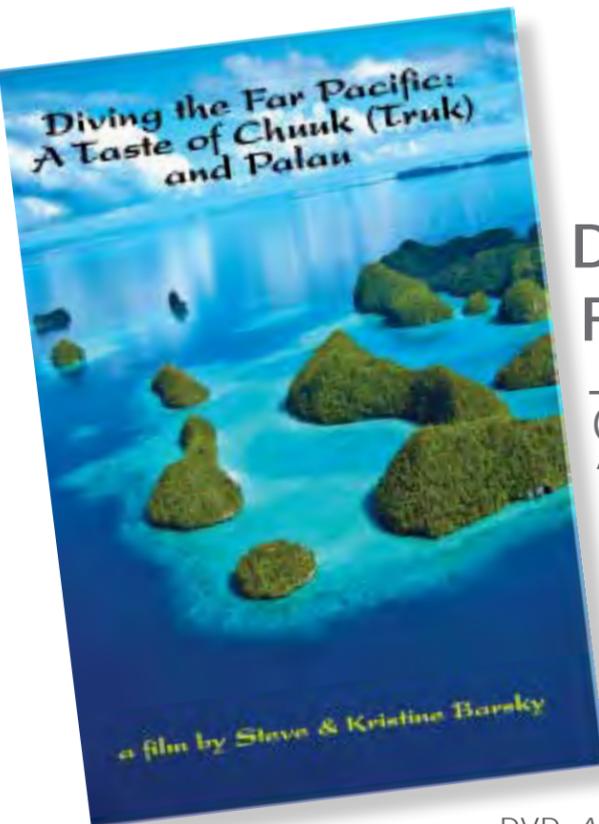
Bunaken Marine Park



Books Film DVDs CDs

Edited by Catherine GS Lim
Simon Kong & Gunild Symes

POINT & CLICK
ON BOLD LINKS



Diving the Far Pacific

—A Taste of Chuuk (Truk) & Palau

A film by Steve & Kristina Barsky. If you are planning to visit Chuuk or Palau for the first time, be sure to get hold of this very informative documentary DVD. The folks at Hammerhead Video have put together a very nice package of two separate videos in one

DVD. *A Taste of Chuuk* runs for 34 minutes, while *A Taste of Palau* runs for nearly 20 minutes.

Both give a very good idea of what to expect for those planning a first visit and makes a good reference for anyone who has already been there. The information is presented wreck by wreck starting with the *Fujikawa Maru* and ending with the *Shinkoku Maru*. The narrative gives good information on the Japanese wrecks, useful advice and warnings and interesting marine life, but the depth information should have been given in metres as well. The next video on Palau is a lot shorter, with topside interest as well as underwater such as the world famous jellyfish lake. This DVD is well put together with good music, historic information and good narration, but the videos weren't always bright enough at times, and the videography was a bit shaky. Total run time: 54 minutes. Published by Hammerhead Press. Standard Definition Widescreen NTSC All region video 16:9. ISBN: 0-9740923-5-5

Sharkville

The great white sharks of Mossel Bay in South Africa are the subject of this documentary, which first aired in July 2008 as part of National Geographic's *Wild* series. The characteristics of Mossel Bay—calm waters, the presence of a seal population and only one cage diving company—made it a suitable venue for the study.

Sharkville represents six years of research by shark expert Ryan Johnson, and reveals much new information about these little-known animals. Amongst this include exciting footage caught on night-vision cameras in which great whites, for the very first time, were seen breaching and hunting seals at night. More than 600 hours were spent tracking the sharks. In addition, filming at night proved to be extra challenging as lights could not be used. Instead, lighting was obtained from moonlight through the use of an image intensifier.

Johnson, one of the scientists at the SA Marine Predators Laboratory (Sampla), also hosts the programme. Although there's been no news of the DVD release (yet!), the programme will be repeated on international National Geographic channels over the next five years, so do watch out for it!

Produced by Ryan Johnson, and Stefania Muller and Charlene Waite (both from Obsessively Creative)
Cameraman: Phil Vail



Still shot from the documentary film, *Sharkville*, by National Geographic

Deadliest Catch: Alaskan Storm

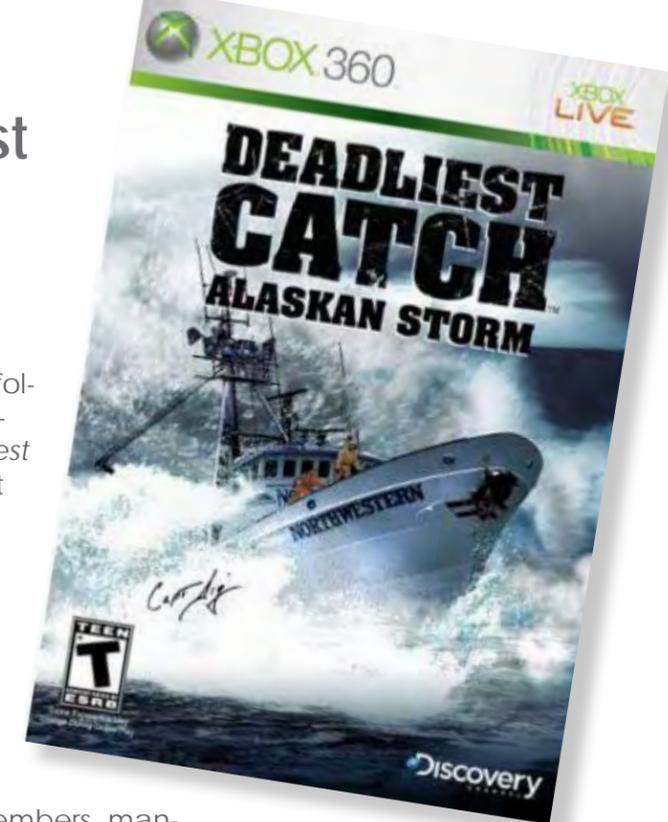
If you are a keen follower of the television series, *Deadliest Catch*, you'll want to get your hands on the computer simulation game, *Deadliest Catch: Alaskan Storm*. It means taking charge of your very own crab boat, choosing your own crew members, managing them, deciding where to fish for crab. In-between, you will have your hands full with side missions pursuing whale poachers, fixing hydraulic hoses, upgrading your ship, etc.

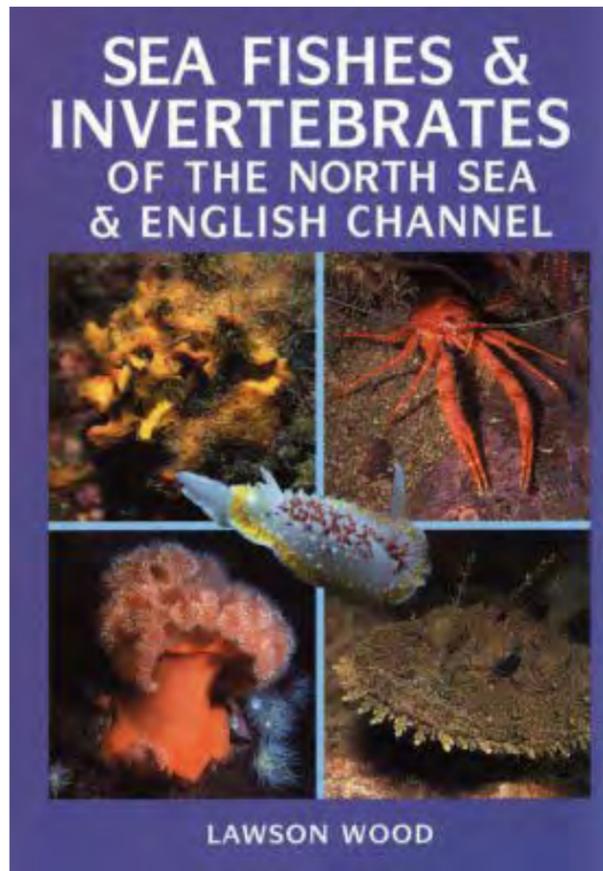
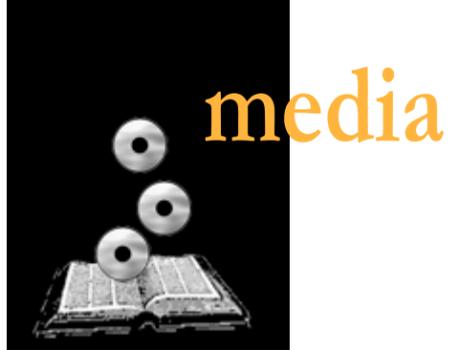
As the captain, you are stuck with having to play mother hen to your crew, helping them get out of trouble with their girlfriends, catering to their supersitutions, dealing with injuries or simply just making sure that there's enough food on the table. After all, a happy crew is often the prelude to a successful operation.

Sounds like a tough job? Well, it is! However, players have the advantage of getting helpful input from Sig Hansen about running a successful crabbing operation. Players can either select a career mode or arcade-style games. Competing with other crabbing ships, players battle to be the first to locate the crabs and to get to the scene before anyone else.

The content in the game is based very closely on reality, right down to the characters, ships, harbour specs, weather, geological conditions, and of course, the crabs themselves, which means it's as close to the real thing as you can get without getting your feet wet—or putting your life in danger.

Developer: Liquid Dragon
Platform: Xbox 360, PC (pending)
Release: June 2008





Sea Fishes & Invertebrates of the North Sea & English Channel

By Lawson Wood. The North Sea has an astonishing profusion of marine life that exists in a relatively small, square region of ocean, which reaches the coasts of Britain to the west and the shores of northern France, Belgium, the Netherlands, Denmark, Norway and in the east, the far southwestern edge of Sweden. The first of its kind, this book includes more than 300 full-colour photographs and black-and-white line drawings. In the introduction, the formation of the North Sea is described as well as the habitats and types of animals that can be found there. Urgent conservation issues of this ecologically diverse area are addressed. The field guide section makes up the core of the book. It has accounts of fascinating species accompanied by identification photographs of almost 300 species of marine creatures, including fishes, molluscs, crustaceans, starfish, sponges and corals.

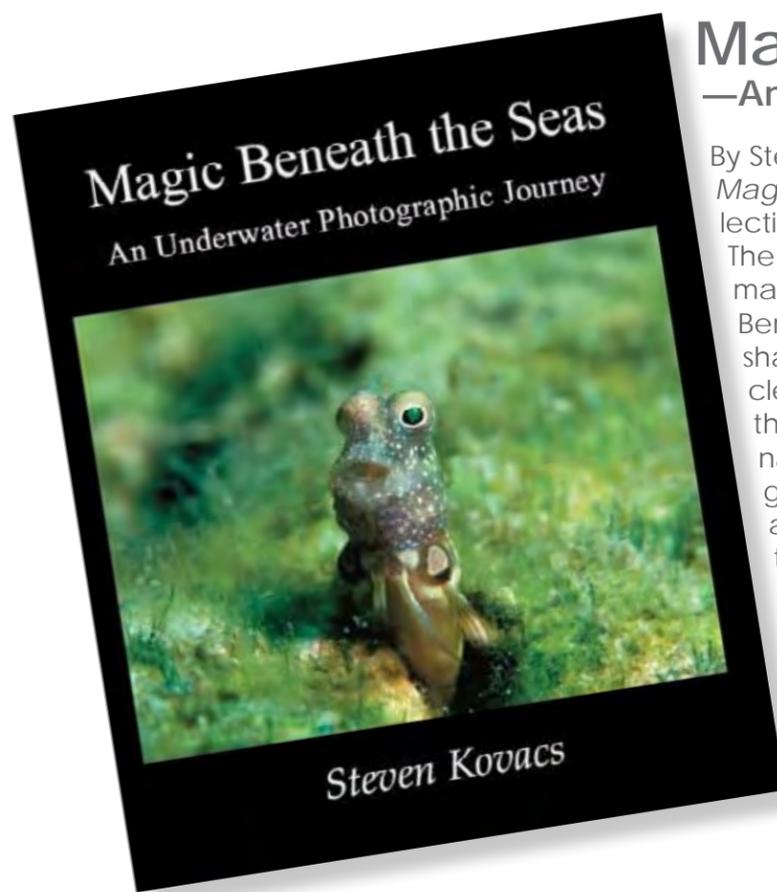
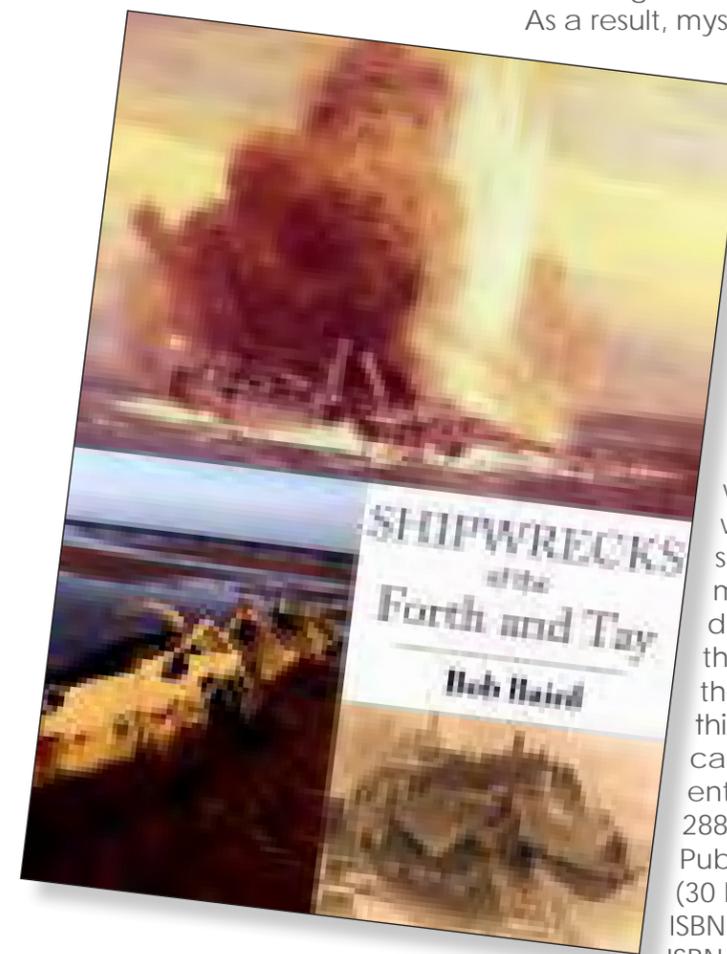
128 pages, paperback 20.6 x 14.8 x 0.8 cm
Published by New Holland Publishers Ltd (Sep 2008)
ISBN-10: 1847731252
ISBN-13: 978-1847731258

Shipwrecks of the Forth & Tay

By Bob Baird. An upgrade of the successful previous edition, *Shipwrecks of the Forth*, this book is a new and improved version of the former. The new edition benefits in a large part to the vast amount of critical new information gathered by the author through 15 years of careful and diligent research. In the text, the details of each wreck are listed, including position, history and outcome. Maps and charts accompany the descriptions, which are illustrated with numerous dramatic photographs. Through the research of this comprehensive work, many exciting discoveries and recoveries were made by divers, including such items as ships' bells and pottery. As a result, mysteries have been solved, and

the identities of certain wrecks previously unknown have been able to be confirmed. The author consulted many primary sources in the writing of this book, including official records from the Admiralty and Lloyds, official German U-boat records and Norwegian, Swedish and Danish records as well as first-hand local knowledge of fishermen, coastguards, lifeboat officers and divers. There were several reasons why vessels were lost. Many ran aground or suffered collisions, but the large majority of shipwrecks in the immediate area of the UK coast were the result of military activities during the First and Second World War. In this regard, the book will hold significant historical interest for shipwreck enthusiasts and history buffs.

288 pages paperback
Published by Whittles Publishing (30 Nov 2008)
ISBN-10: 1904445748
ISBN-13: 978-1904445746



Magic Beneath the Seas —An underwater photographic journey

By Steven Kovacs
Magic Beneath the Seas is essentially a personal marine picture collection of more than 300 images by a Florida-based dental surgeon. The author strives to share with the reader the diverse and fascinating marine life that can be found underwater, hence the name, Magic Beneath the Seas. Animals such as the nudibranchs, manatees, sharks, crabs and reef fishes are featured and described in a very clear and informative style, which makes this book a good read for the nondiver as well. The information presented includes scientific names, the length of the subject, depth and location; all useful to give non-divers an idea of the size and distribution of the marine animals. Most of the images are of high quality, but some seem to have been blown up just for the sake of including them in the collection. A plus point is that the pictures include marine life from North America and the Caribbean and not just the Indo-Pacific. Well written and easy to read, this coffee table book makes a good gift for your diving and non-diving friends.

