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Baltic Sea Wrecks
Soviet WWII Sub

Brazil
Laje de Santos

Spain
Calella

Ecology
Nudibranch Colors

Portfolio
Howard Schatz

Dr Shawna Meyer
Humboldt Squid

In The Shadow Of The Cold War
Wrecks

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COVER PHOTO
Treasures of a shipwreck by Kurt Amsler
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The nudibranch, *Glaucus atlanticus*, by Taro Taylor. This image was selected as Picture of the Day by Wikipedia on March 4, 2008

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Bloody *we call it* Murder

Text by Peter Symes
Photos by Wolfgang Leander

Would you eat your pets? In most cases, the answer would be a resounding no.

The meaningless murder of the Tiger sharks off Aliwal shoals—yes, I use the term murder because these were individuals that we knew and interacted with—fills me with anger, frustration and sadness. We knew these magnificent creatures—they had nicknames—and divers travelled from afar to interact with these magnificent creatures. But now, they are no more.

At least three sharks—probably the very same individuals that graced our covers a few issues back—have not only been illegally killed, but to add insult to injury, they were also captured within a protected marine park.

Here, they were the main attraction for thousands of tourists and divers, some of whom came from around the world to dive The Shoal and have an encounter with the sharks—just like X-RAY MAG contributor, Wolfgang Leander, did in a report we ran a few months back. How stupid and sad is this?

The meat value of these slaughtered animals is nothing in comparison to the revenues they bring in from tourism. One caught shark may fetch a one-time payment of about US\$100 at the auction house, whereas each live individual may generate US\$10,000 or more in tourism income annually. This is also the case with sea life elsewhere—for example, with the manta rays in the Pacific.

“Less than five people a year die from shark bites, yet every time a human dies because of a shark bite, the media goes on a hysterical binge of shark hatred. It’s completely irrational. Approximately 100 people a year die from ostrich attacks. Dogs bite over 50,000 people a year and kill over 100. This makes dogs and ostriches 20 times more dangerous than sharks, yet we don’t call for the eradication of big birds and puppies. On the other hand, humans slaughter tens of millions of sharks a year for soup. Which species is the monster?”

— Paul Watson
Sea Shepard

The Tiger sharks we featured in this cover story have now been poached—within a protected marine park!



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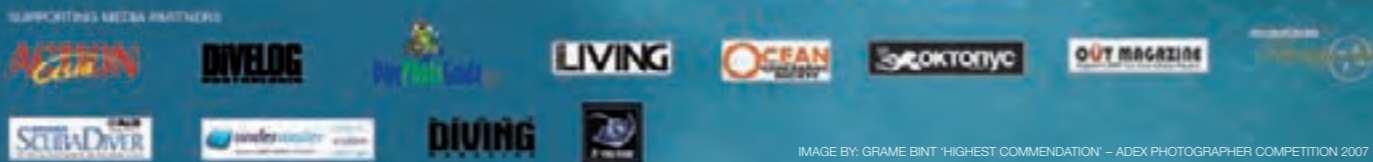


IMAGE BY: GRAME BINT 'HIGHEST COMMENDATION' – ADEX PHOTOGRAPHER COMPETITION 2007

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I am acutely aware that we have managed all risk out of our lives and, to me, “the cage” promotes this soulless experience. The connectivity to nature in a “cage-less” environment is a freedom of individual choice, and in the case of many species of shark on our coast, the only way to experience them in their world and on their terms.

—Mark Addisson



WOLFGANG LEANDER

Not exactly pets, but these wild animals interacted with people

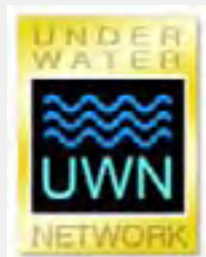
Where there is a demand, there will always be a supply. And the Asian appetite for shark fins—which is completely devoid of any nutritional value and sometimes even toxic with accumulated heavy metals—is the real culprit here. Not the sorry fisherman who lost his head in a moment’s spur of greed and had the sharks lose their heads, too. Sure, he should be persecuted to fullest extent of the law, all right, and hopefully, he will be, to set an example and enforce deterrence.

Most of all, I accuse the Asian governments for permitting this

ongoing speciecide, which is both barbaric and meaningless. They hold the legislative and executive powers to put a stop to the shark fin trade. Outlaw it, I say. Make it a criminal offence to procure, sell and consume shark fin products, put offenders in the slammer, and throw away the key. It is done with controlled substances, why not shark finning? That would put a lid on it, and hopefully, give the sharks a little respite. So, why don’t they do it?

Whose sharks are they to kill anyway?

Do you have to kill them—or other animals—to claim “ownership”? What if I and others would like to preserve them alive? Do we have to catch each of them and put a name tag on them like cattle? Perhaps, that’s not such an outlandish idea—you can invest in a rainforest, why not a shark? Imagine that: Boasting that while you do not own a sleek high-powered top-of-the-line sports car, you do have a live sleek high-powered multi-millennium model shark swimming free in the ocean. ■



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News edited
by Peter Symes
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NEWS

The shallow-water, benthic communities in Antarctica are unique. The waters surrounding Antarctica remain too cold for predators such as sharks and crabs capable of crushing shellfish similar to the mollusks living in the vast continent's seas.

As a result, the Antarctic seafloor has been dominated by relatively soft-bodied, slow-moving invertebrates, just as in ancient oceans prior to the evolution of shell-crushing predators. Nowhere else do giant

pycnogonids, nemerteans and isopods occur in shallow marine environments, cohabiting with fish that have anti-freeze glycoproteins in their blood.

All that might just be about to change in no minor way.



Army of crabs on the threshold of invading Antarctic waters

Climate change has sent a destructive army of predatory crabs marching towards Antarctica's ecologically sensitive coastline, it has been claimed. Scientists say

the crabs, kept out of the region for millions of years by the cold, are about to return. The crabs are prevented from venturing into waters that are much colder than 1°C,

because it causes levels of toxic magnesium to build up in their bodies. But, as temperatures rise, magnesium poisoning will become less of a barrier to them.

Dr Sven Thatje, of the National Oceanography Centre in Southampton, discovered that the crabs were poised to conquer the Antarctic shallows. "The crabs are on the doorstep," he told the annual meeting of the American Association for the Advancement of Science in Boston. "They are sitting in deep water, and only a couple of

hundred bathymetric metres now separate them from the slightly cooler shallow water in the Antarctic shelf environment."

If they break into the shallows, the consequences could be environmentally catastrophic. Over millennia, the indigenous animals living on the sea floor have adapted to a world without powerful predators

such as crabs, shell-cracking fish, sharks and rays. As a result, there is a unique abundance of brittle stars, giant sea spiders, sea snails, and other invertebrates. Some, like the snails, have lost their protective armour and spines. These creatures would be defenceless against the bone-crushing claws of the invading crustaceans. ■

Antarctic krill found at 3000 m



The discovery of krill living on the seabed around the Antarctic Peninsula has changed scientists' understanding of what is a major source of food for creatures such as fish, squid, penguins, seals and whales. Professor Andrew Clarke of the British Antarctic Survey said: "While most krill make their living in the ocean's surface waters, the new findings revise significantly our understanding of the depth distribution and ecology of Antarctic krill... It was a surprise to observe actively-feeding adult krill, including females that were apparently ready to spawn, close to the seabed in deep water." ■

Sharks soon heading to Antarctica too

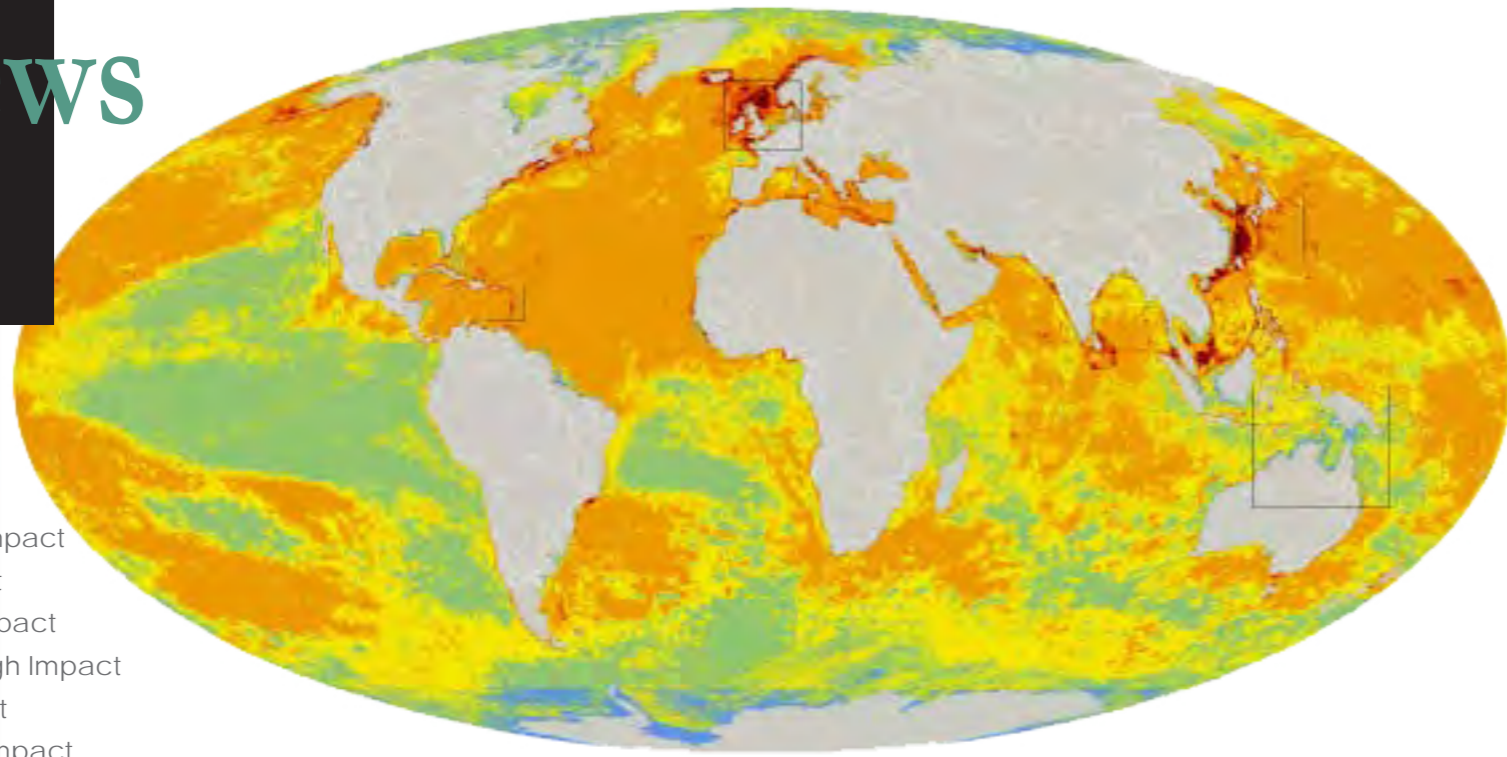
Global warming could bring sharks to Antarctic waters, threatening a unique marine life shielded from predators by frigid conditions for millions of years, biologists warn.

But global warming has already pushed temperatures up by one to

two degrees in the past 50 years, and the waters could become hospitable to sharks within the next 100 years. The water only needs to remain above freezing year round for it to become habitable to some sharks, and at the rate we're going, that could happen this century. Once they get there, it will completely change the ecology of the Antarctic benthic community. ■



Edited by Peter Symes



- Very Low Impact
- Low Impact
- Medium Impact
- Medium High Impact
- High Impact
- Very High Impact

No ocean left untainted by humans

It's probably worse than people realize. There's no space left on the planet that's untouched by human activities. And there's large areas, over 40 percent, that are being heavily impacted. Scientists mapped 17 different human activities in categories like fishing, pollution, and climate change.

— Ben Halpern

Almost half of the oceans have been badly damaged by humanity, and no region has been left untouched, the first global map of human impact on marine ecosystems has revealed.

Ben Halpern, of the US National Centre for Ecological Analysis and Synthesis (NCEAS) who led the ambitious project to chart the changing ocean environment says the world map shows how human have exacted a much heavier toll on the seas through fishing, pollution and climate change than had been thought—with 41 percent of the oceans being strongly affected by 17 human activities.

The world map, which was created by dividing the oceans into kilometre squares, is the first to combine information on how different human influences are affecting the oceans. It examined indicators of environmental health, including coral reefs, fisheries, kelp forests and water quality.

Some of the worst-affected marine areas are found around the British Isles. Parts of the North Sea, the Channel and the North Atlantic off the Irish and Scottish coasts have

all been assessed as suffering very high ecological damage. But there is hope, too. Halpern's research also found large, pristine waters near Earth's poles, guarded today by nearly inaccessible ice.

"This project allows us to finally start to see the big picture of how humans are affecting the oceans. Our results show that when these and other individual impacts are summed up, the big picture looks much worse than I imagine most people expected. It was certainly a surprise to me," Halpern stated to The Times.

"Unfortunately, as polar ice sheets disappear with a warming global climate and human activities spread into these areas, there is a great risk of rapid degradation of these relatively pristine ecosystems," Carrie Kappel, of NCEAS, a principal investigator on the project, said.

Dr Halpern said that while the picture is grim, it could be reversed by urgent action. "There is definitely room for hope," he said. "With efforts to protect the chunks of the ocean that remain relatively pristine we have a good chance of preserving them." ■

Humans the cause behind profound degradation of Caribbean coral reefs

Coral reefs in the Caribbean have suffered significant changes due to the effects of a growing human population, a new region-wide study shows

The number of people living in close proximity to coral reefs is the main driver of the mortality of corals, loss of fish biomass, and increases in macroalgae abundance, a new study published in the *Proceedings of the Royal Society of London* showed. In the study, researcher simultaneously analyzed contrasting socioeconomic and environmental variables.

Coastal development, which increases the amount of sewage and fishing pressure by facilitating the storage and export of fishing products, was mainly responsible for the mortality of corals and loss of fish biomass. Runoff from cultivated land was the main driver of increases in macroalgae. Coral mortality was further accelerated by warmer temperatures.

"It is well acknowledged that coral reefs are declining worldwide, but the driving forces remain hotly debated," said author Camilo Mora at Dalhousie University, Halifax, Canada. "In the Caribbean alone, these losses are endangering a large number of species, from corals to sharks, and jeopardizing over four billion dollars in services worth from fisheries, tourism and coastal protection," he added. ■

The continuing degradation of coral reefs may be soon beyond repair, if threats are not identified and rapidly controlled

— Camilo Mora

Scientists fear 'tipping point' in Pacific Ocean

Seabed off US Pacific Coast suffers from catastrophically low oxygen levels off the US. Most fish have fled—or have died.

Where scientists previously found a sea bottom abounding with life two years ago, they discovered the rotting carcasses of crabs, starfish and sea worms, swooshing from side to side in the current. The low oxygen levels that killed the sea life in 2006 were the lowest in a half-century—and that for the first time, parts of the ocean off the Oregon coast were measured with zero oxygen in the water; 2007 looked only a bit better.

The way the strong spring and summer winds have conspired to reduce oxygen to these extraordinarily low levels is complex. When these winds blow from the north as the Earth is turning toward the east, the water in the shallows along

the coast is forced farther out to sea. This allows water from deeper in the ocean—colder water with little oxygen but lots of nutrients—to seep up near the coast. It is filled with nutrients, because it contains dead plankton, fish excrement and more.

Strong winds and low oxygen levels have persisted for eight summers now, leading scientists to conclude that the ocean is getting close to a "tipping point" where low-oxygen levels are becoming the rule. While scientists cannot prove it is caused by a changing climate, it is consistent with what is predicted by computer projections built to anticipate global warming. ■

Drifting garbage accumulates in the ocean gyres

Drifting garbage Oceans' Killing Fields

Sorting out what's crap

Continents of drifting garbage in the oceans are killing marine life and releasing poisons that enter the food chain heading for your dinner table. In the middle of the Pacific Ocean, a patch of floating garbage has reached twice the size of Britain. Here the water is filled with six times as much plastic as plankton.

By Mike Arvedlund & Peter Symes

For centuries, seafarers have known to avoid the swathe of ocean that lie about midway between California and Hawaii from Equator up to the 50° N latitude. Here, you find the North Pacific Subtropical Gyre, an oceanic desert that lacks the winds upon which vessels with sails depend as well as the nutrients that support large fish populations.

Nonetheless, about ten years ago, Captain Charles Moore decided to cut through these

windless doldrums in his catamaran, *Alguita*, and what he saw here changed his life. When he looked around at what should have been a clear blue ocean, Moore saw a sea of plastic. For days on end, and as far as he could see, there were bottles, wrappers and fragments of plastic in every colour everywhere.

It is nothing new that the ocean's circular currents accumulate drifting matter—*flotsam and jetsam*—in some subtropical areas. But where in past times this matter would be biodegradable and consequently broken down by marine micro-organisms, modern materials such as plastics are non-degradable and starting to fill up the gyre with matters it can't get rid of, creating a plastic soup. This accumulation of debris in huge floating 'clouds' of waste have taken on informal names, the *Great Pacific Garbage Patch*, the *Eastern Garbage Patch* or the *Pacific Trash Vortex*.

Plastics as old as 50 years have been recovered from the ocean. Approximately 20 percent of this trash stems from ships and oil platforms; the remainder comes from land.

It is estimated that plastic makes up 90 percent of all refuse floating in the ocean, and the UN Environment Programme estimated recently that each square mile of ocean water contains 46,000 pieces of floating garbage.

Not only does it pose various serious risks to the marine life, but it is ultimately a threat to human health as well. Huge amounts of the compounds used by the plastic industry are making their way into the seas and oceans. These materials act as chemical sponges that attract other synthetic chemicals such as hydrocarbons and the pesticide DDT. Once these substances make it into the ocean they inevitably enter the food chain, too—and the end of that chain is your dinner plate.

New habitat?

The discovery of The Great Pacific Garbage Patch led Mr. Moore to become an environmental activist. He has recently warned consumers that if we do not cut back on our use of disposable plastics, this plastic soup will likely double in size over the next ten years. He has now been joined by Professor David Karl, an oceanographer at the University of Hawaii, who



Discarded plastic bags are eyesores all right. We can all consent to that. But are they responsible for killing marine life too?



MICHAEL ARVEDLUND

is co-coordinating an expedition to locate the garbage patch. He compares the plastic refuse to a new habitat of sorts. Translucent and drifting just below the surface, it remains undetectable from satellites. The only way to see it is to go there.

Into question

However, exactly how damaging plastics are for the wildlife are subject to an intense debate. Recently the British Prime Minister Gordon Brown, announced that he would force supermarkets to charge for plastic bags, saying that they were "one of the most visible symbols of environmental waste". Retailers and some advocacy groups, including the Campaign to Protect Rural England, threw their support behind him.

However a range of scientists, politicians and marine experts criticised the government for joining a "bandwagon" based on poor science and attacked a

global campaign to ban plastic bags for being based on flawed science and exaggerated claims. Experts quoted by *The Times* says that the widely held belief that

“It doesn’t do the Government’s case any favours if you’ve got statements being made that aren’t supported by the scientific literature that’s out there. With larger mammals it’s fishing gear that’s the big problem. On a global basis plastic bags aren’t an issue. It would be great if statements like these weren’t made.”

—David Santillo, a marine biologist at Greenpeace, cited in the Times

plastic bags kill 100,000 animals and a million seabirds every year remains unsubstantiated, and that bags only constitute a small threat to most marine species. These figures are based on a misinterpretation of a 1987 Canadian study in Newfoundland, which found that, between 1981 and 1984, more than 100,000 marine mammals, including birds, were killed by discarded nets. The Canadian study did not mention plastic bags, said David Laist, the author of a seminal 1997 study on the subject.

The real culprits

Most deaths were caused when creatures became caught up

in waste produce. “Plastic bags don’t figure in entanglement,” he said. “The main culprits are fishing gear, ropes, lines and strapping bands. Most mammals are too big to get caught up in a plastic bag. The impact of bags on whales, dolphins, porpoises and seals ranges from nil for most species to very minor for perhaps a few species. For birds, plastic bags are not a problem either.”

Blame the nurdles

Professor Geoff Boxshall, a marine biologist at the Natural History Museum, said: “I’ve never seen a bird killed by a plastic bag. Other forms of plastic in the ocean are much more damaging.”

Plastic particles known as nurdles, dumped in the sea by industrial companies, form a much greater threat as they can be easily consumed by birds and animals.

Arriving at making the right priorities

Many British groups are now questioning whether a ban on bags would cost consumers more than the environmental benefits.

Charlie Mayfield, chairman of retailer John Lewis, said that tackling packaging waste and reducing carbon emissions were far more important goals. “We don’t see reducing the use of plastic bags as our biggest priority,” he said. “Of all the waste that goes to landfill, 20 per cent is household waste and 0.3 per cent is plastic bags.” John Lewis added

A nurdle, also called a pre-production plastic pellet or plastic resin pellet, is a pellet typically under 5mm in diameter. Nurdles are a large contributor to marine debris and can cause starvation to marine wildlife, as well as other environmental hazards. A nurdle may be called a mermaid’s tear, a term which may also refer to pollution in the form of degraded plastic.

that a scheme in Ireland had reduced plastic bag usage. Geoffrey Cox, a Tory member of the House of Commons Environment Select Committee, said: “I don’t like plastic bags, and I certainly support restricting their use, but plainly, it’s extremely important that before we take any steps, we should rely on accurate information. It is bizarre that any campaign should be endorsed on the basis of a mistranslation. Gordon Brown should get his facts right.”

Our opinion

It feels somewhat awkward to acquit the plastic bag, but problems cannot be effectively addressed without a proper and correct diagnosis. We should curb the excessive use of plastic bags for a lot of good reasons, but the true nature of this problem relates more to garbage and waste is general and should be addressed as such. Wishful thinking perhaps, but if only somebody could invent a giant scoop and get rid of this mess. ■

“The Government is irresponsible to jump on a bandwagon that has no base in scientific evidence. This is one of many examples where you get bad science leading to bad decisions, which are counter-productive. Attacking plastic bags makes people feel good, but it doesn’t achieve anything.”

— Lord Taverne, Chairman of Sense about Science



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A Barrow's carp gudgeon, or *Hypseleotris barrowayi*, is seen in this undated handout photograph released February 26, 2008

New Fish Species Was Discovered in Disused Australian Uranium Mine

Australian scientists announced the discovery of a new species of freshwater fish, two decades after it was sighted in a disused uranium mine in the outback Northern Territory.

It is hoped captive breeding of the rare fish could help protect the species and provide income for traditional owners. Ornamental fish breeder, Dave Wilson, explains to ABC News that he's already received enquires from overseas collectors who are keen to acquire the small rare native fish. "It's reasonably attractive and could be used as an aquarium subject. So we are interested, in conjunction with the local people there, in breeding the fish and offering it to the aquarium trade to use it. From that, we will give some back to the local people to manage their land with a percentage of the sales."

Dr Helen Larson of Kakadu National Park where the fish was found said: "In order to protect things with a restricted distribution like this, it's very good to have captive populations so that if anything does happen in the future—an accident, climate change, development—and the habitat is damaged, we can put back specimens that have been captive bred."

But Mr Wilson warns that the fish might prove very difficult to successfully breed in captivity. "The eggs will hatch after a couple of days and they get these microscopic little larvae that haven't got very big mouths and need very small foods. Quite a lot of the larvae need a particular type of movement to excite them into actually eating. If that's missing, you are not successful, as they just don't eat." ■

Kiribati Creates World's Largest Marine Protected Area

The small Pacific Island nation of Kiribati has become a global conservation leader by establishing the world's largest marine protected area with pristine coral reefs and rich fish populations threatened by over-fishing and climate change.

Diversity in Brazil. On Jan. 30, 2008, Kiribati adopted formal regulations for PIPA that more than doubled the original size to make it the largest marine protected area on Earth.

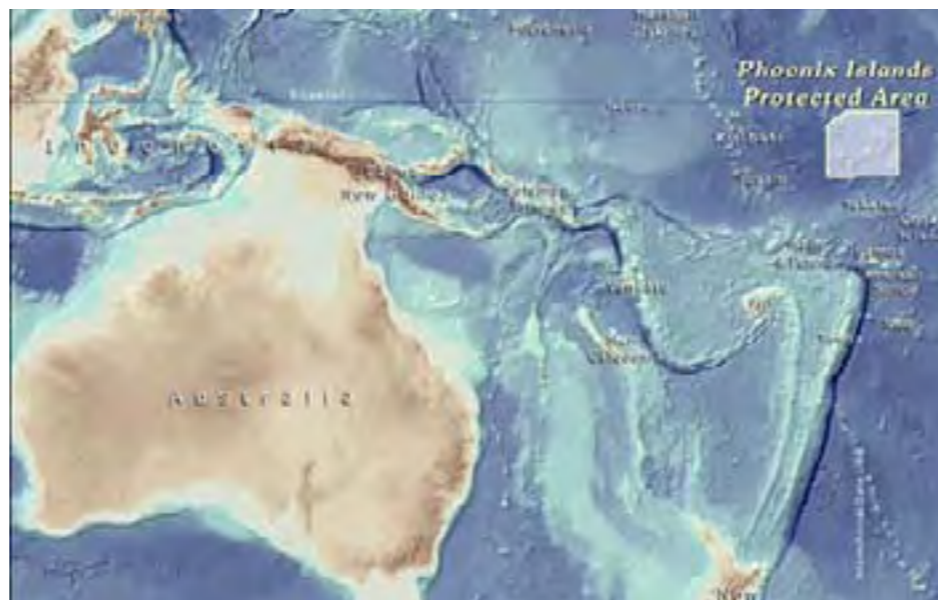
Three research expeditions led by New England Aquarium since 2000 found great marine biodiversity, including more than 120 species of coral and 520 species of fish, some new to science. Some

of the most important seabird nesting populations in the Pacific, as well as healthy fish populations and the presence of sea turtles and other species, demonstrated the pristine nature of the area and its importance as a migration route.

Protecting the Phoenix Islands means restricting commercial fish-

ing in the area, resulting in a loss of revenue that the Kiribati government would normally receive from issuing foreign commercial fishing licenses. NEAQ and CI are helping Kiribati design an endowment system that will cover the core recurring management costs of PIPA and compensate the government for the foregone commercial fishing license revenues. The plan allows for subsistence fishing by resident communities and other sustainable economic development in designated zones of the protected area.

Keeping oceans and marine ecosystems intact and healthy allows them to better resist the impacts of climate change and continue their natural role of sequestering atmospheric carbon that causes global warming. ■



Kiribati is an island nation, a string of coral atolls and 33 islands, draped across the equator in the Central Pacific, almost midway between Hawaii and Australia. It is remote, and the population is sparse and poor. Nonetheless, Kiribati just created the world's largest marine protected area.

The new Phoenix Island Protected Area (PIPA) covers 410,500 km² (158,453 square miles) of ocean that is home to one of the richest marine feeding and spawning areas in the world. It encompasses a coral archipelago, two submerged reef systems and deep sea habitat, including underwater mountains.

Kiribati first declared the creation of PIPA at the 2006 Conference of the Parties to the Convention on Biological

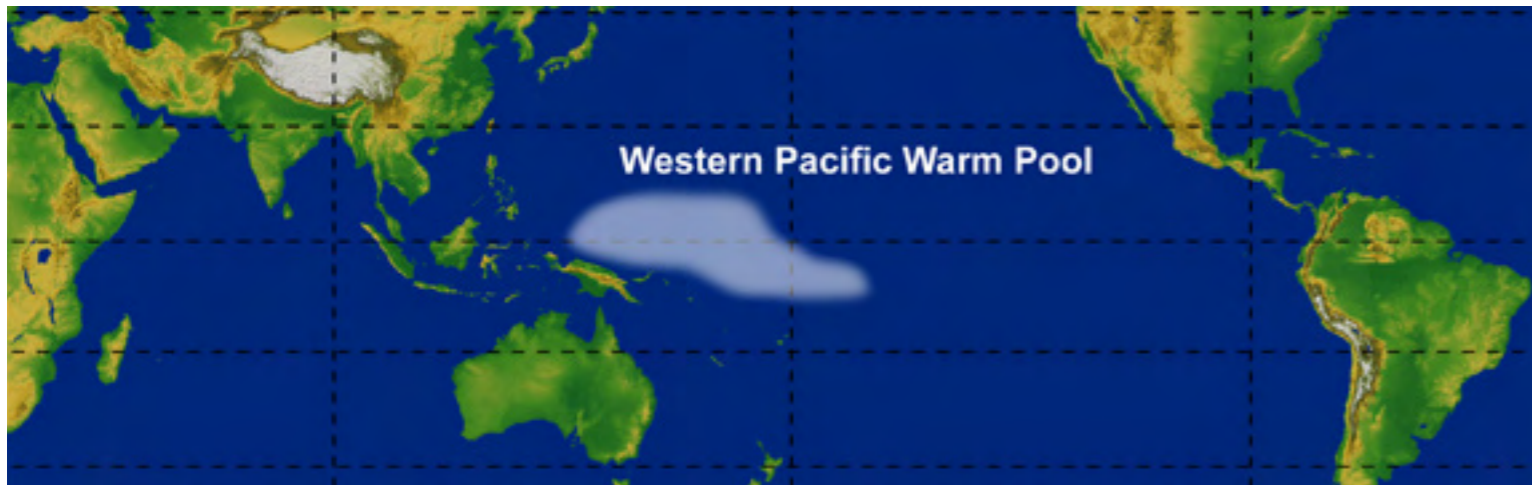


A Fish that Hibernates

The Antarctic cod puts itself into a state similar to hibernation for the winter, researchers have found, which is highly unusual for a fish.

Scientists with the British Antarctic Survey found *Notothenia coriiceps* lowers its metabolic rate during winter, saving energy. As with hibernating mammals, the fish rouse themselves now and again from their dormant state for short periods. Researchers suspect the "hibernation" is triggered by changes in sunlight. The sea temperature varies by only about 2°C between summer and winter, which is probably too small a difference to induce such a significant change in behaviour. ■





The Western Pacific Warm Pool, which lies northeast of Australia, contains some of the warmest ocean waters in the world. Water temperatures in the warm pool have risen less than elsewhere in the tropics, which may explain why reefs there have experienced less coral bleaching

Ocean Thermostat Might Save Coral

Reefs in a region of the western Pacific Ocean have only suffered relatively few episodes of bleaching because the naturally warm waters have remained stable, coral reef researchers noticed.

Some coral reefs could be protected from the impacts of climate change by an "ocean thermostat". A team of researchers, led by NCAR scientist Joan Kleypas, say that there is a region to the northeast of Australia, called the Western Pacific Warm Pool, where naturally warm sea-surface temperatures have risen only a little in recent decades, and corals have only experienced four episodes of bleaching since 1980.

As global warming is damaging many corals elsewhere, some natural processes appear to be regulating sea surface temperatures in that area. It is suggested that as surface waters warm, more water evaporates, and this can lead to an increase in cooling cloud cover and winds.

The study lends support to a much-debated theory that a natural ocean thermostat prevents sea-surface temperatures

from exceeding 31° Celsius (88 F) in open oceans. If so, this thermostat would protect reefs that have evolved in naturally warm waters that will not warm much further, as opposed to reefs that live in slightly cooler waters that face more significant warming.

"Global warming is damaging many corals, but it appears to be bypassing certain reefs that support some of the greatest diversity of life on the planet," Kleypas says. "In essence, reefs that are already in hot water may be more protected from warming than reefs that are not. This is some rare hopeful news for these important ecosystems."

But her colleague at Ncar, Gokham Danabasoglu, warns that projections do not paint

an optimistic picture. "Computer models of Earth's climate show that sea surface temperatures will rise substantially this century," he says. "Unfortunately, these future simulations show the Western Pacific Warm Pool warming at a similar rate as the surrounding areas, instead of being constrained by a thermostat. "We don't know if the models are simply not capturing the processes that cause the thermostat, or if global warming is happening so rapidly that it will overwhelm the thermostat." ■



Quick Time video: NCAR scientist. Joan Kleypas, on coral reefs and the ocean thermostat. (Requires live internet connection)

What is the International Year of the Reef?

"Recognizing that ten years after the first International Year of the Reef (1997) there continues to be an urgent need to increase awareness and understanding of coral reefs, and to further conserve and manage valuable coral reef and associated ecosystems, the International Coral Reef Initiative designated 2008 as the International Year of the Reef (IYOR 2008)." — International Coral Reef Initiative (ICRI), October 2006. IYOR 2008 will consist of a year-long campaign of events and initiatives hosted by governments and non-governmental organizations around the world. For more on the goals of IYOR 2008, see www.iyor.org.

Why is the IYOR 2008 important?

Coral reefs are some of the oldest and most diverse ecosystems on the planet. They provide resources and services worth an estimated 375 billion dollars each year, a staggering amount for ecosystems that cover less than one percent of the earth's surface. Millions of people and thousands of communities all over the world depend on coral reefs for food, storm protection, jobs, medicines, and recreational opportunities.

Unfortunately, many of the world's coral reefs (including the associated seagrass beds and mangrove habitats) have been damaged or destroyed due to increasing human impacts, climate change, and other factors. According to the Status of Coral Reefs of the World: 2004, 70% of the world's coral reefs are threatened or destroyed, 20% of those are damaged beyond repair, and within the Caribbean alone, many coral reefs have lost 80% of coral species. The decline and loss of coral reef ecosystems has significant social, economic, and ecological impacts on people and communities in the U.S. and around the world.

When will IYOR 2008 take place?

The calendar year of 2008 — January 1 through December 31.

If I choose to do something to celebrate IYOR, is it important to network with others?

You're not required to work with others in order to participate in IYOR 2008. All U.S. based individuals, corporations, schools and organizations are welcome and actively encouraged to participate in the IYOR. That said, networking helps ensure that we get the maximum return for our collective IYOR 2008 investments. Follow the steps below to network at whatever level (or all levels) you are most interested: international, national, regional, or local.

How do I get involved with IYOR 2008?

- Check out www.iyor.org for more information on the IYOR 2008 effort. Here you can register your interest with the international IYOR coordinator, sign up for the international email list by emailing info@iyor.org, and download basic IYOR 2008 information and key documents.
- Get involved with the U.S. campaign by contacting the non-profit organization Reef Check — iyor2008@reefcheck.org — to find out who in the U.S. may be involved in your geographic area or field of interest. Reef Check is serving as a facilitator for the U.S. IYOR effort in the non-government community.
- Then, if you'd like to brainstorm and network at the national level, contact the National Oceanic and Atmospheric Administration — iyor@noaa.gov — to get added to the U.S. Coral Reef Task Force Education and Outreach Working Group, a network that encourages information-sharing, collaboration, and collective brainstorming for coral reef outreach and education across the government, non-government, research and private sectors. The USCRTF Education and Outreach Working Group is acting as a platform for anyone interested in sharing information about their U.S. IYOR plans with other organizations, and provides a forum for potential collaborative planning and action.
- Finally, with the aid of the information resources and coordinators above, determine how you or your organization can make a unique IYOR 2008 contribution, and get started!

www.iyor.org FOR MORE INFORMATION

NAUI First Aid Course Continues to Gain Recognition...

It has been a year since the NAUI First Aid Course was introduced and continues to receive positive recognition from experts in the field for quality and thoroughness. By consistently setting the highest standards, NAUI Worldwide is the proven leader in education, training and safety in the diving industry.

The First Aid Course has been reviewed by medical, physiological and emergency medical experts. It contains all the International Liaison Committee on Resuscitation (ILCOR) recommendations and is accepted by the United States Coast Guard Training and Assessment Division as a recognized certification for ship's captain and officer licensing.

The course also received a very favorable review by John Christopher Fin in the January issue of *9-1-1 Magazine*, which serves law enforcement, fire, emergency medical services, search rescue, and disaster management. ■

We made a splash at Our World Underwater 2008... NAUI and Team Scuba continue to generate excitement in the Industry!

NAUI introduced Team Scuba at Our World Underwater 2008. The new dive industry NASCAR was met with much enthusiasm. Thanks to all those that stopped by to ask questions, met Ray Black, Jr.—NAUI diver and Team Scuba driver, toured the race transporter, took photographs with the Team Scuba NASCAR race car and driver, got autographs and showed their support.



NAUI at the Beneath the Seas Show

—BTS Tech Night and Team Scuba!

NAUI Worldwide is on the road again! We are headed to the 32nd annual Beneath the Seas Consumer Scuba and Travel Show this March 28-30 at the Meadowlands Exposition Center in Secaucus, New Jersey, USA. This show is open to the public and is one of the largest of its kind in the country, with over 300 exhibitors and over 60 workshops and seminars presented by industry experts. We have always enjoyed our relationship with Beneath the Seas, as their primary focus is also education. Be sure to stop by the NAUI Booth #340 to get the latest news and product info.

BTS Tech Night was started to provide educational seminars to the ever-growing technical diving community. NAUI Tech has been a strong supporter and contributor of BTS Tech Night, and we are looking forward to another great year. Join us on Friday, March 28, from 6pm-9pm at the Meadowlands Expo Center for BTS Tech Night!