240 pages, 10 x 12 hardcover
317 photographs
Published by NGFL Publishing, Inc.—1st edition (April 1, 2008)
ISBN-10: 097920870X
ISBN-13: 978-0979208706

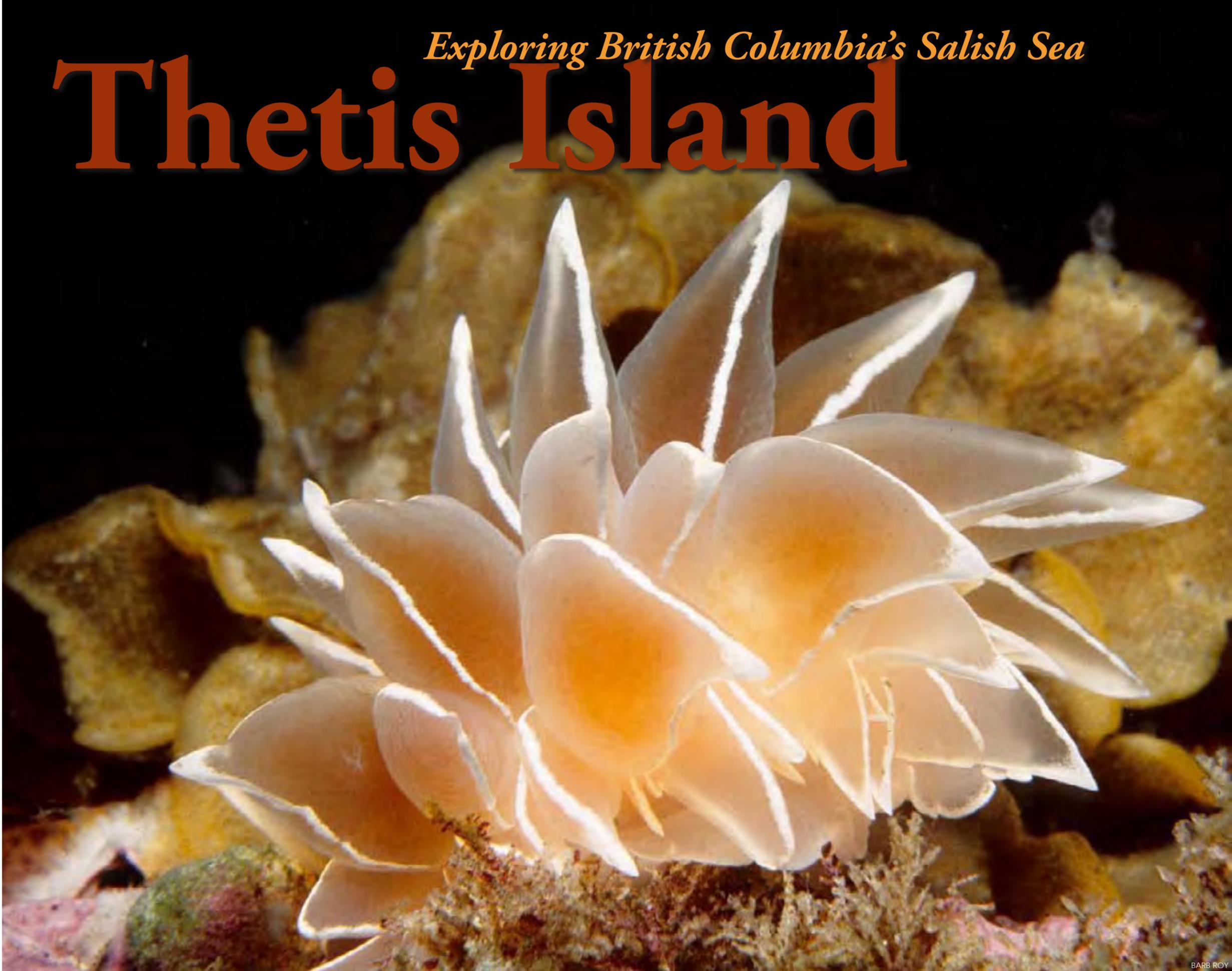
Exploring British Columbia's Salish Sea

Thetis Island

Text by Barb Roy
Photos by Barb Roy,
Andy Lamb and Gunild Symes

Tallen, my youngest daughter and part-time dive buddy entered the cool emerald coloured water with me as the current slowed to a stop to change direction (slack). Full of anticipation, Tallen and I descended down the southwest side of Virago Rock within Porlier Pass, a .65 km (.4 mile) wide channel between the islands of Valdez and Galiano. We swam past rockfish resting on overlapping fronds of kelp and through a dense thicket of bull kelp with tall spindly strands hoisting sacks of air high above with ribbon-like leaves flowing gently in a slight current. The rocky reef below wore a blanket of light pink coralline algae, dotted with tiny white and orange anemones. Before long the area opened up, revealing our prize—the wreckage of the 32-meter (105-foot) steamer tug, *Point Grey*, built in 1911. Looking up at the massive propeller, I marveled at its photogenic, yet mystic appearance.

Frosted
nudibranch



BARB ROY





During February of 1949, while in-route with a load of railway cars in tow, the *Point Grey* tragically struck Virago Rock in thick fog. To make matters worse, the barge in tow rammed the tug from behind, pushing it higher onto the rocks. There the abandoned vessel remained until it rolled over and slipped beneath the surface during a storm in the early 1960s, coming to rest upside down in 10-15 meters (33-49 feet) of water. In late February of 1993, strong currents and stormy weather once again wreaked havoc, breaking the *Point Grey* in half and flipping the bow section right side up.

Tallen snapped me back to reality as she waved, beckoning my presence.

She hovered over the Underwater Archeology Society of British Columbia's (UASBC) plaque, pointing down. It has always amazed me how well some people can utilize facial expressions underwater; Tallen is one these people. She gleamed with a big smile on her face, pointing at four little bright red juvenile Puget Sound king crabs huddled tightly together. I tried to return the smile but was lucky to keep my regulator mouthpiece from falling out. I pointed at my camera housing, then to the huge prop, signifying 'wide angle'. She shrugged, and off she went to check out the rudder.

Marine life covered the two remaining prop blades and the third, which had

broken off, was too well camouflaged to identify. Each giant blade housed an array of invertebrate life, making me wish I would have also brought my macro system. Orange social tunicates, small cup corals and yellow zoanthids shared one of the blades with frosted nudibranchs, painted greenlings and dozens of decorator crabs, all protected by a light covering of red and green kelp, closely resembling leaf lettuce.

We continued down the port side over a caved-in hull with iron ribs stretching across below us. Upon each rib perched a population of tall white plumose anemones, feather stars and clusters of odd-looking swimming scallops. Wary lingcod and immense cabe-

LEFT: Tallen dives at a site off Galiano Island
TOP RIGHT: Propeller on the *Port Gray* wreck

BARB ROY

BARB ROY



Thetis Island



zon, all nestled safely within the tangled wreckage, eyed our every move as we swam over.

Aware of our time restraints and not wanting to experience the 9-knot current this area is known for, we hurried to the bow section.

Yellow, orange and tan sponges helped to create collages of marine art along the way using what were once jagged pieces of hull for canvases. Spotting a rusty circular area, perhaps formerly housing a porthole, Tallen posed for a portrait shot, sticking her face through the opening, with tongue hanging out. What a ham...

Altogether, I counted six different species of nudibranchs, five species of anemones and four different kinds of crab. After another long glance at the mammoth propeller blades, we ascended to the bull kelp for our safety stop. Overall, our depth was a between 10-15 meters (33-49 feet) with moderately good underwater visibility, rendering it adequate for close, wide-angle photography.

This is just one of eight excellent sites divers have to explore when visiting Porlier Pass, part of Trincomali Channel and a dive region commonly referred to as the Chemainus and Thetis Island area, located on the southeastern side of Vancouver Island in British Columbia Canada.

"The local First Nation people refer to this area as the Salish Sea," informs Peter Luckham, owner and operator of the dive charter business 49th Parallel. "The Hul'qumi'num Mustimuhw people often refer to that way because the word tends to capture the notion of the Coast Salish people and their traditional territory—inland

waters stretching from Puget Sound to Johnstone Strait."

Peter has been diving in this area for over nine years and seems to genuinely enjoy introducing divers to underwater paradise year round. "Most are current dives, but with sufficient planning and guidance they are

easily within reach of most divers. The sheer variety of sea life is staggering. All are boat dives excepting Pringle Park and Coons Bay. The bottom at most sites is literally carpeted with white plumose anemones or green and purple sea urchins. When you see how many lingcod hang out here, and not just small ones, you begin to wonder why there is a fishing closure. Once you pull yourself away from the splendor of this spot and start looking closer, you start to see the really interesting stuff, like big crusty Puget Sound king crabs, war bonnets hiding in crevices, sponges, sea pens, and beautiful coloured nudibranchs of all shapes and sizes. The two wrecks here are a glimpse at marine history that you will not find anywhere else. We even found cloud sponge one day in the middle of the pass."

As we headed to our next dive site in Stuart Channel (low current area), closer to the town of Chemainus on Vancouver Island, Peter passionately continued to tell us about his business: "From the Chemainus community dock, we have six good sites

within 20 minutes of the Stuart Channel area and an additional six sites within a 30-40 minute boat ride. I can pick divers up at the community dock in Chemainus or on Thetis Island. Eight more sites are available to us on the Stuart Channel side and in Trincomali Channel, all within a 30-40 minute boat ride. Porlier Pass alone has eight sites, including three great wall dives!"

To accommodate divers, Peter has the *Fat Cat*, a 17-foot catamaran for individuals and couples and the *Xihwu Explorer*, a 37-foot



CLOCKWISE FROM ABOVE: Memorial plaque on *Port Gray* wreck; Sunflower sea-star; Lingcod on ledge; Tallen pokes a tongue out of the window of the 737 submerged at Xihwu Reef in 2006 by the Artificial Reef Society of British Columbia

Thetis Island



BARB ROY



BARB ROY

CLOCKWISE FROM LEFT: Swimming anemone; Grunt Sculpin; Spiny pink scallop; Chemainus Harbour; Peter Luckham aboard the *Xihwu Explorer*, a 37-foot Alwest, serves groups of up to ten divers



BARB ROY

Alwest for groups of up to ten. His dive range extends as far north as Gabriola Passage and as far south to Sansum Narrows, including all islands between.

It was approaching dusk as we arrived at our next site, "Xihwu Reef", meaning red sea urchin reef. Most know it better as the location of the 100 foot long Boeing 737-200 jet plane, scuttled as an artificial reef in 2006 by the local dive community and the Artificial Reef Society of British Columbia (ARSBC). The plane sits 15 feet off the bottom on a custom built stand in 90 feet of water. All windows and doors have been removed and the forward and aft cargo bays are open.

Although wreck certification is

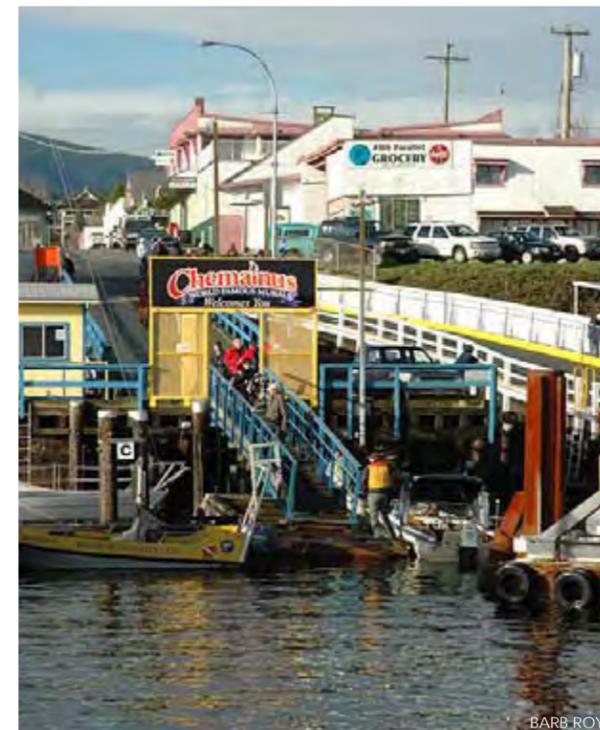
recommended for penetration, Tallen and I entered and swam around with ease. The body of the plane is about 12 feet in diameter and the distance between the front and rear exits are about 65 feet. Wingspan is 100 feet between wing-tips.

First Nation Carvers, Gus Modest of Kuper Island and Doug August of Cowichan created the markers used to honor the reef and as a tribute to the Hul'qumi'num Mustimuhw people. One marker was a large red sea urchin mask, placed on the nose of the plane. The other was a replica, used as a prize in the initial fundraiser when sinking the plane in 2006.

The mask on the front of the plane

dwarfed Tallen underwater as we explored the plane's cockpit, taking turns in the area where countless pilots once flew this mighty silver bird. Here, the maximum depth is 70 feet. A 95-foot depth can be found mid-ship and 150 can be reached off the stern or rear of the jet. Angling upwards, at 27 feet tall, the tail section was only 40 feet deep.

Our good friend Andy Lamb, co-owner of the Cedar Beach B&B on Thetis Island has recorded over 100 different species of critters on the plane as of July, 2008. As a zoologist and co-author of two marine identification books, Andy also offers marine education workshops and loves to dive on the plane



BARB ROY



BARB ROY



BARB ROY

ABOVE: Scene from the 2006 submerging of a 737 in Xihwu Reef by the Artificial Reef Society of British Columbia
LEFT: Tallen looks into the 737

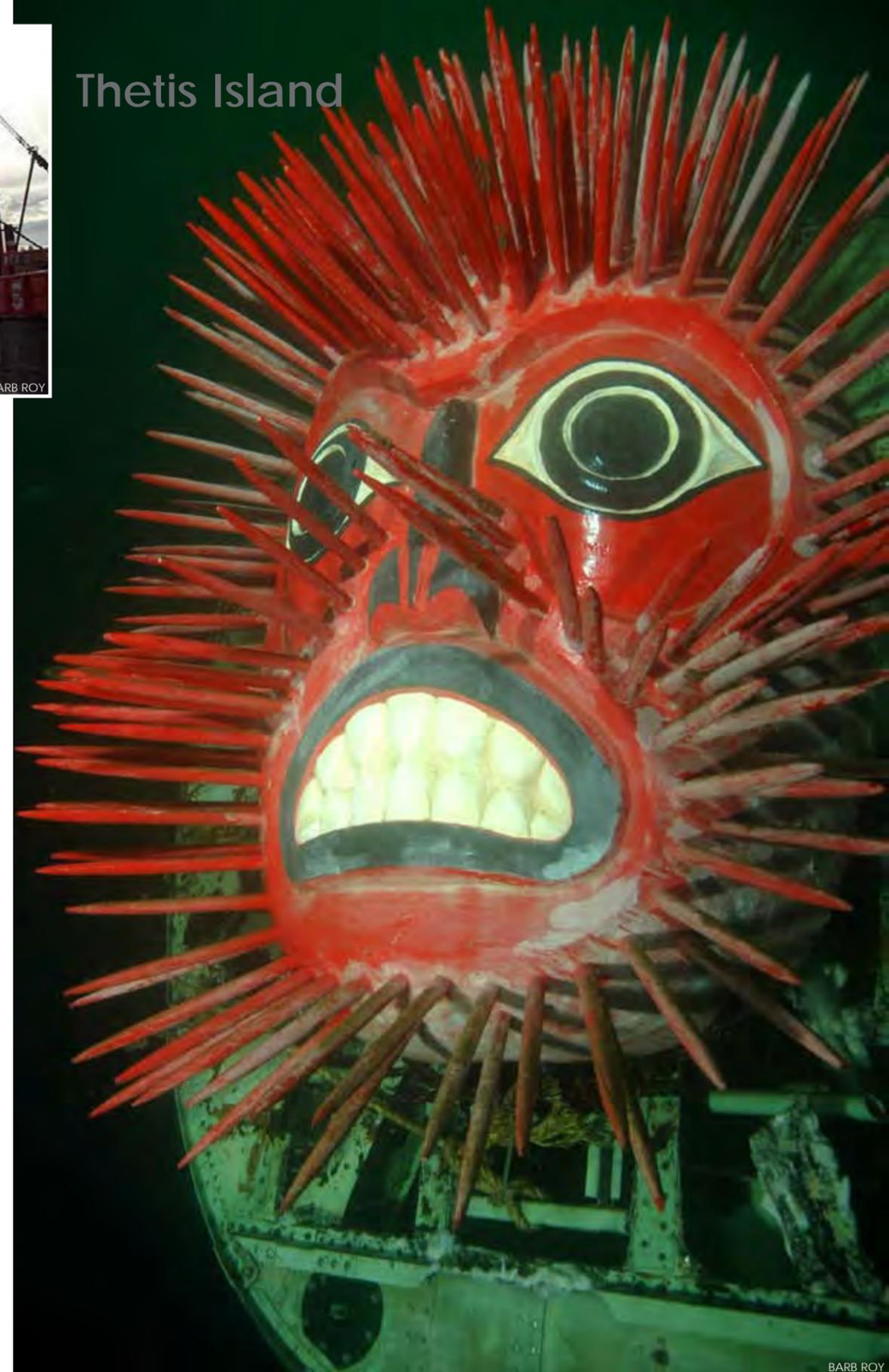
school kids on humorous, fun tours through the aquarium. I once saw her with a group of six and seven year olds walking by like crabs as they headed for the crustacean tanks.

When Virginia mentioned the night before that we would enjoy the view, I had no idea how scenic it would actually be the next morning! In the distance, I could see traces of fog lingering around the Southern Gulf Islands.

After a delicious homemade breakfast, we loaded up our dive gear, along with a hearty lunch Virginia had made for us, complete with soup, sandwiches and cookies. Andy took us down to the marina where we transferred our gear onto Peter's larger boat. The cabin was very spacious and warm, with a head and plenty of changing room. A fresh water hose was available for rinsing gear and cameras on deck.

Andy joined Peter and I for a dive on the historic wreck of the British Bark *Robert Kerr*, located north of Thetis Island between Miami and Ragged Islets, not far from the wreck of the *Miami*, which sank in 1900 after hitting Danger Reef. The once proud 190 foot wooden vessel *Robert Kerr* was built in Quebec in 1866 and originally sailed as a three-mast passenger carrier for Hudson's Bay Company across the ocean from Great Britain to the Pacific Coast. Historic records indicate the *Robert Kerr* was also used to rescue 150-200 people during Vancouver's great

Thetis Island



BARB ROY

ABOVE: First Nation mask mounted on the submerged 737. FAR LEFT: Andy Lamb and Peter Luckham ready for a dive excursion in the 17-foot catamaran, *Fat Cat*; Andy Lamb's book, *Marine Life of the Pacific Northwest*

whenever possible.

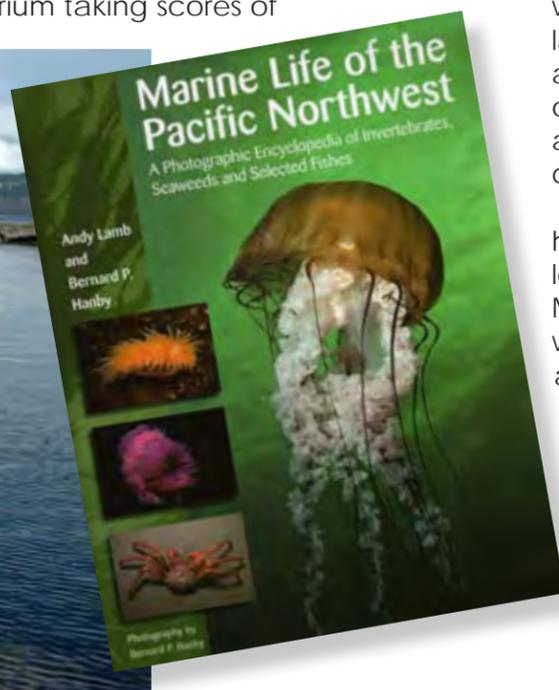
If air supply permits, there is also a nice reef nearby, boasting a healthy supply of critters. Octopus, wolf eels, shrimp, sea cucumbers and rockfish are often seen, along with the occasional sea lion or harbour seal, offering breathtaking encounters!

Andy and his wife Virginia put us up for the night at Cedar Beach in northwestern

style cozy rooms with thick down comforters. Dinner was glazed chicken with an assortment of fresh vegetables, topped off with a scrumptious dessert. Afterwards, we sat around in their large recreation room while a fire warmed us, listened to Andy tell about his experience teaching marine education at the Vancouver Aquarium. Tallen also volunteered for many years at the aquarium taking scores of



BARB ROY





fire of 1886. The vessel was later sold and transformed into a coal carrying barge in 1885. In March of 1911, while in tow from Ladysmith to Vancouver with a full load of coal, the tug towing the *Robert Kerr* wandered off course during the middle of the night, causing the barge to hit Danger Reef, thereafter quickly sinking.

Today what's left of the barge sits upright in 35-70 feet of water with deck knees giving the structure a ghostly skeletal feature. Its cargo of coal lies scattered about the wreckage, blending in with the terrain, but the ship's captain and two iron masts are quite distinguishable even though they wear several layers of marine growth.

While Andy occupied himself with search out hiding critters in the ship's hull, Peter and I swam out away from the stern to examine the nearby debris field. Peter pointed out an old door key plate in the mud, careful not to disturb it. We came

across the ships' double mast ring next, lined with a patrol of copper rockfish. Peter and I gathered up Andy and headed for the bow section. I found Andy to be a lot like Tallen when diving, distracted by anything that moved and curious of what resided in every nook and cranny! I have learned over the years that this is actually a good thing, because both Andy and

Tallen have discovered quite a few new subjects for me to photograph over the years. During our gradual ascent up the reef, we came across several delicate rose stars, white-spotted anemones and giant swimming nudibranchs. Visibility proved to be viable for both wide angle and close-up photography.

Active Pass

My husband Wayne Grant joined me later in the year to explore several more dive sites Peter and Andy, introducing us to Active Point Pinnacle. The reef starting out shallow then dropped off to form a nice wall around 50 feet. Although the wall continued deeper, Wayne and I followed Andy and Peter for a while, then went off on our own, while Andy busied himself with his lingcod survey and Peter checked the anchor.

Visibility was about 30 feet. After seeing the abundance of invertebrate life, I was happy I had decided to use my 50mm macro lens instead of the wide angle. I



often hear about macro photography being so easy, but I find it quite challenging when using a big SLR housed camera, especially when trying to get close to a tiny critter the size of your little finger! The lens does however, allow very close focusing, but to get any form of light on the subject, strobes often need to be twisted awkwardly



CLOCKWISE FROM ABOVE: Beach at Cedar Beach B&B; Dining hall and living room of the lodge; View from the lodge; Twin mast ring of the *Robert Kerr* wreck; Delicious dinner by Victoria





ANDY LAMB



ANDY LAMB

we saw on the dive. Wayne was great at lighting my path with his HID light, turning a deeper, darker dive into a sunny day. When not modeling for me, he likes to float just above me pretending he is my shadow.

Several snails of varying shades of lavender were nestled on a cluster of yellow eggs about the size of corn kernels. Feather stars seemed to cover the site in general, as if someone had planted golden brown sea lilies everywhere. Lined chitons, huge plumose anemones, sea

cucumbers, tiger rockfish and perch were also seen. As for nudibranchs, there were a few very small ones, but the white frosted nudibranchs seemed the most plentiful.

Back on the boat, it didn't take us long to devour the yummy lunch Virginia had prepared. Peter filled us in on the areas potential. "We easily have more than a dozen good dive sites to choose from now, most within a short run from Thetis Island. If the weather is bad around Porlier Pass, we always have sites in



BARB ROY

CLOCKWISE TOP LEFT: Tiger Rockfish can be found hiding in the rocky crevices; Red flabellina on tail fin; Basket star; Coonstripe shrimp

Escape Reef
Escape Reef was our second location. Visibility looked a bit better here, but I wanted to leave my 50mm lens on anyway. We followed the rocky terrain down to 70 feet where it unfolded into a sandy sediment bottom. Each section we came across offered something different. Hiding under huge

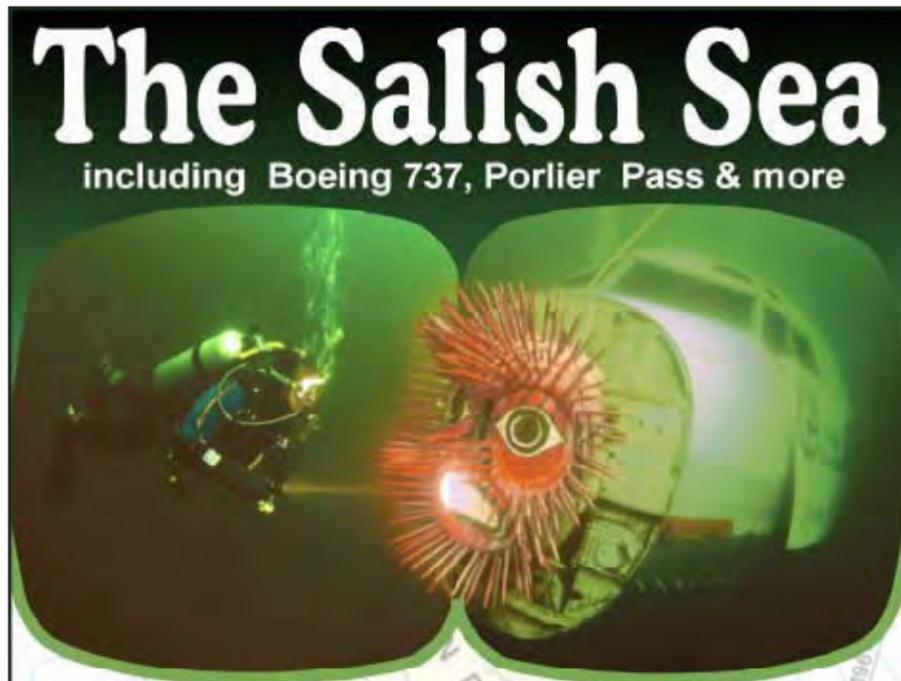
boulders were various rockfish, lingcod and kelp greenlings. Swimming scallops, glassy tunicates, rock scallops decorated in yellow boring sponge, clung to the rocky structures. A strange color variation of swimming anemones caught my attention; I found a whole group together, when I ventured closer.

Stuart Channel. Then, there is Trincomali Channel, but it can be current dependant in places."

"The main part of Active Pass is exceptional," added Andy. "I have done a lot of diving there and know the area well. You would love the colors for your photography!"



GUNILD SYMES

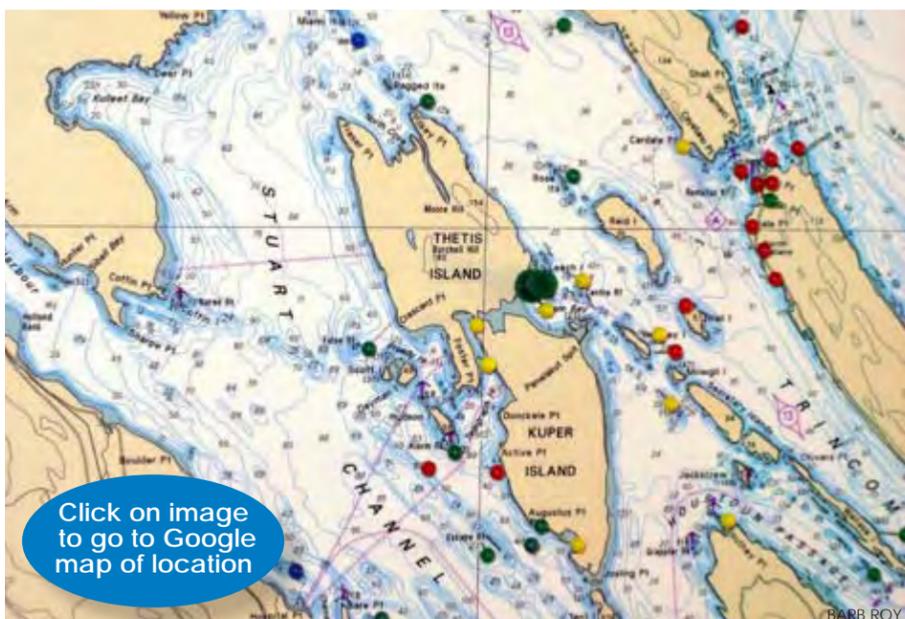


Features diving with **Author/Naturalist - Andy Lamb** & 49th Parallel Dive Charters
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vancouver island

Golden dirona nudibranch



Click on image to go to Google map of location

BARB ROY

Wayne found an area where the ocean floor seemed to move! Closer examination revealed hundreds of brittle stars. Sunflower, leather, rose and sunstars added rich colors to the scenery. As we ascended to do our safety stop, we discovered very different critters on and around a wall! This was perhaps even more colorful than the deeper depths, yielding yellow and white sponge, more anemones, small fish, featherduster worms, kelp crabs and a slim worm habitat. I found it hard to get out of the water when I discovered a heart crab at the end of my dive! Maybe it was the 47°F water temperature that helped me to exit.

Peter said later that he had found stubby squids while checking out the soft bottom during his dive. Andy found several structures on his dive, large enough to swim through! Peter instructed us to leave our gear onboard, and he would fill our tanks.

When asked what other wrecks were available to dive, Peter explained, "We have the 60-meter (190-foot) long wreck of the *Del Norte* (1868), a side-wheel schooner at the northeast entrance to Porlier Pass, the *HMS Panther* (1874) at Wallace Island and the *Peggy McNeill* (1923) a steam tug in Porlier Pass to choose from."

Andy had a map of the area on his wall showing all the dive

sites he and Peter have explored, all color coded with push pins denoting ok, good and excellent sites. There must have been a hundred locations marked.

I encourage visiting divers to plan for a two to three day visit in order to truly be able to sample some of the areas unique sites. There are several dive charter operators available and numerous bed & breakfast inns ready to accommodate, most requiring reservations. Visiting divers can carpool in their own vehicle, taking an automobile ferry from mainland Vancouver to Nanaimo or Swartz Bay. When traveling during the summer months, ferry reservations are highly recommended. Chemanius is located 19 miles south of Nanaimo and 50 miles north of Victoria. When not diving, check out the local museum, 37 murals and 12 sculptures along with art galleries and antique shops. Cedar Beach B&B also offers use of their kayaks to their guests. ■

ANDY LAMB



BARB ROY

TOP TO BOTTOM: View overlooking Thetis Island's Capernway Harbour, with Vancouver Island mountain ranges in the distance; Map of Thetis Island dive sites; Kayak shed at Cedar Beach B&B

fact file

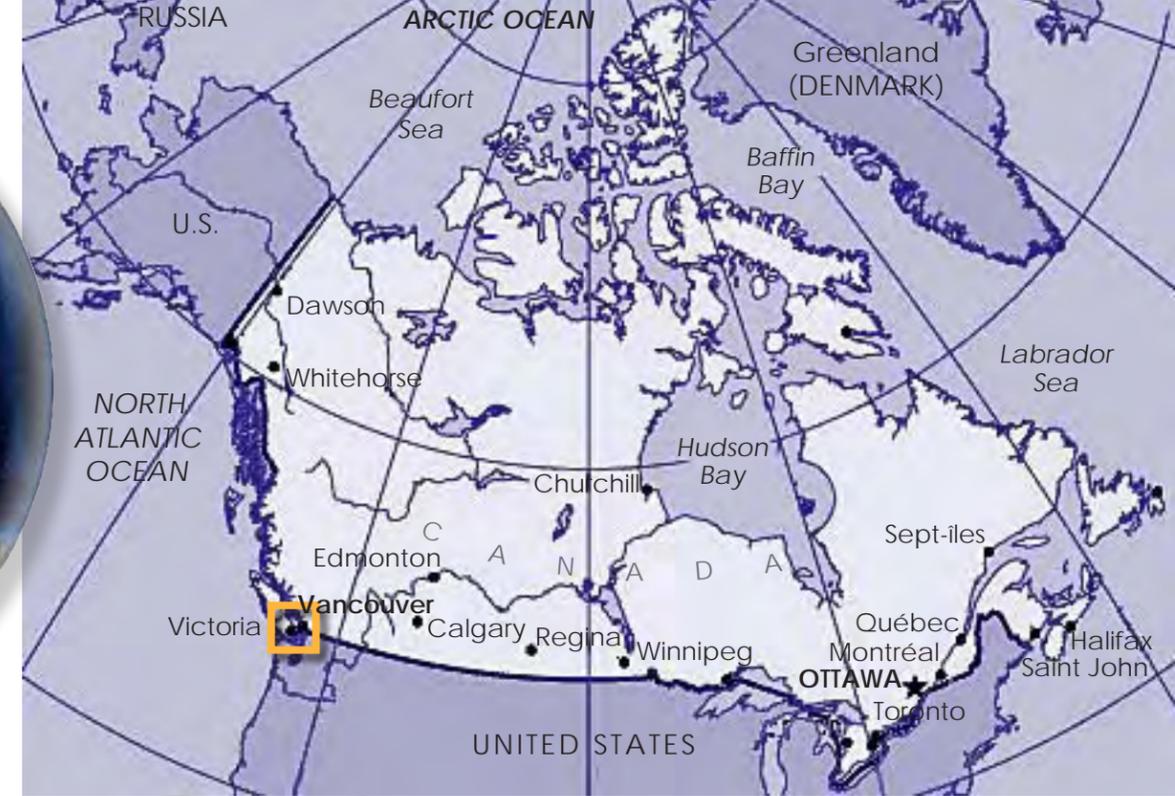


SOURCE: US CIA WORLD FACT BOOK

British Columbia, Canada



CLCOKWSIE FROM ABOVE: Location of British Columbia, Canada, on global map; Location of Thetis Island on map of Canada; Location of Thetis Island off Vancouver Island



History Canada is a country of rich natural resources and vast distances. In 1867, Canada became a self-governing territory while retaining its relationship with the British crown. The country has developed economically and technologically in parallel with its southern neighbor along an unfortified border, the United States. After a decade of budget cuts, the country's greatest political issues are improving education and health care services. Recently, the issue of reconciling Quebec's francophone heritage with the rest of the country's population which is anglophone, has receded after a referendum held by the Quebec government failed to pass in 1995. Government: confederation with parliamentary democracy.