NAUI Tech Presentations:

Helium: The Most Noble of the Diving Gases. Session 2, MEC Ocean Pals Theater. Presented by Tim O'Leary, Director of NAUI Technical Training.

Rethinking O₂ Limits in Technical Diving Session 2, MEC Ocean Pals Theater. Presented by Chris Laughrey, NAUI Tech CD.

DPVs for Technical Diving Session 1, MEC Rooms 1 & 2. Presented by Heather Knowles, NAUI Tech Instructor and Scott Tomlinson.

Team Scuba will be there with Ray Black, Jr., NASCAR driver and NAUI diver. Meet the driver, get an autograph and see the Team Scuba race car in person. Be sure to stop by the Team Scuba display or NAUI Booth #340 for information on how you can get involved in this exciting marketing initiative to bring scuba diving to a new audience of potential divers. ■

Ocean waves travel at 1500m

British scientists have discovered waves that flow deep in the Pacific Ocean. Using ocean-going robots, they detected the waves flowing eastwards about 1500 meters down.

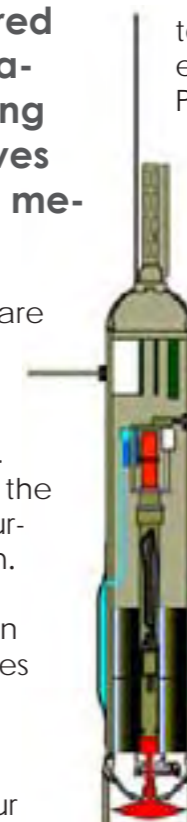
The waves—known as Kelvin waves—are much larger, longer and slower than waves seen at the beach and are triggered by changes in the weather patterns above the tropical ocean. They were known to occur on or near the ocean's surface, but scientists were surprised to find them in the deep ocean.

Dr Adrian Matthews, a meteorologist in UEA's School of Environmental Sciences and lead author of the new research, told the Daily Telegraph: "Everyone thought that there would be nothing to see below about 200m. Much to our delight, however, we found that even at 1,500 metres there was a regular wave in

temperature and saltness, moving east every couple of months across the tropical Pacific."

The finding may be important for predicting climate change and for weather forecasting in the tropics. The scientists believe the ocean waves are caused by the climatic variation known as the Madden Julian Oscillation (MJO), which may in turn be a trigger for an El Nino—the ocean-atmosphere system in the tropical Pacific that influences weather worldwide. The Madden Julian Oscillation is one of the main sources of changes in weather and climate in the tropics. ■

SOURCE: THE TELEGRAPH



The scientific team made the discovery using free-floating robots known as Argo floats. These operate at around 1km depth but surface every ten days, measuring temperature and salinity as they go



Wind Propulsion Is Back, Kite Pulls Ship Across Atlantic

The world's first commercial cargo ship partially powered by a giant kite sets out on its maiden voyage from Germany to Venezuela.

The designers of the *MS Beluga SkySails* expect the computer-controlled kite, measuring 160m², could cut fuel consumption by as much as 20 percent. They also hope the state-of-the-art kite will help reduce carbon dioxide emissions, as it tugs the ship.

Verena Frank, project manager at Beluga Shipping GmbH, told the BBC's World Today programme that the project's core concept was "using wind energy as auxiliary propulsion power and using wind as a free of charge energy. Nevertheless, it differs very

much from traditional sailing, as we do not have any bothersome mast on deck, which might be a hindrance to cargo-loading operations."

The efficiency of the kite depended on wind and weather conditions. But the advantage of the SkySails system "is that you do not need only backward winds—there can also be side winds, and you can still set sail," she said. The kite could also be used on medium-sized cargo ships, cruise liners and trawlers. ■ SOURCE: BBC'S WORLD TODAY



What are we having here?

(Filephoto, unrelated)

Many Restaurants Caught In Fish-Switch

Are you getting the fish you paid for and the fish you ordered, or are you eating something else entirely? Journalists from *The Charlotte Observer* in North Carolina went to investigate matters at local restaurants.

A hidden camera investigation took the reporters to nine different local restaurants, all selling grouper. They ordered the grouper, put the sample into a bag, on ice, and in the mail to be DNA tested at the Guy Harvey Research Institute at Nova Southeastern University in Fort Lauderdale. The mission was to find out whether, seven months after the team first busted local restaurants substituting grouper

Buying one thing and getting another? Is it fraud? A mistake? An oversight? Or a cheap way to increase profits margins? Whatever you call it, you can't call it grouper.

THE CHARLOTTE OBSERVER

with cheaper fish. One would have thought that the restaurants had learned their lesson. They found surprising results.

The verdict Out of the nine tested restaurants, a third were not serving the ordered grouper. "I'm a bit surprised, because I thought with all the publicity from the last time we found a lot of substitution, restaurants would sort of get the message that (there) are forensic methods that are able to identify whether they are substituting seafood or not," said Dr Mahmood Shivji, Nova Southeastern University.

Tests showed that grouper sandwich at one grill was really catfish, and in two other places—one of which one was a repeat offender—the grouper sandwich turned out to be a cheaper fish called hake, which is in the cod family, something that is completely different from a grouper. "It's quite disturbing

because that same restaurant was found substituting the first time. Clearly, they have not learned their lesson, and they've done it again," Dr Shivji added.

North Carolina's department of agriculture director, Joe Reardon, was also blown away by the finds. "We are disappointed. We know they made some initial steps to correct this back in 2007, and we would have expected to see total compliance," explained Reardon. Now, DNA tests show it's still happening.

"If we find that there are continuing issues, then we will be in contact with the Attorney General's Office, and we will be referring this to the Consumer Protection division. They stand ready to investigate this," said Reardon.

37 percent are mislabelled According to a report submitted to U.S. Congress, *Combating Fraud and Deception*, seafood is not what it's supposed to be 37 percent of the time. ■

SOURCE: THE CHARLOTTE OBSERVER



MIKE RAY HUNTZIKER JUNIOR III
ABDULLAH FITROY ENGELHARDT
HUMBERDINK JENSEN

Fishing ban saved wrasse

The Commonwealth of the Northern Mariana Islands is the only jurisdiction in the Pacific to ban scuba-spear fishing, which is seen as a primary factor why the islands still teem with Napoleon wrasses, a type of fish that is being fast depleted in other parts of the world.

According to the Division of Fish & Wildlife, scuba spear

fishing is a type of fishing that is potentially the cause of the rapid decline of Napoleon wrasses in other areas.

"The use of scuba-spear has probably been the single most important cause of the decline of the Napoleon wrasse worldwide," said DFW fisheries research section supervisor Michael Trianni.

The CNMI outlawed the use of the scuba-spear in 2002 and has also placed restrictions on the use of monofilament gill, surround, and drag nets.

These actions, Trianni said, have provided protection to juvenile wrasse that utilize lagoon and reef flats to grow. ■

WWF Launches Sustainable Seafood Website —“Stinky fish”

To encourage more shoppers to make the right choices when it comes to fish, WWF has launched a new website, Stinky Fish. It has information on which species to avoid and a simple guide to buying sustainable seafood.

"Overfishing is the single biggest threat to our oceans," said Giles Bartlett, Fisheries

Policy Officer at WWF-UK. "It is vital that consumers have much better information to help them choose which fish to buy.

"WWF's new Stinky Fish website will provide exactly that. We hope that consumer demand for sustainable seafood and better regulation will transform the most damaging fisheries into ones that we can all buy from with a clear conscience."

Buying seafood with the Marine Stewardship Council's

(MSC) blue eco-label is the simplest and most reliable way consumers can take action to be ocean friendly. Fisheries that want to be certified to the MSC standard must be managed in an environmentally responsible manner.

If more people buy their seafood from a sustainable source, it will inspire the rest of the fishing industry to follow suit, and improve their fishing methods. ■

www.panda.org/stinky

Barry University volunteers assist IAHD participant at annual "try dive" event in Key Largo, Florida, USA

A Perfect Vision

Text by Jennifer J. Hennessey. Photos by Ashley Leonard and Joshua Griffin

The bubbles whoosh past my ears, fast at first, and then less frequent. I run my fingers through the seagrass, over the rocks, dig them into the sand. I try to get my bearings... the rockwall is on my left, the open water to my right. Or is it the other way around?

Am I swimming in a straight line or am I moving in circles? I kick cautiously

for a few seconds, with one hand always out in front of me, feeling for danger. My buddy makes a circle in my palm, then squeezes my fingers five times. Five squeezes for ten meters. I am ten meters deep in the Mediterranean, and I'm blindfolded.

The journey that led me to this moment is an interesting one, to say the least. It's not something that happened all at once, like one of those major life changing events you see in the movies. It was instead a series of smaller happenings that gradually changed my view of the world... specifically the diving world. Let me start from the beginning.

My first encounter with the International Association for Handicapped Divers (IAHD) happened in the winter of 2004, my sophomore year of college. I was attending Barry University in Miami Shores, Florida, earning a bachelor's degree in scuba diving. That's right, scuba diving.

My classmates and I had just completed a lesson in working with disabled divers, and we were traveling to Key Largo for the weekend to put our new skills to use. There, we met Fraser Bathgate, vice president and

director of training for the organization.

The IAHD was holding their annual "Try Scuba" event at a local pool, and they asked the Barry dive students to come help out. These events provide opportunities for people with various disabilities to experience diving in a safe and controlled environment. It is also a good time for new IAHD divemasters and instructors to get some hands-on training experience. My classmates and I received IAHD Dive Partner certifications, which allow divers to assist people with various disabilities in training situations and on real dives.

Up until that weekend, I was like most other divers. I would pull up to a dive site or dive boat, park the car wherever there was a spot available, walk across the gravel parking lot, travel up or down stairs, through sand, over rocks, put on my standard issue dive gear that I bought off the rack at my local dive shop, complete my dive, and then go back the way I came—never giving a second thought to how easy this process was for me.

My attitude began shifting immediately when we arrived at the pool and met the divers we would be working with.

There were about six of them, most of them in wheelchairs, all of them excited to get in the water.

There were so many new things to consider: accessibility of the pool and the surrounding area, equipment alterations, getting the divers in and out of the water, sun exposure and temperature control, buoyancy issues, etc.

This type of diving was new to me, and while I was looking forward to being involved, I was also a little nervous. This feeling didn't last long; soon we were so busy, there was no time to be anything but focused.

Diving disabled

Everyone had a chance to get in the pool, and for most people it was their first time breathing underwater. Not one person left

that day without a smile, including myself. Seeing people leave their wheelchairs and enter an environment where their bodies were completely unrestricted gave me a feeling that is indescribable. I knew I was getting involved with something big—much bigger than myself and my selfish way of diving.

After the weekend was over, our class moved on to the next topic, but I was hooked. From then on, I was committed to learning everything I could about diving with disabilities. I learned that although it is a relatively new concept, research has been done that proves diving is benefi-

cial for people with both mental and physical disabilities.

Physically, it allows them to move in ways that may not be possible for them on land. A paraplegic has just as much potential to be a successful diver as an "able-bodied" person.

Emotionally, it gives people a sense of pride and independence that most other activities can't. Learning to dive takes a considerable amount of work and is a major accomplishment for anyone, especially someone who has had to overcome the additional obstacles caused by disability.

Socially, diving allows people to spend time in an environment





Jen Hennessey along for the ride as return IAHD participant Jay Shearer cruises through the pool. BELOW: IAHD volunteer crew and U.S. soldiers after the 1st annual Wounded Warriors try dive event in Key Largo

How can I better my own dive experience? Where will I have the most fun? How can I get the best dive equipment? The best dive buddy? The best dive job? I had a vision of how diving should be—and it was mostly based on my own personal comfort and enjoyment of the activity. Looking back, I see how clouded my sight truly was.

Taking away the visual aspect of diving brought me back to the very basics of the sport. Feeling the weightlessness, hearing the silence, being perfectly calm and uncontrollably excited at the same time—it reminded me yet again of how much I love diving, and why I want to share that love with others.

Everyone in the world deserves the opportunity to feel these things, and the IAHD makes it possible. No other experience in my life has opened my eyes to the true needs of the dive industry like the time I have spent with the IAHD. I understand now more than ever why this organization was started, and why it must continue to thrive. The IAHD has its own vision of how diving should be, and I couldn't agree more. Sometimes, it takes a blacked-out mask to make you see things more clearly. ■

that encourages them to be adventurous and independent, surrounded by people with similar interests. For these reasons, diving is the perfect activity for someone with a disability, and after learning this, I knew I had to become more involved.

IAHD

I spent the next few years volunteering with the IAHD when they held their "try dive" events in Florida. Each time I attended one of these events, I had a little bit more responsibility and a better understanding of what I was participating in.

While the group of divers and volunteers changes every year, the overall outcome was always the same. Through the help of well-trained instructors and staff, participants were able to get a

taste of what it is like to be a scuba diver. These new divers almost always left with the intention of coming back again for more.

One of the greatest rewards of being a volunteer at these events is being able to share something I am passionate about with people who may not otherwise get to experience it. When a new diver surfaces in the pool for the first time with that inevitable ear-to-ear smile on their face, the feeling of sheer joy is contagious. And listening to them describe the experience afterward, I can hear the pride in their voices. I couldn't be more thankful to be part of an organization that makes such feelings possible.

Before graduating college this past summer, I was required to do an internship that would give me some real-life

experience in a dive-related field. With the assistance of Fraser Bathgate and other IAHD members, I was lucky enough to travel around Europe, and to the Netherlands where the organization's headquarters are located, and complete my internship hours learning about how the organization works, as well as

coming up with new ways to improve it in the future.

The trip lasted two months and included stops in England, Holland, Denmark, and Greece.

Along the way, I met with numerous IAHD representatives and saw first-hand how they contributed to the disabled diving population in their area. My responsibilities varied from working as a divemaster at local dive shops, touring rehabilitation centers, looking at marketing techniques of the organization, writing for the IAHD newsletter, and completing my IAHD pro-training course, allowing me to become a certified IAHD divemaster.

The experience made me more aware of the need for improvement in the U.S. based branch of the IAHD, a project I

plan to be a major part of. With such a large disabled population in the country, there is an obvious market for adapted scuba diving. Unfortunately, many people do not know that this type of activity is even available to them, which is why one of the biggest steps in the U.S. will involve increasing awareness.

The next level

By becoming an IAHD divemaster, I now have the training and experience I need to take my interest in the IAHD to the next level. This means organizing more "try dive" events, and working with other members to improve the overall quality of the organization, both locally and worldwide.

After participating in the pro-training course in Greece this summer, diving blindfolded for the first time, I couldn't help but think back to the beginning of my journey, when I based all of my diving decisions on how I would be affected.



SDI Supports New SUDS Initiative for Physically Challenged Divers

Soldiers Undertaking Disabled Scuba (SUDS) have just returned from Guantanamo Bay, Cuba, where they certified six Wounded Warriors as Scuba Diving International (SDI) Divers. SUDS works with severely injured soldiers who received their injuries while serving their country in world hot spots such as Iraq and Afghanistan. Two of these heroes went on to get their Scuba Diving International Advanced Diver certification as well.

"The conditions in Cuba were perfect," explained SUDS organizer, John Thompson. "We managed to get in a night dive, and the whole trip was really exciting." Thompson, who runs the SUDS program, added that the Naval Base in Cuba was a top choice of location for this SUDS expedition because it is an ideal place for training dives, has a healthy coral reef system, and the group was guaranteed plenty of support from the staff at the US military base. **More on SUDS in next issue.** ■

Diveheart

Important Diveheart Schedule Released

Keep up to date with all the critical programs being presented by Diveheart! One of Diveheart's visions is to make the dive industry, dive resorts and dive operators around the world, as accessible and accommodating to people with disabilities as the ski industry is today. **Link to schedule.** ■

PADI X Campaign

This year will see the first stage of an exciting new program that will eventually spread to many US universities. PADI's new PADI X campaign is aimed at providing scuba diving internships to college students across the country. The new program allows students to complete internships with local dive businesses learning not only to dive, but also the business of diving. Students gain valuable real world experience and become PADI X representatives, marketing diving to their classmates as part of their training. ■

New PADI Emergency Oxygen Provider Specialty

The new specialty course is an entry-level emergency oxygen course that also teaches the recognition of dive illnesses treatable by emergency oxygen. Though suited for divers, the new course has no prerequisites and doesn't include dives, which means it is equally applicable to those who are around divers—boat crew, nondiving buddies, lifeguards, and shore staff. No previous CPR or first aid training is required to take the course. The course is supported by an instructor guide and new student materials, including the Emergency Oxygen Provider Manual, a 52-page, richly illustrated self-study manual and skill development guide. ■



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Getting ready for the audience zipping along on a rolling support...ScubaBoard founder and X-RAY MAG partner, Pete Murray, does not let a leg injury ruin his fun one early morning at the Golden Dolphin

Golden Dolphin Moscow

Text by Andrey Bizyukin
Photos by Peter Symes

The Moscow International Dive Show “Golden Dolphin” took place February 14-17, 2008, in the “Gostiny Dvor” palace just 150 meters from Red Square, the historic center of the Russian capitol. The Golden Dolphin is a specialized trade show and exhibition devoted to scuba diving, spear fishing and water-based recreation. It is the biggest dive show in eastern Europe and hosts an underwater video and photo competition.

More than 230 exhibitors collected in Moscow this year. Visitors, guests, and participants of the show come from 33 countries around the world including the US, Australia, France, Canada, Germany, Hungary, Italy, Norway, Philippines, Malaysia, Lithuania, Indonesia, South Africa, Egypt, Turkey, Micronesia, Palau, Holland, Denmark, Israel, Papua New Guinea, Great Britain, Spain, Sweden, Russia, Latvia, Belarus, Ukraine and others.

International dive equipment manufacturers, distributors of diving and spearfishing gear, underwater photo and video

equipment diving schools, dive travel agencies, tourism authority representatives from different countries, photo and video studios, filmmakers, photographers from all around the world, and famous journalists of leading dive publications participated in this unique exhibition.

The exhibition of 2008 was interesting not only to professionals, who had an opportunity to get to know and purchase the newest dive equipment from the leading international manufacturers, but also to amateurs and beginners, who discovered the many different offers in

diving education programs through PADI, SSI, PDA, IANTD, NAUI, and CMAS. In addition, about 150 journalists from more than 90 international media agencies attended the show.

The event started with a morning press conference. Russian celebrities present

included famous Russian TV show personality, Yana Churikova; Stefan Michl, vice-president of Mares; Gennady Grutsya, president of the Golden Dolphin; Cynthia Norton, deputy of the minister of Philippines tourism; and other VIP guests who stood smiling in the glaring lights



Edited by
Peter Symes



CLOCKWISE FROM FAR LEFT: The friendly folks at Sebal welcome visitors to their booth; ScubaBoard founder, Pete Murray, sporting his newly acquired authentic Russian fur cap, checks out the Kremlin on the Red Square; Pete and Stefan Michl from Mares, showing off their newest model of dive computers

and cameras of the media. They talked and joked cheerfully with the public and the journalists. It was an interesting show for everyone involved, contrary to the usual “genre laws” for this kind of event.

The official inauguration ceremony took place on the main stage of the palace. The stage was converted into a sea port with a white yacht heading into harbor. The chairman of the Russian Federation National Sea Politics department saluted all the guests, participants and exhibitors.

The Golden Dolphin show program in 2008 was very saturated, but the most exciting and successful of the key events was the round table discussion with the participants of the North Pole deep water expedition of the *Mir* apparatus. Arthur Chilingarov, Anatoly Sagalevich, Eugeny Chernyaev and Vladimir Grudzev—the world famous researchers who dove to the bottom of the ocean at the North Pole to reach a depth of 4000 meters—were at the table. They were proud legends of the Russian Federation, and the meeting with them was very popular with a lot of Russian divers.

This year was the 110th birthday celebration of the world famous Italian diver, Lodovico Mares—the founder of the Mares Company. The celebration was organized in Moscow with lots of noise and festivities in February 2008. There were daily presentations, a fashion show

for women’s dive gear collections, a contest for the “Miss Mares” title, a quiz, competitions and a great number of prizes, which left no one indifferent, participants and visitors alike.

Aquanaut—one of the oldest Moscow dive clubs—together with the Germanika company, made all the show visitors happy by offering free try-dives, or introductory dives for beginners. There was a special equipped pool for this non-stop diving program. Each visitor could listen to a short lecture and then get their very first dive experience, together with a skilled, experienced dive instructor.

World famous diving record holders also showed up at the Golden Dolphin, including Stefane Mifsun, five-time free diving world champion (his apnea record is 10 minutes and 4 seconds and has not yet been surpassed); Pascal Benabe, world record holder in scuba diving (his record is 330 meters); well known Florida cave diver, Jarod Jablonsky; and Russia’s own pride and joy, Natalia Molchanova. These celebrities were found to be very accessible while meeting with guests, visitors and journalists attending the show.

The Golden Dolphin was also visited by Sylvain Redoutey, the phenomenally successful French cave diver who is very well known in the exploration diving community. Well-known also for his invention of a new concept in rebreathers, Redoutey



Edited by
Peter Symes



almost went unnoticed with all the noise and storms of applause. He had a meeting with just a few professionals and gave a short interview. Redouty demonstrated his rebreather in the show pool and congratulated the Russian divers for a great show.

This memorial leap year marked the 65th anniversary celebration of the invention of the Aqualung. Golden Dolphin also displayed the "Cousteau Odyssey" flag to honor the great contributions to the dive world by Jacques Yves Cousteau.

The theme of the underwater film exhibit area stitched all of the festival's creative content together with a golden thread. There was everything there.



Wayne Haddon of Aggressor Fleet offers liveaboard adventures

It looked like a real filmmaking studio. Famous Russian artists such as Andrey Makarevich, Yana Churikova, Valdis Pelsh, Alexey Kortnev and other international sport stars were part of the committee overseeing the new creative project called "Golden Dolphin Stars Avenue".

An important part of the exhibition was the VII Moscow International Golden Dolphin video-photo festival competition. The best underwa-

Fashion model shows off an item from the Mares wetsuit collection;

ter images from around the world—including 100 movies and 480 photos from 17 countries—took part in the competition. Only 23 artists won prestigious Golden Dolphin awards after the competition's jury of experts made their final decision. Two new categories—"Best Underwater Photographer of the Year" and "Best Artist Photo Gallery"—were estab-

The cheerful folks at the SITECH booth



lished this year.

Sony was the primary sponsor of the underwater video festival this year. It presented new high definition Sony camcorders adapted for underwater shooting. Visitors had a chance to test all these gadgets and check out the unbelievable quality of the images on the HD Sony screen. There were also seminars, presentations and many prizes from Sony.

Olympus was the primary spon-

sor of the underwater photo festival, and the company demonstrated their new 2008 underwater cameras at the show. There was a lot of interest in this equipment from Russian amateurs and professional underwater photographers.

The presentation by Nimar & BS Kinetics, the famous European housing manufacturer, did not leave anyone who visited their booth indifferent either.

There was a special exhibition called



Edited by Peter Symes



The entourage from Malaysia Tourism and Clement Lee of Borneo Divers and Sabah Tourism (2nd from left.)

“Underwater Rarity” that displayed the old style underwater housings from around 50-60 years ago.

The awards ceremony of the Russian national prize for underwater science and research featured many famous achievements by Russian scientists, underwater researchers, sportsmen, physicians and commercial divers, who were honored with this prestigious award. Segey Ivanov, the first vice-chairman of Russian Federation government, congratulated the laureates of this Russian award.

The primary automobile spon-

ser of the show, Germanica Company, presented the most convenient car for divers and an exhibit of Bruce Hlebnikov from the *Guinness Book of World Records*.

The official show ferryman, Qatar Airlines, presented a special bonus program for frequently traveling divers, and the Ministry of Tourism Philippines invited everyone to visit the unique biodiversity and attractive underwater world of their islands.

Spearfishing is incredibly popular in Russia, therefore, the presentation by the Norwegian tourism

department was very popular with a lot of show visitors.

In the evening, participants of the show had a chance to enjoy the rockin’ musical sounds and performance of the famous Russian rock group, “An Incident”, led by Alexey Kortnev.

The gala ceremony of the show ended with

the presentation of the Golden Dolphin statue awards to all 23 winners of the video and photo competition—the creative divers elite. The champions came up onto the main stage and onto the red carpet, one by one, to loud ovations from the crowd.

The four days of the show flew by like a breath of fresh air. For the public, there were firework displays in bright celebration events, leaving a lot of positive emotions for everyone. Over 23,000 visitors came to the show. It’s clear that diving has very quickly become the new prestigious sport and leisure recreation in Russia. Scuba diving doesn’t leave anybody indifferent after experiencing at least once the underwater realm and the unique beauty of the “blue world of silence”.

The organisers welcome everyone to come to the next Golden Dolphin celebration February 12-15, 2009! Don’t miss your chance to get in touch with the beauty of the sea and became a diver—an explorer of the underwater world!

Delicious traditional Russian cuisine: fresh walnut pear salad with vinegrette, rolled stuffed eggplant, tomatoes stuffed with bulgar wheat, scrumptious carrot and cabbage soup... Yum!

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Picture courtesy by RICHARD NG (MIDE AMBASSADOR)

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Category: Wide Angle
 1st place: Denis Palbiani
 2nd place: Denis Palbiani
 3rd place: Nacho Gil

Category: Macro
 1st place: Boccato Silvia
 2nd place: Wahrmut Sobainsky
 3rd place: Volker Lonz

Category: Black and white photo
 1st place: Denis Palbiani
 2nd place: Denis Palbiani
 3rd place: Elena Azarova

Photographer of the Year:
 Sergey Ilin

Grand Prize: Olga Kamenskaya

Winners of the VII Moscow International Golden Dolphin Underwater Video Festival:

Category: Profi-film
 1st place: Guy & Anita Chaumette
Beyond the blue
 2nd place: Elena Konstantinova

The blue hole of Dahab
 3rd place: Tim Hochgrebe
Marine Passon

Category: Best Technical Production
 1st place: Danny Van Belle
The windows of life
 2nd place: Eduard Poroshin
Gold triangle
 3rd place: Dean Burman
Lair of the Water Wolf

Category: The Big Journey
 1st place: Sergey Gluschenko
I want come to Mavrikiy
 2nd place: Dmitri Balakirev
Philippines
 3rd place: Oleg Yanovsky
From the North to the South

Category: Films About Animals
 1st place: Rafa Gonzales
The last journey
 2nd place: Leonardo Sergiani
Habitat
 3rd place: John Boyle
Klin Warra

Category: Diving in Russia
 1st place: Valery Skvortsov
Two steps in the ice abyss
 2nd place: Andrey Yakovlev
Forgotten world of Kaidy

Category: Wrecks
 1st place: Oleg Bozjok
Titanic of Red Sea
 2nd place: Andrey Lagutin
On the edge of desert
 3rd place: Somogyi Gyula
Closed spaces

Best Video Clip:
 1st place:
 Leandro Blanco
One for all
 2nd place:
 Natalia Molchanova
Illusions
 3rd place:
 Igor Efremov
And I love her

Grand Prize: Danny Van Belle
The windows of life



CLOCKWISE FROM FAR LEFT:

Category: Macro
 1st place: Boccato Silvia

Category: Underwater inhabitants
 3rd place: Mikhail Vedekhin

Category: Underwater inhabitants
 2nd place: Denis Palbiani

Category: Man and the underwater world
 3rd place
 Natalya Chervyakova



Special Jury Prize:
 Yakovlev Andrey
Forgotten world of Caidy

Special prize from radio station,
 Kino FM: Victor Lebedinsky
The call of the sea ■



wreck
rap



The Swedish archipelago where the wreck was discovered

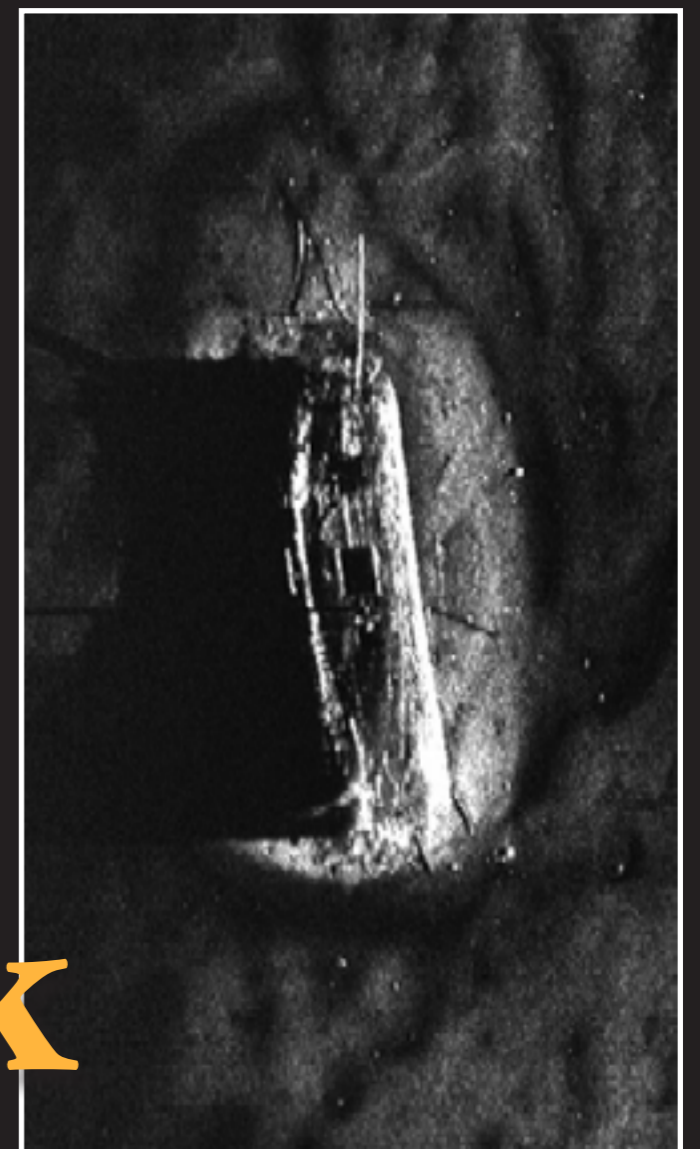


Everything seem to be in an excellent state of preservation, even the delicate wooden artwork seemed to be completely intact



Medieval Mystery Wreck

— Unique intact wreck from the Middle Ages located in the Baltic by the Swedish team, Deep Sea Productions



Side scan sonar image





Mystery Shipwreck in the Baltic Sea

The famous *Vasa* wreck on display in Stockholm is not a rare exception. Once again, the Baltic Sea has yielded a medieval shipwreck in extraordinary, some would say, pristine condition.

A new wreck was discovered in 2007 at a depth of 125m. The vessel is approximately 25 meters long, has a round bow and round stern and two masts, but there might have been three. The ship appears to be

almost complete—except for a mast and missing upper parts of the existing masts—and it sits upright on a predominantly hard bottom with little sedimentation. From what Dutch marine archaeologist, Martijn Manders, could ascertain from early video footage obtained from a remotely operated



The intricate carvings are still intact and will aid date and identify the wreck

bacterial decay. Hemp and flax are deteriorate much more easily than wood.

Dating

Based on build and shape, the artwork and materials, Dr Manders tentatively dates the vessel to the 17th century, perhaps the early 18th century. Ships are mainly identified from specific characteristic parts of a ship found during research, which are then compared with the evidence from contemporary paintings, models and sketches. In this regard, the vessel has a lot of similarities with Dutch shipbuilding techniques but is difficult to classify.

At that time, ships were handmade without drawing up construction plans. This means that vessels even of the same type could differ significantly. One ship type could have elements that

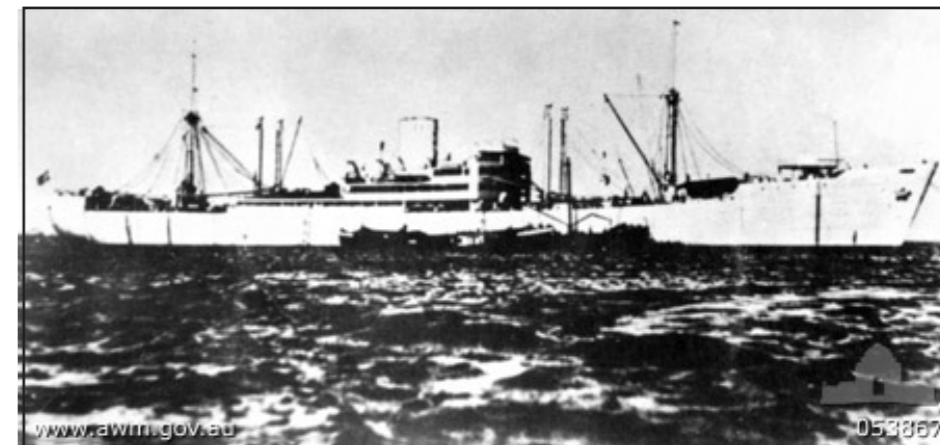


vehicle (ROV), the ship is completely wooden with no sheeting of any kind, and it doesn't

appear to have a keel. It might be flat-bottomed. No leeboard is visible, but against the bulwarks on both sides there are two kevels (kruisklampen). They were probably placed on the level of the masts. The deck is partly damaged and some ornaments have fallen off. On the deck, there are many blocks lying without any rope. Although the conditions are very favourable for the wood, it is striking that there is no evidence whatsoever of rope, Dr Manders reported. The reason for that might be

are called specific for this type at one time, and at another moment, they are not even mentioned. Shipbuilders used each other's techniques, and vessels were often reclassified.

There are many indicators that the vessel was indeed Dutch. Aside from the clues from the construction techniques, the Baltic Sea was also an important trading area for the Dutch in the 17th century. The trade was mostly for bulk goods—foremost grain, wood and iron. Regardless of whether it was actually sailing under the Dutch flag or not, the wreck provides a lot of historic information of significance for the Netherlands. ■



On March 16, 2008, Australian Prime Minister Kevin Rudd announced that *Kormoran* had been found

WWII German attack ship finally located off Australia

An Australian team searching for the lost World War II cruiser *HMAS Sydney* have located the wreck of the German merchant raider *DKM Kormoran* that sank it. The *Sydney* went down off the west coast of Australia after a fierce battle with the *Kormoran* on November 19, 1941.

The discovery of the wreck lying on the seabed at a depth of 2560 metres about 240 kilometres west of Shark Bay underwater, is a breakthrough in the long running efforts to find the last resting place of the *Sydney* and its crew of 645 sailors who all perished when she was lost. The *Sydney* was the largest vessel from any country to have been lost with no survivors during the war.

The location of the light cruiser and the circumstances of its sinking have been among the biggest mysteries in Australian military history. The breakthrough came after the Finding Sydney Foundation, backed by \$4.2 million in federal government funding, began a search earlier this

month, towing sonar equipment through 1800 square nautical miles. By finding the *Kormoran*, the team is "half-way to solving where the *Sydney* is," project leader Ted Graham said.

The search team had also found debris on the sea floor about six kilometres from the *Kormoran*, which they believed marked the site of the main battle between the two ships. The team found the wreck of the *Kormoran* amid a large field of debris, some of which could be pieces of the *Sydney* itself. They will now use a remote-controlled vehicle to search the wreck and look for clues as to the *Sydney*'s whereabouts. ■



The last of Hitler's U-boats has been located in the Black Sea

For years, German submarines *U-19*, *U-20*, and *U-23* were a terrifying presence beneath the waves, preying on British and Russian shipping. Then, 60 years ago, they were suddenly sent to the bottom of the Black Sea. They have finally been found off the Turkish coast—in excellent condition.

The three submarines were originally part of the six-boat 30th flotilla harassing Allied shipping in the North Sea. But the Type II-B, were small by Second World War standards—only 140 feet long—and were replaced in the Atlantic and North Sea by larger boats. After the invasion of the Soviet Union in June 1941, the German high command decided that it needed the flotilla to attack Soviet ships in the Black Sea.

To send the subs by sea past Great Britain and Gibraltar would have been hazardous, and going through Turkish waters would have violated that country's neutrality. So, it was decided to take them by canal to the Elbe, then upstream to Dresden where they were dismantled and taken 85 miles by truck to Ingolstadt on the Danube. They were then ferried hundreds

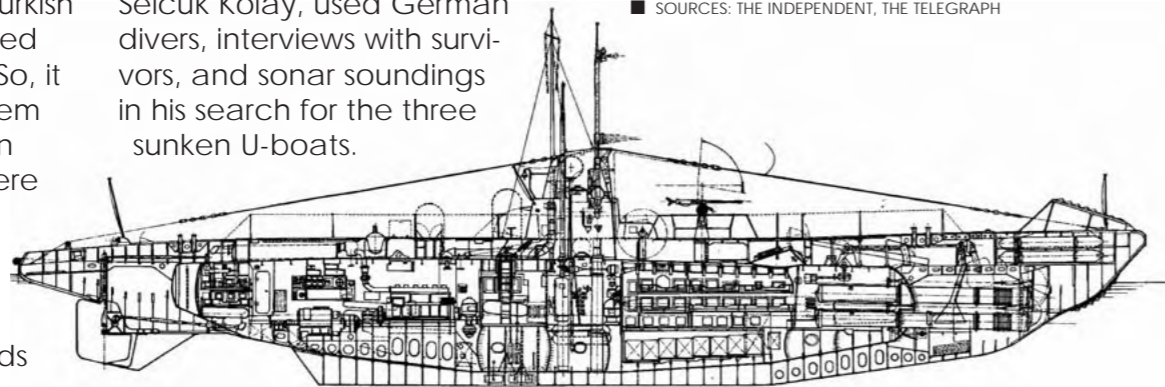
of miles through Germany, Austria, Hungary and Romania, to the Black Sea port of Constanta. Over the next three years, the flotilla sank 45,000 tons of Soviet shipping, while losing three boats.