Geography Located on the northern half of the North American continent, Canada is bordered by three oceans: the

North Atlantic Ocean on the east and the North Pacific Ocean on the west, as well as the Arctic Ocean to the north. After Russia, Canada is the second largest country in the world. It has a strategic position between Russia and the US on the north polar route; about 90% of Canadian are concentrated in the area within 160 km of the border with the US. Terrain: wide plains with mountains in the west and lowlands in the southeast; Natural resources: iron ore, nickel, zinc, copper, gold, lead, molybdenum, potash, diamonds, silver, fish, timber, wildlife, coal, petroleum, natural gas, hydropower; Natural hazards: continuous permafrost in north is a serious obstacle to development; as a result of the mixing of air masses from the Arctic, Pacific, and North American interior, cyclonic storms form east of the Rocky Mountains and produce most of the country's rain and snow east of the mountains.

Economy Canada closely resembles the US in its market-oriented economic system, pattern of production, and high living standards. It is an affluent, high-tech industrial society. Agriculture: wheat, barley, oilseed, tobacco, fruits, vegetables; dairy products; forest products; fish; Industries: transportation equipment, chemicals, processed and unprocessed minerals, food products; wood and paper products; fish products, petroleum and natural gas.

Climate varies from temperate in the south to subarctic and arctic in the north

Population 32,507,874 (July 2004 est.) Ethnicity: British Isles origin 28%, French origin 23%, other European 15%, Amerindian

2%, other, mostly Asian, African, Arab 6%, mixed background 26%; Religions: Roman Catholic 46%, Protestant 36%, other languages 18%

Currency Canadian dollar (CAD) Exchange rate: 1 CAD = \$.82 USD / € .63 EURO

Language English 59.3% (official), French 23.2% (official), other languages 17.5%

Web sites
Go BC Travel Guide: Thetis Island www.gobc.ca/thetis-island-travel
Thetis Island community website Thetisland.net

Dive Operators
British Columbia Dive Guide www.bcdiveguide.com
49th Parallel / Cedar Creek B&B www.divemaster.ca

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Vancouver Coastal Health
10th Floor, 601 West Broadway
Vancouver, BC, V5Z 4C2
.866.884.0888 or 604.875.4252
www.vanhosp.bc.ca ■



There are many fine artisans who make their home on or near Thetis Island. These two dive pendants (left) were created by Dee Smith who handcrafts jewelry out of fused glass



The cozy getaway at Cedar Creek B&B



silver



www.seacam.com



Edited by
Mathias Carvalho
& Arnold Weisz

Back to the future

— *A Green sea turtle gets another chance at life*

Text and photos by Mathias Carvalho and Arnold Weisz

Crawling eagerly towards the ocean and a new future, a sea turtle was saved from certain death caused by the human impact on our oceans. There are ways for humans to harvest the ocean without killing aimlessly. The TAMAR Sea Turtle Project in Brazil shows us, over and over again, that this can actually work.

A Green Turtle (*Chelonia mydas*) carrying a tag number 55655, was unusually fortunate to be saved from certain death by drowning in a fishing net by local fishermen, then nursed back to health at the TAMAR sea turtle station in Ubatuba, Brazil. This is one of many success stories of how environmental awareness, implemented on a wide scale, helps animals to survive.

Until the 1980s, it was very common in Brazil to witness the hunting, killing and egg collecting of sea turtles. The animal's shell was made into a vast array of articles (glasses, combs, bracelets, rings,

and other sorts of ornaments). Turtles were generally captured and killed when ashore on the beach during egg laying season. The impact on the sea turtle population was staggering. These practices are since discouraged thanks to the conservation effort of the TAMAR Project. TAMAR has its name derived from the Brazilian Portuguese word for sea turtle—"Tartaruga Marinha".

"Project TAMAR has already proven its worth as an international reference to other agencies. It has produced great results, but there is yet a lot to be accomplished," said Berenice-Maria Gallo, regional coordinator in charge of the São Paulo State's TAMAR station.

Education

The purpose of this project is not only to care for the sea turtles but also to educate and work in partnership with the local communities. X-RAY MAG visited Project TAMAR visitor center in Ubatuba, the State of São Paulo.

Ubatuba is a popular tourist resort with many fantastic beaches, midway between Santos and Rio de Janeiro, which makes it an excellent place to attract visiting tourists. The TAMAR Center



provides cultural and leisure activities for visitors, with communicating aquatic tanks (recently remodeled to allow for the viewing of turtles under water).

The park is accessible to wheelchair users, and all income from the visitors are reverted back to ongoing projects and operating the center. Also available are souvenir shops, snack stands children's activities areas.

Environmental education is TAMAR's main weapon in the fight against extinction. The center has an auditorium for seminars, where training of interns, uni-



Green turtle 55655 can't wait to get back into the ocean, after some R&R at Tamar Ubatuba



Big ocean, big country, big responsibility

TAMAR FACTS:

Project TAMAR-IBAMA, jointly administered by the government of Brazil and the non-governmental organization, Fundação Pró-TAMAR, has established 18 conservation stations that cover 1,100 km of the Brazilian mainland coast (in the states of São Paulo, Rio de Janeiro, Espírito Santo, Bahia, Sergipe, and Ceará).

The program was initiated in 1980 to investigate and implement a program for the conservation of sea turtles. As a direct result of TAMAR's efforts, the harvest of pregnant females and their eggs has ceased in all major nesting areas.

The success of the program is based on the local participation of the fishing villages, including the employment of former egg poachers to patrol the area's beaches and protect known nests, education programs, and ecotourism.

The majority of stations are staffed year round and not only promote the conservation of endangered sea turtles, but also organize community festivals, support local schools and health care facilities, and assist in developing alternative sources of income for residents who once relied on the exploitation of sea turtles. ■

Text by Arnold Weisz

Brazil, with its immense coastline bears a large responsibility towards protecting sea turtles. With a coastline stretching more than 7,200 kilometres from above the equator and well down into the south Atlantic, the country houses five out of the world's seven sea turtle species. Sea turtles are famous for coming back to lay eggs on the beach where they themselves were born even though they have travelled there from very far away.

The Green sea turtles are perhaps the most famous travellers, migrating great distances. One example is the Florida-tagged Green turtles that have crossed the Caribbean and then been found in Brazilian waters. This puts pressure on the Brazilian conservation efforts, as their success has a direct impact on sea turtle populations in other parts of the world. Here again, the Green turtles show their impressive navigating skills.

Green turtles nest on Ascension Island in the south central Atlantic Ocean from January through April. They then head westward to Brazilian waters, travelling more than 1500 miles / 2300 kilometres to

their favourite feeding grounds.

The Royal Society tracked the post nesting migration of six Green turtle females from Ascension Island to Brazil, by tagging them with satellite devices. Five of them reached the proximity of the easternmost stretch of the Brazilian coast, covering 1,777-2,342 km in 33-47 days.

Many sea turtle species travel huge distances in open seas or along coastlines. This often brings them in close contact with commercial fisheries.

Researchers from the UK and Brazil have studied the effect that hook-and-line fisheries off south-eastern Brazilian has on sea turtles. Over a period, they followed a large fleet of almost 500 vessels and recorded 45 turtles from four different species being caught as by the fleet as bycatch.

The boats used longlines at different depths and trawling at different speeds in order to fish for Dolphin fish (*Coryphaena hippurus*), Bigeye tuna (*Thunnus obesus*), and Yellowfin tuna (*Thunnus albacares*) amongst other species.

The study made by the Institute of Biomedical and Life Sciences, the University of Glasgow, Tamar-IBAMA and Núcleo de Educação e Monitoramento Ambiental (NEMA) showed that monitoring the fleet and bycatch levels, development of mitigation measures, establishment of educational programs, government control over the fleet, and enforcement, are urgently required for the hook-and-line fisheries. ■

versities lectures and other educational activities take place. Audio-visual sessions are also available.

The center is an important focus point, but much of its

"... there are no desk-jockeys here..."

crucial work protecting sea turtles goes on somewhere else. On

the beaches, by each of the local inhabitant's doorsteps, by getting their fingernails dirty is how TAMAR's volunteers and staff really get things done—and show results.

TAMAR's main campaign, "Nem Tudo que Cai na Rede é Peixe" (Not all that are caught in the net are fish), ongoing for years now, teaches fishing communities how to reanimate sea turtles and return them to the sea, as well as calling for TAMAR's help.

"One of the success ingredients is that TAMAR's staff is out there, in the field, working and struggling to improve ongoing projects and initiatives; there are no desk-

jockeys here," said Berenice.

The main threat to sea turtles in Brazil today is incidental and predatory fishing activities. Accidentally trapped in fishing nets, hooks, and corals, and without means to rise to the surface to breathe, they often drown.

Social involvement

TAMAR works closely with sea faring and fishing communities in order to implement environmental and conservation practices. These communities are the main allies that TAMAR has, for they monitor the cast and have better access to incidents. They are more effective in promoting the cause than any effort by the organization.

"We could not

have done it without the support of local fishermen communities, the *caíçaras*.

Without them, very little would have been done to protect our sea turtles. They are their true guardians," said Berenice.

Chocolate sea turtles

TAMAR promotes self sustaining efforts to keep its operations going, besides federal and institutional grants:

- The paper factory: community youngsters produce recycled paper goods, to be sold as souvenirs. Forty percent of their profits goes back to TAMAR for the sustaining of this activity, and the rest goes to the youngsters and their families.

- Private sector partnerships: the "chocolate turtle" sales' royalties go to TAMAR and the preservation efforts.

- Local seamstresses that have, in keeping with their folk cultural activities, contributed with TAMAR by producing recycled textile goods also sold as souvenirs.

"TAMAR works on a self-sustaining model that has an active partnership with local communities, the goal being to support their culture and way of life without endangering turtles," said Berenice. ■



NOAA

Local fisherman gives hope to future generations

Text and photos by Mathias Carvalho & Arnold Weisz

As a comprehensive part of the TAMAR project, local fishermen have been included in the conservation of sea turtles. After we witnessed the release of a green turtle at Cedro Beach, a couple of kilometers outside Ubatuba, that has been nursed back to health after almost drowning in a fishing net, we had a chat with fisherman José Custódio Vieira, also known as "Seu Zeca", the very same person who found the turtle and saved it from certain death.

"It happens ever so often. The animal gets caught on the *cercado* and cannot free itself in time to reach the surface and breathe. A waste, really, for fishermen traditionally come to check their nets only at dawn, when it's usually too late," said Seu Zeca.

Seu Zeca changed all that. A



leader amongst fellow fishermen, he has helped to adapt a new practice, starting many years ago. Today, many of his associates—as well as other community members—now check their nets at dawn and in the evenings, finding any turtles trapped in time to set them free.

At Cedro Beach, Seu Zeca rules with an iron determination. He compensates for the tourism impact of visitors, and to the delight of many children, every time a *canoas* (local fishermen's traditional vessel) brings in a dazed sea turtle, offers some rare insight into sea turtle ecology.

TAMAR is called. In the meanwhile, Seu Zeca teaches any onlookers about the program, reciting the project's mantra by heart. He's a real champion for the cause.

Seu Zeca looks away, humbled, when we applaud his efforts. He just thinks he is doing his share, and cannot understand it when a wealthy tourist throws away a cigarette stub, or a plastic bottle, and pollutes the beach. "It's like throwing garbage in your own living room," he said.

Seu Zeca is proud to be able to say that many turtles were returned to the sea thanks to his efforts. "Still,

so many fishermen still harm them, but for what? We never eat turtles in our family, nor promote their killing in any way," he said.

Seu Zeca remembers, with a heavy heart, the long gone days when his parents would kill and eat sea turtles that were caught in their fishing nets. "I remember the agony of those turtles, lying on the kitchen table, their tear drops and their loud cry when their throats were cut off."

He has tasted turtle meat only once—his grandfather insisted—and readily agrees, it's tasty, but never since has he wanted to do so again. "My own son is a hardcore conservationist; he won't let me kill a snake in our yard, let alone harm a sea turtle."

Seu Zeca is very proud of his children, and the achievements he and others produced, but agrees there is still a lot to be done. "Many won't support TAMAR's work, because they are afraid that it will get them into trouble with the authorities if they report any entrapments, even accidental ones. So, they kill the turtles and eat them instead, covering their tracks—that is just dumb!" he said.

TAMAR taught Seu Zeca and many other locals how to perform CPR on sea turtles that can pass out from lack of breathing. By pressing down their chests and

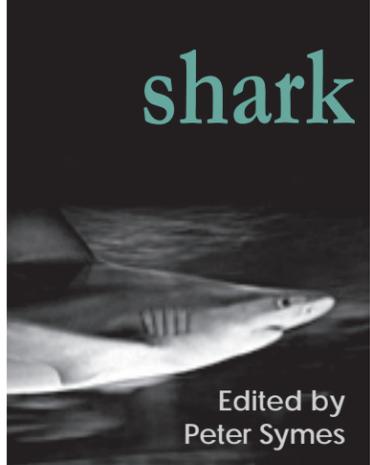
turning them around, they will vomit swallowed water and start breathing again, although many remain too weak and need further treatment—and that is when they call the TAMAR teams.

"The other day, as we were rescuing a turtle and performing CPR, a young boy—a tourist who had been to a TAMAR lecture—began to tell the onlookers how it was done, and did so just perfectly. That gives me hope for future generations, as well as the future of sea turtle generations to come," said Seu Zeca. ■



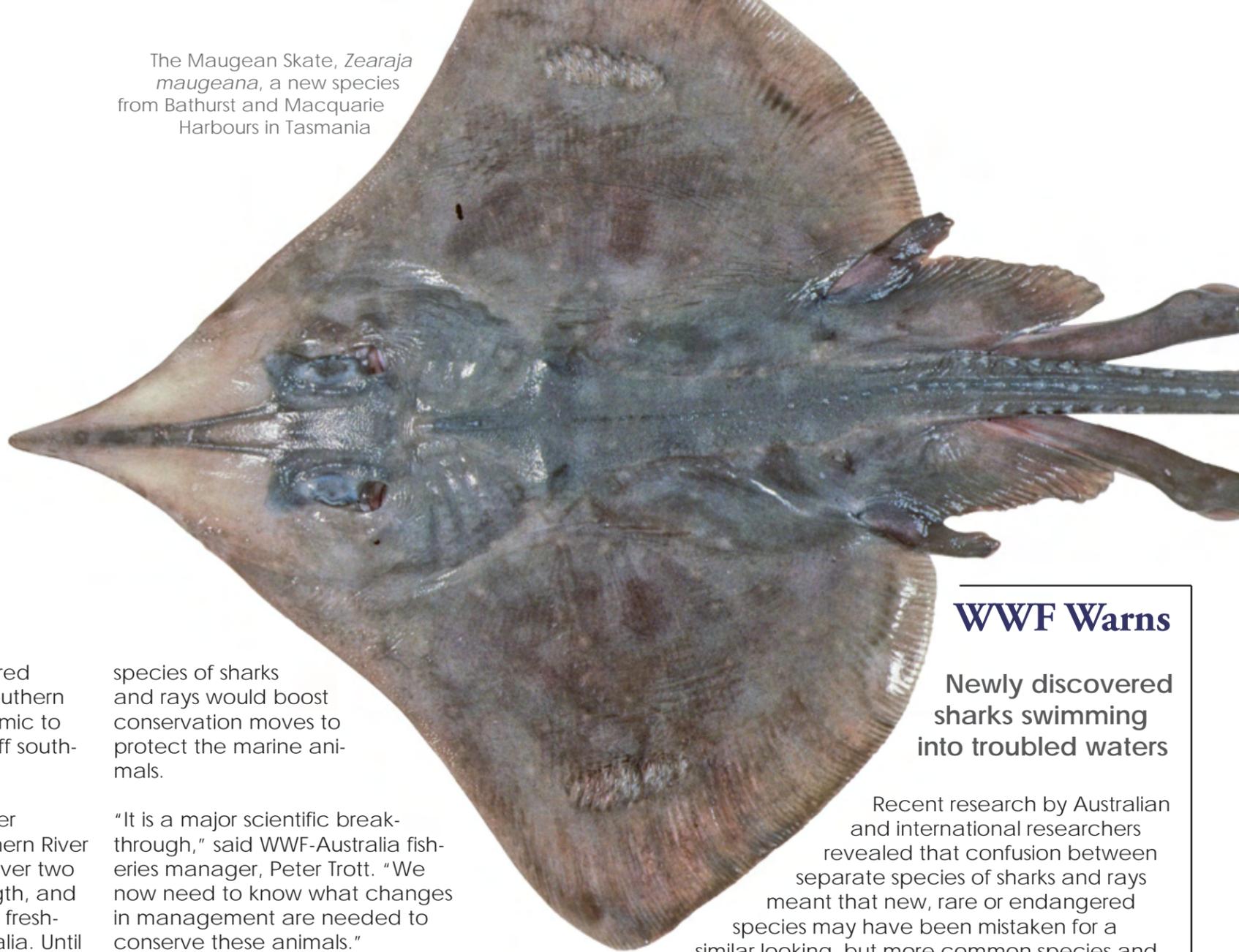
THIS PAGE: Tamar Visitor Centre offers a variety of educational venues. LEFT: Feeding time at Tamar. RIGHT: Local hero, fisherman Seu Zeca. FAR RIGHT: A jar with plastic stomach contents from a sea turtle, containing mostly indigestible plastic





Edited by Peter Symes

The Maugean Skate, *Zearaja maugeana*, a new species from Bathurst and Macquarie Harbours in Tasmania



Over 100 new sharks and rays classified

Australian scientists have used DNA techniques to catalogue and describe 100 new species of sharks and rays in Australian waters.

More than 90 of the newly named species were already identified by scientists and described in book *Sharks and Rays of Australia* published in 1994 but remained scientifically undescribed. The new names and descriptions will now be featured in a revised 2009 edition of the book by Australia's peak scientific body.

One rare species of carpet shark catalogued was found in the belly of another shark.

Some of the new species named include:

- * The endangered Maugean Skate shark, closely related to an ancestor from the Gondwanan period in Australia some 80 million years ago, found at the southwest of the island state of Tasmania. It is one of the only skates in the world found in brackish or fresh-water, and its survival could be affected by climate change, said the scientists.

- * The critically endangered Gulper shark, or the Southern Dogfish, which is endemic to the continental shelf off southern Australia.

- * The Northern Freshwater Whipray and the Northern River shark, which grow to over two meters (six feet) in length, and are among the largest fresh-water animals in Australia. Until recently, these were confused with similar marine species.

Environment group WWF-Australia said the cataloguing of 100 new

species of sharks and rays would boost conservation moves to protect the marine animals.

"It is a major scientific breakthrough," said WWF-Australia fisheries manager, Peter Trott. "We now need to know what changes in management are needed to conserve these animals."

The confusion between separate species of sharks and rays meant that new, rare or endangered species may be mistaken for more common species and inadvertently taken by fishermen. ■

WWF Warns

Newly discovered sharks swimming into troubled waters

Recent research by Australian and international researchers revealed that confusion between separate species of sharks and rays meant that new, rare or endangered species may have been mistaken for a similar looking, but more common species and inadvertently taken by fishermen.

"We are literally fishing in the dark when it comes to sharks and rays," said WWF-Australia fisheries manager Peter Trott. "In many cases, we simply do not know what species we are plucking from Australian waters."

"We now need to know what changes in management are needed to conserve these animals, and that is what the experts will try to answer."

Trott said he expected the scientists to urgently call for more funding to research sharks and for stronger fisheries management to identify those sharks that were caught by commercial fishers. ■



Gulper shark, or Southern Dogfish





WOLFGANG LEANDER

The shark with no dad



Tigershark in the wild (not related to the story)

Artificial Shark Womb Makes Progress

Unborn wobbegong sharks are being raised inside an artificial womb as part of a world-first marine conservation experiment in Port Stephens, Australia.

Scientists hope the technology can be applied to the critically endangered Grey Nurse shark, whose young often eat each other inside the womb.

The wobbegong shark embryos have survived their first week inside the sterile tank at the Port Stephens Fisheries Centre, and will be ready to be "born" into a larger tank in two or three weeks.

"So far, the pups look quite happy," the project's senior researcher, Dr Nick Otway, said. "They like to huddle up in the corner, but when one starts wriggling, they all start wriggling and swimming around a bit."

If the experiment is successful, Grey Nurse pups will eventually be raised in the artificial uterus.

Like wobbegongs, which are not a threatened species, Grey Nurse sharks hatch eggs inside their bodies and keep the pup sharks inside as they grow. Up to seven Grey Nurse pups are hatched at a time, but usually only the strongest two survive until birth after devouring their siblings. ■

VIA UNDERWATER.COM.AU

DNA testing have confirmed the second-known instance of "virgin birth" in a shark.

Scientists have confirmed the second-ever case of a "virgin birth" in a shark, indicating once again that female sharks can reproduce without mating and raising the possibility that many female sharks have this incredible capacity. This compelling new study will be published today in the latest issue of the *Journal of Fish Biology*, a leading international journal. ■

Some like it hot

Australia's critically endangered Grey Nurse shark could benefit from global warming.

Scientists behind a new shark study say that the populations off the Australian east and west coast have been isolated from one another for more than 100,000 years. They say the cold water of the Victorian and South Australian coasts has prevented them from migrating towards each other.

But associate Professor Corey Bradshaw from the University of Adelaide said that as the sea temperature rises, the shark populations may join up, reducing the likelihood of extinction.

"They really don't often go through the Bass Strait," he told ABC News. ■

European Shark Week: 11-19 October 2008

The second annual European Shark Week will take place from 11-19 October, 2008. It's a unique opportunity for people across Europe to demonstrate their support for shark conservation in a way that can really effect change. During European Shark Week 2007, aquariums, dive clubs and other organisations helped host more than 100 events, and together, collected more than 20,000 signatures. www.europeansharkweek.org ■



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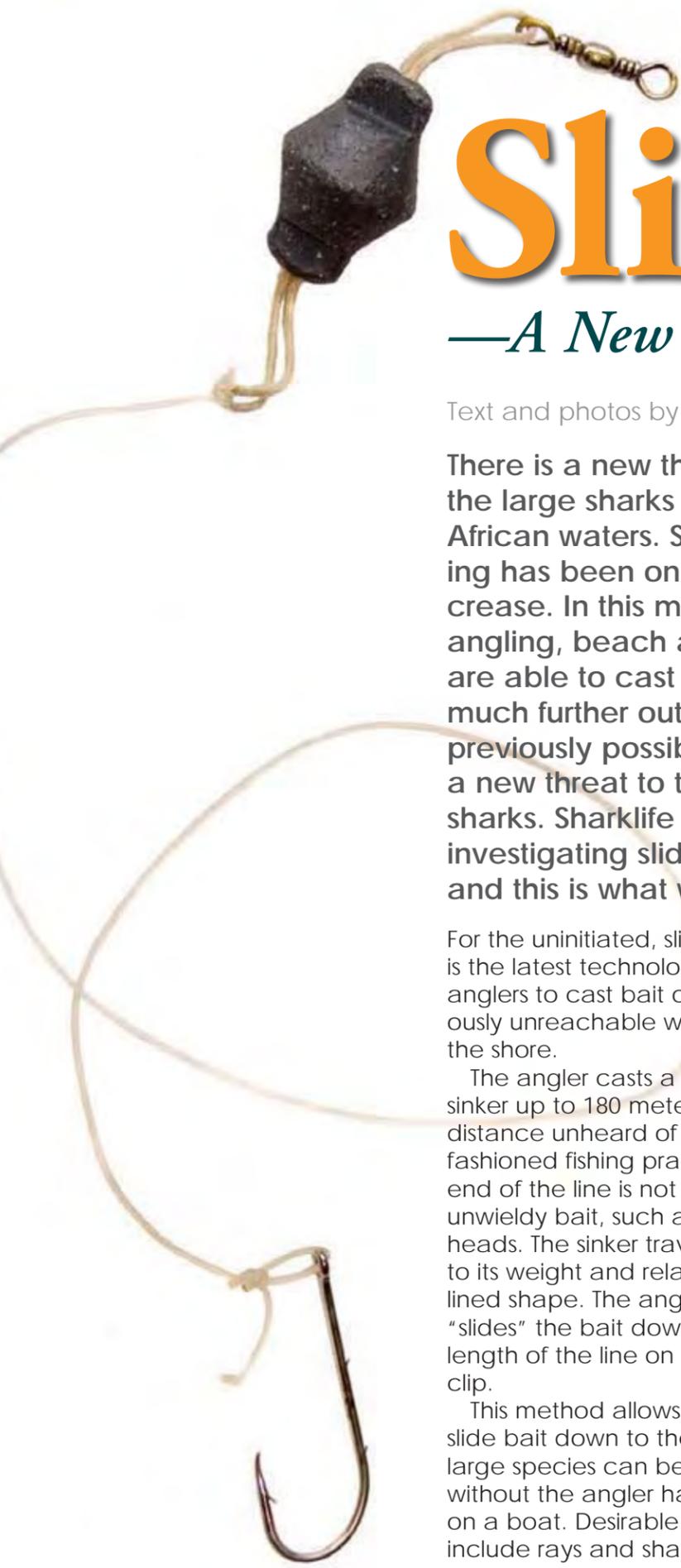
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Information & Registration - www.eilatredsea.com





Slide Fishing

—A New Threat to Large Sharks

Text and photos by Fiona Ayerst

There is a new threat to the large sharks of South African waters. Slide fishing has been on the increase. In this method of angling, beach anglers are able to cast their bait much further out than was previously possible, posing a new threat to the larger sharks. Sharklife has been investigating slide fishing, and this is what we found.

For the uninitiated, slide fishing is the latest technology allowing anglers to cast bait out into previously unreachable waters from the shore.

The angler casts a massive sinker up to 180 meters out, a distance unheard of using old-fashioned fishing practices. The end of the line is not held back by unwieldy bait, such as large fish heads. The sinker travels far due to its weight and relatively streamlined shape. The angler then “slides” the bait down along the length of the line on a non-return clip.

This method allows the angler to slide bait down to the sinker, and large species can be targeted without the angler having to get on a boat. Desirable species include rays and sharks.

Anglers are loading their reels with 300-400m of “Berkley Whiplash Braid” with a diameter of 0.17mm and a breaking strength of 50lbs. The reel is then topped up with 200m of monofilament 0.52 - 0.55mm line.

This set up is so effective, that an angler can have up to 600m of fishing line on his reels to maximize his chances of fighting large sharks. The hooks being used are barbed, chemically sharpened stainless steel, and are generally around a large size ten.

Mossel Bay

In Mossel Bay on the Western Cape in particular, anglers wade out from Diaz Beach onto a sandbank about 100 meters off the beach. The angler is able to cast out to around 250 meters and into the exact area patrolled by Great White sharks around Seal Island.

Seal Island sits about 800 meters off Diaz Beach. It seems this is well known to local anglers, and this popular fishing area produces good prospects, with the probability that a Great White will be hooked and possibly even landed.

Many of the sharks that frequent the Diaz Beach/Seal Island area are in the size range between two and 2.5 meters and are thus of a small enough size to land on the rocks or the beach. This generally occurs after a good

fight of up to 30 minutes, but the “fun” can last a lot longer (hours).

Interestingly, some of the fishermen interviewed indicated that they prefer catching Bronze Whalers, as these put up a much better fight than Great Whites and fight really hard—giving the angler hours of fun and much to celebrate when the fish is finally landed, exhausted.

Some of the fishermen we have seen slide fishing in Mossel Bay

have been approached by a Sharklife representative and confirmed that they were targeting sharks, and in particular, Great White sharks.

The anglers told us that they release some of the sharks, and that others manage to break loose after a fight.

Sharklife has been informed that if sharks do manage to break free of the hooks, they often get wrapped up in the strong lines as they twist to free themselves, and this can, and is

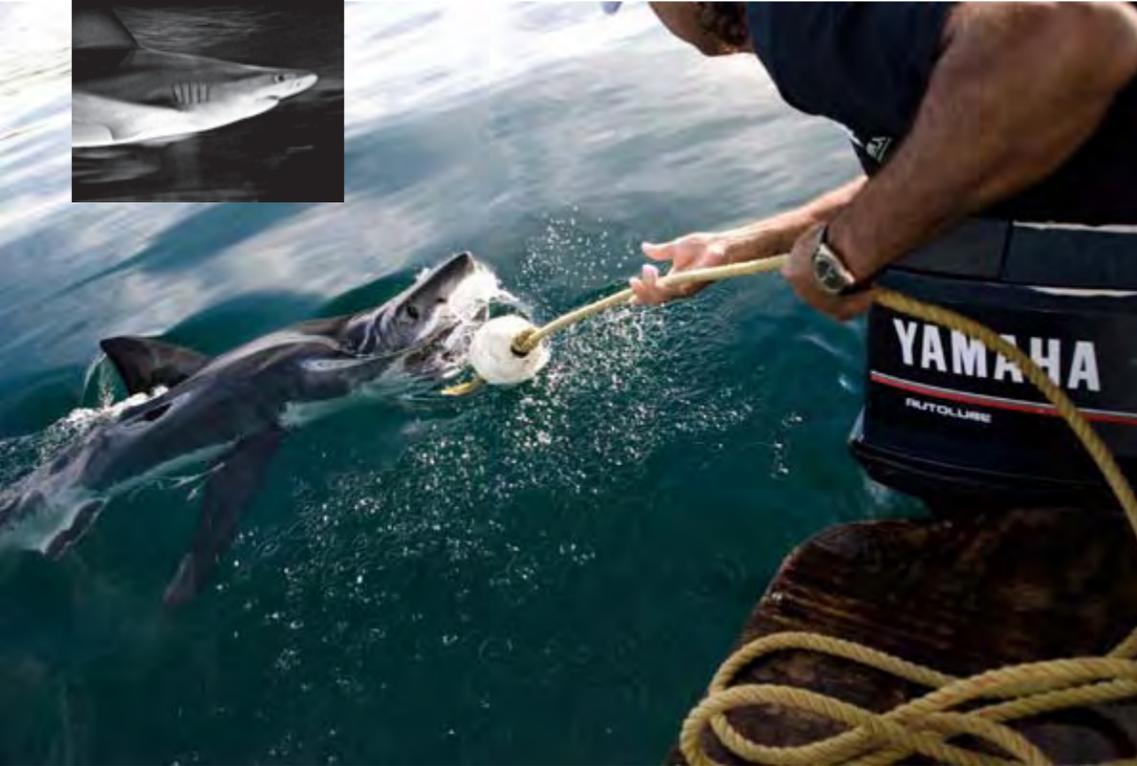
“The protected status of Great White sharks is not helping these predators in the slide fishing arena.”

causing injuries to their dorsal and pectoral fins. It is also possible that such animals may fall prey to their larger and stronger brethren after such an ordeal.

Other areas

It is apparent that slide fishing as a practice and means of catching large sharks is not limited to Mossel Bay. It is being used wherever large sharks and notably, Great Whites, are prevalent. This practice is being used in Macassar, Swartklip and Blue Waters further down the coast from Mossel Bay.





Slide Fishing

CLOCKWISE FROM TOP LEFT: Shark is lured towards boat with bait rope; The shark is within reach for hook removal; Reaching out to grab the line

Effects

SAMPLA (South African Marine Predator Lab) studies the sharks in Mossel Bay and have recently noticed that up to 60 percent of the local Great White sharks have slide fishing hooks in their jaws. Unfortunately, these hooks also carry large sinkers, which the shark may have to drag around with it for a very long time. The size and weight of the sinker

may also be affecting the sharks' ability to feed.

There are often up to 50 Great White sharks patrolling the bay and surrounding area. Mossel Bay's Diaz Beach is a tourist haven. Bathers and the sharks that patrol and feed off Seal Island have shared the same small patch of water for decades with only one incident resulting in the death of a scuba diver on the surface.

This fact is well known amongst the locals in Mossel Bay, even the slide fishermen interviewed. In fact, the shark cage diving industry has operated in the same area for at least 15 years.

Mossel Bay's Great White sharks have the capacity to draw tourists, and in turn, benefit this seaside town immensely on many different levels.