In September 1944, the Red Army entered Romania and its government switched sides stranding the remaining three subs. Their crews were ordered to scuttle their boats and try to make it home by land. They rowed to Turkey, but were interned for the rest of the war. Turkish marine engineer, Selcuk Kolay, used German divers, interviews with survivors, and sonar soundings in his search for the three sunken U-boats.

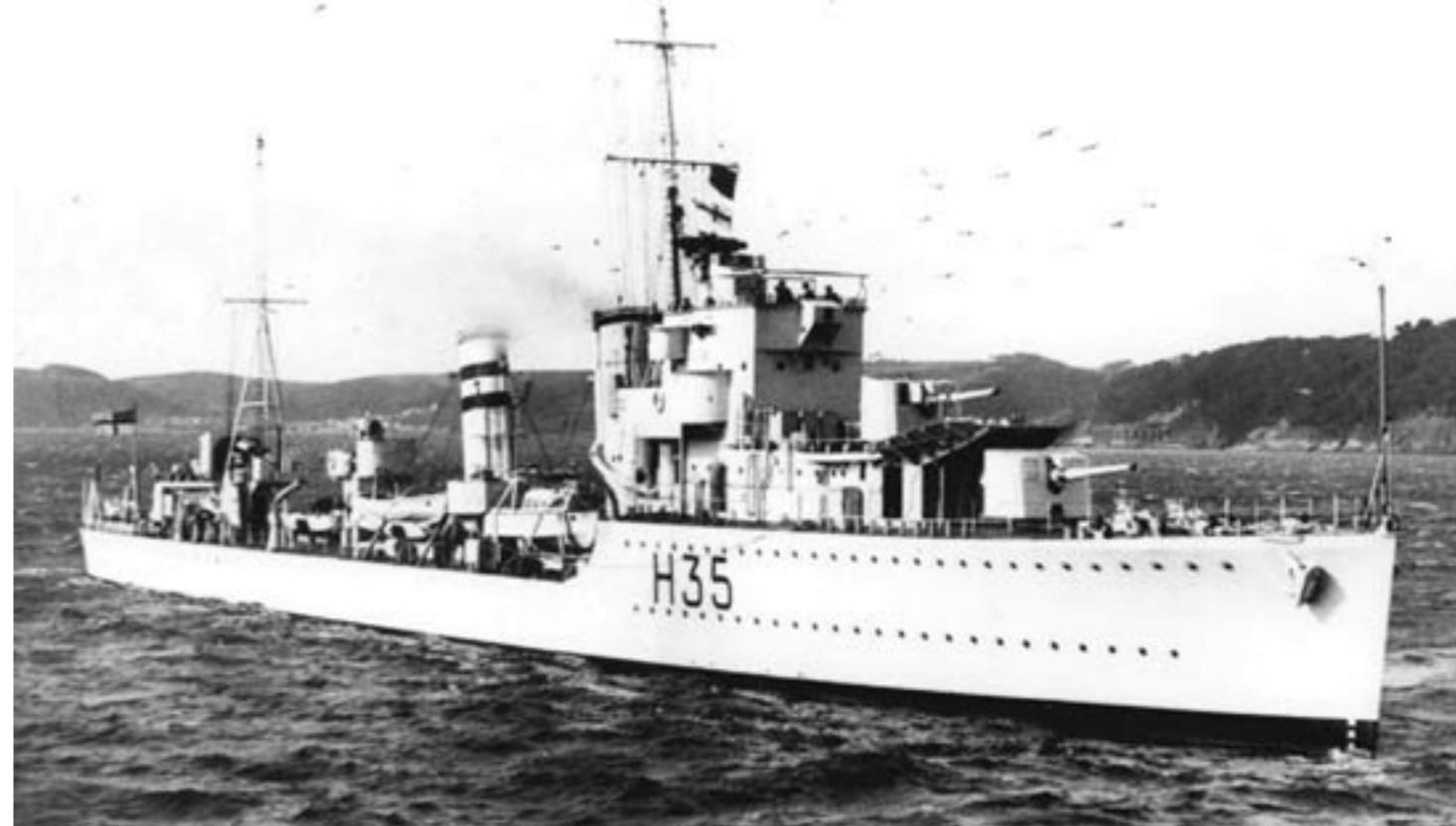
His divers located *U-20* two miles off shore in only 24m of water. "It's in wonderful condition, still fully intact," he said. *U-23* lies in 49m of water three miles off the coast, while the *U-19* is further out and at a depth of more than 500m.

Only 20 Type II-B submarines were ever built, and just one survives, making the prospect of retrieving three of them in good condition an enticing one for naval historians. And as the 25-man crew of each ship got out alive, they are not considered to be war graves.

■ SOURCES: THE INDEPENDENT, THE TELEGRAPH



On 10 April 1940, *HMS Hunter* was badly damaged by gunfire from German destroyer *Georg Thiele* and collision with *HMS Hotspur* did the rest. The ship sank in the centre of the Ofot fjord with heavy loss of life



British WWII Destroyer Found in Norwegian Fjord

68 years after she sank during Battle of Narvik, the wreck of the Royal Navy destroyer *HMS Hunter* has been found

HMS Hunter has been found resting on the seabed 305m below the surface, where she has been undisturbed since April 1940 when she sank with the loss of 110 seamen. She was one of two Allied destroyers lost during the first Battle of Narvik—the Germans lost four destroyers.

British ships had been sent to the remote port of Narvik during the German World War II invasion of Norway with orders to prevent enemy forces from landing. The British entered the harbour early on the morning of 10 April 1940 and sank two German destroyers and six merchant ships.

However, another five German destroyers were at anchor in other fjords and attacked the British flotilla, killing Captain Bernard Warburton-Lee, destroying his flagship, sinking *HMS Hunter* and damaging two other ships. There have been several attempts

to find her over the years, but she was finally discovered by the Norwegian mine hunter, *Hnoms Tyr*, while on an exercise with the Royal Navy, Royal Norwegian Navy and Royal Netherlands Navy.

Ceremony

In a statement, the British Ministry of Defence said, "It became clear that this was the long-lost *HMS Hunter*, lying as she was when she had finally succumbed to the unforgiving waters after bravely fighting during the Battle of Narvik," it said.

A procession of ships, led by Flag Ship *HMS Albion* and including *HMS Bulwark* and *HMS Cornwall*, held a formal wreath-laying and memorial service, conducting synchronised ceremonies on deck.

They then turned in formation and steamed over the wreck. The crew who died were also toasted

in the traditional Navy way, with a tot of rum poured over the side. Wreaths were laid at the site, which will be marked as a war grave.

Major General Robison, the commander of the UK's amphibious force, said: "Finding *HMS Hunter* was a poignant moment, and being able to pay our respects along with our Norwegian and Dutch allies is particularly fitting to those who lost their lives."

Closure

One of *HMS Hunter*'s survivors, Fred Ward, has spoken of his "great sense of relief" that the wreck has been found. John Hague, 87, who also survived the sinking, said: "I am so pleased and overwhelmed to know that after so many years *HMS Hunter* has been found, and my fellow ship-mates have a resting place." ■

SOURCE: BBC

Edited by
Peter Symes



Going through Singapore?

Singapore's Changi Airport has now opened the doors to its ultra-modern Terminal 3. The largest of the airport's terminals, the S\$1.75 billion facility adds a capacity of 22 million passengers a year, raising the airport's total yearly capacity to about 70 million passengers. The new terminal covers a massive 380,000 square metres, with more 100 retail, food and beverage outlets, and service concessions. An automated people mover enables quick and efficient transfers between all the terminals, while a high-speed inter-terminal baggage transfer system will greatly assist passengers with connecting flights. While currently being used exclusively by Singapore Airlines, four additional carriers including China Eastern Airlines, Jet Airways, Qatar Airways and United Airlines will use the new terminal as of March 26th. ■

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Odyssea Divers Opens New Resort in North Sulawesi

Only a short 25-minute drive from Manado's Sam Ratulangi International Airport, Cocotino's resort is ideally situated to explore North Sulawesi's wealth of underwater attractions. Sitting astride scenic Wori Bay in the village of Kima Bajo, the resort offers expansive views overlooking the dormant Manado Tua volcano and the islands of the Bunaken National Marine Park. Wholly owned and managed by Odyssea, guests can expect the same level of service that is provided aboard their *MV Odyssea 1* liveaboard trips. Guests can choose from a Villa Room or one of the beautifully appointed Posi-Posi or Kano-Kano Suites. All group sizes are well catered to, with single, twin-sharing or triple-sharing options avail-



able. Each room comes complete with air conditioning and fan, ensuite bathroom with hot water, safety deposit boxes and complimentary bottled drinking water. Wireless internet access is available throughout the resort. Photographers will appreciate the digital room. Don't worry if you leave the laptop at home as computers are available along with charging facilities complete with 110V and 220V surge protected outlets. DVDs and CD are available for purchase.

After a memorable day of diving, be pampered with a traditional Indonesian massage in the resort's exclusive spa or relax by the swimming pool with an exotic cocktail to watch a spectacular sunset over the Sulawesi Sea. Dine under the stars on delectable local cuisine, all prepared with freshest of local ingredients. www.odysseadivers.com ■

Travelling with batteries

As of January 1, 2008, the US Department of Transportation will no longer permit loose lithium batteries to be packed in checked baggage. To avoid potential problems, keep all batteries in your carry-on baggage, as there is generally no restriction on the number of batteries allowed. Lithium-ion batteries, often found in laptop computers, differ from primary lithium batteries, which are often used

in cameras. If you must carry a battery-powered device in any baggage, package it to prevent inadvertent activation. Only use a charger compatible with your rechargeable battery – don't mix and match! If possible, place each battery in its own protective case, plastic bag, or package. Place tape across the battery's contacts to isolate terminals, as this prevents short-circuiting.

While there is no explosion hazard associated with either kind

of battery, the Federal Aviation Administration has studied fire hazards associated with both primary and lithium-ion cells. While research has shown that an explosion will not result from shorting or damaging either lithium-ion or primary lithium batteries, both are extremely flammable. Primary lithium batteries cannot be extinguished with fire fighting agents normally carried aboard aircrafts. Whereas, most common extinguishing agents easily extinguish lithium-ion batteries. ■

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Curacao Dive Festival

From May 24 – 31, the 2008 Curaçao Dive Festival kicks off a week long celebration of all things aquatic

The week long celebration attracts divers from around the world to experience this Caribbean island's plethora of attractions, both above and underwater. Famed for waters as blue as its namesake liqueur, the island and it's environs has been

proclaimed "Healthiest Marine Environment in the Caribbean/ Atlantic."

With more than 60 sites to choose from, divers of all skill levels will enjoy a wide range of underwater attractions from wrecks to wall dives. Notable dive sites include The Tugboat at Baya—a wreck easily accessible as a shore dive; The Crash Site—the remains of a small airplane that fell off the *USS Eerie* after being struck with a German torpedo; The Mushroom Forest, named

after the large numbers of star corals whose bases have been eroded by clams and sponges; and Playa Kalki—nicknamed "Alice in Wonderland" for the colourful profusion of corals and reef fish. When you dive on Curaçao you have excellent shore access to the coral walls. Topside, a wide range of activities has been organized throughout the week.

A series of workshops will be held, ranging from

Environmental and Marine Art Painting with renowned painter Ron G. Steven, to dive safety, ecology and underwater photography. In addition, a number of social events are planned including cultural events, beach barbecues, nightly meet and greet events and a farewell cocktail party on the final evening.

For more information, see the official website for the Curaçao Dive Festival at www.curacaodive.com ■

The World is a book, and those who do not travel, read only a page. —St. Augustine

First Annual Fish ID Challenge

Sand Dollar Condominium Resort and Bonaire Dive & Adventure will be hosting the First Annual Fish ID Challenge from August 9 - 16 or August 16 - August 23, 2008, in conjunction with Fish ID experts Patti and Scott Chandler of ReefNet, Inc. Well known for their work in marine life identification and documentation, the Chandlers have spent the last 17 years documenting fish species, behaviors and creatures for future study and identification.

www.sanddollarbonaire.com/FishID ■



Inflight Concierge

Air New Zealand is launching an in-flight International Airline Concierge service, which is believed to be an aviation industry first.

Commencing in April, the service will be provided on all international flights between Auckland and Los Angeles, San Francisco, Vancouver and Hong Kong. "Air New Zealand will employ up to 90 concierge staff, who will be dedicated to making every customer journey before, during and after an Air New Zealand service a special event," said Ed Sims, the airline's international manager. "Every one travelling with us—no matter how full the aircraft—receives the personal attention they deserve and the advice they need."

In a move aiming to revolutionize the long-haul travel experience, each flight will be staffed with a team of travel advisers, disrupt managers, loyalty and destination experts. Duties will range from escorting passengers to and from the aircraft and assisting with travel arrangements to helping making a selection from the in-flight wine list.

"With this new move, Air New Zealand leads the world in in-flight service," said Damien O'Connor, New Zealand Minister for Tourism. The airline has recently been judged as having the world's best passenger service in the prestigious Air Transport World magazine awards. ■

Stan Waterman liveboards

Spend a week aboard a liveboard with one of diving's true pioneers

Aggressor Fleet, the world's largest liveboard fleet, has announced dates for dive charters with diving legend Stan Waterman. Four charters will be available during 2008: Belize *Aggressor III*, May 10-17; Palau *Aggressor II*, July 13-20; Cayman *Aggressor IV*, July 26-Aug. 2; and Turks & Caicos *Aggressor II*, Oct. 11-18. One of diving's true pioneers, he is best known for his TV documentaries and film work. Among his many achievements, he was associate producer and underwater cameraman for the classic film, *Blue Water, White Death*. Spend a memorable week of diving as Stan shares entertaining stories of his remarkable career with his trademark wit and charm. ■

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Cardinalfish and other reef fish eavesdrop to find a new home

Fish Listen To Where They Want To Live

Just like prospective human home buyers, reef fish scout new neighbourhoods before moving. According to Edinburgh University researchers, fish use their acute sense of hearing to eavesdrop on locations before deciding where to live. After studying shoals of fish near Australia's Great Barrier Reef,

they discovered damselfish, cardinalfish, emperors and blennies chose communities by the "reef noise" they give off.

Very young fish choose locations with invertebrates such as shrimp, which give off a high frequency sound, and hide in holes snatching passing food. As they

mature, the fish become "more aware" of the social groups and communities they would like to live in. One is then chosen based on their needs—just like a human would choose a new neighbourhood based on local schools or employment possibilities. ■

Fish Can Count

While it was known that fish could distinguish big schools from small ones, researchers from the University

of Padua in Italy have discovered that they possess a limited ability to count how many other fish are

nearby. A series of experiments were conducted on a lone mosquito fish to see whether it would prefer to join a school of two or four others. Significantly more often, females preferred to join schools of four fish rather than three and consistently preferred schools of three fish over two. In a second series of experiments, fish were revealed to have the ability to process even larger numbers. Although unable to directly count over four, they were able to distinguish between larger numbers if they differed by a ratio of 2:1. This demonstrates that fish are able to visually estimate larger numbers, just not very accurately. ■



One, two, many



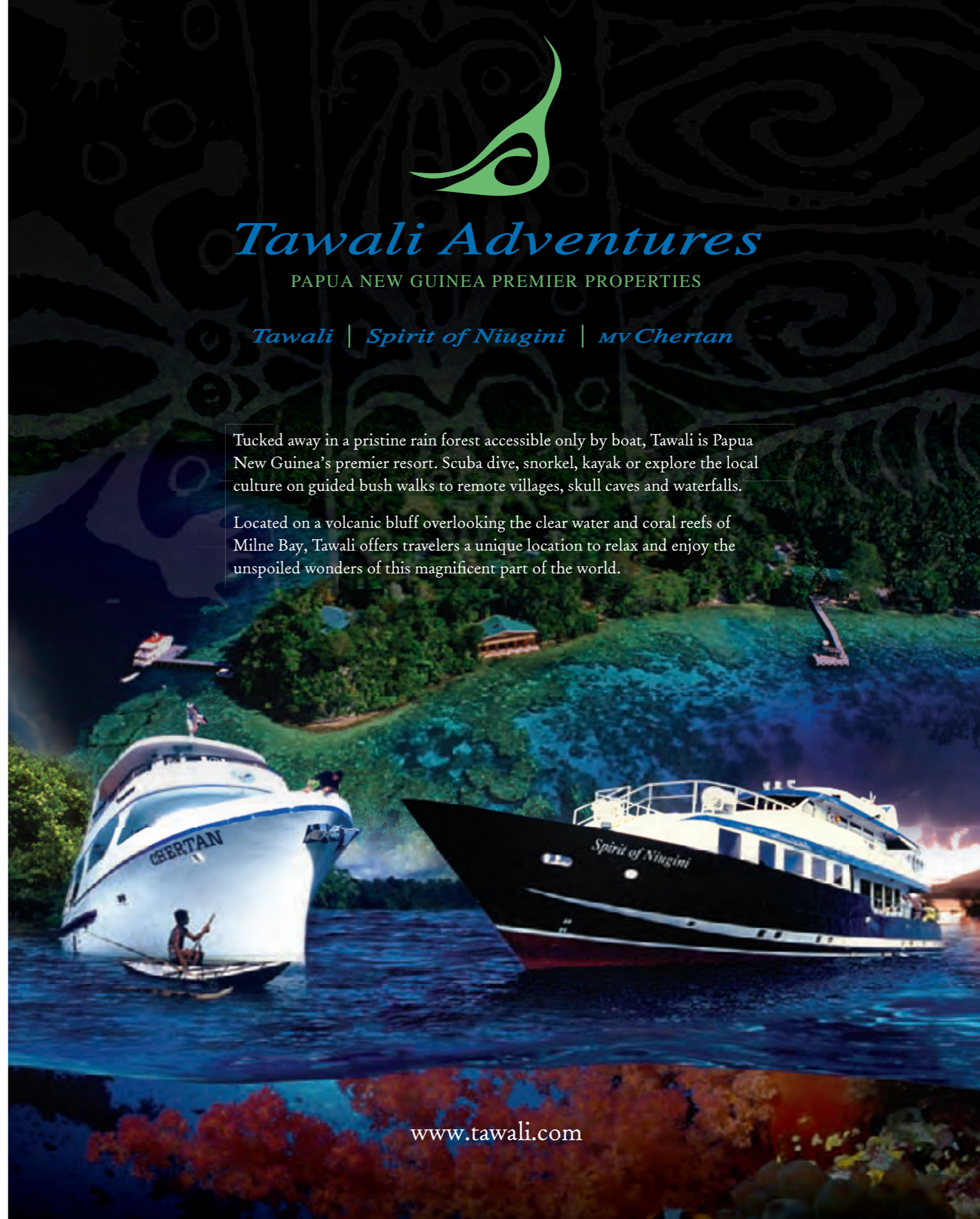
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We all paused a moment—all of us caught by the sudden seriousness of what we were now doing. With this find, we were sure that this was the Soviet submarine S8—missing since October 1941



S8 lies on 55 m depth. At first, there was doubt about the identity, but divers have confirmed that the brass number on the conning tower says C8 (= S8)

Below some ragged pieces of wreckage lying on the bottom beside the hull, I see something a little out of place. It's more polished and more regular in its outline. I carefully descend and remove the pieces of metal that hide it. My colleague, Marcus Runesson, is above me providing ample light, making my task much easier. With the debris removed, I see that it is a brass plate shaped like the number eight—matching the letter "C" we earlier found up on the submarine's tower. I hold the eight up to show Marcus, and we share that moment of joy of having found another piece of the puzzle that is the wreck of this Soviet submarine just off the Swedish island of Öland.

The Soviet submarine S8 was of the Stalinet's type. She left base in the Finnish Bay on 11 October 1941 and believed mined and sunk off Suursaari between 12-14 October 1941. She was discovered in 1991 in a location near Öland (see map page 30) by Marcus Runesson, Mats Karlsson, Stefan Fransson and Sture Hultqvist using a side scan sonar

Together, we lifted the heavy plate and placed it beside the C on the deck of the hull, beside the submarine's fin. Marcus and one of the other divers of our team, Johan Alexandersson, carefully, positioned them as they once were placed by the proud crew. We all paused a moment—all of us caught by the sudden seriousness of what we were now doing. With this find, we were sure that this was the Soviet submarine S8—missing since October 1941. Yet another of the many Soviet submarines lost in the depths of the Baltic is found and identified. More families may now know the fate of their relatives, previously only listed as missing somewhere in the Baltic.

S8 background

The submarine S8 was built in the town of Gorkiy—today, called by its old name of Nishniy-Novgorod—at the Krasnoje Sormovo-yard between December of 1936 and April of 1937. She belonged to a large class of submarines known as the S-class—meaning Srednaja or "medium". (Western observers initially, erroneously, reported the S to stand for *Stalinets*). The design of the class was of German origin.

Although Germany was prohibited from owning or developing submarines after WWI, development did indeed continue—the yards simply moved their engineer-

**A Soviet Submarine is Missing in Action
... somewhere in the Baltic**

The Hunt For S8

Text by Carl Douglas
Photos courtesy of
Deep Sea Productions

Baltic Wrecks

ing departments to Holland. Several countries, in addition to the Soviet Union, purchased designs from the joint firm, among them Sweden, Finland, Spain and Holland. The German engineers further refined the design, eventually resulting in the long-distance Type IX class for the German Navy.

The *S8* was commissioned into the Soviet Navy's Baltic Fleet on June 30, 1940. The first year was spent working up the crew and preparing for the war that loomed.

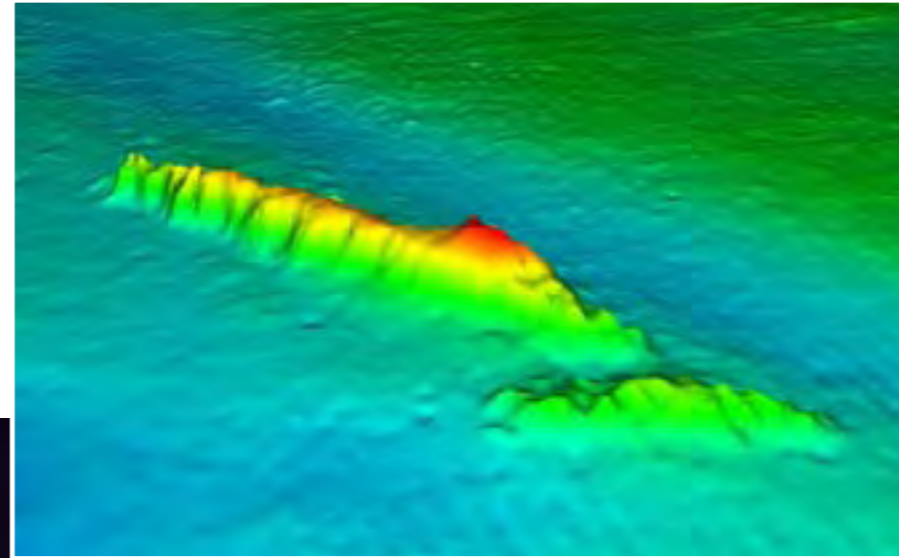
When Nazi-Germany attacked on June 22, 1941, the *S8* was based at the large submarine base at Ust-Dvinsk—today's Daugavgriva—just north of Riga, Latvia. Along

with seven other submarines, she belonged to the 1st Division of the 1st Brigade of the Baltic Fleet. Shortly after the outbreak of war, the *S8* was sent to sea along with those submarines that were serviceable.

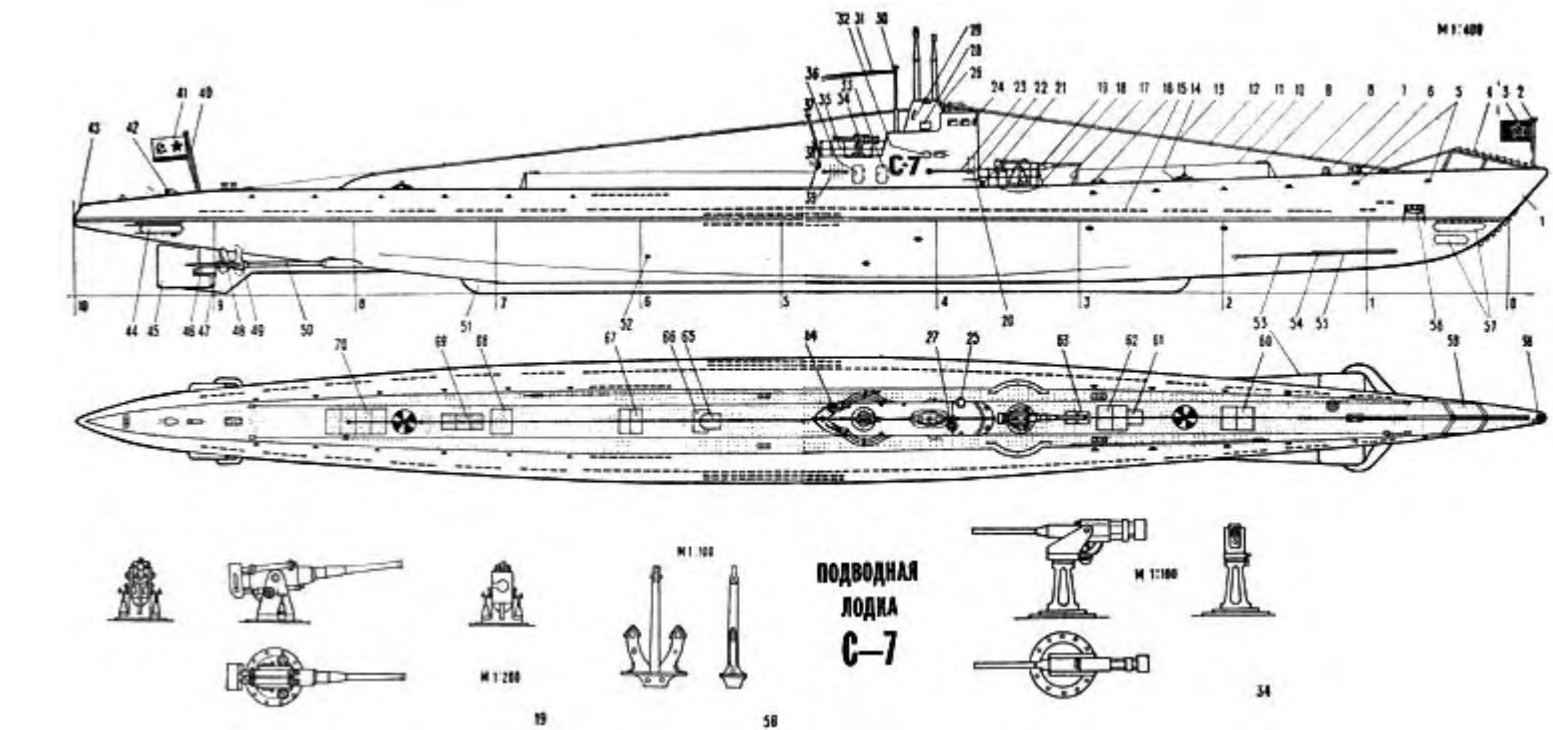
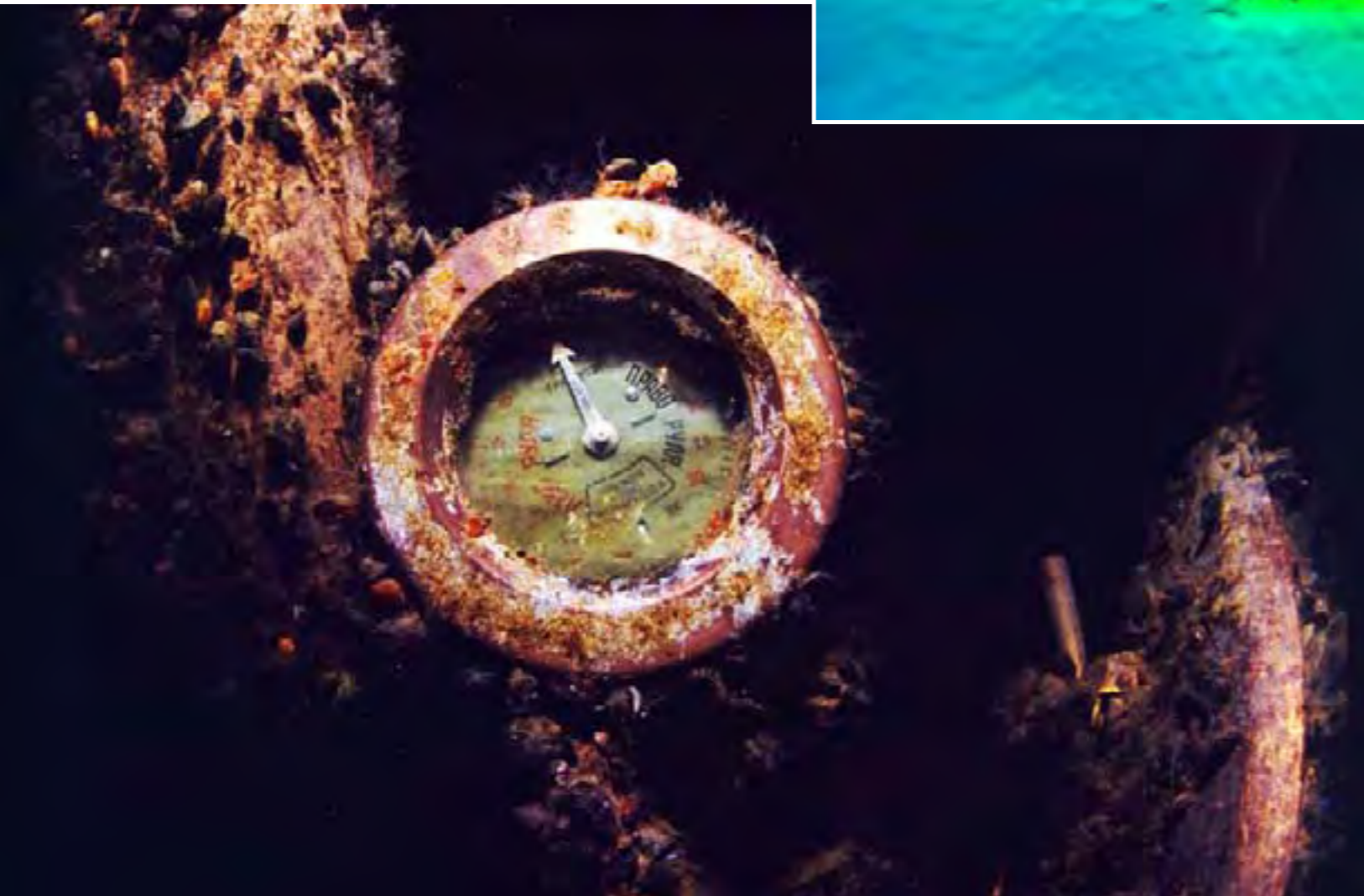
As the Nazis advanced, the Soviet submarines were forced back, first to Tallinn in Estonia and finally to the bases around Leningrad—today's St. Petersburg—at the end of August. It was not until early October 1941 that the *S8* could be dispatched for a full combat patrol,

together with three other boats of the smaller SHCH-class.

The force was tasked with interdicting the shipping carrying iron-ore from neutral Sweden to Nazi-Germany in the area between Norrköping and the island of Öland.



The cannon on the foredeck, in front of the tower



The dial on the rudderindicator

Design of the identical sister-vessel S7



Baltic Wrecks

Just one of the four boats survived its mission and returned to its base.

On October 11, 1941, Captain Ilia Braun of the *S8* radioed what was to be his final report. He stated that he had reached a position just north of the Estonian island of Dagö in the Bay of Finland. After the *S8* became overdue from her patrol, it was assumed that she had been lost just after her last report, either from one of the thousands of mines Finland and Germany had sowed in the Gulf of Finland, or possibly sunk by another submarine (as had her sister ship the *S7* was later to be sunk by the Finnish submarine, *Vesihirsi*). Her crew joined the many millions of Soviet soldiers reported missing in action during WWII.

The discovery

In June, our group from Kalmar's Scubasport dive store left port to make side scan images of two previously located wrecks—the *Nicomedia* (one of four ships sunk by the Royal Navy submarine *E19* on October 11, 1915 and the *Emmy Haase*).

Along for the ride was also Sture Hultqvist with his homemade "lucky" side scan sonar. This equipment had previously located both the so-called "champagne wreck", *Jönköping*, where some 1,600 bottles of 1906 Heidsieck champagne were salvaged, and the Soviet submarine *S7*.

After completing the imagery and diving the *Emmy Haase*, the vessel headed south toward the other wrecks. The sea was very rough, and only Marcus and the young son of the skipper were not seasick.

Marcus consulted his charts and asked that a small detour be made, so that he could check a position, which some local fishermen had given one of our project leaders,



Mats Karlsson. They had reported retrieving aluminium-parts from their trawls—most likely from the wreck of an aircraft.

Marcus picked up the story: "It was between nine and ten in the evening, and the sun was just setting. Stefan [Fransson], was at the helm, and I manned the side scan sonar. After just 15 minutes of searching around the position we had been given, there was a very clear wreck on the screen. I screamed out loud and ran down to get the others, lying below and being seasick."

They were a bit slow to make their way up to the bridge—Mats thought Marcus was joking with them. But after a while, both Mats and another of the group, Sture, made the effort to come up to see what they had found.

What they saw on the screen was an elongated cigar-shaped object. What could it be? An airplane or some unknown mystery-ship? A torpedo boat or another type of long and narrow vessel? After doing another few turns over the position of the wreck, the group decided to head south to the wreck of the *Nicomedia* to get the side scan images they needed, and then return to dive the mystery-wreck in the morning.



ABOVE: Author and team member Carl Douglas
FAR LEFT: Latern on the port side of the turret



Hatch

The first dive

At six in the morning, Mats was still too seasick to dive, so Marcus and another diver in our group, Stefan Fransson, made the first dive on the new wreck. All they had was air, so the plan was to just make a very brief dive to try to ascertain what was down there.

It was at a depth of 45m where Marcus first saw an outline of a hull on the bottom. Lit up by his torch light, he saw an anchor, some sort of hand rail and a half moon-shaped porthole without glass. Although affected by nitrogen-narcosis, Marcus and Stefan spent another ten minutes on what they agreed was the bow of some sort of ship before ascending.

How did it look?
We haven't been able to find an image of the S-8, but this is the S-9



Baltic Wrecks

On the surface, the rest of the gang waited anxiously. Sture was using Photoshop to make the side scan images more clear. When the divers reached the boat, Mats called out the question on everyone's mind, "Was it an airplane?" and Stefan answered with irony, "Do airplanes have anchors?" After listening to the divers' report and analysing Sture's images, the group arrived at the startling conclusion that they had probably found a submarine.

Back in Kalmar, they contacted the maritime historian, Björn Åkerlund, who started searching for clues in the available literature. Nowhere was there any indication of a submarine sunk in the area where the wreck was found. As the research continued, they focused more and more on submarines lost during the First World War. The main reason behind this was that due to the improvements in communications during the interwar years,

more is known about where submarines were lost during the Second World War. In the earlier war, the very primitive radios available meant that very little could be known about how and where many submarines were lost.

The group arrived at a list of possible submarines that could be the one they had located. The most likely candidate was the Russian submarine *Lvitsa* (lioness) lost on or about June 11, 1917, somewhere south of the island of Gotland. Other possible choices were the British Royal Navy submarine *E18*, the sister

boat of *Lvitsa* called *Gepard* or possibly some unknown German boat.

Mission: Identify and Document

Immediately after coming ashore after finding the wreck, Marcus called the undersigned and wanted me to come document the wreck and, naturally, try to identify it. The group also informed the media of their find, which led to a lot of speculation as to what it was they had found. On the Russian side, there was great scepticism as to the possibility that it could be the *Lvitsa*.

Finally, one month after the initial discovery—after a number of aborted attempts on account of weather—we left port on July 29 to try to ascertain which submarine it could be. On the way out, I went over with the group the various details on the hull for which we would be looking in order to try to at least narrow down the number of possibilities. I went over such things as the shape of the fin, the shape of the conning tower, the placement of the rudders, anchor and hatches, the hull cross section and measurements, the types and placement of any deck-guns, and the number of torpedo



S8 Data

Crew: 46 men
Length: 77,75 meter
Width: 6,4 meter
Draft: 4,06 meter
Displacement: 1,090 ton submerged
Maximum diving depth: 100 meter

Armament: One 100mm cannon gun with about 200 rounds). One 45mm cannon with about 500 rounds). Six 21-inch (533mm) torpedotubes (4 in the bow and 2 in the stern) with a total of 12 torpedoes.