Sharklife thought initially that anglers might deny they were targeting Great White sharks to avoid prosecution. After a couple of fishermen were questioned, it seemed this was not the case. Currently,

prosecution is not a real threat in the minds of many fishermen. Anglers know it is unlikely they will ever be prosecuted and so, it appears, they continue to target Great White sharks.

If questioned by authorities, an angler simply has to state that he was fishing for another species, and he is "off the hook", as most sharks are not protected in this country. It is impossible for the authorities to argue, despite the fact that Great Whites are protected.

In South African law, a person is innocent until proven guilty beyond any

doubt. If an angler is prosecuted for catching a Great White and states in court that he was trying to catch a Bronze Whaler, but hooked a Great White in error, then the presiding magistrate has no choice but to acquit him of the charge. In fact, prosecution is rarely embarked upon, as it is largely a waste of money, and the system's already limited and over-stretched in resources.

The protected status of Great White sharks is not helping these predators in the slide fishing arena.





A SAMPLA researcher shows the sinker following its removal



Successful removal of hook from the shark's mouth

Barbed vs barb-less hooks

Sharklife notes some progression in that certain limits are shortly going to be enforced by the Western Cape Anglers Association (400 members) and the South Africa Shore Angling Association (SASAA) in all competitions. Most notably, slide fishing techniques can still be employed in fishing competitions but only with barb-less hooks. According to a spokesman for

the Cape Association, it is far harder to catch a shark using barb-less hooks, as the fish can easily slip itself off the line.

Apparently, the two methods of fishing—using barbed and barb-less hooks—are very different from each other, and anglers will need to practice with the same barb-less hooks used in competitions or else they will not succeed. Could this be good news for the Great Whites?

Unfortunately, the slide fishing hooks SAMPLA is finding on the sharks in Mossel Bay are barbed. It is possible that news of the change in competition rules has not yet filtered down to local anglers as the SASAA only changed this rule on 24 July 2008.

This particular hook was removed from a Great White Shark's mouth and that same hook being removed from that

shark. The barb is clearly visible.

Prohibition & safe zones

Sharklife proposes that the practice of slide fishing and the use of heavy shark tackle be prohibited in identified zones with high densities of Great White sharks. Anglers can continue to enjoy their sport without this intrusive and environmentally unfriendly method being employed in certain zones.

Various involved bodies are currently looking at codes of best practices together with manuals and training, in conjunction with anglers. Sharklife hopes the time is ripe whilst these methods are being developed and taught to anglers and whilst information is being disseminated for the authorities to look at the possibility to prohibit slide fishing entirely in certain zoned areas.

Scientists working in the field would be able to provide the required justification for these areas being zoned

as Great White shark "safe zones". Sharklife encourages Marine and Coastal Management (MCM) to urgently attend to this enquiry.

It appears that certain anglers in Mossel Bay are targeting the local Great White shark inhabitants. Anglers know that Great White sharks are a fully protected species and may not be caught. Sharklife understands that MCM are considering the prosecution of certain individuals who have been identified.

Whilst changes happen slowly, we can only hope that it is the case that at least those anglers governed by ruling bodies will stop using barbed hooks even when practising for competitions. This step by the SASAA and WCAA is to be viewed as the beginning of change and a step, albeit a small step, in the right direction.

Sharklife is a registered non-profit organisation addressing the exploitation of sharks and ocean fisheries in South Africa. For more information, please visit: www.sharklife.co.za. ■



...to go where no one has gone before

Deconstructing a 330m World Record Dive

Text by Pascal Bernabé
Translation by Aurelie Brun
and Michel Ribera
Photos by Francois Brun

Pascal centers himself, preparing mentally and physically for the deep dive



Tuesday, July 5, Propriano, Corsica 9am

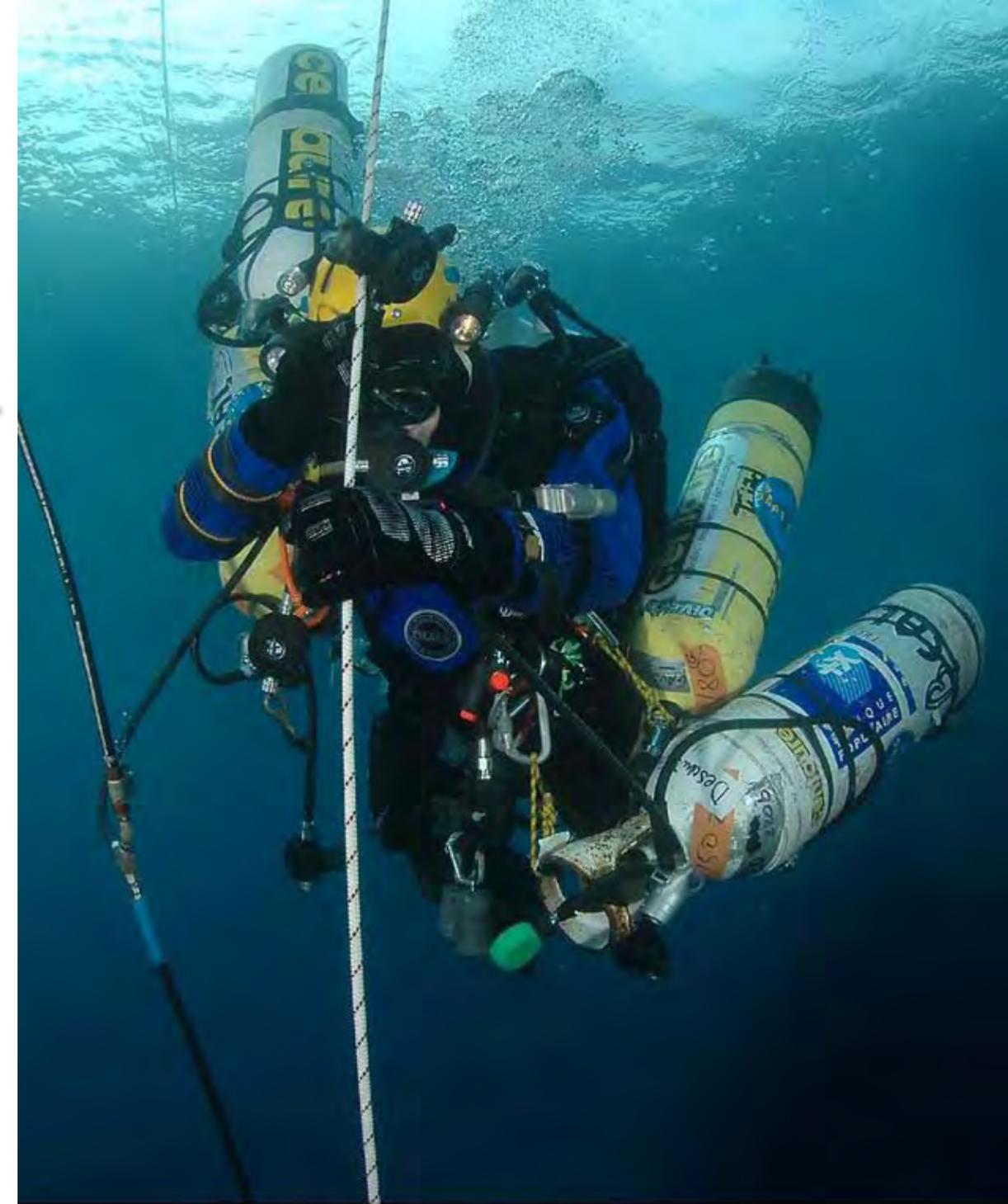
This is the moment I have waited for for years. I sit comfortably on the side of Denis Bignand's dive boat and under my fins, which are already dangling in the water, I have a 400 meter drop off.

The Valinco waters are unexpectedly quiet. There have been so many times where we had to postpone this dive because of wind. Making this dive come true grew into an obsession,

and the idea was stuck in my head. I look around. I see Porto Polo just a short distance down the coast. At my feet is a big buoy under which 350 meters of rope is suspended with a 50kg weight attached in the other end. It is waiting for me. Pity that I still feel this knot in my stomach despite of all my relaxation, calm breathing and the good conditions.

Around me the team has sprung into action: Hubert, François, Tono, Christian, Sophie, Frank and Denis from U-Levante. I have already put on the 18-liter double set with another 7-liter for the dry suit, and very compact double wings. I have reduced the equipment to the absolute minimum in order to lower the risks of making mistakes and becoming confused at the bottom. Only the gas quantities have been over-dimensioned. I have always been afraid of running out of gas.

I enter the water and finish gearing up in a somewhat meticulous manner. I find it necessary, as I don't want to leave anything to chance. I focus on holding on to my concentration despite some small last minute problems. I visualize the dive one more time and make sure I don't forget anything



from the checklist, as if preparing for a spacewalk. The analogy is not entirely out place as the ascent from the bottom will take longer than a return journey from space.

It really is a trip into the unknown for which I am preparing. In spite of all the meticulous preparations, uncertainties remain, especially concerning my state of mind and body at the bottom since there have only been three other scuba divers who have gone below

300 meters.

With my movements being slightly restricted by my six large tanks, I finally commence my dive. I leave the surface, the barrier that separates the air, my friends and security from the depths of loneliness. At this moment, my stress is supposed to disappear only it doesn't. I pause at six meters, but only for a moment, to regain my focus, but I am in a hurry to be at the bottom. The descent commences, slow at first, then

feature

increasingly faster because of my weights. At 70 meters, I hang my 18/50 tank, switch to the 6/72, and start gaining speed.

I pass the 100-meter depth mark without paying much attention and continue gaining speed. I pass the 150-meter tag. During my first mixed gas dives in 1993, that depth seemed virtually inaccessible. But since 1996, between the exploration of underwater caves and assisting Pipin and Audrey Ferreras in their freediving record attempts, I went back

down to between 150 and 174 meters about 15 times, often under challenging conditions and with tasks to accomplish (exploring, unwinding lines, filming, assisting, etc). This gave me a certain psychological ballast and confidence diving to these depths and especially ascending and performing the decompression stops.

I fly past the 200-meter tag. This is the third time since I started practising deep diving. The first time was in the huge underwater cave of Fontaine de Vaucluse in

1998 where I reached a depth of more than 250 meters. The second time was on the open sea off the Catalan coast (Northern part of the Spanish Mediterranean coast – ed.), where I had the same team as I have now. Then, I dove from the *Majunga*, François Brun's boat, and went to a depth of 231 meters. But today, this almost feels like just a formality, since the objective is to go much deeper!

Still no HPNS

The rope runs quickly between

my gloves. Too quickly! I need all my concentration to equalize, to pass the tanks onto the big snap hook that secure me to the rope, to inflate my drysuit, which is fortunately equipped with a big flow rate.

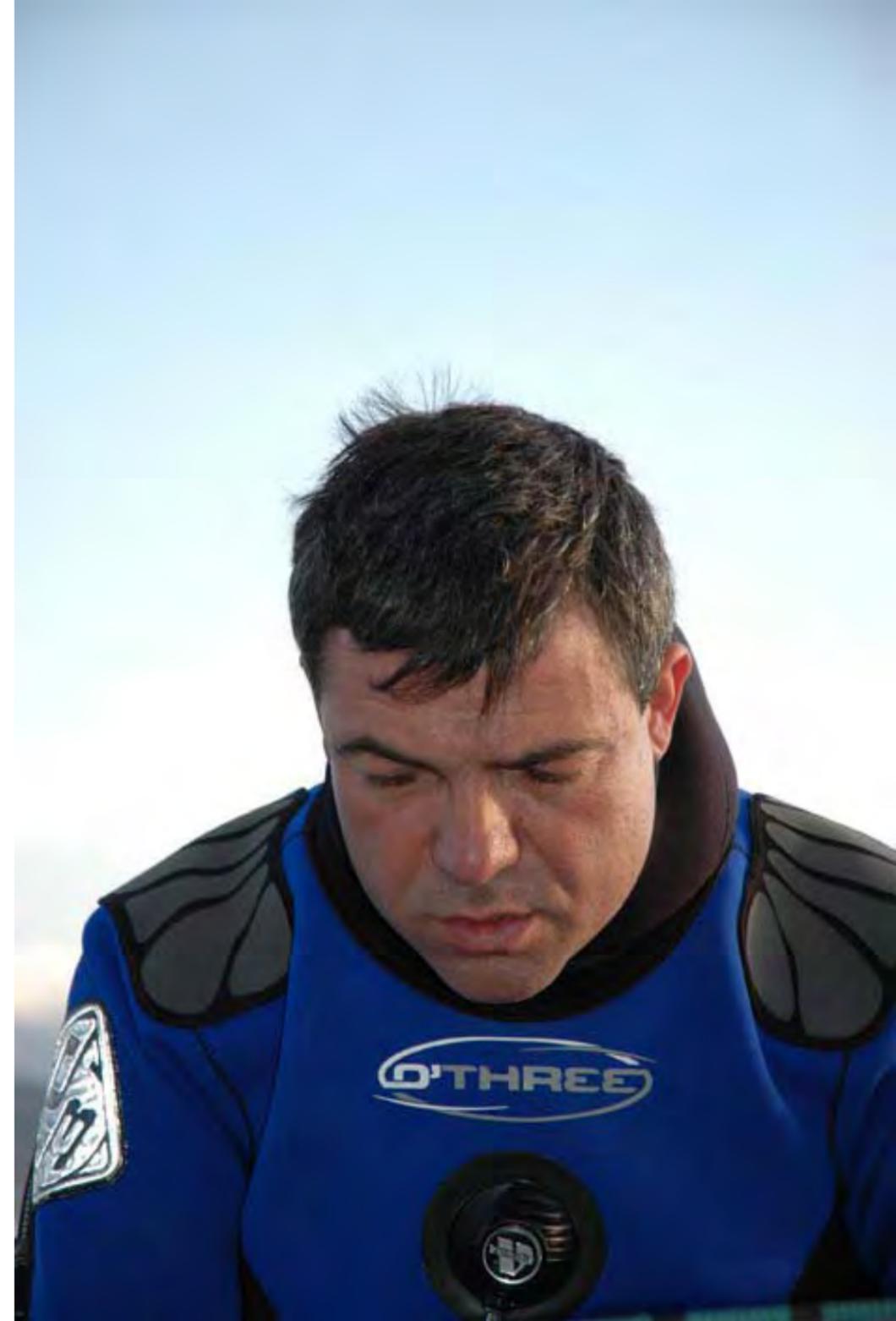
I am approaching the last 20-liter tank, which is attached to the 250-meter tag. It is actually at a depth of 265 meters because of the elasticity of the rope and marked with a chemical light stick as is custom for all cylinders at such depths. I have a difficult moment. I abandon the 6/72 20-liter travel gas that I have been breathing since 70 meters and start breathing on the bottom mix, make the knot... too many things to do at the same time.

The High Pressure Nervous Syndrome is now well developed in the form of light shivers and in particular, difficulties in concentration. Worse still, the travel gas tank I was supposed to attach slips off the rope and gets away from me! My friends get it back a few minutes later without really understanding what is going on and not without a certain apprehension.

For me, of course, things are not getting better with the depth. But I now feel comfortable with only four big tanks filled with bottom mix. Strangely, passing the depth of 200 meters, I am shaking less than I was at the Fontaine du Vaucluse. I am not having any obvious visual disturbance (distance problem) either, except for an advanced "tunnel vision" effect—my visual field seems restricted and being without much peripheral vision.

My Apeks regulators and my Aqualung Titan are working wonderfully well. I hardly notice the

World Record



300-meter tag that really should have grabbed my attention. A flasher is blinking, indicating the very deep zone. I reach the 320-meter depth tag (actually situated at more than 335 meters) when a big deflagration occurs in my right ear, along with a

sharp pain. My stress, which left me when I passed 70 meters, returns with a vengeance. There and then, I am convinced that I have a big lesion on my eardrum. I quickly inflate my wings and begin the ascent. The pain in my ear doesn't get worse. I try not to



Final check. TOP RIGHT: Meditation



think about what may happen next and concentrate only on the ascent.

Reaching 265 meters, I am glad to get to the decompression tank for my first deep stop. Then the ascent starts again, this time at a slower ten meters per minute rate. This is another big difference between this dive and diving the Fontaine du Vaucluse dive. Back then, I was hit much sooner by HPNS, and it left me later, too, around -70 meters.

By contrast, today, I feel few symptoms above 220 meters. At 215 meters, I make the second deep stop while I hang the second deco tank on. From here on, the ascent gets even slower with a snail pace five meters per minute until I reach the 165-meter deco stop and the next tank. My ear doesn't hurt as much as I thought it would, and I feel as if I am back in familiar territory.

From 150 meters, the ascent slows further to an excruciating slow three meters per minute ascent speed, and I have all these tanks accumulating around me dangling on the rope and on my har-

ness.