Propulsion: Two Kolomna diesel-engines (with a total of 4,000 shaft horsepower). Two electric motors (with a total of 1,100 shaft horsepower). Two axles with two three-bladed propellers.

Maximum speed: 19,5 knots surfaced and 9 knots submerged using the electric motors.
Fuel: about 100 tons

Range:
9,500 nautical miles at 10 knots.
3,380 nautical miles at full speed
9 nautical miles at full speed submerged. 148 nautical miles at 3 knots submerged

UBOAT.NET



LEFT: Map of the Baltic Sea region
BELOW: Propellor of the wreck

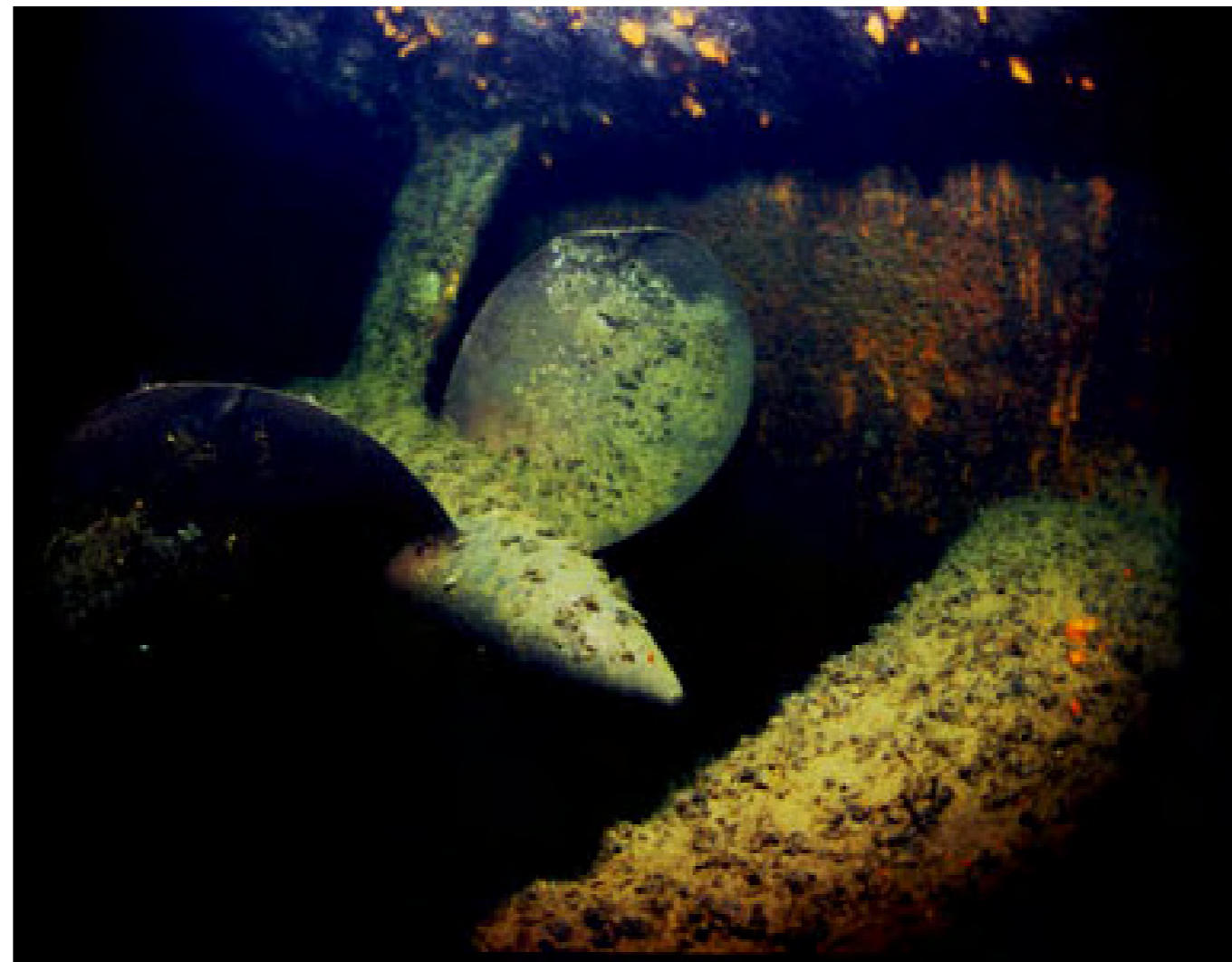
tubes. For this dive, we would keep the number of questions pretty basic.

The first of our team in the water would be Johan Alexandersson and Jonas Dahm, with the task of photographing the wreck and any discernible details from my list. The second group would be the video team, consisting of Marcus, Lena Cloffe, Robert Westerberg and myself.

After giving the lead team a half hour of

quickly adjusted the camera and lights. Visibility was very good—between 10 and 15 meters. The hull appeared to be in good shape, very little marine growth was visible on it.

What I saw around me, however, didn't look right at all. It was much too clean and streamlined in relation to the pictures I'd memorized of the *Lvitsa*, the *E18*, the *Gepard*, and the other possible candidates from WWI.



lead time, we jumped in, formed up, and descended into the darkness. Halfway down, we encountered Johan and Jonas, well into their decompression. They appeared content with their dive and signalled us to go on.

We proceeded down the line. It got darker and darker. Suddenly, I was on the wreck. I landed on the deck just aft of the fin and

When I swam over toward the fin, I noted that the shape of the rear part for the fin and the little platform with its anti-aircraft cannon looked vaguely familiar. I took in the aft lantern, the railing around the platform, the shape of the actual gun, and the housing for the periscopes just forward of the gun. I tried to keep some healthy doubt and not fall

The Soviet Navy's Baltic Fleet lost over 40 submarines during WW2.. Most of the submarines lost were sunk in the minefields of the Bay of Finland

ABOVE: Position of the S-8. In 1941 the Soviet Union ordered unrestricted submarine warfare against all shipping in the Baltic. In an effort to bottle up the Soviet naval units in their bases in their surrounded fortresses at Leningrad the Germans and their Finnish allies planted arrays of minelines and minefields across the bay of Finland with thousand of mines. In light of all this, for a Soviet vessel just to break out into the Baltic was a major achievement in itself.

What sunk the S8?

There are currently two main possible causes to the sinking of the *S8*:

1. That she hit a mine. There are several factors indicating this. Our impression is that the damage forward of the fin is more extensive on the lower parts of the hull. On the bow, there is a large section of the outer pressure hull missing, while the upper part of where the hull has been separated show rather less damage. Most metal-pieces point up — as if the explosion occurred below. On one of the sidescan-images there is something that might be a mine anchor a little distance from the wreck. It is known that the Germans

planted a mine line across the Baltic to roughly this area.

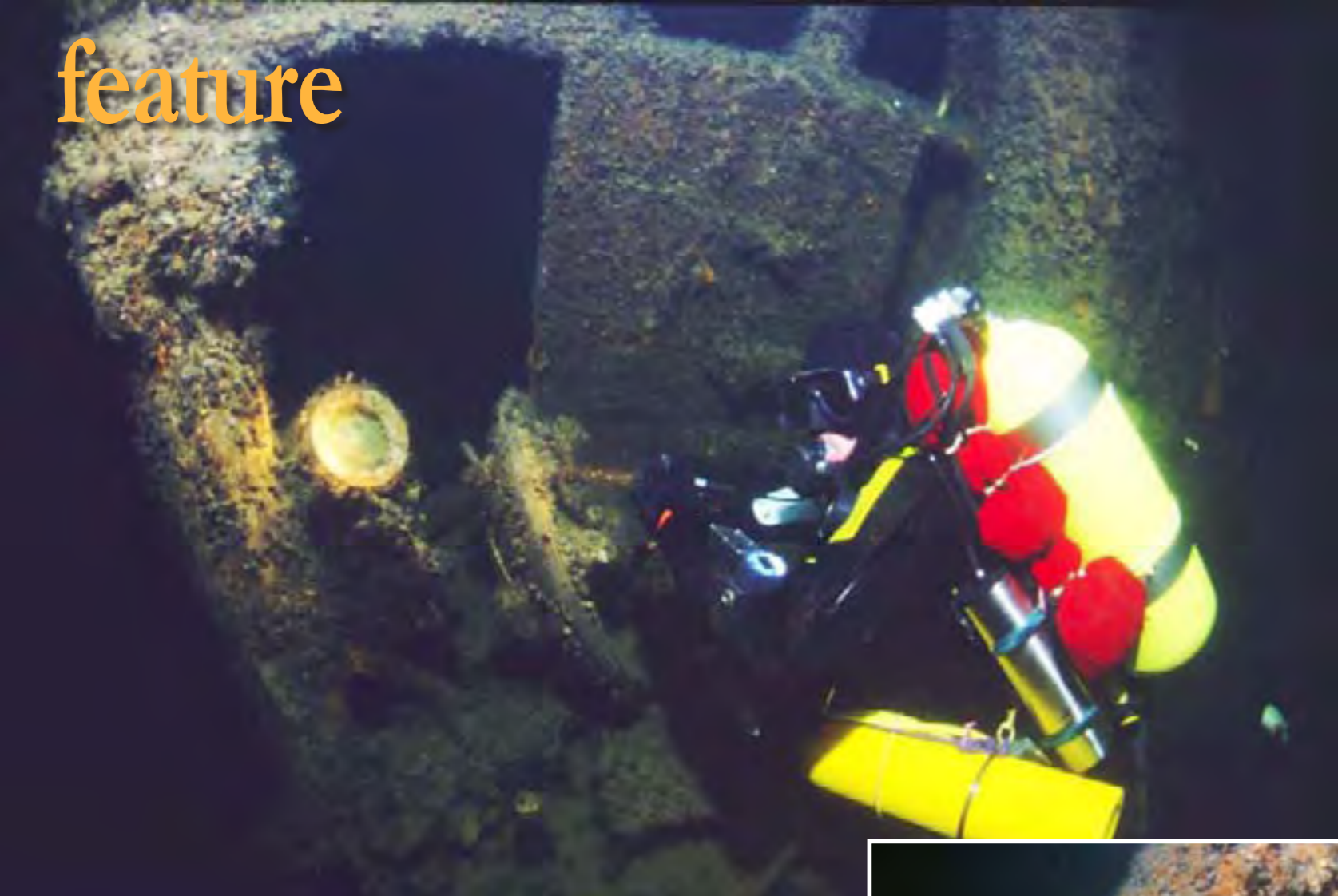
2. That she was sunk by some form of cannon or rocket fire. There are a number of holes in the hull on both sides of the hull break that could be the result of shelling or rockets. Additionally, there are what might be shells from the *S8*'s main 100mm deckgun — a sign that she was sunk in combat. What speaks against this theory is that there are no known reports of such an action in this area in either Swedish or German records. Possibly, the aircraft lying somewhere in the area could have been involved. ■

Historical Background to the Submarine War in the Baltic

In the autumn of 1941, the situation in Russia was desperate. The very existence of the country was being threatened. Nazi-Germany unleashed its blitzkrieg against the Soviet Union on June 22, and after only a few months, the situation was nothing short of catastrophic. The extremely rapid advance of the Nazi armies meant that Leningrad (today's St. Petersburg) was already encircled in September 1941, and Moscow itself very nearly lost. During the first five months, the Red Army is said to have lost some five million men killed, wounded, missing or captured — equalling its entire strength when the war started. No international aid was forthcoming, other than a trickle from an equally weak England. Nazi Germany, in the late fall of 1941, appeared invincible.

This was not a situation where the Soviet Union could ill-afford being careful. Unrestricted submarine warfare was ordered against all shipping in the Baltic. Neutral Sweden was desperately trying to stay out of the war, currying favor with both sides, exporting vital goods and materials to both sides. Swedish iron-ore from the far northern mines had flowed south to the hungry German industries of the Ruhr. During WWI as well, the Allies had tried to interdict these supplies.

The Soviet Navy's Baltic fleet lost over 40 submarines during WWII. During the first week after the German surprise attack alone, some 12 were lost. Most of the submarines lost were sunk in the



THIS PAGE: Scenes from the wreck in the Baltic Sea

a meter aft of the cut, the hull was intact.

I swam on toward Marcus' light. He had found the bow section lying on its side a few meters away to the right. We moved on and inspected the characteristic net cutter in the bow. I videoed the entire bow with stabilizers, anchor and all the details that I could find, in order to ease final identification.

Going aft again, we looked at the port side of the fin. The weather shield had been completely torn away. We looked straight in on the bridge with a rudder-indicator and opened the hatch. We peeked down and saw all the way down to the main deck inside the sub.

In the stern, we inspected the props and rudders. To my surprise, I discovered a torpedo a quarter of the way out of the port aft torpedo tube. It appeared to be stuck just outside the port of the tube. Suddenly, my lights go out, indicating that it is time to go. After 30 minutes on the wreck, we start the ascent to our first decompression stop.

Immediately after the dive, we gathered to look at the video and to discuss what we had discovered during the dive. Marcus explained that what he had seen on his first dive was actually the net cutter and anchor in the bow, thinking the former was a railing of some sort. Jonas

Baltic Wrecks

mine fields of the Bay of Finland. In an effort to bottle up the Soviet naval units in their bases in the surrounded fortress of Leningrad, the Germans and their Finnish allies planted many thousands of mines in an array of mine lines and mine fields. In addition, there were underwater nets and cables. These were protected by scores of armed vessels and aircraft patrolling above, ready to hunt down any Soviet submarines that dared venture forth. In light of all this, for a Soviet vessel just to break out into the Baltic was a major achievement in itself.

All told, some 66 Swedish steamers were sunk in the Baltic. Two hundred and three Swedish sailors lost their lives, and some 50 suffered debilitating injuries. On the other side of the equation, 94 Swedish vessels were sunk in Allied service and some 1,379 sailors lost their lives.

The export of iron ore to Nazi-Germany was and is controversial. It is clear that it contributed to the Nazi war machine. It is also clear that the fact that the export was allowed to continue kept Sweden out of the war. Neither can the importation of vital supplies from Germany to Sweden be ignored.

The Swedish government did what it could to maintain our freedom and independence—regardless of the moral questions raised then and now. Was it worth the price? Is it possible to judge in retrospect? My view is that we should study and learn from history—and not always pass judgment based on our knowledge and our morality. ■

immediately for the too obvious, easy answer to our questions.

I continued swimming along the deck beside the fin. A little further, I had to acquiesce to my initial gut reaction—this was a sister ship to the S7, the Soviet WWII submarine we had discovered the year before, north of Stockholm. I looked over to my dive buddy Robert, and we both nodded slightly. He had noticed the same things that I had.

My first thought was that this sub was not supposed to be here. In all my research, I had found no indication that any

Soviet submarine had been sunk in this area. It's naturally an absurd thought—it's here, after all.

The Swedish export of iron-ore to Nazi-Germany was and is controversial. It is clear that it contributed to the Nazi war-machine.

We made our way forward. Marcus and Lena swam ahead, and Robert helped me with lighting. We noticed that the forward section of the fin showed severe damage, and that the main 100mm deck gun was missing from its place in front. The explanation came a few meters later. It was as if a giant wielded an enormous axe cutting the ship in two. The cut was very clean; just



The aft torpedo tubes

told us about the letter C he had seen on the port side of the fin. None of us saw it, but fortunately my camera did. The letter is very obvious in the video. We take this as confirmation that it is indeed an S-class boat (in Russian the letter C is pronounced as an S).

Following some discussion and checking in some books, we decided that this sub could be any one of several—among them S2, S4, S6, S8 or S10. All of these were lost during the war in such a manner that one cannot be 100 percent sure of the exact location of the sinking. But which one was this sub? How do we figure this out?

Ever since the notorious submarine-intrusions during the 1980s, any news concerning Soviet subs have been front page news in Sweden. Somehow, the media found out that we were out diving

the wreck. Immediately upon our return, journalists started hounding Marcus and the others.

It is impossible to imagine what it is like to have information that the media wants. The group from Kalmar got a quick lesson. There was enormous pressure for them to release our findings. After a few days, the news was released, making the covers of several national newspapers and the national TV newscasts on three networks.

Another attempt ...

We returned on August 18th to dive the wreck of the sub again. This time, we had enlisted the help of a Russian dive buddy, Max Mikhaylov, to come with us to Öland. Normally, he is an IANTD instructor and, at the time, ran a dive center in the Maldives. But he just happened to be visiting us when we planned to dive the mystery submarine again.

For him, the coming dive would be a deeply personal quest. He served as a diver in the Soviet Red Banner Northern Fleet in the Kola Peninsula and his father was an officer in the Navy. He naturally felt connected to the crew of the sub and was committed to helping us identify her.

Baltic Wrecks

The purpose of the following dive was clear to all—to attempt to ascertain which submarine we had found and to gather information as to how

This sub could be any one of several—among them S2, S4, S6, S8 or S10. All of these were lost during the war in such a manner that one cannot be 100 percent sure of the exact location of the sinking. But which one was this sub? How do we figure this out?

she came to rest where she did. We decided to focus our work around the fin and the area around where she was broken in two. We would spend more time studying these

areas in detail to try to answer our questions.

Again, we were lucky, and arrived on the wreck at the fin—this time, just forward of it. We began the dive on the port side of the fin. Max swam around the fin and took in the scene of the wreck. Marcus and Johan inspected the compass hanging down from the wrecked side of the fin. In front of my camera, Johan began to clean and polish the letter C also hanging there. While filming, I look around and discover the brass number 8. After documenting this find, we again move forward and examine both sides of the break in the hull.

Mostly twisted metal, it is difficult to even imagine how it might have looked 50 years ago. After ten minutes, Max signals that his suit is leaking and that he is leaving us. When Johan and I leave the bow area and swim along the starboard side of the hull, we find another set of brass C and 8.



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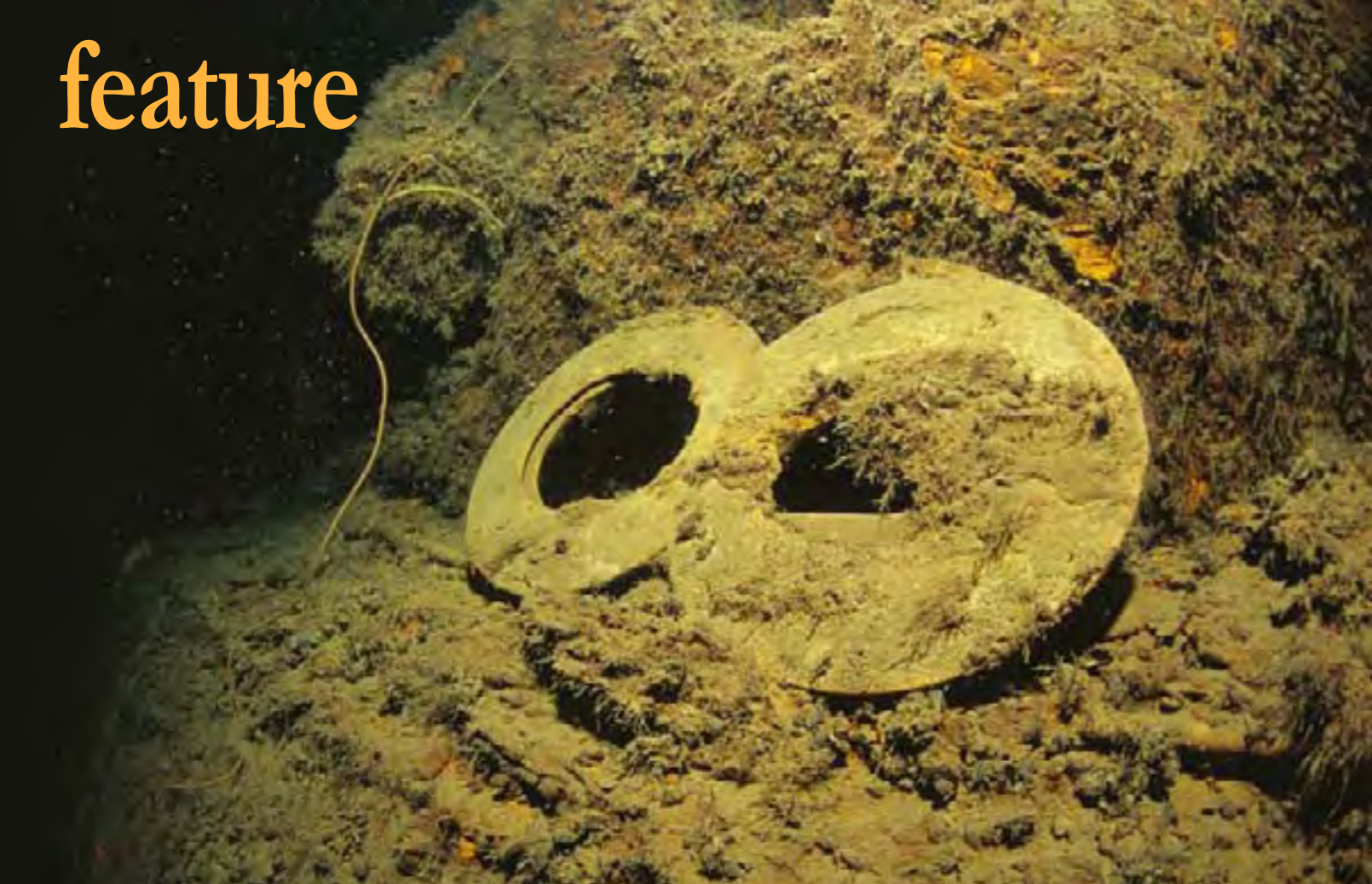
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The figure '8' of the brass identification plates for the S8

After examining the smaller 45mm gun, we again leave the wreck and begin our journey toward the surface.

A very content group returned to shore. After warming up the thoroughly frozen Max, we all shared our observations of the wreck. We had discovered further pieces of the puzzle that this wreck presented. We were all touched by the intense emotions felt by Max after having dived this wreck. The discussions on the way home mostly dwelt on this subject. We all considered what it really meant to dive on wrecks where people had perished.

Back ashore, Max called Alexander Nortchenko of the Russian Navy Submarine Veterans Association in St. Petersburg. He told him about our dive and

about the brass figures we had found. Nortchenko was very intrigued by this—he explained that it was a common practice to use brass figures during the 1930's, but that it was strictly prohibited from about 1940. He had no information of it occurring after this period. However, he did believe that some submarine-captains did use unique marks, such as the ones we had found on the S8, in order to raise the morale of the crews.

Max and Nortchenko agreed that the sub we had found was the S8, despite that it was found in an area other than where it had been reported sunk in 1941. It couldn't really be any other ship. Nortchenko did not believe any other submarine of the S-class had any reason to be in the area.

The S8 today

Today, the wreck of the S8 is a protected site. No diving, fishing, anchoring or any activity that might disturb this war grave is permitted by Swedish law. This is in accordance with the wishes of the Russian government, which takes a very active interest in these wrecks.

A memorial service similar to the one held at the site of S7 was held on the deck of a Russian Navy destroyer. In Russia, this issue is very emotional. The incredible losses sustained by the nation during WWII means that every family lost dear ones. Thus, the war is not just history, but something that is still very much kept alive.

With one exception, the wreck is exactly as she was when she was discovered on June 19. The

number 8 once again adorns the fin of the submarine, beside the letter C. No objects have been salvaged. All of us that in various ways have been involved in this project hope that she will remain intact.

Personally, I think Max described it best when he spoke of the S8 and her ill-fated crew: "The submarine was their home. They were proud of it. They worked with it, polished it and improved it. The vessel is still their home. When we dive we visit their home. You ask permission to visit—which I think they give, if they see that you just want to visit them and show your respect."

As to her demise, I believe it is more likely that the sub hit a mine. My hypothesis is that the S8 lost the use of her radio on October 11, but that Captain Braun decided to proceed with his mission despite this. His objective was to gain access to an area south of the island of Öland in order to hit the iron ore transports along the Swedish coast. In this area, there is no protective archipelago, and the transports are forced out into the open ocean. Braun, and the other three commanders in their group, had most likely divided their operational area between Norrköping and Öland into separate zones for each submarine, and that of S8 was the southernmost one. The open turret hatch would indicate that the S8 was on the surface at night, charging her batteries while carefully inching her way south.

During the summer of 1941, the German Navy had placed a number of mine lines between Klaipeda, Latvia, and the south-

The Project

Project leaders: Stefan Fransson, Mats Karlsson and Marcus Runeson.
Sidescan operator: Sture Hultqvist
Research: Björn Åkerlund
Divers: Marcus Runeson, Stefan Fransson, Lena Cloffe, Robert Westerberg, Johan Alexandersson, Jonas Dahm, Max Rite, Johan Candert and Carl Douglas.
Crew of KR71: Jimmy Johansson, Peo Johansson and David Mölleberg

Dive depth: 54m at the bottom, 49m at decklevel.
Dive times: 30 minutes bottom time; between 40 and 50 minutes decompression.
Bottom gas: Trimix 18/30 (18% O₂; 30% Helium)
Decompression gas: 50% Nitrox from 21m and 100% O₂ from 6m.

ern tip of Öland. Their objective was to prevent any Soviet naval units that might escape the battled fortress of Leningrad from reaching the southern Baltic.

The Germans wanted to protect the vital iron ore trade but also the training of their own submarine-crews. These mine lines started just outside the Swedish three-mile limit. Sweden also

placed mines in the area, stopping just inside the German mines. Captain Braun was most likely trying to exploit this gap between the German and Swedish mines.

We are unlikely to ever know for certain what exactly happened, but like other mysteries in the Baltic this does not prevent us from trying to solve the question. ■

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*Trading in treasures
from the past:
— The illicit recovery
and movement of artefacts
from shipwrecks*

Trading in Treasures

Text by Arnold Weisz
Photos courtesy of UNESCO,
Enrico Cappelletti and Peter Symes

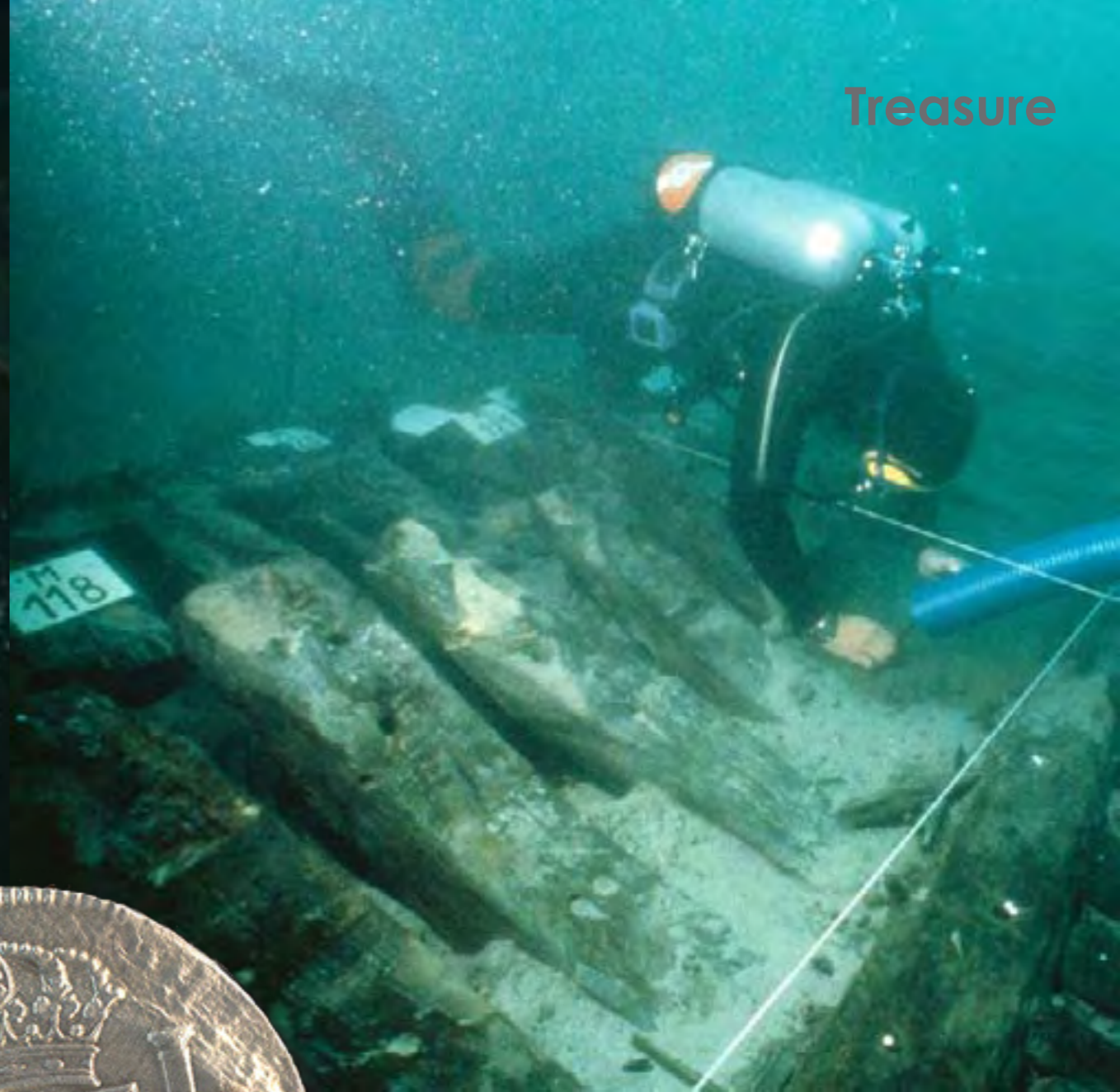
Today, some of the world's most important legacies of our sea-faring heritage are being looted for profit. With the technology that is available to divers today, more and more shipwrecks are becoming reachable. Not only to amateur divers, marine archaeologists, but also to treasure hunters.

Shipwrecks are cultural resources, but they also fall prey to trophy hunters and profiteers who trade in illegal historical artefacts. Looting of shipwrecks has existed as long as there has been sea transport. There is a market for illegal antiques retrieved from shipwrecks. Over the last 20 years, as the antiques market has exploded, looting has reached epidemic proportions, according to the Illicit Antiquities Research Centre in Cambridge, England.

This is happening all around the world.

Crude salvaging operations and delicate archeological excavations are not a good match





ROV's have reached further into the oceans than divers. The new technologies prove to be both a blessing and a curse for archeological artifacts resting on the bottom of the sea

A UNESCO report asserts that as early as 1974, studies showed all known wrecks off the Turkish coast had already been pilfered. Furthermore, it is estimated that at most of the approximately 600 antique wrecks, which are known to lay off the coast of France, only a mere five percent remains untouched.

Cultural heritage lost

Shipwrecks have always attracted sport divers. They are lured to wrecks by stories of silver coins, gold bars, Roman ampho-

rae, cannons and crates of Chinese porcelain. Many are genuinely interested in a ship's history and what led to its demise. Others are just interested in collecting brass objects, bells or other artefacts. This small scale retrieval of artefacts, sometimes done by sports divers, is having an impact on historical sites.

On the other hand, the organized looting of historical shipwrecks by treasure hunters is having a far more destructive impact than the removal of random artefacts. Looters or treasure hunters have no regard for the historical and cultural value of the artefacts they salvage. Neither do they have any respect for the potential benefit to the public.

The artefacts illegally retrieved from

shipwrecks are sold to private collectors and mostly disappear from the public view forever. Illegal treasure hunting on shipwrecks is not only dispersing historical artefacts into the homes of private collectors, but also wreaking havoc on the wrecks. Often, these treasure hunters destroy large parts of the wreck that hold no interest to them, but could prove to be invaluable to underwater archaeologists.

Deeper and deeper

The introduction of the underwater metal detector opened a new era for underwater treasure hunters. This, combined with ever improving equipment and diving techniques, has increased looting.

The last few years have seen an increase of sport divers being able to go deeper and deeper into the ocean. Diving that used to be restricted to professionals is now pursued by amateur

sport divers.

The equipment needed for dives down to 100 meters is readily available at an affordable price. Mixed gas diving is no longer a hazardous activity just done by offshore divers, but an intricate part of the sport diving community. Equipment used to search for wrecks like side-scan sonar's can be bought on the Internet.

Nobody should draw the conclusion that anyone entering the water in diving equipment armed with a metal detector is an looter. Around the world, the scuba diving community has been of great assistance to many archaeologists and museums. Many displays in museums and famous findings of great historical and cultural value can be seen by the public



PETER SYMES

Who wouldn't like to uncover treasure like this? Alas, even if you did, it wouldn't be yours to keep

antiques is very difficult, but tracking the legal trade is not that easy either. The disparity in how different countries regulate and classify their trade of antiques makes it hard to estimate even legal trading. According to estimates by various sources, there are some three million undiscovered shipwrecks scattered across the world's oceans. Even though the number of wrecks with a known position is far less, there are still enough wrecks to make this a big business. Some of the wrecks found over the last 30 years have unveiled enormous values.

"Treasure hunting is driven by commercial logic and not by the concern for increasing our knowledge of history," explains Mounir Bouchenaki, Assistant Director-General for Culture at UNESCO.

Odyssey Marine Exploration, one of the largest recovery companies in the world, announced in May, 2007, that they had recovered over 500,000 silver and gold coins from a shipwreck. The 17 tons of artefacts were recovered from a wreck whose name is kept secret, but code named "Black Swan".

The company states in a press release: "The work accomplished to date on this site has diligently followed archaeological protocols using advanced robotic technology, and the artifacts are now undergoing a meticulous conservation process by some of the world's most experienced coin conservators."

The company is in a legal battle with the Spanish Government over the finds. The dispute is a result from Spain's claim that it has a right to a share in a treasure

if it was recovered in territorial waters or is connected to the nation's heritage in any way.

UNESCO's website says that famous wrecks such as the *Geldermalsen*, the *Nuestra Señora de Atocha* and the *Tek Sing* have been destroyed by treasures hunters.

Michael Hatcher, made a profit of about US\$15 million from the sale of Chinese porcelain he found in the wreck of the Dutch ship *Geldermalsen*, which sank in the China Sea in 1752. Mike Hatcher and his Swiss partner, Max de Rham, discovered the wreck of *Geldermalsen* (or the Nanking cargo) in May, 1985, in the South China Sea.

Christie's, the world's biggest auction house, sold the pieces off for a while, but then quietly stopped, probably because of the controversy and legal problems raised. We asked the auction house how they make sure that all the items they auction through Christie's are legal.

"As a matter of policy, Christie's will not sell any lot that we know or have reason to believe is inauthentic, counterfeit, or illegally recovered. This applies to all property that we offer for sale around the world, from fine art to collectibles, from furniture to wine. We take all appropriate steps to establish authenticity and ownership, and work with the leading experts, authorities and institutions in the relevant field to research the property that we sell," said Maarten van Gijn in Christie's public relations and marketing department.

The auction house opted not to answer our questions regarding the sales of the Nanking cargo even if they have chosen to highlight this on their website: "Since it opened in 1973, Christie's Amsterdam has taken a strong lead in certain sale categories, notably sunken treasures recovered from shipwrecks... In 1986, Christie's Amsterdam sold the world-famous

Time capsules

The past is a part of the present and the future. Shipwrecks are time capsules that contain invaluable historical information. First of all, a shipwreck represents a moment of a bygone era. A shipwreck portrays life aboard the vessel, and how it unfolded on the ship until it sank. Artefacts and finds of human remains can tell untold stories about the people who worked and travelled on the ship. Besides the information directly linked to the ship, a wreck often holds a lot of unknown historical information about life at the time it existed. Random collecting and organized looting leaves irreparable damage to many historical shipwrecks.

Nanking Cargo—a trove of more than 150,000 pieces of 18th century Chinese porcelain and gold ingots—for more than 37 million guilders."

Legal protection

The legal protection of underwater cultural heritage sites such as shipwrecks, scales from non-existent to the highest standard. The disparity in the strengths of legislation between different countries on the protection of heritage sites leaves gaps in international law that enable treasure hunters to operate from a merely commercial perspective.

There have, however, been some significant steps forward taken in protecting our maritime past. It started in 1970 with UNESCO's Convention on the Means of Prohibiting and Preventing the Illicit Import, Export and Transfer of Ownership of Cultural Property. This

thanks to vigilant divers.

Archaeologists are much more concerned about the large scale commercial treasure hunters, who have done some spectacular and well publicised recovery operations over the years. Gold and silver coins and other valuable artefacts have always triggered the search for treasures under the sea.

The International Council on Monuments and Sites (ICOMOS) published their Global Report in 2000 where they pointed out that the threat of looting affects particularly underwater heritage sites as treasure hunting is facilitated by new technologies and markets. This problem is most likely due to insufficient international and national legislation protecting underwater heritage sites.

A billion dollar business

The international traffic in stolen, looted, and illegally exported art and antiquities rivals in monetary value the illegal trades in drugs or people. Trade in looted antiquities has been estimated to be in the billions of dollars.

Not only do the looters have new tools for their disposal, the traders and buyers of looted artefacts also have easy access to each other. The appearance of new ways of marketing and selling illicit cultural artefacts, such as mail-order catalogues and Internet auctions have made the access to markets a lot easier.

Internet sales in particular have opened the market to millions of potential new customers and are virtually impossible to police. Policing the traffic of

was the most important international convention dealing with the problem of the illicit movement of cultural heritage.

Continuing the work in 2001 came UNESCO's Convention on the Protection of the Underwater Cultural Heritage, which was adopted by the general conference in its 31st session. It aimed to encourage states to join the convention and raise public awareness of the need to protect underwater cultural heritage sites.

Of course, not all countries follow the rules laid out by these conventions. For example, during the period of 1993-95, the Portuguese legislation allowed for the sale of artefacts of archaeological excavations. Following this legislation, at least six international treasure hunting companies set up operations in Portugal to exploit the rich underwater cultural heritage found off its coasts. The legislation was finally frozen in 1995 and repealed in 1997, allowing for a revival of scientific underwater archaeology in Portugal.

A report from the Swedish National Council for Crime Prevention states that "trade between EU member states is

Nice mementos from a good dive. But can you keep it? It all depends. In some countries, you can apply for a permit

not subject to regular customs checks. The focus has now been shifted to goods that enter the EU from third countries. The risk of being discovered for illegally moving stolen goods within the EU is minimal. In addition, individual customs officer's knowledge of cultural objects is restricted to customs controls. Much greater expertise is needed to suspect the illegal movement or import of cultural objects."

Prosecution

Many countries have started protecting their underwater cultural heritage, through lawmaking. Many countries have laws protecting shipwrecks and regulating the ownership of shipwrecks.

On the other hand, laws alone will not render the protection of shipwrecks. It

will take many more steps in action to accomplish this.

Investigating and prosecuting looters and illegal sales of artefacts from shipwrecks is an important way to address the problem. Police forces around the world often have limited resources and have to give priority to crimes that have a more visible impact on society. Thefts of cultural objects are therefore most often regarded as a marginal problem by the police compared to other areas.

Stolen object registers are not always suitable for cultural objects. Even though there are attempts to coordinate the efforts across borders in investigating illicit movement of historical arte-

PETER SYMES



Jewellery recovered from the Italian wreck *Polluce*

facts, different practises often prevent investigations from being done efficiently.

Sweden, for example, no photographs of the objects in the stolen goods register, which makes identification difficult. Photos are included in Danish police registers, but police working methods can cause problems. Not all objects are registered nationally and may require searches via local websites.

We asked Pål Nymo, who is a researcher at the Norwegian Maritime Museum in Oslo, if Norway has good enough protection of its underwater heritage. "Not at all," he said, "The legal framework, control of diving operations and the control of export of items recovered is far too inadequate."

Treasure



In recent years, there really have not been any large scale recovery operations of artefacts from any commercial operations in Norway. And according to Nymo, looting done by amateur divers or collectors is not a great concern.

"They are a minority amongst the diving community here, but even they can inflict great damage on wreck locations. On the other hand, by far the worst offenders are the authorities, like the Norwegian Coastal Administration and the oil companies," said Nymo.

Nymo raises an important red flag here. It is not only treasure hunters and mindless collectors who destroy shipwrecks or archaeological sites under water. Around the world, people and machines are taking a toll on such sites, as they work on their building projects.

One of the main responsibilities of the Norwegian Coastal Administration is improving coastal channels and constructing and maintaining fishing ports. This kind of activity often compromises archaeological findings under the sea.

The real culprits

Who are the real culprits? The looters, the traders or the collectors? The legal issues are complex, as countries take different approaches to such issues as the private ownership of ancient cultural artefacts and the equation of illegal export with theft. The looting of cultural material will only stop when collectors, museums and dealers refuse to buy unprovenanced objects.

There is an increasing number of reports that the illicit trade of artefacts and antiques is linked to organised crime. A constantly increasing private demand for archaeological goods, the lack of scruples by people connected with the illegal trade of the objects, and the increasing involvement of international organised crime, have over the past few years given the market for artifacts and objects of art a new and extremely worrisome dimension and character. Archaeological objects and works of art are ideal for money laundering because they are fungible and easy to sell. ■

PETER SYMES



Dutch porcelain retrieved by sports divers in the Baltic



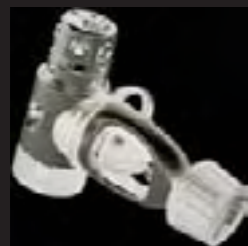
silver



www.seacam.com

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POINT & CLICK
ON BOLD LINKS



Edited by
Arnold Weisz

Equipment

Gee Whiz



Diversitea Diversifies

After two years of development, Diversitea is releasing a new (and different) product line! Crystal Dolphin Bath Salts and Bath Tea are infused with Crystal and Reiki energy, then essential oils are added, which make them a unique bathing experience. Everyone who has tried them agrees that they are different from any bath product they have ever experienced. They can also be safely used in a Spa or Hot Tub. www.diversitea.com

SV1 and SV2 Snorkels

The SV1 and SV2 streamlined snorkels are made as effective alternatives to regular snorkels on the market. Both SV1 and SV2 models are designed to make the snorkel self-draining and deliver effortless clearing. This design includes one-way valves that channel the water away from the mouthpiece allowing the user maximum comfort. The SV2 is designed with a semi-dry top with horizontal vents to defuse splashed water before it enters the barrel. Both designs feature a quick-disconnect keeper that allows 30 degree rotation, and a dial silicone mouthpiece, the same that is used with the company's regulators. www.atomicaquatics.com/snorkel.html



Hand warmers

With a snap of the fingers, can be used to provide warmth during or after a dive. The Lava Pad is filled with a safe, non-toxic liquid. The Lava Pad is also available in smaller rectangular pads. To activate, snap the small metal disc inside causing the liquid



to change. The Lava Pad instantly heats, up to 130 °F / 54 °C, with no outside power source. The Lava Pad can be used over and over again simply by boiling it in water until the contents change back to liquid form. www.lavapads.com

Fusion Tech

Whites now has a 1 mm neoprene skin available. This new Tech skin has a combination of 1 mm neoprene and lycra panels to ensure mobility is not compromised by the increased durability of neoprene. They have also added stylish new graphics to this skin to add fashion to diving. For those that already own a Fusion drysuit, the lycra skin can easily be removed and replaced with the new tech skin. The Fusion drysuit will be sold with the lycra skin, and the tech skin will be sold as a separate item. www.whitesdiving.com



Cressi Ellipse Steel / MC 5

The new regulator combining the Ellipse second stage with the brand new MC5 diaphragm first stage. According to Cressi, the performance of this regulator has been improved by a special assistance chamber that triggers off a strong Venturi effect between the central diffuser and the intermediate pressure outlets. The Ellipse is a light regulator, which has a weight—including the MC5 second stage and the yoke—of just 550 g. www.cressi.it



Shark Radio

The radio shark connects to and is powered by USB. It can record any AM or FM radio broadcast in real time. The fin-shaped device acts as an antenna and can be positioned for best reception and recording. Any recorded broadcast can be transferred to an iPod or any other AIFF-compatible digital music player to replay on the go. The radio SHARK is shark and PC compatible. www.griffintechology.com





Poseidon

The new Flexisuit from Poseidon combines the flexibility, weight and manouverability of a wet suit with the insulation of the dry suit. The suit is equipped with Kevlar reinforced socks with a thin and strong sole. The suit has a front zip. The sealing in neck and wrists are made of a special soft, stretchy neoprene. A range of accessories are available to fit the Flexisuit such as a rock boot, a hood and several types of gloves. www2.poseidon.se

Immersion challenger

The Challenger dive watch has both an analog and a digital module, which enables the wearer to track the actual depth and temperature during their dive. The inbuilt memory tracks the maximum and minimum depths recorded as well as the maximum and minimum temperatures recorded during the dive as part of a 50-diver log memory system. The Challenger is also programmed to make real time calculations to activate a rapid ascent alarm. In poorer lighting conditions, their so-called all-day-glow lithium crystal display gives contrast and visibility, while an electro luminescent back light is also available and activated underwater via a tilt of the wrist for ease of use during dive mode. www.immersion.it



Scubapro Bella BCD

Scubapro is introducing the Bella buoyancy compensator, specifically designed for female divers. The new Bella was developed around Scubapro's brand new wrap-around air bladder. The new full-wrap bladder retains its 360 degree cradle-like shape even when fully inflated. The result is a buoyancy compensator that actually "hugs" the diver throughout the full range of inflation. Additional Bella features include: contoured hip indents, cushioned shoulders, 3-dump deflation system, soft neoprene neck and padded backpack, fully-adjustable cummerbund, zippered cargo pockets, accessory D-rings and quick-release integrated weight system, with ergonomically-sized weight release clips. Bella is available with choice of balanced power inflator or AIR2 Alternate Inflator Regulator. www.scubapro.com



Test RescueEAN



Matches, safety pins, zippers and pencils. Some ideas are blindingly obvious in hindsight after they have been thought out. The RescueEan pod is one such invention. It is a low-tech and easy-to-use gadget that enables divers to administer nitrox or oxygen from a scuba tank to a dive patient via a face mask. The kit is meant to fill a gap between what is the best solution—a real oxygen rescue kit, which is often not available right on the spot when and where an accident occurs—and administering basic first aid by making most of what is quite often at hand: tanks with nitrox. You simply connect one end of the pod to a low pressure inflator hose—it comes with a standard connector—such as your BCD or drysuit inflator hose and the other end to the mask and your all set. As easy as that. Twist the pod to control the gas flow rate. The little bright orange pod can easily be worn on a belt or clipped onto a BCD.

What I liked about the unit was that I was able to operate it with gloves

on—and probably with stiff cold hands, too. It says on the package that it is "a lifesaving aid for *qualified divers*", and there is a cautionary note in the instruction leaflet that it is only to be used by persons who have received adequate training from qualified medical personnel. I think that is nonsense and probably just a legal precaution aimed at the litigious US market. The unit is so straight forward to use, and if someone is about to die or get injured, try and save him by all means. You can only make the situation better. The RescueEan pod is not a replacement for a real oxygen kit and can't substitute proper training, but it is a piece of very useful equipment that you can bring with you on your dive and possibly buy you very valuable minutes until professional medical attention can be provided. It is a cheap insurance. I would not be too surprised if the characteristic orange canister became a common sight on dive boats around the world. I've got one in my kit bag already. www.rescuean.com

pearls of the
mediterranean

Calella

*Diving the Wild Coast
of Spain*



Text by Harald Apelt
Photos by Wolfgang Pölzer and Peter Sutter

WOLFGANG PÖLZER



pearls of the mediterranean

CALELLA DE PALAFRUGELL, COSTA BRAVA, SPAIN

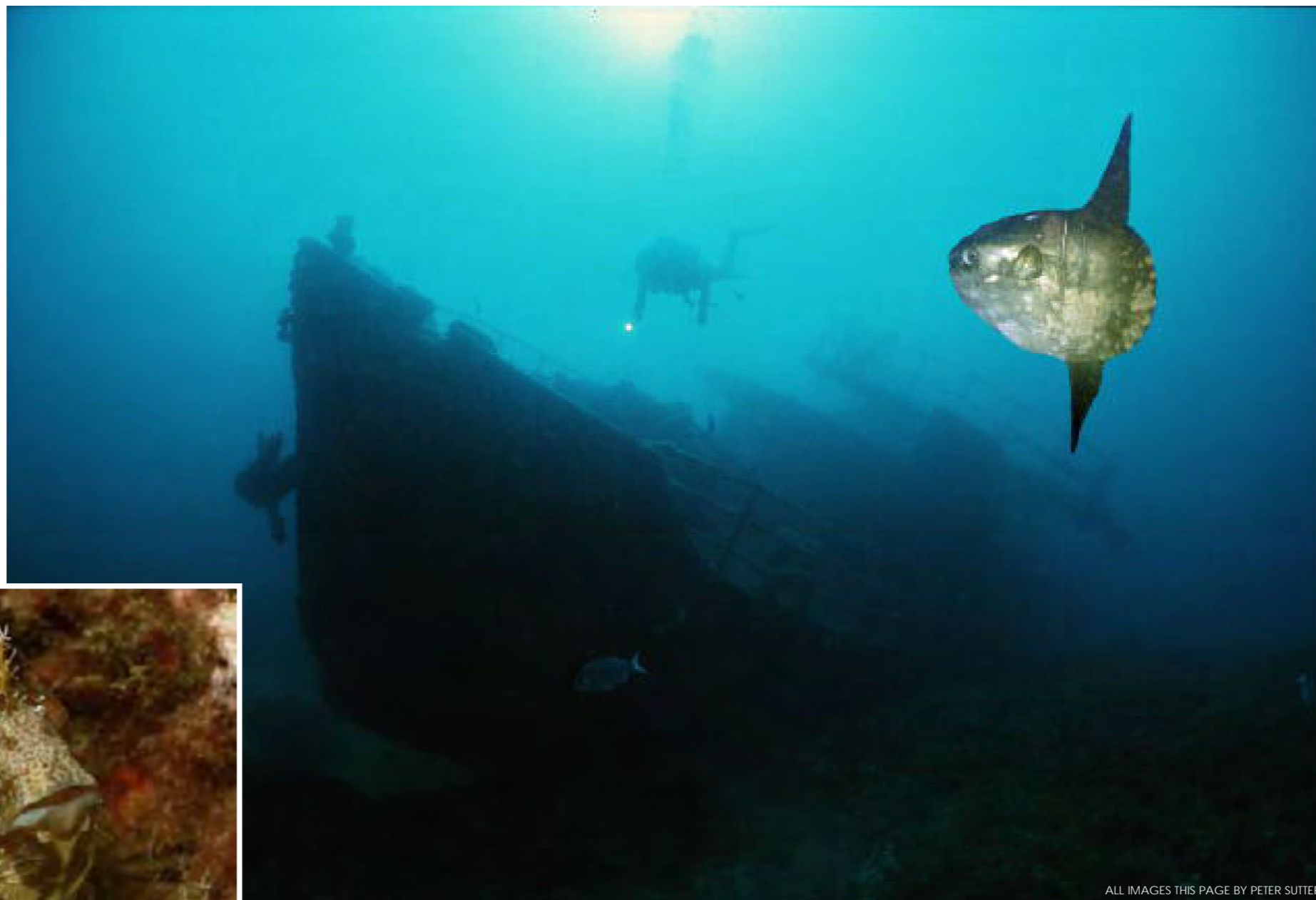
The Costa Brava is called “The wild coast”. And indeed the sea can turn out to be quite rude sometimes up here in the northern part of Spain close to the French frontier. This part of Spain called Catalonia is one of the most frequented European tourism destinations. And it is unusual that in this part of the Mediterranean some little hidden pearls have kept their picturesque qualities. One of these pearls is Calella de Palafrugell. Let’s take a look at this nice place and its fantastic dive sites.

In its former years, Calella de Palafrugell was a little fishing port, which led a hidden life far away from the big Spanish metropolis of Barcelona. It was the home of Spanish fishermen who sold their catch in the market halls of Palafrugell, a small city in

the back country of Calella de Palafrugell. The inhabitants of Calella are proud to be the Calella of Palafrugell, because 60 kilometres north of this little Costa Brava pearl, you will find another Calella—Calella de la Costa, a city that is like a tourism

bunker with big apartment houses and all the trappings of mass tourism.

Let’s take a closer look at the smaller one, which has developed more slowly as a tourist destination. Here, one will look in vain for big apartment



PREVIOUS PAGE: Beach life at Calella de Palafrugell, Costa Brava, Spain. INSET: Soft corals of the reef
LEFT: Blenny peaks out of its shelter

ABOVE: Big sunfish patrols a wreck at Calella
COLUMN OF IMAGES: Scenes from the reef and the wrecks at Calella

ALL IMAGES THIS PAGE BY PETER SUTTER

pearls of the mediterranean



bays separated from each other by rocks make up its frontline to the sea, and they make a perfect frame for relaxing, swimming and diving at Costa Brava. In one of these bays, called Port Pellegri, the Poseidon Dive

houses, huge hotels with hundreds of beds and the typical tourism machinery that is often found in so many other destinations. Its close proximity to the sea and its historical connection creates the atmosphere of Calella de Palafrugell. Although this little location is right on the ocean, it has no port. Five little



have created an international team that is ready to show you the loveliest dive sites in the whole of the Mediterranean.



Center has stood here for nearly 40 years now. The German founder, Horst Lindner, and his Russian wife, Tina,

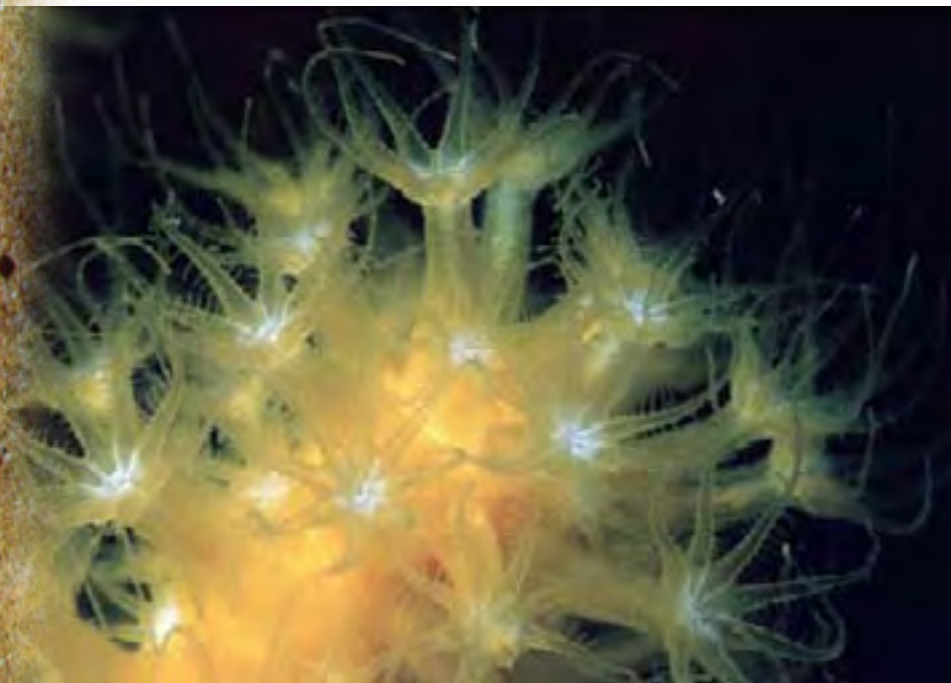
It's a rare mixture of good climate, nice back country with a lot of things to be discovered, and an awesome seaside with deep blue-green water and more than ten absolutely perfect dive spots. Poseidon Calella owns a dive boat, *Poseidon*, with has space for 20 divers, who can board the vessel right on



THIS PAGE: Samples of sealife in the colorful underwater realm of the waters around Calella—reef fish, soft corals, tunicates, anemones and spotted flatfish



ALL IMAGES THIS PAGE BY PETER SUTTER



the beach. The diving center is placed in one of the old stock rooms where, in former times, the Calella fishermen placed their equipment, nets and boats during the winter months. That's why it is not much more than 20 steps from the dive center to reach the *Poseidon* to start the dive trip. Normally, two dive trips are planned each day. The dive sites are near Port Pellegri

and can be reached within a few minutes. One of the most frequented and preferred dive spots at Costa Brava is not much more than 1000 meters away, directly in front of Port Pellegri Bay: the Outer Reef 1. It is formed like a cone, starting at 6 meters of depth and falling down to 44 meters. The northern side of this reef is an explosion of colours and displays the best the Mediterranean Sea is able to offer. Colour changing gorgonias, overhangs, and crevices, are the

pearls of the mediterranean



Calella

home of nearly all kinds of marine life. This spot is a highlight for everyone, because at each depth, there are fantastic views, and even beginners won't have a chance to lose their direction. Wherever you hang out at the reef, swimming upwards leads you automatically back to the buoy and the dive boat.

Another spot you should visit while diving with Poseidon Calella is the wreck of the *Boreas*. It's nothing spectacular, but still a nice WWII tugboat to view. Built by the Germans, it had a colorful life. It is amazing that it did not find the same end as so many other German warships.

It was built in 1938 in Königsberg as *Pellworm* and worked in the second world war as a supply ship for the German battleship, *Tirpitz*. The *Tirpitz* was sunk on November, 12, 1944, in Norway by Allied air raids. The supply ship "*Pellworm*" survived the war and was later used as a mine seeker and training ship for the German



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Delicate floating jellyfish grace the seas around Calella. Be wary of their tendrils

Navy. In 1976, the *Pellworm* was retired from Navy duty and was sold.

The ship had several owners in the following years. The last one being of questionable business. The ship—now called *Boreas* and sailing under the Panamanian flag—was boarded by Spanish Navy patrols in 1986 and discovered to be transporting illegal drugs. The vessel was confiscated at Costa Brava harbour Palamos and stayed there for three years. Nobody wanted to own this old veteran

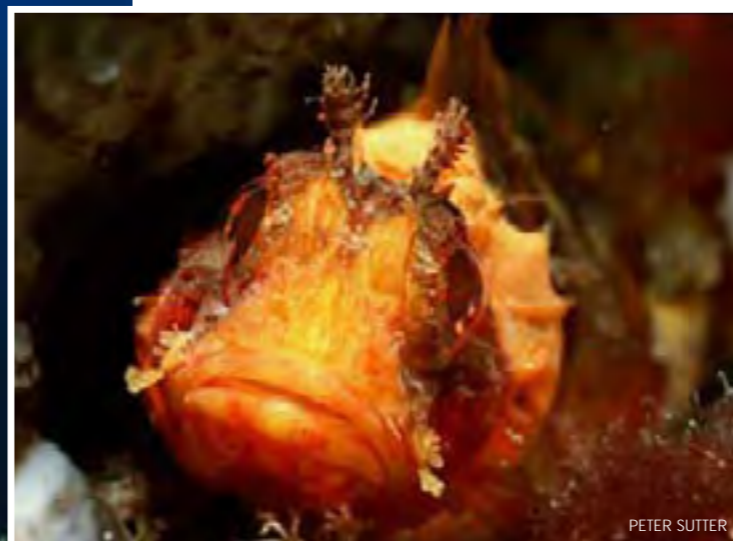
and take the costs of its nefarious affairs. Finally, the diving centers of Palamos came to an agreement with the authorities to prepare the *Boreas* as dive wreck or artificial reef. It was finally plunged to a depth of 600 meters, outside of the port entry of Palamos.

Although the wreck has been damaged more and more by the tough

Costa Brava winter storms, it still offers quite a spectacle when one dives the engine room and the hold of the *Boreas*. It is lying upside down on the sea bottom. The propeller can be found at a depth 32 metres.

Besides the good diving, Calella has some really nice alley ways to be explored as well as a good amount of bars and restaurants. As in most Mediterranean regions, Costa Brava has some months during the year in which you are better off avoiding the coastline. These are from July up to mid-September during the school holidays and the main travel season when Calella de Palafrugell is overcrowded. The crowds cause an uncomfortable atmosphere that nobody really wants.

Aside from this time period, you won't find many nicer places to spend the holidays—especially if a car is available. There are so many nice places to discover in the back country.



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LEFT: Diver explores wall of climbing corals. INSET: Brightly colored fish hide in the reef

WOLFGANG POLZER

pearls of the mediterranean

Calella



Divers have easy access to the dive boat a few paces from the dive center on the beach



THIS PAGE: Scenes of sealife on the reefs around Calella—soft corals, gorgonians, anemones, decorator crabs, spiny urchins. BOTTOM RIGHT: The picturesque coastline of Calella



ALL IMAGES THIS PAGE BY PETER SUTTER

Anyone who is interested in historical places should visit Pals. This little village is situated around a little hill. Half a century ago, Pals was nearly dead. It was a village with only a few old inhabitants and no attractions except its history and no future. Employment was only found on the coastline in the tourism business. That's why more and more people, especially the young ones, followed the money and decided to leave their sleepy home towns.

Pals was rediscovered in during

this period by some traditional artisans such as painters, ceramicists and wrought-iron craftsmen. They renovated the old houses, closed the village for any motorised traffic, and Pals was born a second time. Nowadays, Pals is the village that is frequented by thousands of tourists who seek the atmosphere of medieval times.

Numerous tourist busses shuffle



in the masses during the main season. So much so that some Pals' people are asking themselves whether or not this change of character was really a big step forward.

If you are interested in the counterpart of Pals, you should visit Peratallada. It is just a 20 minute ride by car from Calella. Here, you will discover the unadorned, historical atmosphere of

an old Catalan village. The old women still meet to exchange news at the well while washing their laundry. Historical restaurants offer typical Catalan cuisine. There are so many things to see and do all around the historical city wall, that one really is surprised that something like Peratallada still exists.

Of course, you should take the opportunity to visit the museum of Salvador Dali in Figueres, and the



Large gaping groupers and delicate Christmas tree worms make their homes on the reef



pearls of the mediterranean

Calella



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Romantic evenings in Calella see soft light reflected off the waves along the seashore, which is dotted with a choice of restaurants and cafes

INSET MACRO IMAGES THIS PAGE: Brightly colored nudibranchs and spirals of nudibranch eggs decorate the reef



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capital of Catalonia, Barcelona, is just about 100 kilometers away from Calella and can be reached within one hour of driving time on a perfect highway.

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The amount of all these great activities that surround one's diving trips makes

Calella de Palafrugell a real pearl of the Mediterranean. But it is not the last and only one. Our next issue will take you to Croatia, to visit the island of Vis and its lovely hidden places. ■



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fact file



SOURCE: HARALD APELT, CIA WORLD FACT BOOK

Calella de Palafrugell, Spain



History The powerful world empire of Spain in the 16th and 17th centuries saw the nation take command of the seas to England. However, Spain failed to embrace the industrial and mercantile revolutions, which caused the it to fall behind Britain, Germany and France in political and economic power. During the two world wars, Spain remained neutral, but suffered devastating during its own civil war from 1936 to 1939. After the death of dictator Francisco Franco in 1975, there was a peaceful transition to democracy. In 1986, Spain joined the EU. Rapid economic modernization has given Spain one of the most dynamic economies in Europe. It has become a global champion of freedom. However, challenges including Basque Fatherland and Liberty (ETA) terrorism, illegal immigration, and slowing economic growth continue to hamper the government. Government: parliamentary monarchy. Capital: Madrid

Geography Spain is located in southwestern Europe. It borders the North Atlantic Ocean, the Mediterranean Sea, Bay of Biscay, and the Pyrenees Mountains in the southwest of France. Coastline: 4,964 km. Terrain: large, flat to divided plateau surrounded by rugged hills and the Pyrenees to the north. Lowest point: Atlantic Ocean 0 m. Highest

point: Pico de Teide (Tenerife) on Canary Islands 3,718 m. Spain holds a strategic location along approaches to the Strait of Gibraltar. Calella de Palafrugell is situated in the northeast of Spain, just 80 kilometres south of the French frontier and lies in the centre of Costa Brava. The capital of this region is Girona, an old city whose old medieval center is worth visiting. Costa Brava starts in the north end at the French border at Port Bou and ends down at Barcelona in the south, the capital of Catalonia.

Environmental issues

Deforestation and desertification; air pollution; water quantity and quality nationwide; pollution of the Mediterranean Sea from effluents from the offshore production of oil and gas and raw sewage.

Climate Costa Brava is not an all year round destination. Although it has the mild Mediterranean climate, the cosy times start in the beginning of May. The season finishes at the end of October. Sometimes, the "Tramuntana" brings windy or even stormy days. That's why you should bring along a pullover and a windbreaker especially early in the season. April and May normally are good months for diving. During the main season in July and August, the diving centers are empty, but the beaches are

overcrowded. And another reason not to go there in these months: All the bays look like parking lots at a football stadium because they are occupied by hundreds of sport boats that bob up and down at their buoys in the water. There's no space for swimming.

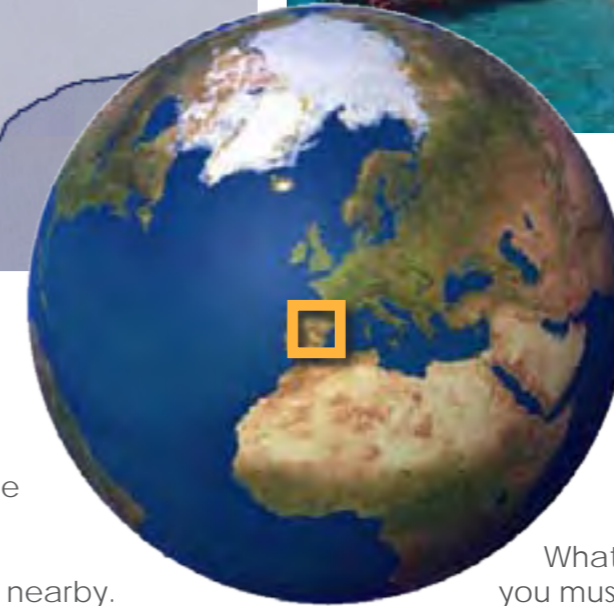
Currency Euro. Exchange rates: 1 EUR = 1.48 USD, .74 GBP, 158.13 JPY, 1.47 CAD, 1.66 AUD, 2.09 SGD

Population 40,448,191 (July 2007 est.) Ethnic groups: composed of Mediterranean and Nordic types. Religions: Roman Catholic 94%, other religions 6%. Internet users: 18.578 million (2006)

Language The official language is Castilian Spanish, 74%. Catalan 17%, Galician 7%, Basque 2%, are official on a regional basis.

Visas & Permits All members of Schengen countries of the European community need only a valid identity card. Visitors from all other countries need a passport and a classic visa.

Travel How to reach it by car: Get on the highway "Autopista del Mediterrani" leaving Girona-



By plane: Two airports are nearby. Girona airport is only served by some carriers (such as RyanAir). From Girona airport, a bus shuttle connects to the coast. Barcelona International Airport is about 100 kilometers away from Calella de Palafrugell. The bus ride from Barcelona (Estació del Nord) to Palafrugell takes 2 hours, price 15 €. More information and timetables are available at www.sarfa.com.

By car: The best way to reach destinations and have mobility during the visit is to rent a car, which you can get with really good deals at the airport in Barcelona (for example, one week in May starts from 119 €; A mid-class car or Peugeot 100 starts at 159.50 € incl. insurance and unlimited kilometers for seven days at www.carbookers.com).



The dive shop is just a few steps away from the dive boat

national parl of Cape de Creus. (www.ullaundpaul.de). On the way back to Calrella, you should visit the Dalí museum in Figueres, Dalí's home town. The museum is located in an old theatre, and it was here that the first works of the famous painter were shown to the public. In 1960, Dalí himself restored the building, which was bombed during the Spanish civil war, and opened its doors for the public in 1974. After his death on January 23, 1989, in Girona, he was buried in his home town of Figueres in the crypt of this museum.

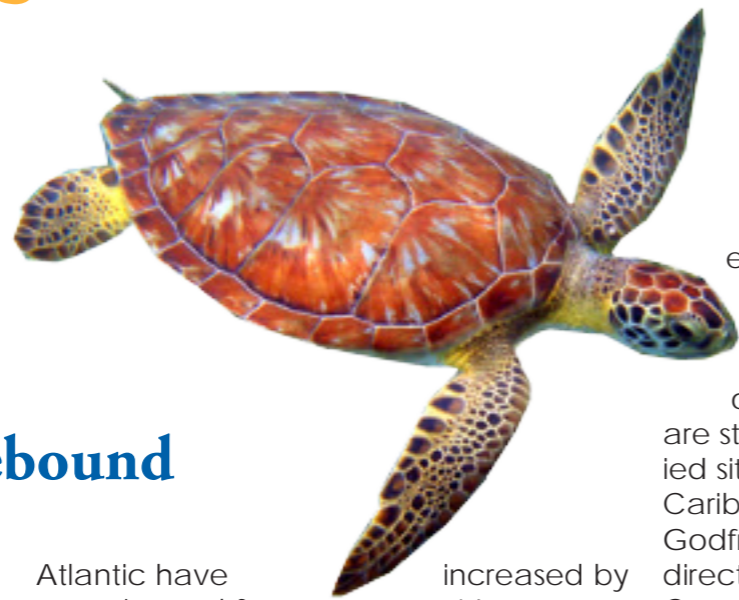
La Bisbal is a city you will pass on your way to Calella, and you will at once be caught by its unique presentation of artworks, which are widely produced here. From the moment you reach the first house on the main road through the town, you will recognise that La Bisbal is one of the biggest pottery centers in Catalonia. Thousands of pottery products and ceramic artworks are displayed right on the main road. It is an invitation to stop and have a closer look at the ceramic shops in the town. ■

WOLFGANG PÖLZER

turtle tales



Edited by Peter Symes



Green turtles on the rebound

Encouraging news has emerged for one of the world's largest marine herbivores, the green turtle. A new study shows that long-term protection of the sea turtles' nesting beaches is successful in achieving increases in the green turtle populations.

The authors of an article recently published in *Global Ecology and Biogeography*, who research green turtles in Australia, Costa Rica, Japan, and the United States, have found that green turtle nesting on four beaches in the Pacific and two beaches in the

Atlantic have increased by an estimated four to 14 percent each year over the past two to three decades. The increases in nesting varied considerably among the rookeries, most likely because historical and current exploitation of green turtles is different at each site.

"These results should be celebrated," said Milani Chaloupka, lead author of the report and vice chair of IUCN's Marine Turtle Specialist Group. "They demonstrate that green turtle populations and presumably the green turtles'

ecosystem roles can be recovered in spite of drastic population declines in the past."

Despite this good news, hunting of turtles and poaching of eggs are still problems in some of the studied sites, including Tortuguero on the Caribbean coast of Costa Rica. David Godfrey, MTSG member and executive director of the Caribbean Conservation Corporation, commented, "In Tortuguero, the recovering green turtle population attracts millions of dollars in tourism revenue each year for the local community as tourists come to watch the turtles lay their eggs. Unfortunately, these same turtles are still hunted by the thousands when they swim to Nicaraguan waters in search of seagrass, so conservation efforts must continue." ■

Leatherback crosses the Pacific, sets new record

A leatherback sea turtle has been tracked by satellite swimming 20,558 kilometers (12,774 miles) across the Pacific Ocean.

Using satellite technology and transmitters that were attached to nesting

females using a backpack-like harness, nine leatherback turtles from a previously unstudied population nesting on the beaches of Jamursba-Medi in the Indonesian province of Papua were tracked by satellite. The transponders sent signals to satellites every two days, allowing the scientists to record diving

behavior, sea temperatures, and high-resolution geographic positions. During 647 days of swimming, one turtle was tracked swimming across the Pacific Ocean where it, after 647 days, reached the cool waters of the Pacific Northwest—where a feast of jellyfish awaited. This first record of a trans-Pacific migration by a leatherback is the longest recorded migration of any sea vertebrate. It was also recorded that some of the turtle's dives took it down as far as 1000 meters into the cold darkness below the ocean surface. ■



Bali: Leatherback Turtle rescued by Heinz von Holzen Team

During our daily visits to the fish market in Jimbaran, we witnessed once again the brutal capture of an ancient leatherback turtle that was caught a few hours earlier around the cliffs of Uluwatu. Fortunately for the turtle, their flesh is regarded as not very tasty, and most likely, for this fact, we were able to purchase the turtle from the fisherman. We then had to wait for a few hours for the tide to rise before we were able to release the, by then, totally exhausted lonely wanderer of the deep, back to his very endangered and fragile home.

It took not less than ten of our stronger employees to carry this poor creature back to the ocean.

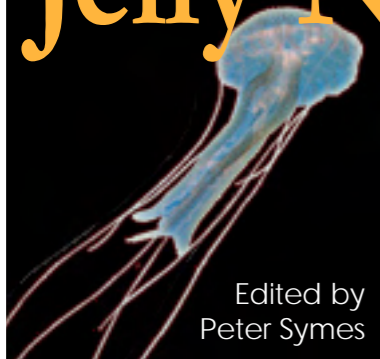
It was for me, personally, the first time to be face to face with a

leatherback turtle. Looking into the eyes that must have been a tenth of the size of a human eye, together with the sad look of the turtle with streams of tears running down the face, made me suddenly realize what we humans have done to planet Earth during our very short visit.

At the same time, I realized that over the passed ten years since we were actively involved in protecting sea turtles here in Bali, we actually have made a significant contribution in the dramatic slow down of the turtle trade. With this in mind, I would encourage everyone to assist nature to make certain that our children will have the same chance as we still have in living and experiencing our magnificent planet in its fullest beauty. ■

—Hein von Holzen





Edited by
Peter Symes

New guidelines on jellyfish sting treatment wanted

A recent study, published in *Emergency Medicine Australasia*, has found people are unsure whether to apply ice or hot water, while some use over-the-counter creams. Current guidelines from the Australian Resuscitation Council recommend ice for tropical and non-tropical stings and hot water for blue bottle stings.

Dr Mark Little says the guidelines need to be reviewed. "I think that first aid for jellyfish stings needs to be a lot more simple, and those of us that do research, we're going to need to do more research to clarify.