When I get up to 70 meters, there are nine 20-liter deco/travel tanks that I have to manage. Reaching 65 meters, I get onto the second rope. There, I am happy to see François Brun, with whom I usually explore deep shipwrecks, in particular, one located off the Catalan coast at 110 meters. Our last journey was as exploration training dive three weeks ago. He's using a Inspiration rebreather. He comes for an update and to provide me with food and drink. I let him know about my pain in the ear and a light nausea. He rids me of four tanks, and after spending a little while with me, he has to perform his own decompression profile.

Hubert Foucart relieves him at 50 meters. He is a follower of what he calls "baroque" diving—deep dives either in caves or on the open sea, down to an impressive 211 meters, and he assisted Pipin, too. He gives me a mix of water and Vogalene in order to prevent nausea. Then, it is Denis' turn to come to



The team

Sixteen people in total, divers or mariners from Toulouse and from Catalonia, have followed this project (and other projects: shipwrecks, cave diving, etc) and have carried it on their shoulders since the beginning; everyone has his own specialty but continues to multitask. Preparations, cancellations, and doubts have all been commonplace since my 231m dive in 2003. Without these people or the patience of their families, none of this could have been done. I will never thank them enough for their kindness, efficiency and devotion:

- François Brun, a well known shipwreck explorer

- Christian Deit, specialized in raiding, cave diving, canyon exploration, scuba diving
- Hubert Foucart, cave diver and shipwreck explorer, with his passion for the deep dive
- Sophie Kerboeuf, highly skilled diver who cooked good little dishes for me
- Patrick Tonolini, cave diver and rebreather diver, who mixes everything with his Bauer-Purus
- And all the ones who were not able to come, amongst whom were Laurent and Paco.

In Propriano:

- Denis Bignand and his instructors from U-Levante

- Francis Machecourt from the CREPS of Ajaccio and his wife Sylvaine
- Théo Laumonier
- Laurent Grillot (Lolo)
- Pierre Schiffer and Christian Gay-Capdeville from Aquasport Contois
- Pascal Vieux and Jean-Louis Léandri, a mariner from U-Levante
- Louis Lari from the Pilotine Santa Maria and his son, Jean-Marie, pilote of the port

Thanks to Henri Benedittini who brought us all of his help one more time; Bernard Gardette, the Comex scientific director, for all his valuable advice; and Professor Bourbon of the Nervous System Functional laboratory (CHU Toulouse-Rangueil) for his formation on mental preparation. ■



Technical decompression

Some important points and notes:

Some initial one to two-minute very deep deco stops were performed from 265 meters. And from that depth, the ascent speed decreased in order to avoid serious accidents of Type 2—that is, vestibular/neurological accidents whose symptoms may start deep in that type of dive.

The late John Bennett suffered from these kinds of symptoms after his record breaking dive to 308 meters. He suffered from dizziness and vomiting from 66 meters upward and during the whole decompression, which lasted nine hours and 37 minutes.

In this light, it is mindboggling that it was not too long ago that the accepted standard rate of ascent was 30 meters per minute (30 meters/min).

These slow ascent speeds and the deep deco stops require large quantities of gas. That is why we used 20-liter tanks at 265 meters, 215 meters, 165 meters (8/62), 145 meters, 115 meters, (13/57), 95 meters and 80 meters (18/50) as well as on the second line that was about 60 meters long—at 60 meters (20/50), 51 meters (25/50), 39 meters (25/50), 30 meters (38/33), 21 meters (50 percent O₂), 15 meters (60 percent O₂). We also used two O₂ sets of surface supply diving equipment at minus 6 meters.

We used a large fraction of helium in the decompression mixes, which we considered easier to eliminate in the last deco stops. We avoided exceeding 30 percent of nitrogen during the ascent up to 21 meters.

All those elements allowed me to have a relatively short decompression,

compared to the 12 hours decompression that figures on my longest diving tables and is also Nuno Gomes' decompression time when he dove to a depth of 318 meters three weeks earlier in Dahab, in the Red Sea.

Therefore, I opted to use those tables because of the water conditions, the pains and the seasickness. I thought that staying longer would overexpose me to exhaustion.

Moreover, I felt reassured knowing that in the 1960s, Keller had only a three-hour decompression (in a chamber) after a 300-meter dive! Plus, in 2004, Mark Elyatt performed a dive to 313 meters in only six hours 36 minutes. So, I felt that there was plenty of decompression time.

Helium—a sword that cuts both ways

In order to limit narcosis below 40 to 50 meters, we used increasing proportions of helium in the gas mixes. The downside is that helium also subjects you to additional loss of body heat and facilitates the onset of High Pressure Nervous Syndrome (HPNS).

This syndrome gets aggravated by helium below 150 and by the high speeds of descent characteristic for those dives. It has also been demonstrated during many experiments in chamber, and a few ultra deep TEC dives showed that the presence of another narcotic gas, usually nitrogen, masked the effects of the HPNS, which is characterized by shaking of the extremities and then of the whole body, visual problems, difficulties in concentration and impaired performance.

A few years ago, I was thinking about adding hydrogen, but I gave up

the idea because of the dangers of handling this gas as well as a remaining uncertainty concerning decompression and the effects of a fast compression.

But of course, the more nitrogen we add, the greater the risk of nitrogen narcosis or even the combined effects of narcosis and HPNS! Everything is therefore about getting the dosages right. It is a balancing act. Too much helium means increased risk of HPNS. Too much nitrogen means too much narcosis and increased risk of being bent.

In the practice, while attempting relatively fast descents in the chamber (10 to 30 meters/min), it appears that levels of 13 percent to 18 percent nitrogen noticeably decrease the HPNS effects, without causing too much narcosis. On extremely deep TEC dives, the equivalent air depth for the divers at the bottom was 70 to 100 meters.

An equivalent air depth of maximum 60 meters seemed reasonable to me. This is associated with a partial oxygen pressure of 1.4 to 1.5 bars. That didn't prevent me from being significantly affected by HPNS from 260 meters. However, the mix I used probably minimized its impact, and kept me from developing a dangerous case of narcosis.

Concerning the descent speeds, it seems, according to the experiments in chambers, that descending one meter/min or even slower, will notably improve performance. But it doesn't seem useful to reduce the speed from 30-40 meters/min to 10 meters/min. On the contrary, it is even likely that it only gives HPNS more time to manifest itself. It will also considerably increase the already very long deco stops. ■

Pascal recuperates after achieving a world record 330m deep dive

see me, also with his rebreather and brings me Sophie's good little purees and soups, in giant syringes. This salty food is a good alternative to condensed milk, sweet chestnut puree, marmalade, jelly and water already absorbed. Then, he brings me a rebreather that, however, won't work. Consequently, the rest of the ascent will be done with open circuit, but at least without any particular technical problem despite of the high percentages of helium.

From 30 meters, I start feeling the effects of the strong swell on the surface. The pain in my ear increases and soon enough each movement of the rope is becoming a nightmare. The decompression turns into torture. And that is not all. At about 12 meters, I get seasick.

Dealing with the pain and the nausea begins to exhaust me. The end of the decompression is done with Christian, Pierre, Lolo, Théo, Francis and his wife Sylviane, who stay with me up to -3 meters. I finally break the surface again after a

dive of 8 hours and 47 minutes.

The return to the surface that I dreamed about during the whole long time of the decompression is brutal—I am shaken by the swell, which only makes my seasickness get worse. My friends help me get rid of my equipment, while I raise myself with difficulty on the Zodiac. There, I am taken care of and quickly rushed to the shore by my old buddies, Tono and Deit. Still exhausted, I keep breathing the oxygen for another half hour on the ground while rehydrating myself abundantly (water and water plus Adiaril).

I should be happy. But I just feel a little bit more serene, and a little bit frustrated by the vertiginous, but too short descent that already just feels like a memory.

The game has worked today; my blood analysis wasn't too bad. However, I am already thinking about what could be improved. ■

Equipment:

It is simply of vital importance that, on such a demanding dive, the equipment is simple, rugged and extremely high performing! We entrust it with our lives, here more than anywhere else, and under the most extreme conditions!

AQUALUNG: One of the regulators that I used at the bottom was a Titan, which worked admirably. We often use it in cave diving, because the second stage is easy to disengage. Le Gend regulators (the top of the line) were settled on all decompression tanks, even the deep ones. Hubert and I had used Aqualung regulators during assisting dives with Pipin, between 140 and 170 meters. Hubert had also used them during a -211 meter dive. aqualung@airliquide.com
+33 4 92 08 28 88

APEKS: All bottom regulators were Apeks ATX 100, whose breathing capabilities are really impressive at 330 meters. With an Apeks, it feels like breathing at only 20 meters! I used those regulators with total confidence, since they had successfully been used by a

Norwegian at 225 meters, and even by John Bennett at 308 meters. It is also the most commonly used regulator amongst English Tec and cave divers in the worst conditions. www.apeks.co.uk or Aqualung France

AGA: AGA supplied ten Helium tanks and six oxygen tanks.

PETZL: Fifty snap hooks specifically for each situation were used—locking snap hooks to secure the deco tanks as well as quick opening ones for delicate or fast operations. Petzl also supplied all the spelunking handles, which helped with manipulating ropes and bringing the tanks back up. www.petzl.com

TORTEC: Tortec supplied the seven to 18-liter tanks used at the bottom and during the decompression.

BÉAL: Béal supplied all the ropes—descent, decompression, shot line, etc—more than one kilometer in total, as well as the cord and lines. www.beal-planet.com

www.segytek.com ■



Pascal arrives on the barge, with the horizon stretching beyond

PARTNERS IN CORSICA:

● Diving Center U Levante in Propriano

Without the help of Denis Bignand who knows the bay like the back of his hand and all the best places, and who organized everything there, without his competence and his efficiency, we might still be looking for a site. He and his friendly instructors were a precious help to us, and I thank them. www.plonger-en-corse.com
plonger-en-corse@wanadoo.fr
+33-4-95-76-23-83
+33-6-22-44-75-99

● Vigna Maggiore Camping in Olmeto Beach
Location with a beautiful view. Jacques Bidani the friendly owner, welcomed us with opened arms and put us in two comfortable bungalows. He also entertained us with hearty local stories.
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+33-6-20-55-51-78

● The Maritime Agency Sorba in Propriano which really facilitated the Marseille-Corsica crossing.
+33-4-95-76-00-98
VOYAGES-SORBA@wanadoo.fr

● La Compagnie Méridionale de Navigation (the meridional navigation company)
● Prima Gaz Company
● Barcarès Yatching
● Banque Populaire Toulouse Midi-Pyrénées (and the association of customers of this bank)
● Mr. Bordes and Mr. Mézergues and the Echelles Centaures
● Mr. Vinsonneau and Mrs. Demoor, for their precious financial help.
● The Socex in Castanet (31): Eric and Frank—oxygen and inspection. ■



Edited by Kurt Amsler, Peter Symes & Scott Bennett

The Triton nudibranch only comes out to feed at night, but be careful, as they are light sensitive



Text and photos by Kurt Amsler
Translation by Arnold Weisz

Night diving is the ultimate for many divers. Underwater photography without light is challenging, but with a few additional pieces of camera equipment and special techniques you can master this as well.

Night underwater photography is usually restricted to plants or animals. Often it is either animals that are hunting for food under the cover of darkness, or daylight active animals that are sleeping. Worthwhile objects are, for example, sleeping fish, nudibranchs, sea stars and worms. All living creatures, and especially crustaceans, which leave their dwellings in the dark, are best captured with close-up or macro photography. Sleeping fishes can often be approached by inching closer and closer until you are just a few centimetres away. This gives you the opportunity to get close-up images of their eyes and fins, which, during daylight, are virtually impossible. Many

A slave strobe gives you additional effects to improve your images

Night Photography





Tungsten lighting effect on stingray

UW-photographers ask me if flashing strobes will disturb a sleeping fish. Good news! It is scientifically proven that sleeping fish are not disturbed by strobes. They don't seem to notice and continue to sleep peacefully.

Close-up or macro

Fishes that are active during the night are, on the other hand, much more difficult to photograph. Even catch-

ing them with your light could scare them off. I'll give you a small tip though; the lights from a diving boat often attract predators such as barracudas and garfish. To get a good shot of these fishes, simply sneak up on them from the shadow side.

In general, photographers should always be alert at any time. Combined with luck, this will get you the best night time images, for

example, of octopuses and eels when they catch their prey.

As photo subjects during a night dive are often very small, most of your photography will be close-up or macro. On cameras with viewfinders (analog or digital), you can use close-up lenses. When using SLR cameras, it is best to use lenses with 50 to 30-degree angels.

Equipment

Skip your wide angle lenses for night diving—except if you are going to capture very close up images within the 25 to 40 cm range. You don't have any daylight to take into consideration. Instead, you need to make your strobes fill the whole frame and point exactly at

Animals that are fixed like the soft coral shown here, or slow moving animals, are particularly good subjects for night photography



Night Photography

the object. The best way to do this is to attach a small pilotlight onto the strobe and use this to aim. Some strobes even have a built-in pilot light. This shouldn't be stronger than 10W and last a minimum of one hour. Additionally, the strobe should be able to release at least 50 flashes at full power. If the strobe fails to deliver at this level, you are in danger of maybe loosing out on your shots.

Techniques

The most important prerequisite for making good underwater night photography is to be 100 percent ready. The camera settings should always be preset for the expected subject matter. Photographers who have to fumble with their settings or make tedious adjustments to the strobe arms will definitely loose their chance to capture the subject. Always have a small flashlight on

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Hermit crabs are maybe not the slowest, but often make very nice subjects

Keep your hands free by attaching small torches to a helmet



hand for easier operation of your camera settings. It might be a bit uncustomary for many, but using a helmet with mounted lamps keeps your hands free,

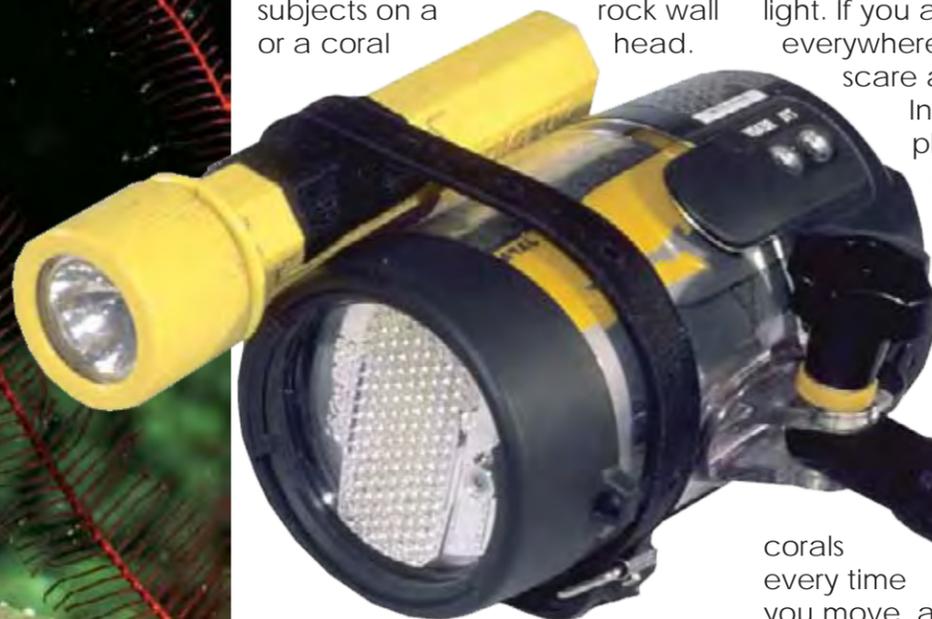
Choice of subject

Although all this technology and equipment with special features solves a lot of prob-

lems, it all comes down to the choice of subject matter. I recommend that you don't venture on long swims during night dives, but concentrate your search for photo subjects on a rock wall or a coral head.



lems, it all comes down to the choice of subject matter. I recommend that you don't venture on long swims during night dives, but concentrate your search for photo subjects on a rock wall or a coral head.



Take a really close look in all the nooks and crannies, and even on flat sandy bottoms.

Just keep in mind that most nocturnal animals will stay out of the light. If you are shining your lamps everywhere, you will certainly scare away a lot of animals.