"At the moment, heat certainly has more evidence than ice, and I think heat would be more effective at relieving the pain of a jellyfish sting." ■



Pretty but painful

Jellyfish infestations are on the increase

Last year, the mauve stinger, a lovely-looking jellyfish from the sub-tropical waters of the Mediterranean, suddenly turned up in the Irish Sea exploding into an infestation that covered 26 square kilometres to a depth of 10 metres wiping out Northern Ireland's fledgling salmon aquaculture industry in a matter of days. A week later, a similar mass, this time both mauve stingers and the indigenous compass jellyfish, threatened the Scottish coast. This might be dismissed as one of those anomalies that news agencies move on slow days under the heading "oddities" except that there was nothing odd about it. In the Mediterranean, increasing jellyfish swarms have been playing havoc with summer vacationers on the Mediterranean coasts,

threatening billions in tourism revenue. In 2006, they washed up on the beaches from Costa Brava to the Cote

d'Azur by the tens of millions causing 70,000 beachgoers to seek medical treatment for painful stings and allergic reactions, while clean-up crews struggled to dispose of tonnes of rotting creatures. Off the coast of Africa, a sudden jellyfish infestation near Namibia has ballooned to three times the biomass of the entire resident fish population. And the commercial fishing industry in Japan has been plagued by repeated outbreaks of monster jellyfish that grow to two metres in diameter.

Why?

What's triggering the infestations isn't clear. While historic records show they are not a new phenomenon, it is clear that the frequency and magnitude appears to be increasing.

Population explosions may be triggered by pollutants, which provide higher concentrations of nutrients. Over-harvesting jellyfish predators, like tuna and sea turtles, may also upset the natural regulation. It has also been suggested that rising ocean temperatures and changed currents are to blame for both providing optimal breeding conditions and for moving populations to new territory.

Most likely it's the convergence of all these circumstances, as happened in the Black Sea, where an introduced jellyfish coincided with over-fishing at the top of the food chain and nutrient pollution. This one species came to represent 90 percent of the total marine biomass there. ■



Jelly-fish 45, designed by Giancarlo Zema is a floating dwelling unit for up to six persons. It's spacious dimensions are 10 metres high with a diameter of over 15 metres allows the sea dwelling owners to live either above or below sea level in perfect harmony with the ocean environment.

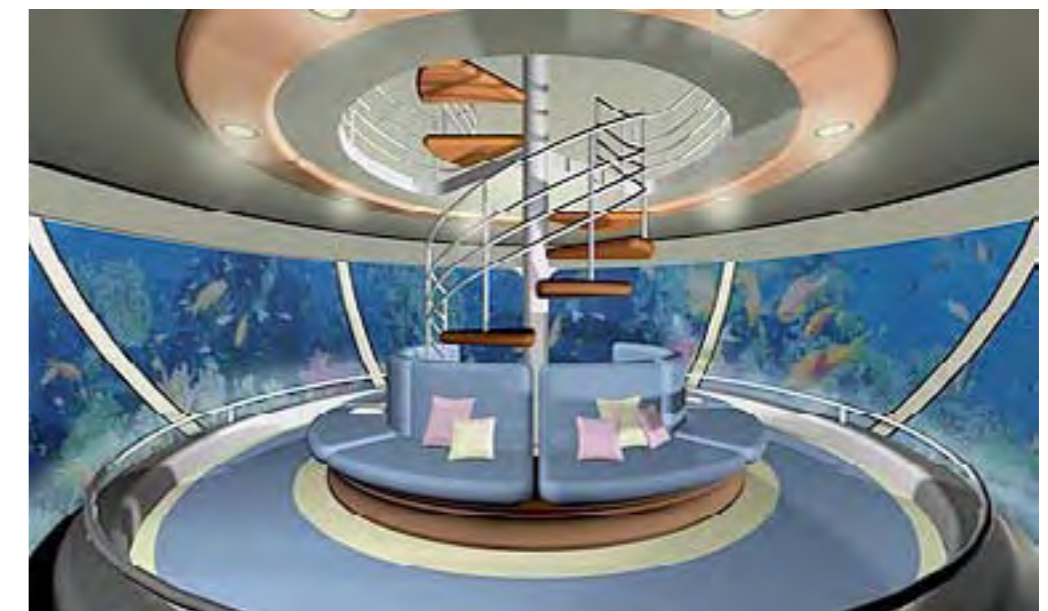
It consists of five levels connected by a spiral staircase. The top level

is 5.6 metres above the sea level and has been kept for study rooms.

The next lower level is situated at 3.5 metres above the sea level and contains the night time zone while the next lower level at 1.4 metres contains the daytime zone with a kitchen and bathrooms. The lowest living level at 0.8 metres above the sea level is

semi-submerged and has been kept for the guest room, bathroom and technical spaces. The acrylic viewport globe is situated at three metres below sea level.

The main carrying structural component of the Jelly-fish 45 is entirely constructed from plastic reinforced by incorporated fiberglass while the submarine globe is made from acrylic with a high compressive resistance. ■





Comb jellies are now breeding in Danish waters

It is tiny, only about an inch and transparent. Aside from the cold, it has no enemies in Danish waters, and the sheer numbers of them now threatens the fragile cod stocks

Baltic sea invaded by comb jellies

German and Danish researchers have found evidence that the warty comb jellyfish may be threatening the cod stocks in the Baltic Sea.

The jellyfish, which is indigenous to the North American East coast, is likely to have been introduced into the Baltic Sea by shipping traffic, and feeds on zooplankton (as do the fish) as well as fish larvae and eggs.

Mnemiopsis leidyi has spread further and further since it was first discovered in the Black Sea in the 1980s. From there, it advanced into the Azov Sea, the Marama Sea, the Mediterranean and the Caspian Sea, always accompanied by a drastic decline in fish stocks.

The area where the jellyfish have now been found, the Bornholm Basin, is the most important breeding ground for cod in the Baltic Sea. "As soon as we saw the eggs inside the warty comb jelly, we knew which effects this organism could have on the entire planktonic ecosystem of the Baltic Sea," says Holger Haslob of the Leibniz Institute for Marine Sciences in Kiel, Germany.

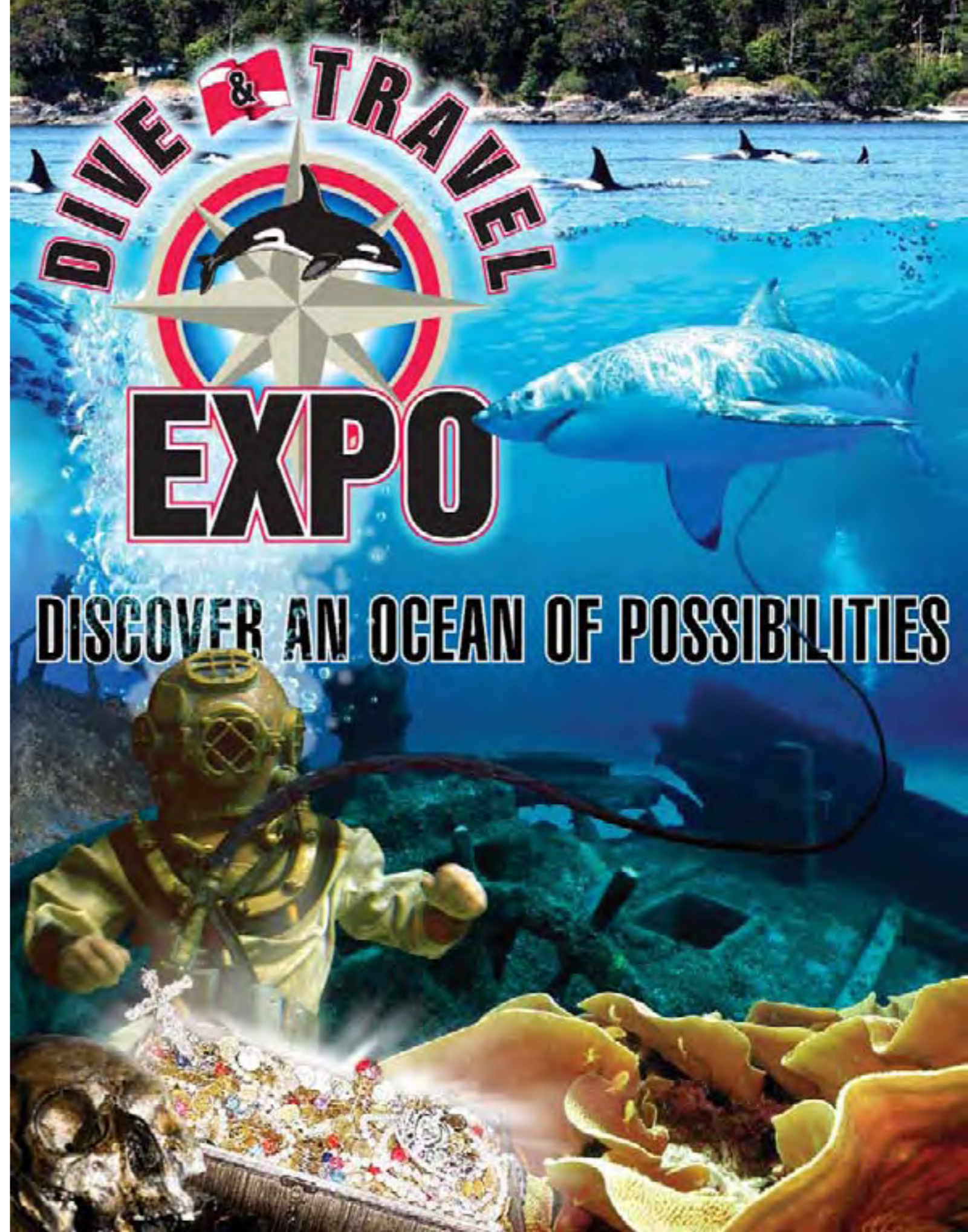
The find confirms the researchers' suspicion that the invasive species will threaten the survival of the cod in its early life stages, adding to the pressure from overfishing and environmental pollution from which the cod stock has been suffering for years. In addition, the jellyfishes' feeding behaviour might have a lasting effect on the entire ecosystem, as cod is one of the species at the top of the food chain in the Baltic Sea.

At the Øresund Aquarium in Helsingør, Denmark, marine biologist

Jens Peder Jeppesen is concerned about the abundance of these jellyfish particularly in the middle of the winter, where it is expected that the low temperatures would kill them. But they seem both resistant to cold and capable of reproducing. It comes at

very bad time, as this is the time where the cod spawns, and the ecosystem is already very badly affected following 50 years of overfishing. It is obvious that the many jellyfish will consume many of the fish eggs. ■

Mnemiopsis have a lobed body that is oval-shaped and transparent, with four rows of ciliated combs that run along the body vertically and glow blue-green when disturbed. They have several feeding tentacles. Unlike cnidarians, *Mnemiopsis* doesn't sting



Claiming the North Pole

Leaping into the unexplored



North Pole, Thursday, 2 August 2007. During a dive of 12 hours 11 minutes, two Russian bathyscaphes descended to the bottom of the ocean—a world first

conducted under warm conditions. There are a lot different devices, chargers and batteries—they come with four big tool sheds, compressors to fill air, tanks with oil and pumps for hydraulics. And all their devices for wireless and navigation should be in a laboratory. It requires a special technical setup. We really needed to rebuild the ship quite a bit, but you just can't do that with a nuclear ice-breaker. So, we couldn't base our bathyscaphes there.

Our regular support vessel, the *Academic Keldysh*, was undergoing a renovation for other purposes, so we found the diesel-powered ice-breaker, *Ivan Papanin*, in Murmansk. It had a cargo hold like a football field and two 25 tons cranes. However, the *Ivan Papanin* wasn't powerful enough to break very thick ice, so we weren't sure that it could make it to the North Pole. But we went with it anyway.

Of course, we had no funds, so MacDowell went on looking for sponsors.

Even James Cameron became interested in this project, but he was too busy with new movies to become involved. Arthur Chilingarov then joined our project in 2003, and this was a turning point, as Arthur was very experienced with ice-breakers.

For us, the biggest problem was the funding. The price was incredibly expensive. But we decided to aim anyway for a dive expedition to the North Pole in 2007, as this was the International Polar year. We were preparing the bathyscaphes, and safety aspects took a lot of my attention. This project was a leap into the unknown, and we had little idea what lay ahead for us.

Russian flag placed at the North Pole by explorers



On August 2, 2007, the weather was good at the North Pole. The sea was calm, the water temperature was just -1° C, with the air at a balmy 0° C. That morning two Russian mini submarines, Bathyscaphes *Mir-1* and *Mir-2*, were sent down and at noon, *Mir-1* touched down on the seabed at 4,261m, planting the Russian flag

Translation by Andrey Bizyukin
Photos courtesy Anatoly Sagalevich

What follows is an exclusive interview of Anatoly Sagalevich by the journalist Gleb Cherniavsky.

Gleb Cherniavsky (GC): First of all, our congratulations to you on your achievement. Let me first ask you, when did you get the idea of diving at the North Pole? And how did you get the idea that this was possible?

Anatoly Sagalevich (AS): The idea came to light in 1998. I met Don Walsh and Mike MacDowell who were traveling with a tourist ice-breaker at the time. And they threw the idea to the wind, why not dive on the North Pole? Mike thought it was an impossible idea. But Don told him: "I know one person who just might go along with such an idea," and brought up my name. Mike then came to our institute, and we discussed this crazy

idea. I was instantly captivated. I then had to come up with all the technical solutions. I made some connections with an ice-breaker service in Murmansk and flew up to take a look at their nuclear ice-breaker, *Soviet Union*. We wanted to put our bathyscaphes, *Mir*, on this ice-breaker. Its hoisting cranes could manage 25 tons each, and as our bathyscaphes weighs 18.5 tons, it was possible to deploy them from the ice-breaker board.

GC: And which other equipment would you need to support these deep water bathyscaphes?

AS: First of all, we needed to figure out how we could service the bathyscaphes. Doing it outside in the cold on the open deck at the North pole was not an option. The maintenance needed to be

feature

We had only a little information from submariners who went under the ice. We only knew that no magnetic compasses would work. Wherever we went, we had to rely on hydro acoustic devices for navigation.

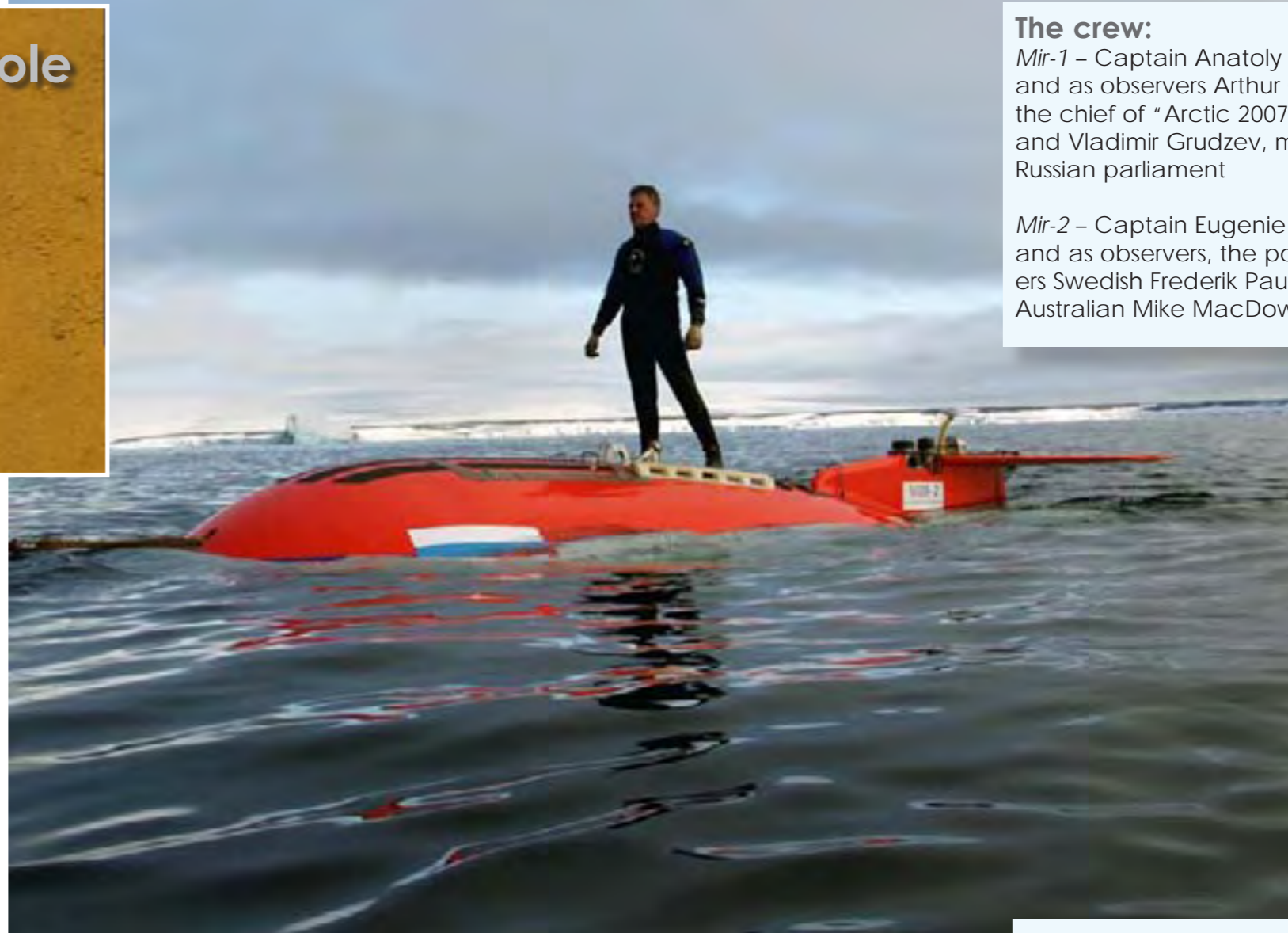
GC: Are you saying that you went to the North Pole without any navigation systems?

AS: Not entirely. We used a navigation system that could relate to hydro-acoustic stations that we hung through the ice. Usually, we put them on the bottom. Also, we developed two hydro-acoustic direction finders that could lead us back to the ship. So we had two navigational systems.

The bathyscapes were



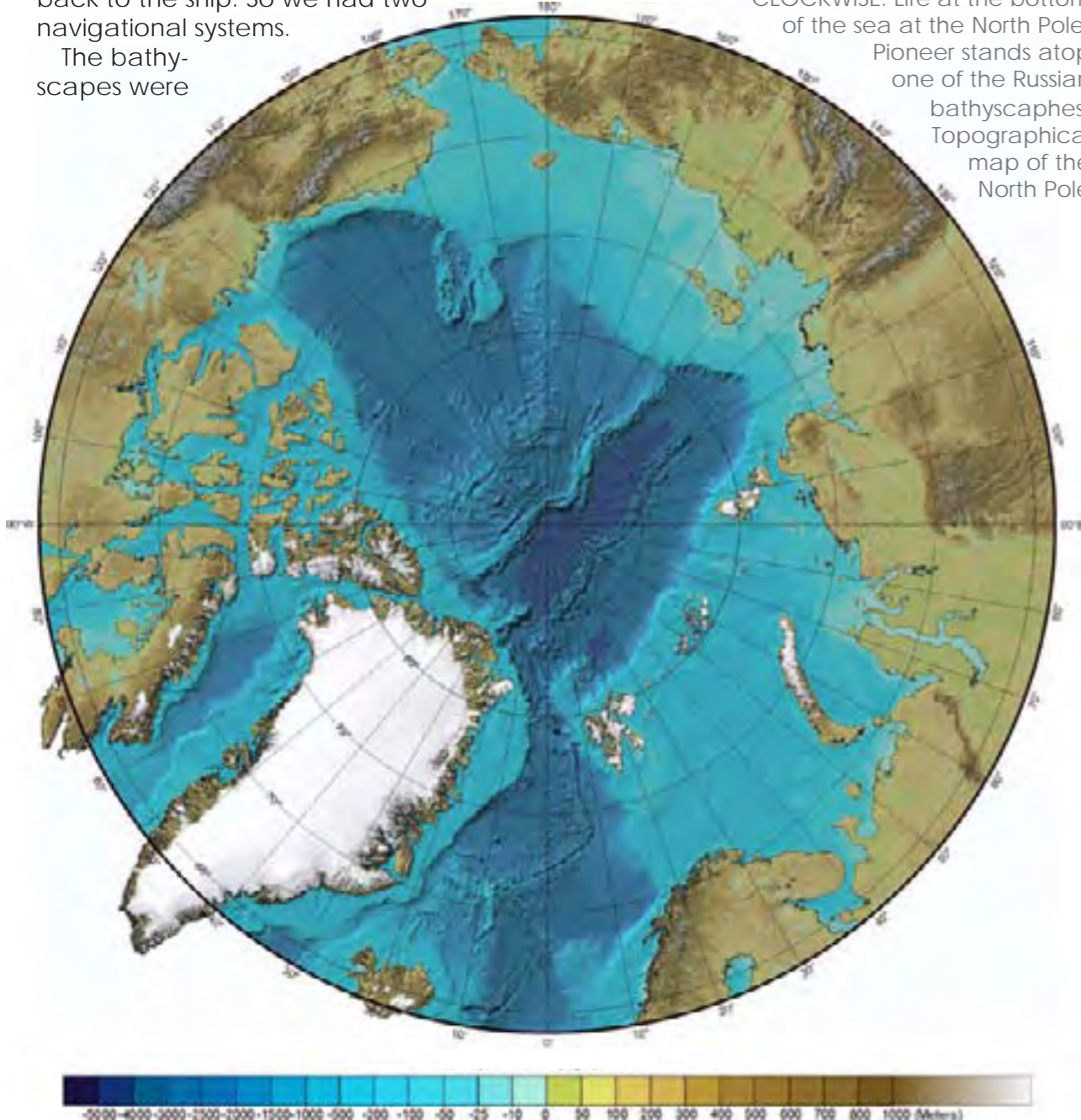
CLOCKWISE: Life at the bottom of the sea at the North Pole. Pioneer stands atop one of the Russian bathyscaphes. Topographical map of the North Pole



The crew:

Mir-1 – Captain Anatoly Sagalevich and as observers Arthur Chilingarov, the chief of “Arctic 2007” expedition and Vladimir Grudzev, member of Russian parliament

Mir-2 – Captain Eugenie Cherniaev and as observers, the polar explorers Swedish Frederik Paulsen and Australian Mike MacDowell



powered by three hydraulic engines, but we added two extra electric engines to have auxiliary power in case of an emergency. Our bathyscaphes have to constantly keep moving horizontally. Vertical movement is provided by a ballast system by taking water in and out. Especially for the North Pole, we decide to use a mix 50 percent antifreeze liquid and 50 percent water instead of standard water in ballast system. This was to prevent the valves from freezing, and it turned out to be a very wise decision.

We also added solid ballast (which we had never done before) to save battery energy during ascent in such cold water. We wanted to play it safe and make sure we had enough power in case of a lengthy search for a hole in the ice on the way back.

GC: What kind of battery power did you have?

AS: We had quite a lot of it—about 100 KW-hours. During a regular dive, we would spend most of the battery power on the bottom and leave 10-20 percent for surfacing. We carried a radio that could be used on the surface to call in the mother ship to pick us up. But on the North Pole, the bathyscaphes would be diving under the ice, which meant that nobody could locate us there. We had to find the openings in the ice ourselves.

One of the main questions was how to come back though the same hole in the ice! Just imagine the ice 2-3 meters thick having a small hole about 50 times 30 meters into which you should navigate a 7.8 meter long bathyscaphe from a depth of about 4000 meters.

Dive profile (Moscow time zone):

- 09:28 Bathyscaphe *Mir-1* commences its dive.
- 10:07 Bathyscaphe *Mir-2* commences its dive.
- 12:11 Bathyscaphe *Mir-1* touch down on the seabed at the North Pole
- 13:46 Beginning of ascent
- 18:08 Bathyscaphe *Mir-1* reaches the surface after 8 hours 40 min.
- 19:15 Bathyscaphe *Mir-2* reaches the surface after 9 hours 08 min. Samples of sediment and water were collected, and video and photography of the continental shelf were taken. A Russian flag from titanium alloy was planted on ocean floor at the North Pole.





LEFT: The nuclear ice-breaker *Russia*. BELOW: Anatoly Sagalevich tells the story of the journey to the North Pole

North Pole



when we came as close as 30-40 meters, it completely disappeared from our echosounder. But from this depth we were without connection with our navigation stations. Nonetheless, we decided to continue the mission. We have, however, retained some, although very poor, hydro-acoustic communication with our ship. We heard them very poorly, but they heard us clearly.

GC: Did you have a soft landing on the North Pole sea bed?

AC: Yes, there was very soft ground. Just one wrong movement and the water became silty and the visibility reduced to zero. We took samples of the bottom sediment. We also found some white sea anemones and brought one up as a sample. We left a cylinder of stainless steel with the letter "conversion to issues" on the North Pole sea floor. If someone comes there, they will see that we were here already. But I don't think that will happen any time soon.

GC: Will this cylinder not be

covered by silt?

AS:

Eventually, yes. But we also planted the flag of the Russian Federation made from titanium as well. The flag stands up one meter from the bottom. The speed of silt accumulation is just 0.5 cm in a millinium, so the flag could be seen for many thousands of years.

GC: What was your decision when you realized that you couldn't modify the ice-breaker?

AS: We decided to use two vessels: The nuclear ice-breaker and the ice classified ship *Academic Fedorov* on which the Bathyscaphes would be based.

On July 22, 2007, we set sail from the port of Murmansk. The nuclear ice-breaker *Russia* went in front and cleared a passage in which the *Academic Fedorov* followed. We were finally heading to the North Pole.

GC: How was the dive and how did you manage to navigate under the ice?

AS: We positioned sounding devices at a depth of one hundred meters and one kilometer apart, with another acoustic device hung below our main ship to act as a homing bea-

con. We always knew our position in relationship to these acoustic devices.

Of course, there was some drift. At 200 meters depth, we were already 500 meters away from the ice hole. And this distance kept increasing.

At that moment, I switched on an echo sounder, and we saw a distinct band at 3,000 meters. Arthur Chilingarov said, "That's the bottom." But I know it was deeper here. We encountered a strange natural phenomenon.

GC: Do you mean that what appeared to the bottom on the echo depth-sounder, was not the real bottom?

AS: Exactly. In fact, it was a halocline, a border layer between bodies of water with different salinity. When we passed through this layer, we lost the signal from the acoustic devices at the surface and

went on without navigation. We were cut off from the surface.

GC: So, it was the border of two different water densities?

AS: Yes, it was quite a strong border. We really need to make more scientific research on this phenomenon, because when we check other geophysics references on salinity and temperature, we can't find any evidence of such distinct borders. But it was real enough, and it did cut us off from our navigational references.

GC: Do you have any scientific explanations for this phenomenon?

AS: Not at this point. We suspected dense concentrations of plankton. But we looked carefully with our lights, and we didn't see any. The border layer appeared more smeared when we came closer. Then,





North Pole

CLOCKWISE:
The nuclear ice-breaker *Russia* clears a passage in which the ice classified ship, *Academic Fedorov* follows

Mir-1 and *Mir-2* are lowered into their storage bay on the *Academic Fedorov*

Researchers inspect the *Mir* apparatus in preparation for the exploratory dives at the North Pole



GC: Did you see any other animals, except for the sea anemones?

AS: Yes, we did. We saw (*Teuthoidea*) calamaries and small shrimps while we descended, and small holothurians and star fish on the bottom. These are usually about 10-15 cm, but these were only 3-4 cm. This could be due to the low oxygen concentrations under the ice.

The big surfaces of ice prevent the exchange of oxygen between the ocean and the atmosphere. So, the oxygen concentration is low here, and that reflects on the abundance of animals and plankton.

We were on the bottom for one hour and 40 minutes. The other

bathyscaphe arrived and made a soft landing 50 minutes later. We wanted to meet them, but decided against it, because we were concerned about the silt and bad visibility. We didn't want to make any unnecessary movements in relationship to the main ship's position either.

We finished our scientific and official duties, released the ballast weights, said goodbye to second bathyscaphe crew, and headed towards the surface, searching for the opening in the ice cover.

GC: And how was it encountering that border layer at 3000 meters going up?

AS: It was not there anymore

GC: This is an interesting phenomenon...

AC: Yes, it is. And we have to look more into this. During the ascent, we reconnected with our navigational beacons. But at around 1000 meters, there was so much noise, that we had problems finding the right direction. So, we tried to find the way home by systematic experimentation. For example, we should go at an angle of 120 degree. But our gyrocompass didn't work properly. We tried to follow a 120-degree course according the gyrocompass but noticed that the distance to the opening in the ice increased.

We then turned 90 degrees, and again, the distance to the opening increased. We did another



Lowering *Mir* apparatus into the water

North Pole

Our bathyscaphes can find certain details, but we have restricted power resources and to get the full natural picture we need completely different sort of technology. We ran this project as a useful technological experiment but it is just a small one. Science without technology this is nothing. The aircraft are flying, submarines are diving and cars are running. All of these started with science and engineers created all of them. Science comes first, then technology follows. When we talking about our technological achievements, about our people and our striving for the unex-

plored. This is not about romantic notions, it is the reality. We have already heard from some scientists that this was just a crazy idea and reckless scheme. But we beg to differ.

GC: Do you consider yourself a scientist or engineer?

A: I am good at both. I think more like an engineer, but I can say with confidence, that I am also capable of conducting good scientific oceanographic research.

GC: What are your plans for the future?

AC: We are discussing the possibilities of a world tour for our bathyscaphes. But again, this is

also a question of money. We have everything—the ship, the bathyscaphes, a professional team—except, we have no financing apparatus. If the Russian government would show a bit of generosity, we could organize an entirely Russian expedition. In this context, I want to remind everyone one more time that our North Pole diving expedition was made completely with Russian technology and conducted by Russians. This was a Russian project. And I dream to see more such national projects!

Gleb Cherniavsky is a contributor to the Russian dive magazine, DiveTek. ■

er turn, which according our gyrocompass was a 300-degree heading. But in reality, it was quite the opposite direction. So, the gyrocompass had a 180-degree error. Finally, we deducted that the right heading was 280 degrees.

The ascent was very difficult. We had to find the opening in the ice. We had the video camera going pointing to the surface direction to give us an indication as to what was ice and what was water. The first time we thought we had found open water, it was just a small hole in the ice. Our ice hole was 30 meter wide.

Then, we came close to the propeller on the ice-breaker and had to back off. After that, we were caught by the ice anchor from our main ship and gently got away from it, too. Every time I tried to find the right hole in the

ice, the current moved us away from the hole, and we had to start all over.

We searched virtually blind-folded for 35-40 minutes. We were staring at the monitors when we spotted a light in front of us, and the main ship showed up on the locator. Grudzev cried out, "Get us out of the water!" I saw some splashing motion on the monitor. And up we came, very quickly.

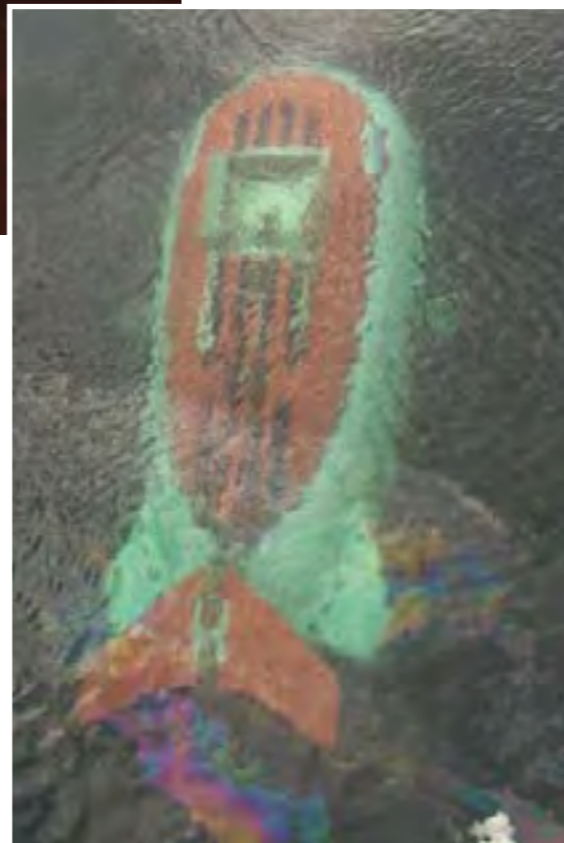
GC: What are the main conclusions to be made from this expedition?

AS: From my point of view, it is a great technical achievement—the triumph of technology and humankind. This is like the space flight of Jury Gagarin, like man's venture into outer space and the landing on the moon. This is a leap into the unexplored. We practically didn't know what to

expect. We were prepared use special technical innovations made for the North Pole, and it had worked quite well. I suppose that this is the main achievement. We just opened the window to the unexplored, and now we know how to do this the right way many times over.

GC: What scientific achievements was made?

AS: If we are talking about the exploration of the underwater shelf, these dives brought little new. We need to conduct a completely different sort research here applying other technology.



ABOVE: *Mir* heading out on its historic mission

RIGHT: Eugenie Cherniaev the captain of "Mir-2" does the final equipment checks before the North Pole dive





Putin congratulated Artur Chilingarov, Anatoly Sagalivich and Evgeniy Chernyaev with medals designating the men 'Heroes of Russia'

Canada Seeks To Claim Underwater Ridge

Submerged on the Arctic Ocean sea floor off the northwest coast of Ellesmere Island and possibly reaching all the way to Russia, the spectacular, 2,000 kilometer long chain of rugged peaks and plunging canyons known as Alpha Ridge is one of the Earth's last major unexplored geological features.

The sprawling ridge with its jutting crest rising nearly 3,000 metres above the surrounding plain is known only from the seismic and sonar probes of polar scientists since its discovery in the early 1960s.

Given the rapid melting of the Arctic ice cap, and the growing demand for undersea oil, gas and other natural resources, any nation who could successfully lay claim to these areas could one day exploit the Alpha Ridge's suspected storehouse of mineral and biological riches.



Beginning this month, a crucial sea floor mapping mission is aimed at extending Canadian sovereignty to the Alpha Ridge—and its potential resource riches—before a 2013 deadline set out by the UN Convention on the Law of the Sea, to propose undersea extensions to Canada's coastal boundaries runs out. "We are trying to prove scientifically that Alpha Ridge is a natural prolongation of the North American continent," says Jacob Verhoef, chief of the Atlantic division of the Geological Survey of Canada.

Using deep-sea explosives and seismic scanners, they'll gather data about the shape, composition and density of the ridge to compare with better-known stretches of Canada's polar continental shelf. Among the unresolved questions about the ridge is whether it ends mid-ocean or is essentially part of the same undersea mountain range extending north from Siberia and called the Mendeleev Ridge after legendary Russian scientist Dmitri Mendeleev.

Russia could well argue that the entire mountain complex is an extension of the Asian continent. The drowned mountains, first identified in 1963 by U.S. researchers aboard a drifting ice station named Alpha, were first substantially investigated by Canadian scientists a quarter-century ago. The 1983 Canadian Expedition to Study the Alpha Ridge produced groundbreaking maps of the region, but Verhoef's research team is seeking definitive evidence that the massive rock formation is geologically linked to Canada's established continental shelf. ■

It's about politics



Medals from the Russian President

Russian President Vladimir Putin awarded medals to three men who planted a Russian flag on the ocean floor under the North Pole, staking a symbolic claim to the resource-rich region.

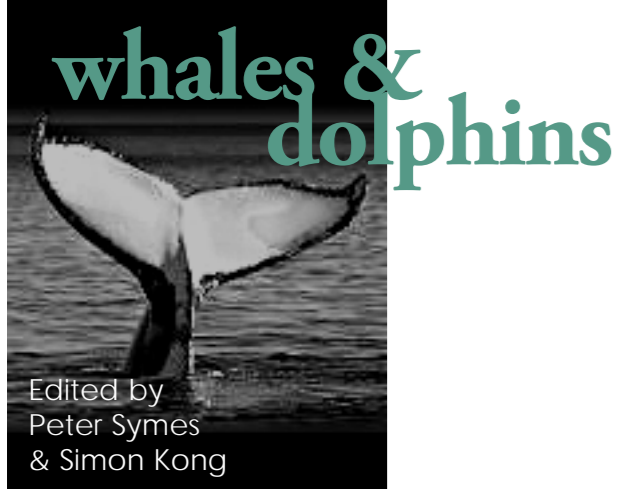
In a ceremony at the Kremlin, Putin congratulated Artur Chilingarov, Anatoly Sagalivich and Evgeniy Chernyaev awarding them medals designating them "Heroes of Russia".

"Today we won't back away from the Arctic, and we will be hard to stop," said Chilingarov, who in turn presented Putin with a copy of the flag the expedition members planted on the seabed.

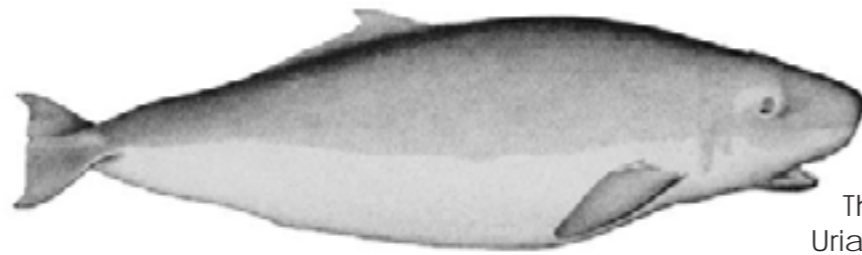
Global warming is melting the Arctic ice cap and governments now believe that it is only a matter of

time before they will be able to start exploiting previously inaccessible energy supplies locked inside the seabed whose ownership is disputed. Russia is aiming to prove the Lomonosov Ridge, named after 18th century Russian writer and scientist Mikhail Lomonosov, runs for hundreds of kilometres along the seabed from Siberia, stretching beneath the North Pole. If Russia can prove the link, the Kremlin plans to claim the northern continental shelf and its resources as Russian. ■





Edited by
Peter Symes
& Simon Kong



Chile announces permanent whale protection law

The Chilean Environment Minister Ana Lya Uriarte has announced a permanent whale protection law. "We are going to dictate a law to protect whales in Chile," said Uriarte after meeting with Greenpeace international environment group representatives. The law seeks to protect whales permanently, since the current law will only be in force until 2025 and does not protect the whales ecosystem. Uriarte praised Greenpeace for its stand on Japan's announcement of hunting whales and has backed its proposal for a worldwide whale hunting ban. Many protests have taken place in Chile since November after Japan resumed whale hunting. ■ SOURCE: CHINAVIEW.CN

Found and (soon) lost

Only three years after being discovered off the coast of Australia, environmentalists fear the rare snubfin dolphin could be facing extinction. Discovered in 2005 near Townsville, the snubfin was found to be distinct from its Asian cousins following genetic testing, and subsequently declared Australia's only native dolphin. It has a slow reproductive rate and spends years raising its young. ■

WWW.NEWS.COM.AU

US judge reinstates sonar curbs

Judge Florence-Marie Cooper ruled that there was no reason to exempt the US Navy from a court injunction barring the use of powerful submarine-detecting sonar in a 12-mile zone off southern California. The exemption was granted by President George W Bush who cited national security when he ordered the Navy's submarine detection exercises to go on. While conservationists hailed the judge's ruling, the judge also expressed "significant concerns" about the constitutionality of President Bush's exemption. Natural Resources Defense Council (NRCD) attorney Joel Reynolds says, "It reinstates the proper balance between national security and environmental protection." ■ SOURCE: BBC NEWS



Japanese city resumes Dolphin hunt

The city of Nago in the Japanese prefecture of Okinawa, recently turned the clock back 20 years by commencing dolphin hunting again. Nago hunted dolphins 20 years ago but stopped after receiving

bad publicity over the practice—much as Taiji does today. However, a small percentage of fishermen still retain licenses to kill dolphins (six boats in total), and when around 100 dolphins appeared off Nago

Bay, the six boats set out to sea and drove the dolphins into the bay, where they were slaughtered. The fishermen's annual kill quota allowed by Okinawa prefecture are nine Bottlenose dolphins, 92 Short-finned

pilot whales and 20 False killer whales. This is a sad reflection on Japan's attitude towards the continued and rising international condemnation of drive hunts in the country. ■

SOURCE: MARINE CONNECTION

Japanese Villagers Eat Mercury-Laden Dolphin Meat

Fishermen hunt dolphins about every day in Taiji, in southwestern Japan. Locals know they offend Western sensibilities by eating dolphins, but they say it's a tradition hundreds of years old. Findings suggest that eat-

ing dolphins may not be good for one's health. The Japanese government said in 2005 that bottlenose dolphin meat contains 12 times more mercury than blue fin tuna—high levels of mercury in fish can cause health

problems in pregnant women and young children. A city councilman in Taiji, Junichiro Yamashita, grew so concerned about the mercury levels that he persuaded locals schools to stop serving dolphin meat at lunch. He even

plucked some of his hair, sent it off for testing, and discovered that it contained seven times as much mercury as the U.S. Environmental Protection Agency considers safe. ■

SOURCE: CNN.COM

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Edited by
Michael Symes

There has been much discussion in recent years about the effect of increasing global temperatures on marine fauna (see also the last issue of this magazine). However, it has often been overlooked that the increasing acidity of the oceans may have an even greater, and more insidious, effect on marine life than just a simple rise in temperature. Although acid rain, which contains nitric acid and sulphuric acid, falls into the oceans, it is the absorption of CO_2 from the atmosphere that is the most important contributor to oceanic acidity. This is because the shells of many marine creatures are made of calcium carbonate, which is a salt of carbonic acid, and which itself derives from CO_2 . Any change, therefore, in the concentration of CO_2 in sea water could have drastic consequences for marine invertebrates in particular and thereby marine life in general.

Acidification *of the oceans*

Effect of absorbed CO_2 on marine fauna

Text by Michael Symes



The absorption of CO_2 may have slowed global warming, but there has been a resulting change in seawater chemistry. To understand why the effect of increasing atmospheric CO_2 , which leads to increased absorption of CO_2 in sea water, is important, it is necessary to understand some of the chemistry of carbonic acid and its salts. However, before we can discuss the effect of this acidity, we must have a useful description of what we mean by acidity and acid strength. The most common and useful unit to describe the magnitude of acidity is the pH value.

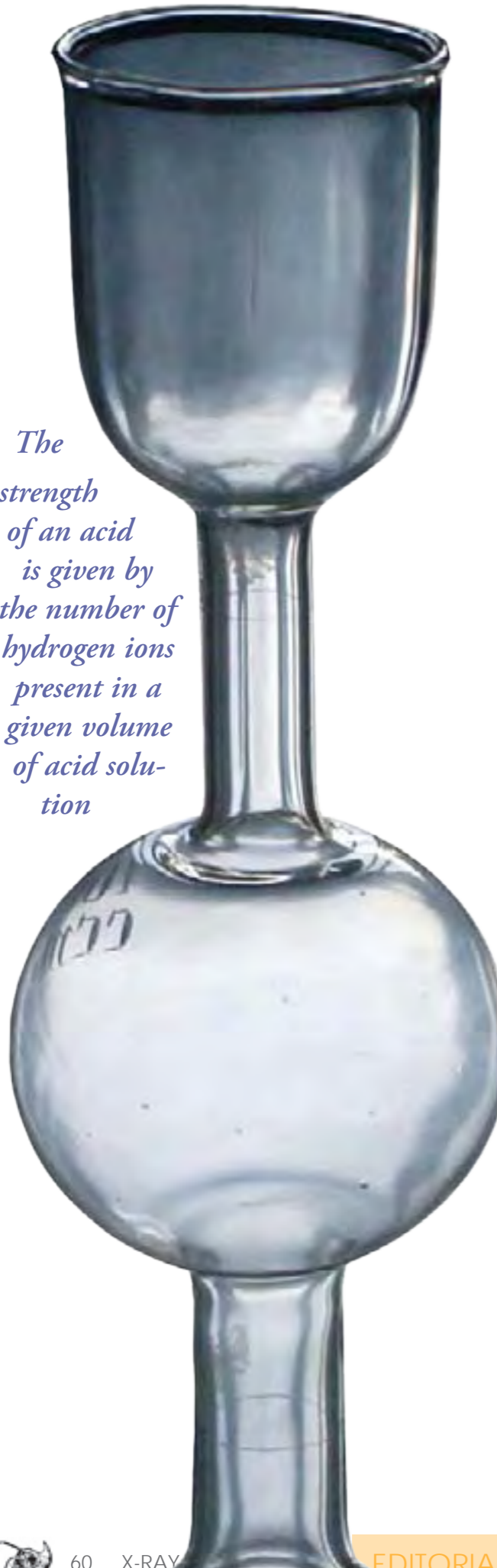
Measurement of acidity using the pH scale

When compounds, be they acids, alkalies or salts of these, dissolve in water they dissociate, wholly or partly, and in some cases extremely slightly, into their component ions.

For example, the gas hydrogen chloride, HCl , dissolves in water to give the ions H^+ and Cl^- . We call this solution *hydrochloric acid*.

Similarly, when the salt calcium sulphate, CaSO_4 , dissolves in water the ions Ca^{++} and SO_4^{--} are formed.

The strength of an acid is given by the number of hydrogen ions present in a given volume of acid solution

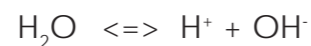


Acid strength

Now, the strength of an acid such as HCl is given by number of hydrogen ions present in a given volume of acid solution.

If the acid is very concentrated and therefore very strong, the concentration of hydrogen ions will be very high. The strength of the acid is therefore proportional to the concentration of hydrogen ions.

Water partially dissociates into hydrogen ions and hydroxyl ions according to the following equilibrium:



So water, like many other substances, can act both as an acid (having H^+ ions) and as a base (having OH^- ions).

The concentration of hydrogen ions, given in moles, is generally of the order of between 10^{-1} and 10^{-14} moles per litre, with water having a hydrogen ion concentration of 10^{-7} moles per litre. This means that water dissociates to only a very small degree.

However, these are cumbersome values to use, so the hydrogen ion concentrations are converted to the much more convenient pH values.

This is done by taking the negative of the \log_{10} of the hydrogen ion concentration. To give an example—If the hydrogen ion concentration is 3×10^{-6} moles per litre then the pH value is given by:

$$\begin{aligned} \text{pH} &= -\log_{10}(3 \times 10^{-6}) \\ &= -(\log_{10}3 - 6) \\ &= -(0.48 - 6) \\ &= 5.52. \end{aligned}$$

It will be seen, then, that a decrease of one unit in the potential of the hydrogen ion concentration, say from 10^{-4} to 10^{-3} , means a decrease of one pH unit.

To understand why the effect of increasing atmospheric CO_2 , which leads to increased absorption of CO_2 in sea water, is important, it is necessary to understand some of the chemistry of carbonic acid and its salts.



Accordingly, a unit decrease in pH value means a ten times increase in the hydrogen ion concentration i.e. a ten times increase in acidic strength.

The molality of hydrogen ions in pure water is actually 1.004×10^{-7} mol kg^{-1} . The pH value of pure water is therefore $-\log_{10} 1.004 \times 10^{-7}$ i.e. 6.998 or to 2 decimal places 7.00.

As water is a neutral substance from the acid/base point of view, a pH value of 7 is considered as being midway between acid and alkali.

An aqueous solution of HCl of unit molarity, i.e. 1 mole per kg, with virtually complete dissociation, will have a pH of 0.09.

Some typical pH values

- Battery acid: ca 1
- Gastric juices: 1 – 3
- Lemon juice: ca 2.2
- Household vinegar: 2.5 to 3
- Tomato: 4.0
- Cheddar cheese: ca 5.90
- Camembert cheese: ca 7.44
- Concentrated solution of baking soda: 8.2
- Household cleaning fluids: 10 to 11

Note: It is usually claimed that the pH scale runs from 0 to 14. However, there is no fundamental reason why pH values cannot exist outside this range. For example, a 2 mole per kg solution of HCl in water has a pH value of -0.31 . Also there is no reason why a very strong basic solution should not have a pH value exceeding 14. For most purposes, however, it is sufficient to confine our attention to the range 0 to 14.

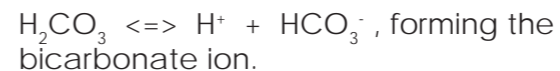
Carbonic acid

As stated above, the acidity of seawater mainly arises from the amount of CO_2 in it and the acids it forms. Carbon dioxide is highly soluble in water in which it forms an equilibrium with carbonic acid,

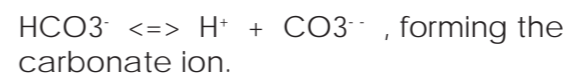


About 0.5% of the dissolved CO_2 remains as H_2CO_3 with the rest immediately dissociating in the two steps given by the following equilibria:

Firstly,



Then,



In absolute terms there are, on average, about 45ml total CO_2 per litre of sea water, but because of these two equilibrium reactions, nearly all of this is found in the carbonate and bicarbonate ions. Only about 0.23ml CO_2 per litre occurs as dissolved gas in the water i.e. 0.51%.

Hydrogen ions are liberated in these equilibrium reactions, which means that the pH of seawater is largely determined by the concentration of bicarbonate and carbonate ions. The pH is usually 8 ± 0.5 .

However, when CO_2 is added to seawater, more H_2CO_3 is formed and the number of hydrogen ions increases. The pH thereby decreases, with the seawater thus becoming more acidic—though it might be more descriptive to say less alkaline.

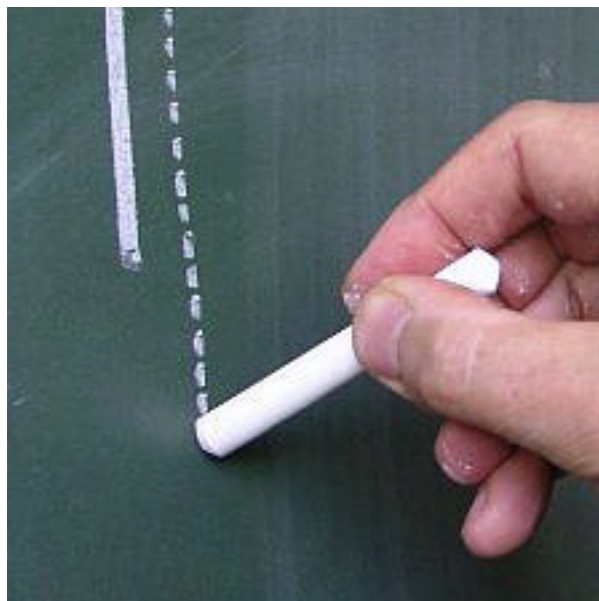
The carbonate ion can interact with cations such as Ca^{++} and Mg^{++} in the seawater causing them to precipitate as insoluble carbonates. Calcium carbonate is the main constituent of chalk, limestone and marble. It has a solubility of only about 20mg per litre of cold water, and because it is so insoluble, it is an important constituent of coral reefs and mollusc shells.

Calcium carbonate is an important constituent of coral reefs and mollusc shells



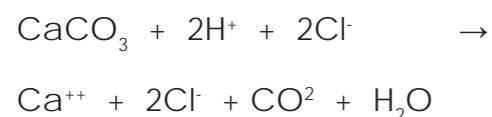
However, and this is important for understanding the effect of increasing CO_2 in sea water, this calcium carbonate, although it is insoluble in water, dissolves in acidic solutions.

For example, as many of you will have seen, the strong acid hydrochloric acid, HCl , will dissolve chalk. This gives a solution of calcium chloride and carbonic acid, which then dissociates to produce water and the emission of a froth of bubbles of CO_2 .



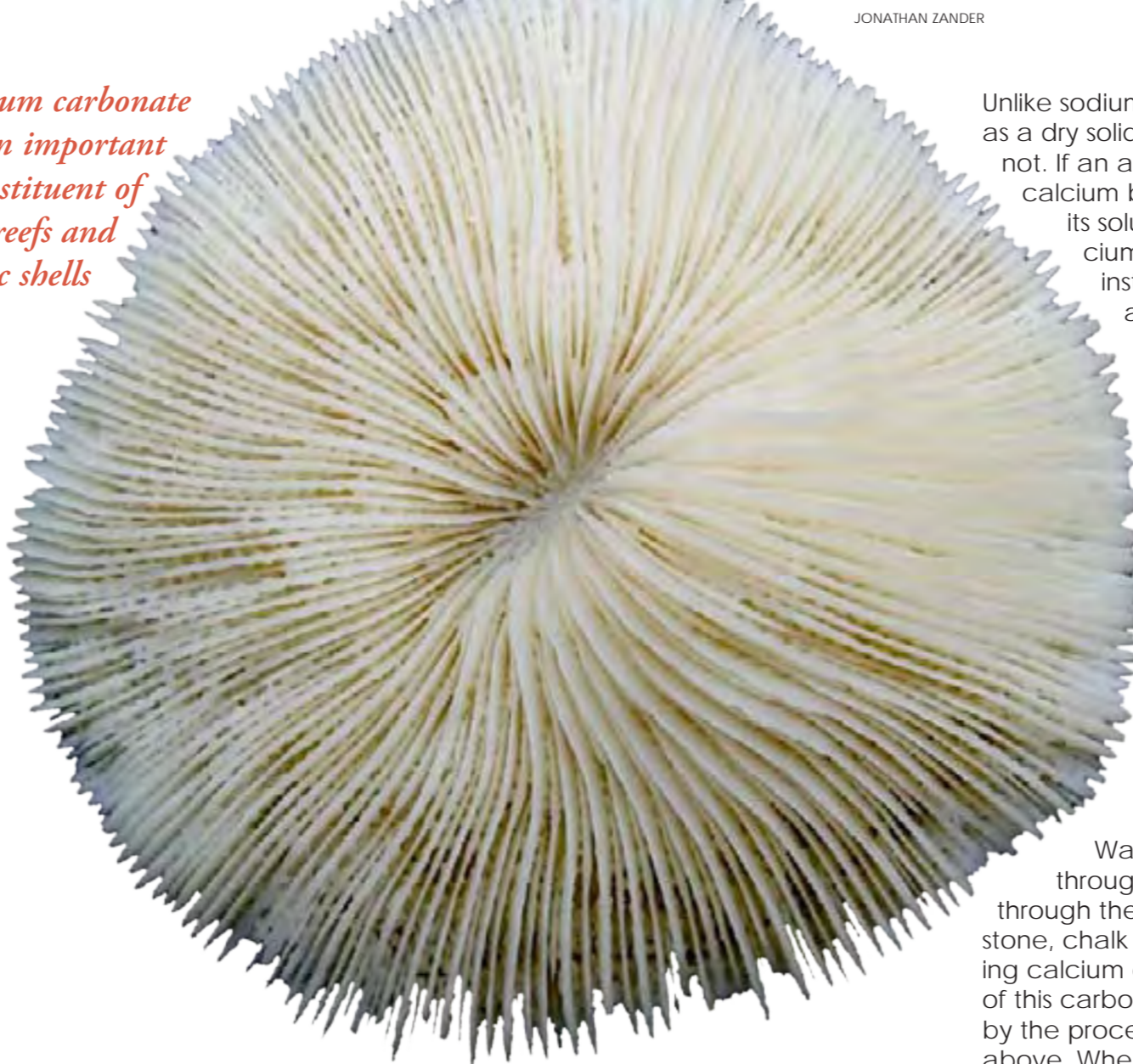
Acids will dissolve chalk. Chalk is made by minute calcite plates shed from micro-organisms called coccolithophores

This is shown in the following reaction. Note that it is not an equilibrium; it only goes one way as the CO_2 is continually removed as a gas.



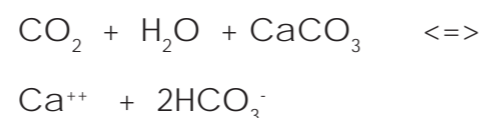
When acids dissolve, chalk CO_2 is released

Calcium carbonate is an important constituent of coral reefs and mollusc shells



With carbonic acid, however, which is a weak acid, a different reaction occurs. When there is excess CO_2 dissolved in the water, the following equilibrium occurs in which the bicarbonate ion is formed:

Equilibrium A



The right hand side of the equilibrium is thus a solution of calcium bicarbonate that, unlike calcium carbonate, is quite soluble, having a solubility of 166 g per litre. However, it exists only in solution. This solution contains calcium ions, carbon dioxide, bicarbonate ions and carbonate ions.

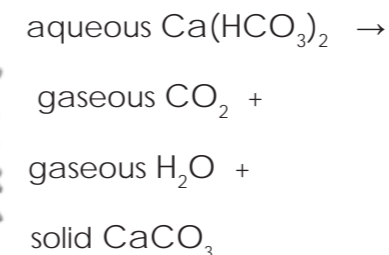
As this is an equilibrium, the more CO_2 pushed into the left hand side of the equilibrium, the more it will force the equilibrium to the right i.e. the more the insoluble calcium carbonate will be changed into the soluble bicarbonate.

Incidentally, the bicarbonate ion is useful in the kitchen were it is to be found in NaHCO_3 , sodium bicarbonate, better known as baking soda. When it combines with moisture and an acidic ingredient such as milk (pH about 6.4), bubbles of CO_2 are formed that expand under the oven temperature, causing the cake, or what ever is being made, to rise.

Equilibrium A is fundamental for understanding the effect of the increase of CO_2 on the chemistry of seawater and on the life in it

Unlike sodium bicarbonate, which exists as a dry solid, calcium bicarbonate does not. If an attempt is made to prepare calcium bicarbonate by evaporating its solution to dryness, solid calcium carbonate will be obtained instead, together with water and CO_2 as shown in the following reaction.

Reaction B



This reaction is important, for example, in the formation of speleothems such as stalactites and stalagmites.

Water picks up CO_2 as it passes through the atmosphere and through the topsoil. As it flows past limestone, chalk and other minerals containing calcium carbonate, it dissolves some of this carbonate, forming bicarbonate by the process given in equilibrium A above. When this solution reaches the roof of a subterranean cave, the water will evaporate, and insoluble calcium carbonate will be formed as shown by reaction B. As this is formed preferentially where the evaporation is greatest i.e. at the lower ends of protuberances, increasingly longer formations will be formed.

Reaction B is thus important for understanding certain geological processes. However, it is reaction A that is the most important for understanding the effect of CO_2 on life on Earth. It is fundamental, in fact, for understanding the effect of the increase of CO_2 on the chemistry of seawater and on the life in it.

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Even small local changes in pH towards the acidic can have great effects on marine life

rents circulate around the globe, they eventually arrive in the North Pacific where they rise to the surface before plunging down deep again to continue on their deep journey. As it upwells, the cold water absorbs more CO₂ from the atmosphere, which means that equilibrium is pushed to the right giving an increased production of bicarbonate ions at the expense of carbonate ions.

Effect on marine fauna

Most of shell-forming molluscs which utilise CaCO₃ to form their shells belong to two classes: the *Gastropoda* i.e. the univalves, snails, and the *Bivalvia* i.e. the clams, oysters, scallops, etc. Other classes of molluscs that form calcium carbonate shells are the *Scaphopoda* (the tusk shells), the *Polyplacophora* (the chitons) and the *Monoplacophora* (for example the deep sea *Neopilina*). Some echinoderms such as starfish, sea urchins and sand dollars have hard exoskeletons formed of calcium carbonate, as do some annelid worms; and so, of course, do the reef structures of corals.

All shells of the mollusca are composed of basically the same material. This is calcium carbon-

ate, in the form of calcite or aragonite, crystallised out in an organic matrix and laid down in layers by the shell glands of the mantle tissue. Aragonite and calcite are two polymorphs of CaCO₃ in which the crystal structures differ. Aragonite forms naturally in almost all mollusc shells as well as in the endoskeletons of both warm- and cold-water corals. In some mollusca, the entire shell is aragonite, while in others, it is a mixture of both aragonite and calcite. These shell-forming animals produce their calcium carbonate shells or skeletons from the CO₃²⁻ ions in the sea water.

The shells of crustacea, such as lobsters, crabs and shrimps are different in that they are built up from only 30-50% calcium carbonate together with 30-40% protein and 20-30% chitin. Chitin is a polysaccharide polymer also found in the exoskeletons of terrestrial insects.

Now, we have seen that the insolubility of calcium carbonate in seawater depends

As the concentration of CO₂ in the water increases, the carbonate ion concentration decreases. There will therefore be less material for animals to build their shells

on its acidity i.e. its pH value; and as the concentration of CO₂ in the water increases, the carbonate ion concentration decreases. There will therefore be less material for animals to build their shells. This will inhibit calcification i.e. the process by which these animals rebuild

their shells, and the skeletal growth rates of calcareous plankton, for example, will be reduced. Not only that, the increasing acidity can actually dissolve away the shells of oysters, clams, krill and pteropods, so that in areas of high CO₂ concentration these animal will die. Creatures with shells living at higher, colder, latitudes, and also in near-shore waters, will therefore probably be in the most trouble. For example, shell-building planktonic organisms such as the coccolithophorids and foraminifera are an important basis of the food chain in the waters of Antarctica which,



Increasing acidity can actually dissolve away the shells of oysters, clams, krill and pteropods

Acidity of the oceans

The acidity of the oceans can arise from two main sources.

- Acid rain, which is formed when rain water absorbs CO₂, together with nitric acid and sulphuric acid, on its fall through the atmosphere.
- Direct absorption of CO₂ in the surface water layer.

Although acid rain is obviously important for terrestrial life, it seems to play a minor role in making sea water more acidic on a global scale. Its impact, though, is somewhat greater in shallower waters such as the coastal regions. It is the direct absorption of CO₂ by the surface of the sea water itself and the corresponding impact on its chemistry that affects marine creatures. We therefore concentrate here on the acidity arising from absorption of CO₂.

Since about 1800 i.e. from the start of industrialisation in Europe, the amount of CO₂ in the atmosphere has increased by about 36%, from 280 parts per million (ppm) to 380 ppm i.e. 0.038%. It is claimed that nearly 50% of the CO₂ released due to human activities over the last 200 years has been absorbed by the oceans.

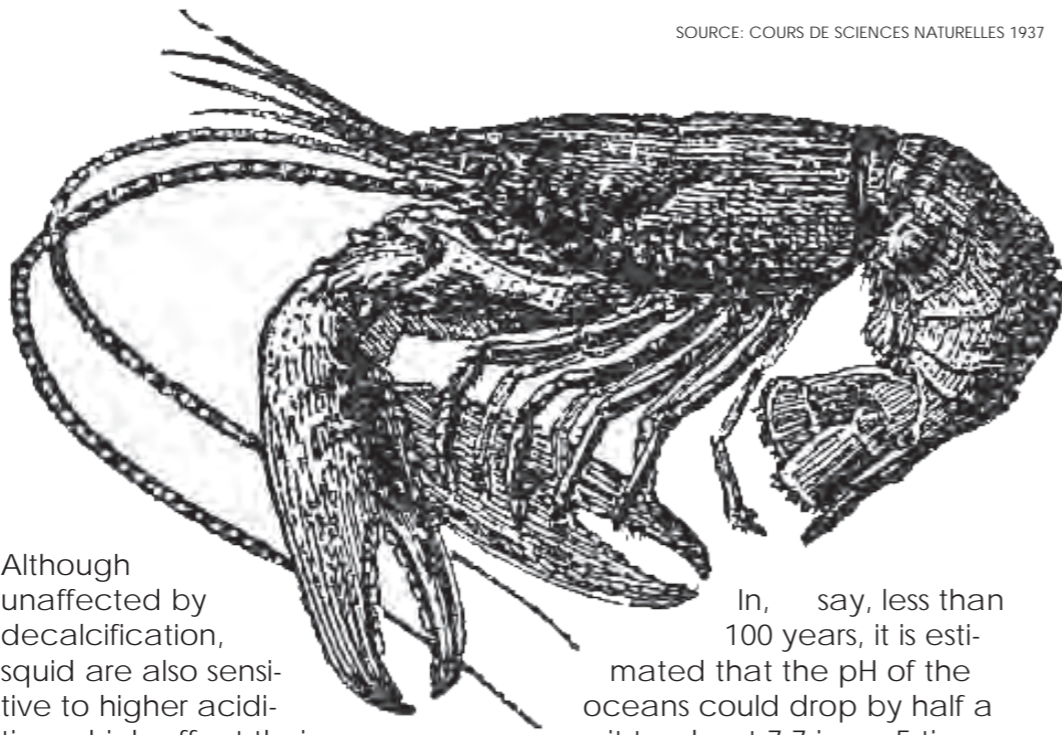
Currently, the oceans absorb about 22 tons of CO₂ per day. However, the oceans tend to mix rather slowly and, because CO₂ mainly enters the water by gas exchange at the surface, most CO₂ is found in the top layers of

It is claimed that nearly 50% of the CO₂ released due to human activities over the last 200 years has been absorbed by the oceans

the oceans or in the shallow seas. This means that the acidity is not completely uniform throughout the oceans. Deep cold waters, which only circulate to the surface very slowly, are far from being saturated. In 2005, the warm waters around the widely separated islands of the Canaries, Hawaii and Bermuda, had a pH of ca 8.09.

It is important to remember, especially in these times of global warming, that warm water dissolves less CO₂ than cold water. This means that, according to equilibrium A, this will favour the production of carbonate over bicarbonate.

As stated, the pH of seawater varies both in time and place, and due to the equilibrium A given above, even small local changes in pH towards the acidic can have great effects on marine life. For example, as the deep cur-



being cold, can absorb greater amounts of CO₂. The increasing CO₂ content of sea water will also affect the thickness and strength of lobster and other crustacea shells thus affecting their ability to survive in their normal habitats.

Although protected by their spines, echinoderms are preyed upon by, among others, the triton shell, the trigger fish, crabs and shrimps, and by other carnivorous echinoderms. Echinoderms also serve as hosts to many symbiotic shrimps, crabs, worms, snails and even some fish. Any change in the ability of these creatures to form their protective armour, and to survive in their present environment, could therefore be a disaster for both host and prey.

Krill and pteropods are major food source for juvenile salmon, herring, pollock, cod mackerel and many other fish. Disturbing the lower end of a food chain can have dramatic effects at the higher end of the chain. As these organisms provide food and habitat for other species fewer of these animals will then have a feedback effect on the populations of their predators and their prey. Entire eco-systems can therefore change or even completely disappear for ever.

Although unaffected by decalcification, squid are also sensitive to higher acidities, which affect their blood circulation and respiration.

The future

The situation is very complex. The increasing amount of CO₂ in the atmosphere will lead to an increased uptake of CO₂ in the oceans. However, the increasing level of CO₂ is leading to an increase in global temperature thereby causing ocean water temperatures to rise. This increase in water temperature will then decrease the solubility of CO₂. So, will we arrive back at the status quo or will there be a permanent change in the

CO₂ content of the oceans? At this time, it is not known how this interaction will be resolved.

Some things do already appear to be clear, though. The surface waters will become more and more saturated with CO₂ so that in the short term, the oceans will probably become a much less efficient sink for CO₂. This will obviously have an effect on the Earth's climate.

In, say, less than 100 years, it is estimated that the pH of the oceans could drop by half a unit to about 7.7 i.e. a 5 times increase in acidity, with the amount of carbonate available to marine organisms dropping by 60%. And some scientists believe that in less than 50 years, the oceans could become too acidic for corals to survive at all.

Although the future may seem somewhat black for the marine fauna, the increase in CO₂ content of the oceans may actually be beneficial to a number of marine flora, for example the sea grasses, although this is not certain.

In the long run, it is estimated that over a period of several thousand years about 90% of the anthropogenic CO₂ emission will end up in the oceans, and that the pH of the oceans could be lowered permanently. It is somewhat naive perhaps, but we must assume that humans are sensible enough, and clever enough, to reduce CO₂ emissions to a level below that which they are today. What the effect on marine life will be of all the already accumulated CO₂ in the oceans is, however, unclear. One thing seems to be certain though: it probably won't be a benign effect. ■

It is somewhat naive perhaps, but we must assume that humans are sensible enough, and clever enough, to reduce CO₂ emissions to a level below that which they are today



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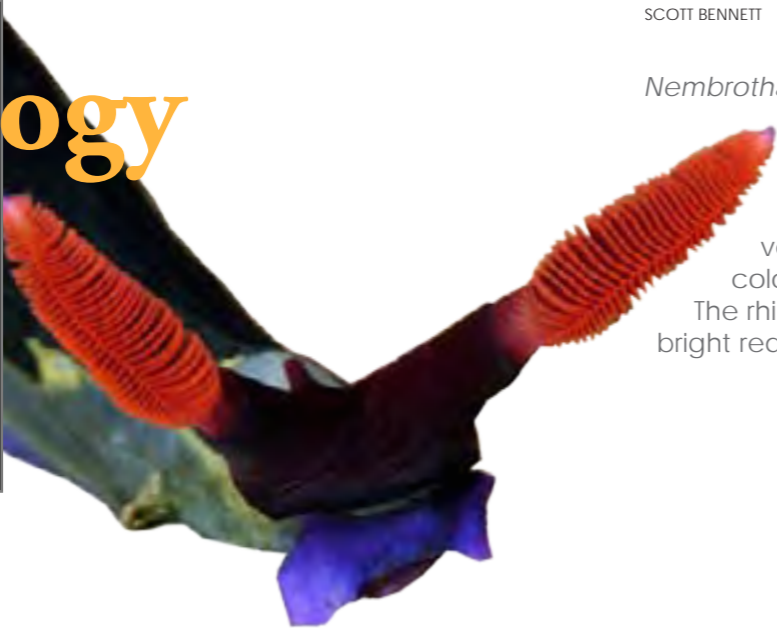


By Michael Arvedlund



SCOTT BENNETT

Nembrotha chamberlaini
This recently (1997) described species has a very distinctive colour pattern. The rhinopores are bright red



SCOTT BENNETT

Chromodoris annae. This is another of the *Chromodoris* quadricolour colour group of species characterised by black longitudinal lines, bluish backgrounds and orange borders

Why are they so colourful?

Naked beauties

Most divers have seen them. Weird-looking crawling creatures with odd shapes, antennae and amorphous bodies and draped in pychedelic colours. We are not talking about aliens from outer space but nudibranchs. But why do they have to look so weird?

Photos by Scott Bennett and Nonoy Tan
Text by Michael Arvedlund and Peter Symes

Nudibranchs are found in all of the seven seas, from the tropics to the polar regions. More than 3000 species are known, and new species are being discovered and described at regular intervals. The word "nudibranch" comes from the Latin *nudus*, naked, and the Greek *brankhia*, gills, and in several languages their name translates into "naked snails".

Naked indeed, and clearly exposed as such. How do they manage to survive in a brutal world full of hungry predators?

Chemical defences

Without a protective shell, nudibranchs, and other sea slugs, had to develop a number of other defensive mechanisms against predation. These include cryptic colouration, or camouflage, and behavioural modifications, such as only being active at night. But probably the most significant development has been the use of

Nudibranchs have nude gills. Therefore the scientific Latin name "Nudi" (nude) "branches". LEFT: *Chromodoris Willani*



SCOTT BENNETT



Warning colouration. Many species with bright colour patterns are full of distasteful chemicals. Others with stinging cells or toxic glands have brightly coloured tips. This species is a *Flabellina exoptata*





NONOY TAN

Many opisthobranchs are mainly active at night when predators cannot see them. Others are able to swim for short periods when disturbed, and so escape predators.

branches are asleep or short periods and so escape predators.

LEFT: *Chromodoris willani*. This species is one of a group of similarly coloured species with a bluish white or translucent white background colour and dark blue or black longitudinal stripes

related species. In particular, terpenoid compounds, which are derived from sponges, are concentrated around the mantle border and in the mucous secretions of the mantle. At their natural concentrations these chemicals deter crabs and reef fishes from preying on the slug.

Why all the colours? Many animals, which are very distasteful or poisonous to eat, have bright colour patterns. The bright colours are considered to be a message to potential predators warning them to stay away. We call such warning colouration *Aposematic colouration*.

In one nudibranch family, the Chromodorididae, the colour patterns of many species are spectacular and obvious. Research in recent years has shown that these animals have specialised glands in their mantle that contain poisonous and distasteful chemicals from their sponge food. It is thought that by linking bright colour to bad tastes, these nudibranchs can teach fish and other potential predators to leave them alone.

In a development of this, we often find geographic areas where groups of unrelated chromodorids have evolved very similar colour patterns, so that they share the load of teaching fish to leave the colour pattern alone. One example of this mimicry in southeastern Australia are a group of about ten red spotted species, some of which are very difficult to tell apart. Most chromodorids have these mantle glands. ■

chemicals to make them poisonous, or at least extremely distasteful, to potential predators. In fact, *Opisthobranchs* (the subclass that nudibranchs belong to) have become subjects for research by marine products chemists who are gradually uncovering just how widespread and in what complex ways chemicals are used by sea slugs. Many store these chemicals in special glands in their skin.

What has caught the attention of chemists and physiologists are the many different pathways the molecules are produced. In some cases, these compounds are absorbed from ingested prey and stored unaltered by the opisthobranch, and in other cases, the compounds undergo some modifications. They may also be produced entirely by the opisthobranch itself.

All different Usually, each species has very specialised food requirements, and often its defensive molecules are also unique and differ from even closely



Egg mass from a Spanish Dancer



SCOTT BENNETT

Yellow and black. Classic warning colouration displayed by a Sagami Bay Tambja

Many opisthobranch egg masses form a spiral ribbon, and most of these spiral in an counter-clockwise (sinistral) direction from the centre. However some such as *Melibe australis* and *Melibe engeli* seem to be dextral, coiling clockwise from the centre. There is some discussion in the scientific community as to whether spiraling tends to be counter-clockwise in the northern hemisphere and clockwise in the southern hemisphere. To complicate the matter, some species start the egg spiral from the outside, whereas the majority start from the centre, in which case, the spiral will be made turning the other way.