In addition, in order to plan your night dive carefully, you must also take care of the environment. In the dark, it is even more difficult to see where you put your hands or fins. Position yourself in a way that you don't bump into the

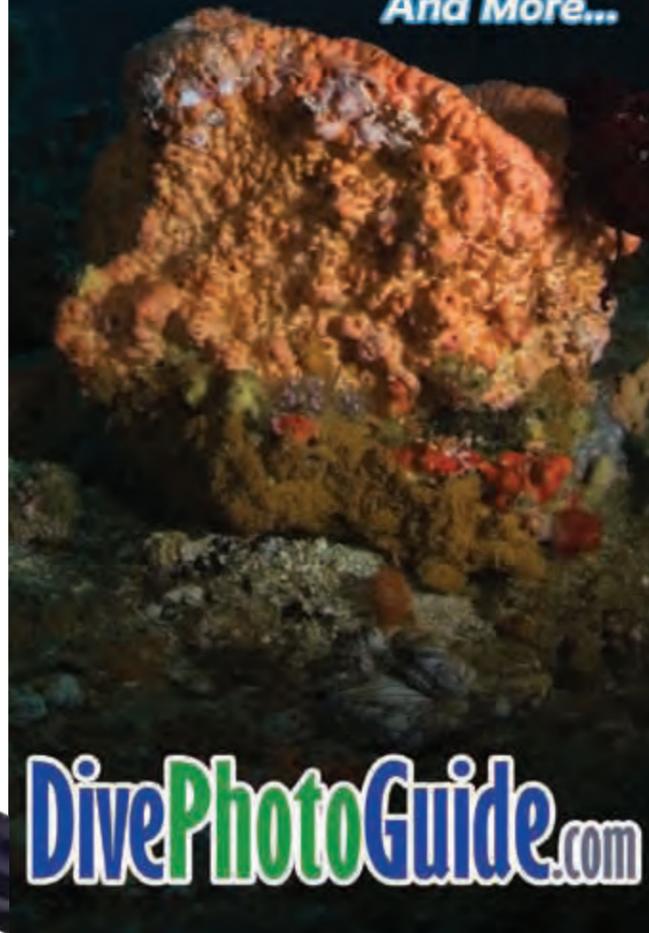
corals every time you move, and move slowly and deliberately.

ABOVE: Mounting a pilot lamp onto your strobe makes aiming much easier. LEFT: Muray eels are nocturnal animals that start to hunt a few hours after sunset

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Feeding Triton snail

BELOW: Sleeping Parrotfish



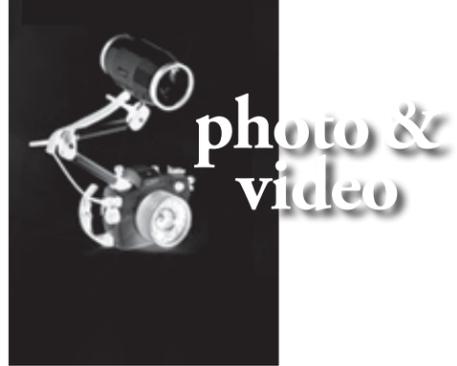
Seacam—Amsler Edition with built in target lamp

Practical tips for night time underwater photography:

- Eighty percent of all images taken during night dives are either macro or close-ups. Keep your search for subjects within a small area, such as a coral head.
- Always prepare the correct camera settings before you enter the water. This helps you avoid unnecessary movements with lamps under water.
- Most nocturnal animals get scared by light. Try to dim your lamps. A pilot light on the strobe

- doesn't need to have more than 5-10W. If you need to use your flashlight during the dive, cover it with some of your fingers to dim the light.
- Night dives are often done too early. Many nocturnal animals are most often active and come out of their dwellings 2-4 hours after sun down.
- Operating camera equipment in the dark is much more difficult than during a day time dive. Keep your equipment down to a minimum to avoid fumbling, to get better images.
- Mount your external lamp directly on the strobe with, for example, duck tape or rubber

- bands. This allows you to more easily adjust sharpness and aim your strobe.
- At night, it's even more important than during day time dives to have good buoyancy and know where you put your fins.
- Flashes from strobes don't disturb fishes. But long exposures with dive lamps do. While searching for your subjects, don't point your lamps too long at fish.
- Night time underwater photography requires careful planning. Often photographers forget to pay attention to their air supply, depth, or surroundings when concentrating intensely on the photography. ■



"Canikon—watch your rear mirror" With its 24.6 MP 35mm format full-frame CMOS sensor, the **Sony a900** has the highest resolution in its class. The Alpha 900 body will be available in November for about US\$3,000 along with related accessories



The clash of the Titans begins

The megapixel race has gone to the next level



Canon's update to the hugely popular full-frame EOS 5D is here, the **EOS 5D Mark II** has a stunning 21.1-megapixel full-frame CMOS sensor with DIGIC 4 image processor and a vast ISO range of 100-6400. It can shoot up to 3.9 fps



Aquatica is now shipping its housing for the **Canon 1Ds Mk III**, featuring the best that technologies and ergonomics can offer and in addition to the classic Nikonos type and Ikelite type manual connectors, the S6 type connector is being offered as well



Leica has once again revolutionized the world of photography with a digital S-System that's perfect for professional use. The **Leica S2**, with its premium AF objectives including everything from ultra-wide to super-telephoto, is an absolute photographic highlight. The digital SLR camera has a special new sensor with 30 x 45 mm and 37.5 megapixels. The S2's metal body is appreciably smaller and easier to carry than similar models from other camera brands, and yet it's also nearly twice as fast thanks to ultra-modern processor technology

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Relaunch of UnderwaterCompetition.com

The renovated website, *UnderwaterCompetition.com*, is home to the organization's series of international photo competitions, hosted collaboratively between their two popular underwater photo and video websites.

In just four years, these competitions have become some of the most prestigious and widely supported international underwater photography and video competitions in the world.

As their readers already know, the primary competitions are unique in the fact that they are held in association with two dive expos on opposite sides of the world simultaneously. Our World Underwater in Chicago, USA, and DEEP Indonesia in Jakarta, Indonesia.

Not only did the staff give UnderwaterCompetition.com a facelift, including highlighting and ranking winning photographers, but they also automated the entire competition. As a participant, you can now sign up for your own UnderwaterCompetition account, upload your submissions, and pay for your entries through this website. ■



Aquatica Nikon D700 Housing

The new 90m (300ft) depth rated Aquatica Digital Pro housing for Nikon D700 features a bold new design machined from solid aluminum, it is treated and anodized to military specification, then painted with a robust weather and wear resistant finish. Positive bayonet mounting offers the fastest access to lenses for rapid changing without having to remove the SLR from the housing. Allows the use of lenses from 180 degrees fisheye to the longest of macro lenses. Tele-converter port extensions are also available. The line of standard accessories such as the Aqua View finder, remote control cord, and TLC line of strobe arms are also fully compatible with it. The suggested retail price is 2,949.00 USD www.aquatica.ca

Sealux Nikon D3 Housing

The sturdy aluminium construction is hard anodized and additionally passivated in a special process to make it seawater-resistant. A combination of large O-rings, double seal shafts and fourfold-sealed keys ensures maximum safety. The GD-Viewfinder is a high-quality optical system features several layers of coating and provides a brilliant image, which is 150%, enlarged compared to that of the camera viewfinder. www.sealux.de



Ikelite Housing for Sony HDR-CX11 & CX12

This "Clearly Superior" design provides full view of the camcorder, control functions, and back "O" ring seal for assurance the system is safe. Maximum operating depth is 60m (200ft). Weight above water is less than 8lbs (3.6kg) for easy packing, and very slightly negative in saltwater for stability and comfortable handling. Controls for the LCD Screen Touch Pad provide full access to setting white balance and white balance shift. An included removable UR/Pro filter enhances red tones in tropical blue water settings with available sunlight at depths up to 80 feet (24m)



Ikelite Nikon D90 Housing

With the exception of the focus selector lock and diopter adjustment, controls for all camera functions are provided including D-Movie and Live View. As an added bonus, both the media card and battery can be replaced without the removal of the camera from the housing tray. Also included is TTL conversion circuitry that functions perfectly with current model Ikelite DS digital SubStrobes. Complete creative control is enabled with seven manual power settings in half-stop increments, with all choices obtainable with a simple twist of a knob on the housing's back. Although Non-Ikelite strobes can be utilized with the system, TTL capability is not available. www.ikelite.com



Photoshop CS4

The 64-bit edition of the new Photoshop will allow PCs with lots of RAM to work on very large images with less hard disk swapping, thus speeding up operations. With the diminishing amount of RAM available to modern PCs (due to a 4GB limit on 32-bit Windows versions such as the still popular XP that's an update of extreme significance. While Photoshop users may take a while to move to the new 64-bit version, CS4 offers plenty of other features and upgrades to keep 32-bit users happy.

The new Canvas Rotation tool makes it effortless to rotate and work on an image from any angle. New path-bar navigation and workspace selection buttons across the top of the Bridge window let you instantly go to just the right display for every task. Also included are new Camera Import controls, visual folder navigation, and a Carousel View for larger image-group selections. The software also provides a smooth pan and zoom experience, allowing users to edit images effortlessly at the highest magnification. ■



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Stéphane Braud



P O R T F O L I O

PREVIOUS PAGE: *Grotte aux naiades, Mauritius*
Oil on canvas, 100 x 73 cm, sold
LEFT: *Epave d'avion japonais (New Guinea)*
Oil on canvas, 130 x 89 cm, 8,000€
BELOW: *Faille de la tour de boucan canot*
(Reunion Island), Oil on canvas, 65 x 50 cm, Sold



Text edited by Gunild Symes
All images courtesy of Stéphane Braud

Underwater artist and diver, Stéphane Braud, was born in the southwest of France, in Libourne, in 1955. Braud began painting when he was 20 years old. Later, he discovered the wonderful world of scuba diving at Reunion Island. Eventually, it seemed a logical step for him to join his two passions, diving and painting. So, he decided to paint under the sea. Braud is now called "the blue fisherman" and considered to be one of the most celebrated sub-aquatic painters in the world.



Ancre à la havanne (Caribbean), Oil on canvas, 146 x 97 cm, 9,500€



La tour de boucan canot (Reunion Island)
Oil on canvas, 146 x 97 cm, 9500€

In his working process, Braud combines the agility of a certified diver with the speed of an experienced artist. To paint under the sea, Braud adapted his materials and developed his own technique, which enabled him to paint onto canvas scenes of the ocean.

In his artwork, Braud captures, for the pleasure of his audience, the bluish luminosity of the underwater world, ghostly images of wrecks, and the plethora of colours inherent in the surrounding nature.

When Braud settled down to paint on Reunion Island, where he was mesmerized by the underwater world around the island, it was, at first, difficult to paint under the sea, he said. He made his first paintings under the sea in 1996 and continued to work underwater in search of his own unique, personal style.

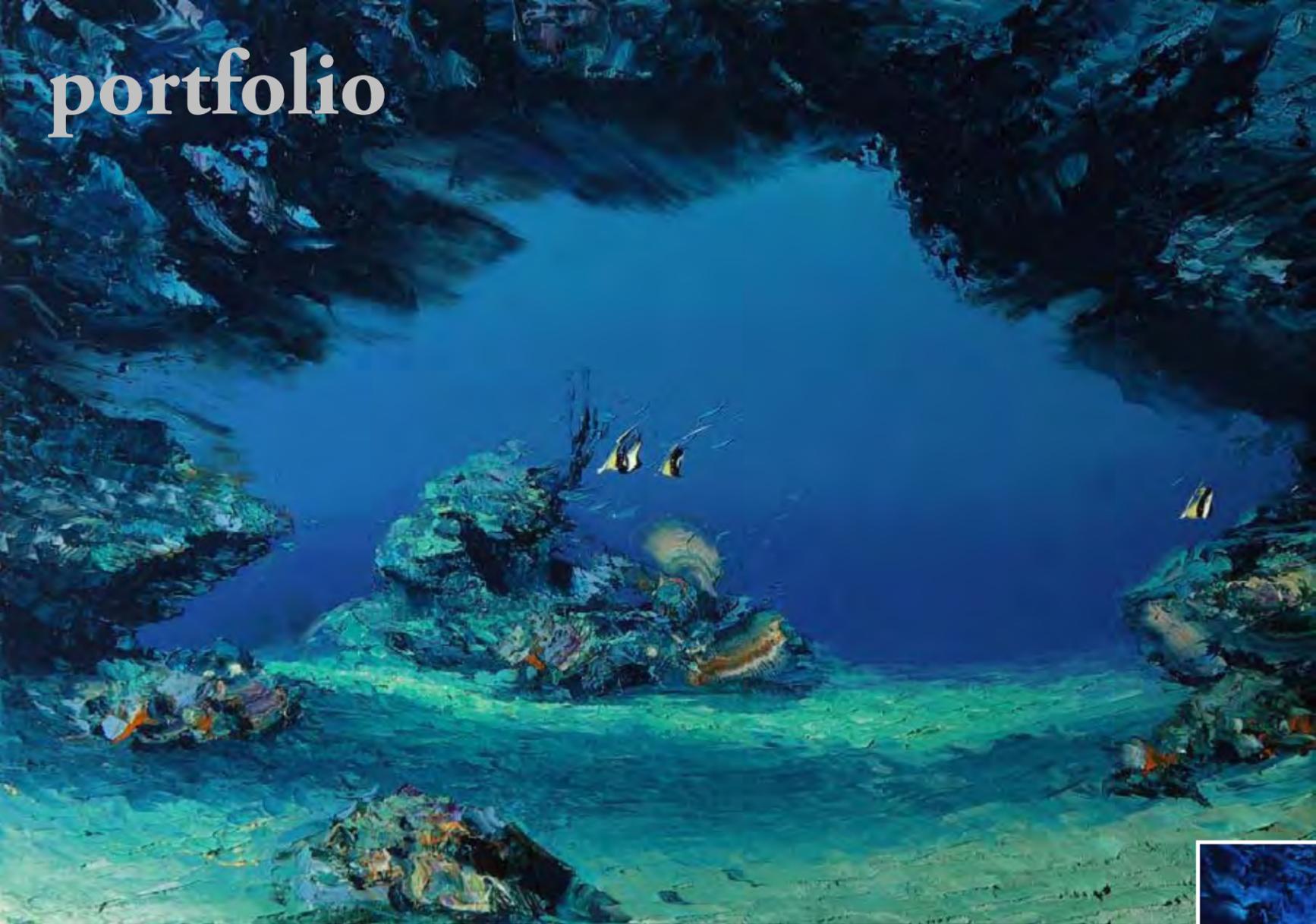
Since then, Braud has painted under the sea regularly at Mauritius, Bahamas Virgin Island, Belize, Martinique, Corsica and Sardinia. He also paints



ABOVE:
*Ancre à la
havanne*
(Caribbean)
Oil on canvas
146 x 97 cm
9500€



LEFT:
Self-portrait
Oil on canvas



Grotte à Bequia, Grenadines (Caribbean) Oil on canvas, 65 x 45 cm, Sold

in his studio, particularly the large paintings. Braud said that it was difficult to paint the larger works under the sea simply due to the inconvenience in transporting the larger formatted paintings on the dive boat.

Braud uses oil paints—the water can't mix with the oil, he said—and also uses a palette knife for painting. He said that he was not an underwater photographer, but often filmed his sites in research for the paintings.

"My favorites places are the coral reefs, especially for their architecture," said Braud. In the future, he would like to paint images of the coral reefs of Australia, the Pacific islands and the islands of Asia, he said.

After living on Reunion Island and Mauritius for 22 years, Braud moved to the south of Spain. He said that he does not dive in Spain, because the dive sites do not correspond to his work. But his work is displayed at several galler-

ies in Europe and several private collections.

A primarily self-taught artist, Braud said, "I want to represent the underwater world with an eye of a diver and painter."

For more information, please contact Galerie Bartoux at galeriebartoux.com or email stephane.braud@wanadoo.fr. You can catch Braud's blog at: stephane-braud.over-blog.com or visit his website at: stephane-braud.com.

Forêt de corail noir (Mauritius) Oil on canvas, 60 x 60 cm, sold



Stéphane Braud

SOLO & GROUP EXHIBITIONS

- 1997 Réunion Island
- 1998 Réunion Island, Mauritius
- 1999 France (Couchevel, Mégève, Annecy), Martinique, Guadeloupe, Ivory Coast (Abidjan)
- 2000 Bahamas (Nassau), Miami (Miami Art Expo), Saint Augustin (Florida), France (Couchevel, Saint Paul de Vence), Réunion Island
- 2001 Martinique, Hawaii, New York (New York Art Expo), France (Paris, Ajaccio, Couchevel, Saint Paul de Vence), Réunion Island
- 2002 Hawaii, Orlando, Martinique, France (Couchevel, Saint Paul de Vence)
- 2004 Bruxelles, Strasbourg
- 2005 Belgium (Knokkes le Zout, Coutrai), Monaco, Genève
- 2006 Belgium (Gand Line Art), Ansvr, Luxembourg, Genève, Saint Tropez, Monaco, Honfleur, Biarritz
- 2007 Honfleur, Biarritz, Saint Tropez, Toulouse

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- 30 October - 9 November 2008 Marbella-Puerto Banus, Casa del Mar (Spain)
- 1 -15 September 2009 Saint Tropez, Embassy of Tourism (France)

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