Spanish Dancer

NONOY TAN

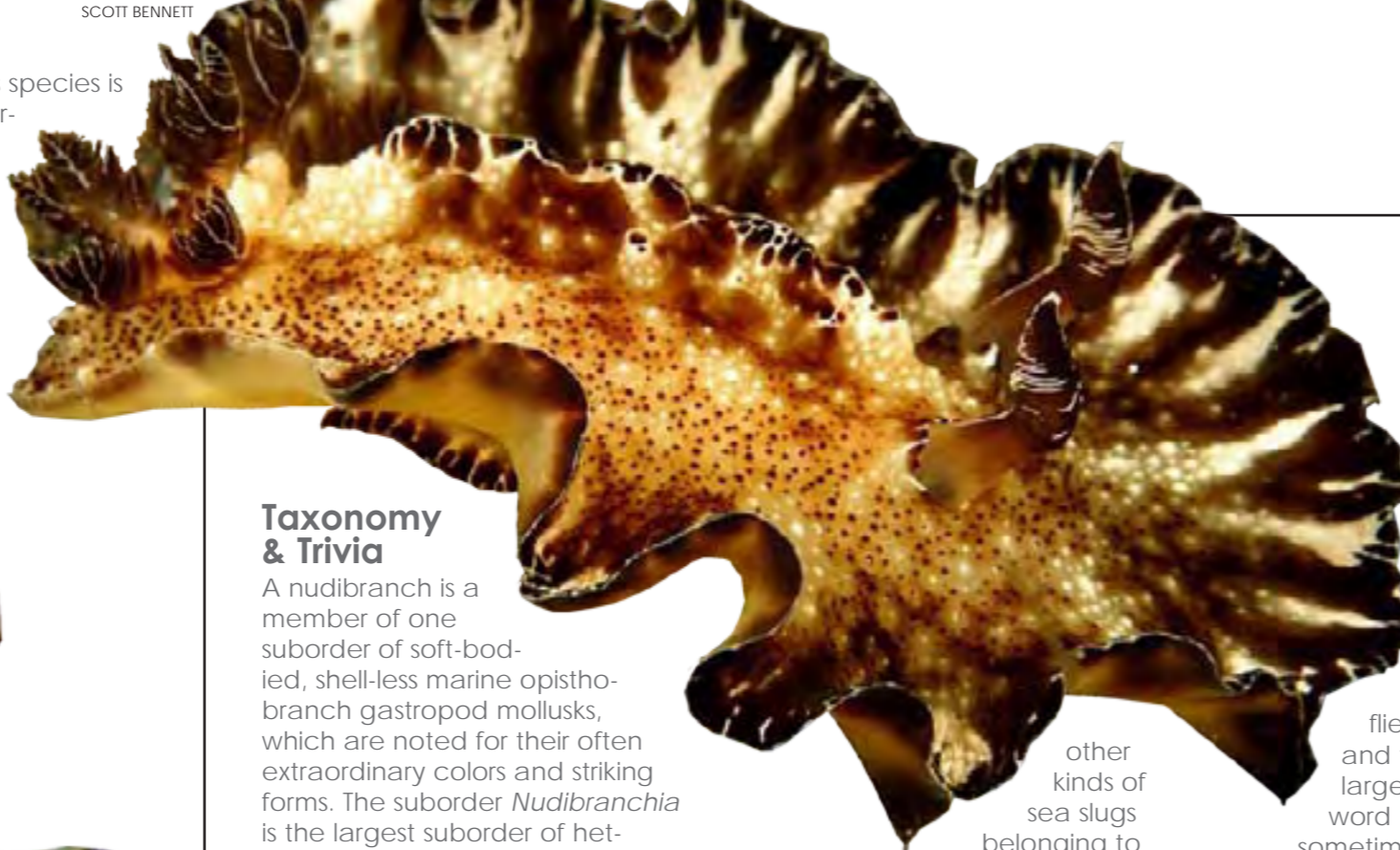
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Discodoris boholiensis. This species is characterised by the narrow visceral hump, which forms a narrow median ridge from the rhinophores to the gills, and wide mantle skirt



Millers Nembrotha, *Nembrotha milleri*. One widespread method of defence is to hide from predators by having a colour, shape and/or texture that matches their food or background environment. Grey-green to dark green body with blackish longitudinal wrinkles down the body. There are three basal gill stalks which split into five branching gills

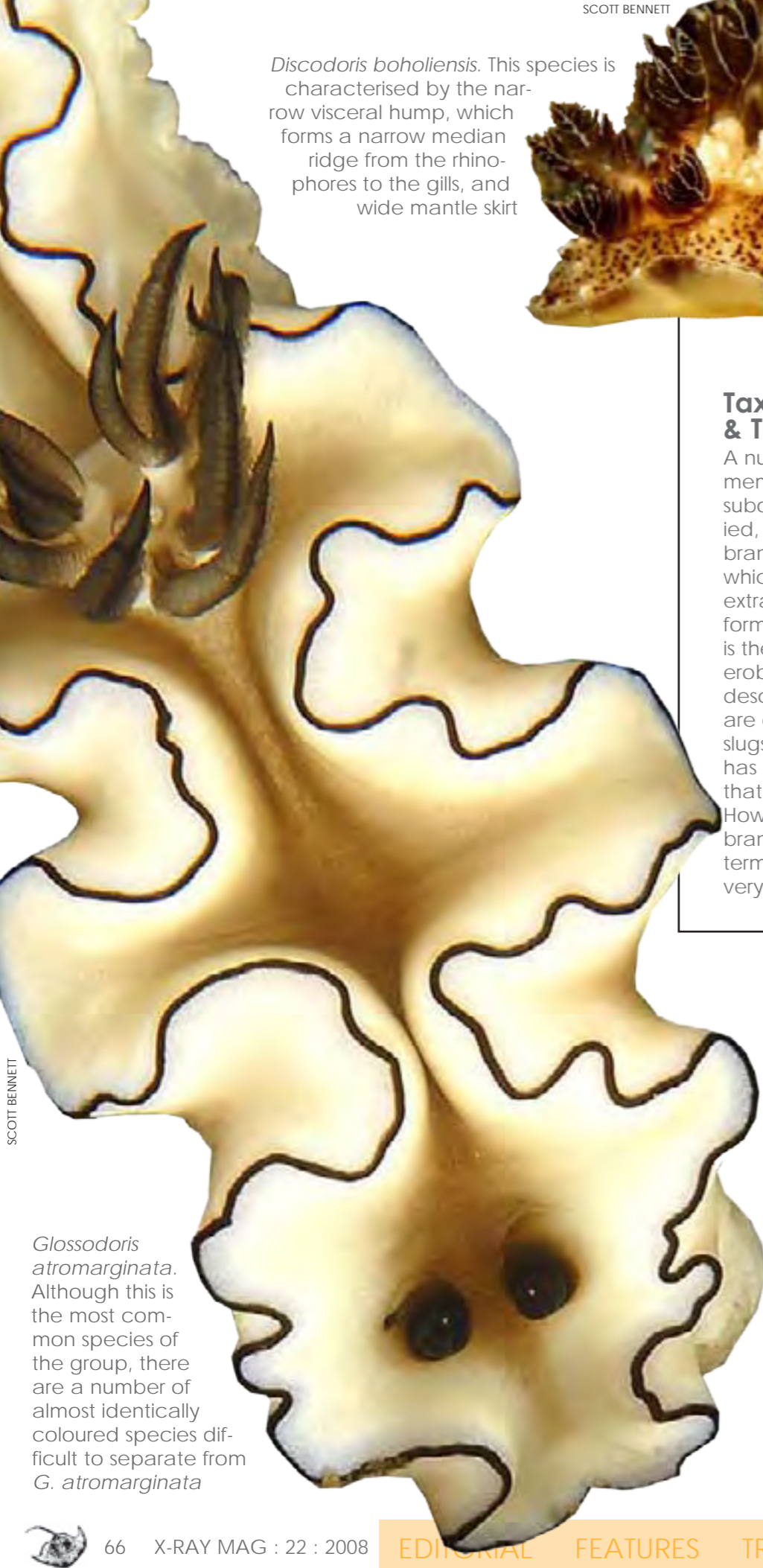
Taxonomy & Trivia

A nudibranch is a member of one suborder of soft-bodied, shell-less marine opisthobranch gastropod mollusks, which are noted for their often extraordinary colors and striking forms. The suborder *Nudibranchia* is the largest suborder of heterobranchs, with more than 3,000 described species. Nudibranchs are often casually called "sea slugs", a non-scientific term that has led some people to assume that every sea slug is a nudibranch. However, while it is true that nudibranchs are very numerous in terms of species, and are often very attractive, there are numerous

other kinds of sea slugs belonging to several taxonomic groups that are not very closely related to nudibranchs. A fair number of these other sea slugs are colorful, and thus, even more easily confused with nudibranchs. Other marine shell-less gastropods or "sea slug" groups include additional heterobranch shell-less

tropod groups such as the *Cephalaspidea* sea slugs including the colorful *Aglajidae*, and other heterobranchs such as the *Sacoglossa*, the sea butterflies, the sea angels, and the often rather large sea hares. The word 'sea slug' is also sometimes loosely applied to the only very distantly related, pelagic, caenogastropods within the superfamily *Carinariioidea*, and may also be casually used for the even more distantly related pulmonate sea slugs, the *Onchidiidae*. (From Wikipedia). ■

Chemical defence. The skin of many opisthobranchs contains distasteful and sometimes toxic chemicals



Glossodoris atromarginata. Although this is the most common species of the group, there are a number of almost identically coloured species difficult to separate from *G. atromarginata*

New nudibranch books

Neville Coleman's new *Nudibranchs Encyclopedia – a review and how it compares to the new Debelius and Kuter *Nudibranchs of the World*.*

Tim Hochgrebe, Underwater Australasia



The long awaited *Nudibranchs Encyclopedia - Catalogue of Asia and Indo-Pacific Sea Slugs* by Neville Coleman has finally arrived and what an encyclopedia it is!

Neville Coleman has made the excellent decision to publish this massive book as a hardcover, and with its over 400 pages, it really needs to be. The hardcover makes the book more professional, and naturally, it will last longer in any diver's library. He still managed to keep the book quite compact in its dimensions (160

x 235 mm), and for nudibranch fans, this book will still fit into their travel case.

The first 30 or so pages is dedicated to nudibranch biology, which makes this book much more than just a reference book to identify that strange new nudibranch you found on your last dive. He talks about the different habitats where nudibranchs are found and also how to find them. He explains how they see, smell, hear, taste and feel and all with beautiful photographs to illustrate each fact.

There are some excellent sections on nudibranch behaviour, including tailing of individuals, burrow-

ing and mantle flapping behaviour, and of course, nudibranch sex and defence.

In his typical emotional style of writing, Coleman manages to draw the reader into the passion and excitement that these critters bring to his life. This makes the book much less 'dry' than many of the books written by scientific 'purists'.

Another difference to Coleman's previous nudibranch publications is the fact that he openly invited many nudibranch lovers from around the world to contribute their findings and

images to this book. It is great to see how many people share the passion and enjoy finding new and previously unseen species and behaviour. By accepting other people's contributions, the scope of the book has certainly widened, and the quality of the imagery has improved, as there were more images to choose from.

Over 3000 images are contained in this work, which makes it the most comprehensive publication on nudibranchs in the world. And since it focuses solely on Asia and Indo-Pacific sea slugs, it is clear that this book is to become 'the bible' for slug lovers diving this region of the planet.

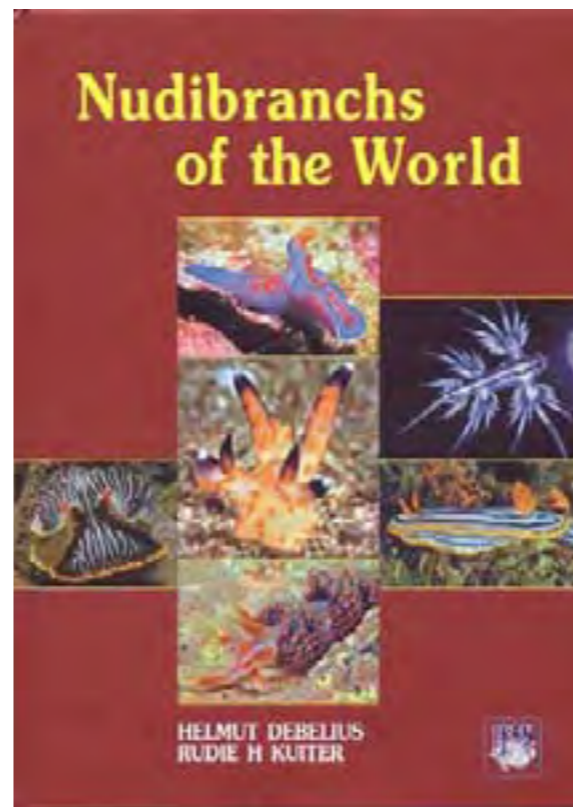
Another new book on nudibranchs is Helmut Debelius and Rudi Kuter's title *Nudibranchs of the World*. This book is much larger in size (210 x 280 mm), and therefore quite a bit heavier. Pages within the book have excellent print quality and stunning photography. *Nudibranchs of the World* feels more like a coffee table book of nudibranchs than a reference book,

In contrast to Coleman's book, which includes ophiotobranch (non-nudibranch) sea slugs, *Nudibranchs of the World* only covers true nudibranchs and sorts them in a more evolutionary or scientific manner. It has an introductory section to each family that highlights the specific features that differentiate each family from the others. Over a third of

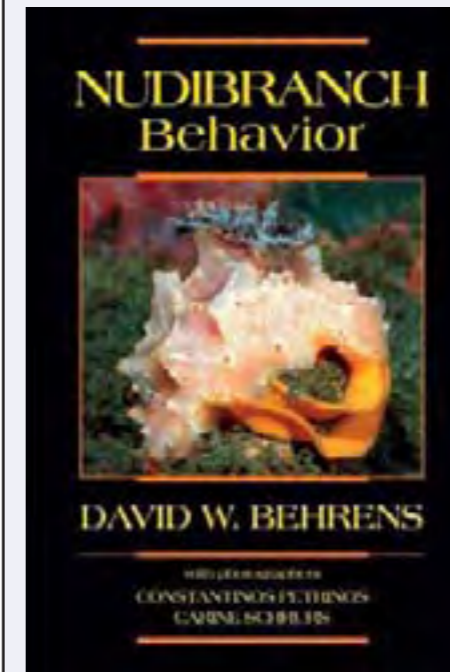
the Debelius/Kuter book focuses on the family *Chromodoridae*. It is amazing to see the regional colour variations in some species.

In summary, as a big nudi lover, you will obviously have to have both books. The Debelius/Kuter book really made me want to go and spend more time diving outside the Asia and Indo-Pacific region, as there are so many beautiful nudibranchs I have yet to discover. In terms of usefulness, I prefer Neville's book—there are more images, it is focused on my favorite region, and will definitely become the first book to open when I see a new nudibranch, or when people submit images to the Underwater Australasia photo galleries and ask questions about the identity of their find.

To purchase your own copy of these books, have a look at the book section at the link below: [underwater bookshop](#). ■



Not new but still very handy



The book should really be titled Sea Slug Biology ... I also find the term behaviour a bit misleading. It is, however, a great book.

Nudibranchs are among the most beautiful creatures on the reef, with colors and shapes that dazzle and delight. Unlike fish that may disappear before our eyes in a flash, the showy nudibranch glides slowly along the substrate, allowing us the time to savor this extraordinary sight. With their shell-less unprotected bodies, how do they survive in seas filled with hungry mouths? How do these sightless creatures navigate the reefs to find food and mates? What and how do they eat? How do they reproduce? What special relationships have they developed with other reef inhabitants? These and many more questions are answered in this informative and lavishly illustrated book. You will never look at nudibranchs the same way again. ■

Soft cover: 177 pages
Size: 180mm x 250mm
ISBN: 1-878348-41-8

Good to know: *Aeolid cnidosac*

The *Aeolid cnidosac* is one of the most remarkable examples of recycling in the animal kingdom. These animals feed on cnidarians (sea anemones, corals, hydroids, jellyfish, etc.) and are capable retaining at least some of the cnidarian's stinging cells (nematocysts) in a functional state, so that they are able to reuse them in their own defence.

The *Glaucus atlanticus* (below) is an example of a nudibranch that can severely sting humans.



Cnidarians, or coelenterates, have a wide range of nematocysts, some of which are used for poisoning prey, some for catching by harpoon-shaped barbs, others for entangling with sticky secretions or entangling coils. The three nematocysts in the cnidosac photo above are barbed nematocysts. When they are triggered, the spiral thread, which is easily seen in the photo, uncoils as a long thread to attach the barb to the cnidarian, or in this case, to the cnidosac.

It is now thought that nematocysts reach a state of physical but not physiological maturity in the cnidarian. Usually, after some time, they then become part of the cnidarian's functional armoury. It is thought that the nematocysts, which are captured and able to be used by the aeolids, are those that are physically mature when eaten, but not yet physiologically mature. ■

TARO TAYLOR



*Dr Shawna
Meyer &*

The Red Demon

Text and photos by Cindy Ross

As the Mexican Baja sky blazes fiery pink in the warm evening air, Shawna Meyer, founder of SquidDiving.com, loads the tanks aboard the panga boat for the divers daring to encounter the Humboldt squid face-to-face. This is not diving for the meek.

The Humboldt Squid, also known as "The Red Demon", is a large, aggressive carnivorous creature that moves in shoals of up to 1200 individuals, at speeds of up to 24 km/h. Weighing in at 48-100 kilos and spanning up to three metres in length, these intelligent, powerful squid communicate by flashing red to white as they work together to capture prey, then simultaneously turn and cannibalize each other. With eight arms, two specialized feeding tentacles, ice blue blood and problem solving intelligence, these creatures are constantly identifying other marine dwellers as "predator" or "prey".

So, what drives this mermaid to frolic in the water with these monsters? Shawna began diving in 2006 and found a world under the water that changed her life. "Prior to diving, I saw the ocean as a big blue mass of water with waves crashing on the beach. Not anymore. I've been given a chance to see the life it offers. It provides adventure you can't get anywhere on land. In just the last few years of diving, I've seen some amaz-



Dr Shawna Meyer is an expert on close encounters with Humboldt squid



Humboldt Squid

100 divers) a chance to see these creatures in their natural habitat, and she wants to encourage more people to have this experience. Diving with squid is dangerous, however, all precautions to ensure the safety of the divers are taken. Suspended in 300 vertical metres of water column, and donning an 8 kilogram chainmail armor suit, divers are suspended by a 12 metre safety cable attached to the boat. As they watch and wait in the dark water, the Humboldt are lured in. Suddenly, the divers see the mammoth creatures with human like eyes. It's an adventure that is for the brave-hearted, and one that will bring you a deeper perspective of the world beneath the waves. Here, divers witness one of the most ferocious creatures on earth, having a chance to see the intelligence and grace that are too often left out of television documentaries.

Researching the Humboldt

When Shawna isn't escorting tourists, she participates in research studies on the Humboldt Squid. On a recent expedition with Steve Blair, curator of the Aquarium of the Pacific in Long Beach, California, Shawna assisted with conducting experiments that will help determine the possibility of keeping Humboldt Squid in captivity.

Once out in the water, they set up the free-floating net pen, where squid are placed to conduct the experiments. The squid are lured to the surface by first deep water jiggling a squid, and hopefully, as the first jigged squid comes up, he brings the whole shoal along, as they are fierce cannibals. It wasn't long before Steve was shouting that there are squid coming en masse. Shawna grabbed a camera and dove into the water to record the event. With dead fish thrown in the water, the 40 – 50 squid were in full attack mode chomping away at the bait.

Shawna stayed close to the floating pen, even though it was not tethered to the boat, deciding it was sturdy enough to clutch, so the squid couldn't snatch her to the depths easily. Positioning herself, she pushed the record button on the HD camera, and aimed at the action below. As the 2 – 3 metre squid danced for the camera, a large squid took notice of Shawna and aimed toward her. She grasped



Meyer manages to get up close and personal with the Red Demon

ing animals. I have also seen those animals already disappear. I understand the diversity in the oceans, how important each species is to each other and to us; that when one goes away, if extinct or simply leaves the area, how it effects the rest of the life in the water,

and that it can even effect us on land. I've been out on the water, and where there were supposed to be fish, there were none. I hear stories from the locals how the water is acting unusual. It's colder when it should be warmer and vice versa. Fishermen report they don't

catch as many fish as before, and they say the fish are all gone. I know that we can't just leave it up to the scientists, with letters behind their names, to say when and how to make a difference. We as human beings have a responsibility to take care of our planet, and

we need to start doing it now. We also have a responsibility to see all we can. Underwater, there is still so much life to experience, to learn from, and to enjoy."

Shawna's mission with the Squid has provided a very limited few (less than



Underwater photographer captures the amazing interaction between Meyer and a Humboldt squid



MONTEREY BAY AQUARIUM RESEARCH INSTITUTE

Humboldt Squid trivia

Humboldt Squid are large, aggressive and predatory squid that move in schools of up to 1200 individuals in the waters of the Humboldt Current in the Eastern Pacific Ocean. They swim at speeds of up to 13 knots miles per hour (24 km/h,) propelled by water ejected through a hyponome (siphon) and by two diamond shaped fins. Their tentacles bear suckers lined with sharp teeth with which they grasp prey and drag it towards a large, sharp beak. They are most commonly found at depths of 200-700 metres from Tierra del Fuego to California.

Recent findings suggest the range of this species is spreading north all the way up to Canada. Historically, the two-metre-long Humboldt squid would only ride warm ocean currents northwards from the tropical waters off Central America and Mexico only during El Niño events. There, they would feast on Pacific hake, a fish that can grow up to a metre in length. But when the periodic warming ended, they would make their way back to the tropics.

Bruce Robison of the Monterey Bay Aquarium Research Institute in California says overfishing of tuna in the tropics has caused squid populations to rise. This occurs because tuna feed on the same smaller fish that squid eat, and also prey on young squid, keeping the population in check. The growing squid population has now moved north as global ocean temperatures have risen.

These animals have demonstrated a tendency to meet unfamiliar objects aggressively, attacking divers and rendering deep-sea cameras inoperable. Each of the

squid's suckers is ringed with sharp teeth, and the beak itself can tear flesh, although it's believed they lack the jaw strength to crack heavy bone.[5] Nevertheless, they eat their prey by grabbing it with their tentacles and biting it repeatedly with their beak. Working together, several squid are able to devour large prey very quickly.

Recent research suggests that the squids are only aggressive while feeding, being quite passive at other times. Their behaviour while feeding often extends to cannibalism, and they've been seen to readily attack injured or vulnerable squids of their own school. This behavior may account for a large proportion of their rapid growth. As they are believed to have a lifespan of only about one year—although some researchers believe they may survive up to four years—during which they may grow to 2m and weigh 45kg; their growth rate is astounding. ■



Watch this video clip from Monterey Bay Aquarium at www.x-ray-mag.com/node/395

ahold of the pen, but there were already several huge squid inside the pen, so there was no refuge to be had there. Feeling something near her head, she turned to find the angry jiggled squid. She was right in the middle of the bait. Quickly, she exited the water, realizing the danger she had been in.

Shawna actively is documenting location sightings. The Humboldt have been expanding their migration into new waters, not known for Humboldt activity. This causes alarm, as these creatures devour everything in their feeding frenzy. Even though the squid are vulnerable out of water, when slammed onto the deck of a commercial fishing boat, they are still very powerful creatures in the water. Intelligent, strong, resilient and able

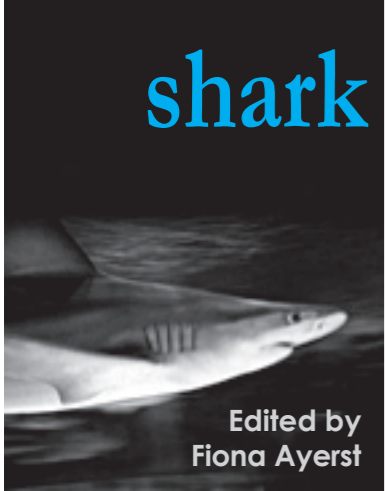
to reproduce in mass quantities. If the population soars out of control, Shawna fears that we could be looking at a devastating future for other fish populations in our oceans. She would like to see an enforcement of fishing for sharks, whales and other apex predators in the oceans, as these are the creatures who feed upon, and balance out, the populations of squid.

For as long as she has been diving with the squid, Shawna can only count three women who have encountered the Humboldt while SCUBA diving. Two were with Jean-Michel Cousteau's "Ocean Futures Society", acquiring pictures for a photo essay. The third diver unfortunately arrived late in the season, and due to bad weather, only witnessed one squid and not a shoal.

Shawna and the customer agreed that diving with one squid didn't achieve the full effect, and she would come back in the warmer season to complete her experience.

Shawna wants to encourage more women to come and dive with these magnificent creatures. Diving in crystal blue waters on a typical dive vacation, where you can see the bottom, all the life on reefs, and tiny tropical fish is nice, but nothing compares to the awe that comes with experiencing the Humboldt naturally in its environment. There really is nothing else like it on the planet. ■

*Cindy Ross is the founder of **GirlDiver.com** and **Dive For The Cure**. She is a regular contributor to X-RAY MAG's column, **Mermaid Matters**.*



Edited by
Fiona Ayerst



Evil prevails when good men sit and do nothing

— Edmund Burke

News from South Africa has rocked the shark diving world. We have lost eight of our Tiger Shark ambassadors to a local fisherman in the past month. These Tigers were famous. With their soulful eyes and striking silver stripes, they were trusting and playful and, above all, incredibly beautiful. We will sorely miss them, the majestic ladies from the Mecca of shark diving in Kwa-Zulu Natal. The site for their demise was Aliwal Shoal (The Shoal), off Umkomaas.

It is suspected that three of the sharks were illegally slaughtered during the first two weeks of February 2008, for their fins and meat. There have been many more sharks killed before and since, but these are the ones of which we are sure. Their bodies were recovered at a fishery holding fridge and are now evidence of the crime committed against them, wrapped in plastic and lying in a freezer. These are the three sharks whose deaths are causing anguish and fury amongst those who spent hours enjoying their antics in the water.

There are 14 local operators who take clients to see sharks in this area, and many visitors are international. The place is a mini-

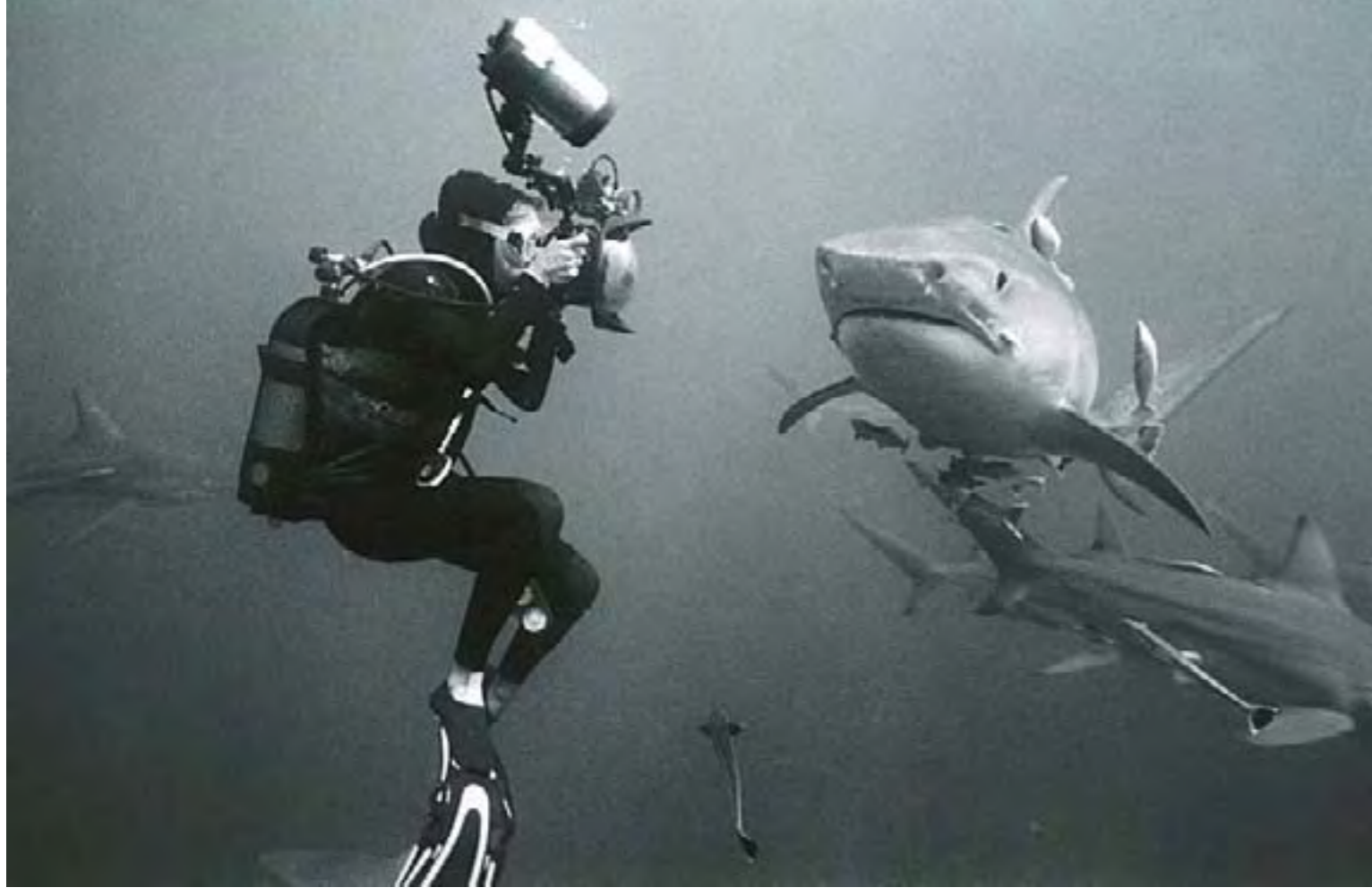
Gansbaai in the making, and with warmer and cleaner water than the Cape, a draw-card for the country. Local marine biologist, Matt Dicken, who has been investigating such things, told me that in a recent survey, 41 percent of people interviewed would not dive at The Shoal, nor travel there, if the Tiger shark diving was not available as an option for them to enjoy.

No wonder there is an uproar!

My first whiff of trouble was an anguished SMS from Mark Addison, the owner of Blue Wilderness. Mark and his team have, over the past ten years, taken many an ardent diver and scientist out to view

Text by Fiona Ayerst. Photos by
Fiona Ayerst & Wolfgang Leander

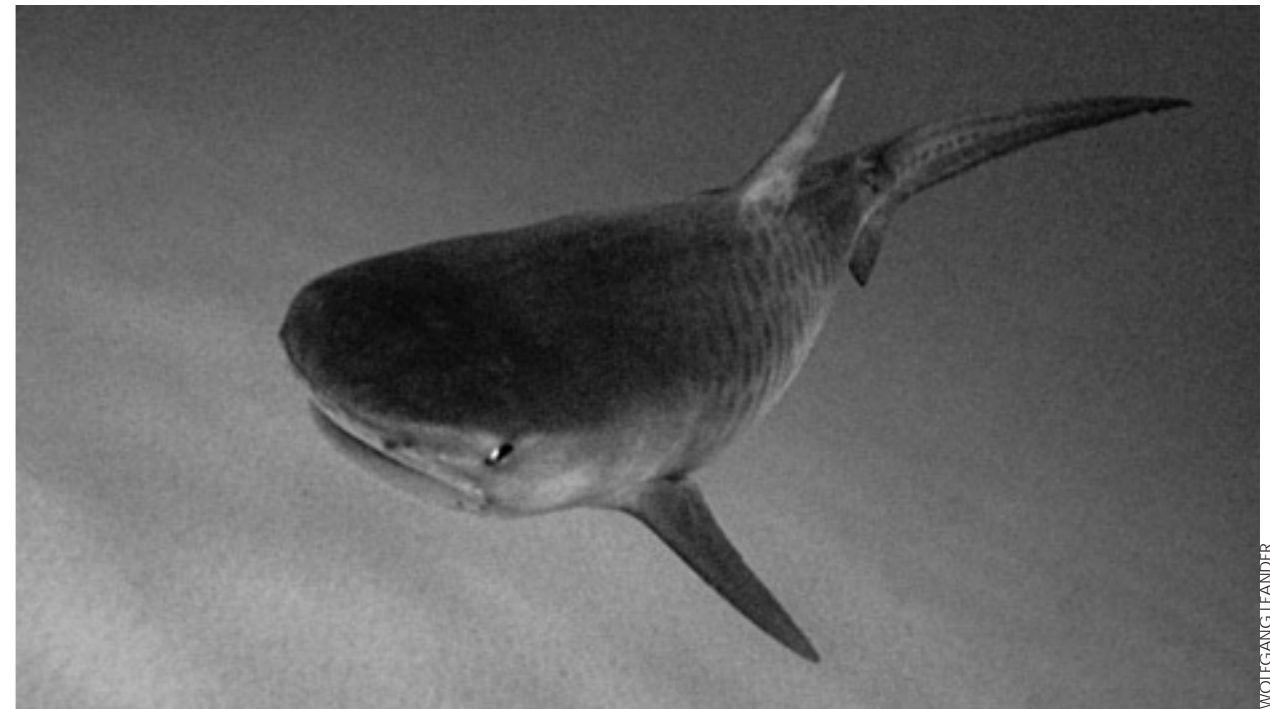




With their soulful eyes and striking silver stripes, they were trusting and playful, and above all, incredibly beautiful

Why did they have to be killed?

He would argue not, but I beg to differ. It would have been beneficial for him to attend the crime scene even if it was just for the sake of fishermen, operators and tourists who look to KZN Wildlife for support and enforcement of laws. In this instance, KZN Wildlife had been entrusted with the pro-



WOLFGANG LEANDER

tection of our heritage. Perhaps Naidoo would not be out there today wagging a finger at those he blames for “turning him in” and threatening to take away their

livelihoods—which he may have managed to do already—and even their lives. Is it possible that if enforcement was forthcoming and obvious, unscrupulous op-

and study the Tigers. Renowned advocate for shark diving, free diver Wolfgang Leander wrote an informative and passionate article in *X-RAY MAG* issue 18 about the spectacular thrill of diving with the Addisons and the sharks of The Shoal. If you look back and read the two articles, this will firmly plant in your mind the supreme waste and tragedy of this incident.

The furor started on February 15, 2008, when a fisherman from Durban area, Mr. R Naidoo (Naidoo), came ashore at the Park Rynie launch site (Rocky Bay) and was spotted with three dismembered Tiger Sharks on board. Local dive operators and tourists watched helplessly, and in horror, as they saw Naidoo driving away from the site with headless and gutted sharks—their tails hanging over the back of his vehicle.

Rocky Bay is within the newly proclaimed Aliwal Shoal Marine Protected Area (MPA). Compliance in the MPA is entrusted to

Ezemvelo KZN Wildlife (KZN Wildlife) who receive fees for their work in the area. It is illegal to catch, transport or to be in possession of any of the following fish in the MPA: Great Whites, Spotted Ragged-Tooths, Tigers, Bull, and Whale Sharks. That Naidoo caught the sharks is not in dispute. On more than one occasion, Naidoo has publicly admitted to killing the sharks.

Once the carcasses had been spotted, the local KZN Wildlife officer for that area was called in. The compliance officer said he could do nothing as it was a Friday afternoon, and he had to get a search warrant to be able to go to Naidoo’s home. The incensed operators were told that there was no possibility of the officer getting a search warrant on that day, nor over the weekend. Worse than this, they were made to feel like accessories to the crime for not having taken a picture of the sharks with their cell-phones! The

disbelieving onlookers were told that if they had a photo, there would be no need to get a warrant, and an arrest would have been immediate!

Is this acceptable and is it, in fact, correct? I believe we should be looking deeper into this. Other instances of neglect and disinterest by KZN Wildlife and its officers are “seeping out of the woodwork”. As Naidoo drove away with three tails of their livelihood hanging over the back of his vehicle, the operators had a compliance officer on the other side of a phone saying there was nothing he could do. One can just imagine the frustration and anger.

To compound issues, the officer did not venture to Rocky Bay at all on that fateful afternoon. Why not? There were many witnesses still around. If he had at least arrived at the scene of the crime, would it have made a difference?

Is this how we want to see our sharks?



FIONA AYERST





portunists would think twice about slaughtering the animals that live there?

As Mark Addison says, "The blatant flouting of these regulations and the total apathy on behalf of the enforcement authorities when asked to intervene leads one to ask what value there is in these Marine Protected Areas without enforcement capability and capacity."



Worker finning a shark
Although many international visitors flock to Gansbaai to see the famous Great Whites- each day on the same harbour where they launch, tons of sharks are caught, finned and exported for the Asian fin market.



FAR LEFT AND BELOW: Tiger sharks
LEFT: Reserchers tagging sharks

My investigation into this matter indicates that many of the people living on the "Sunshine Coast" feel the same way. Some of them use the apathy to their advantage, but for most of them, what happened on that fateful day is just another example of whatever problems are causing KZN Wildlife to fail both the marine life and the community. Their function is vital and crucial, but they are seen to be impotent.

It is, however, clear that we cannot blame an individual, and I certainly do not intend to do so. Having spoken to KZN Wildlife, it is clear that they do have sufficient resources and manpower to manage the area with which they have been entrusted.

What needs to be investigated is how and why.

How is it that vital evidence may have been lost due to certain omissions on the agency's part, and why did this occur? More importantly, how can this be addressed, so it does not happen again? KZN Wildlife sees how important their role is, and they have told me "the will is there". They are dedicated to holding these enquiries and coming up with resolutions. I will be holding them to this.

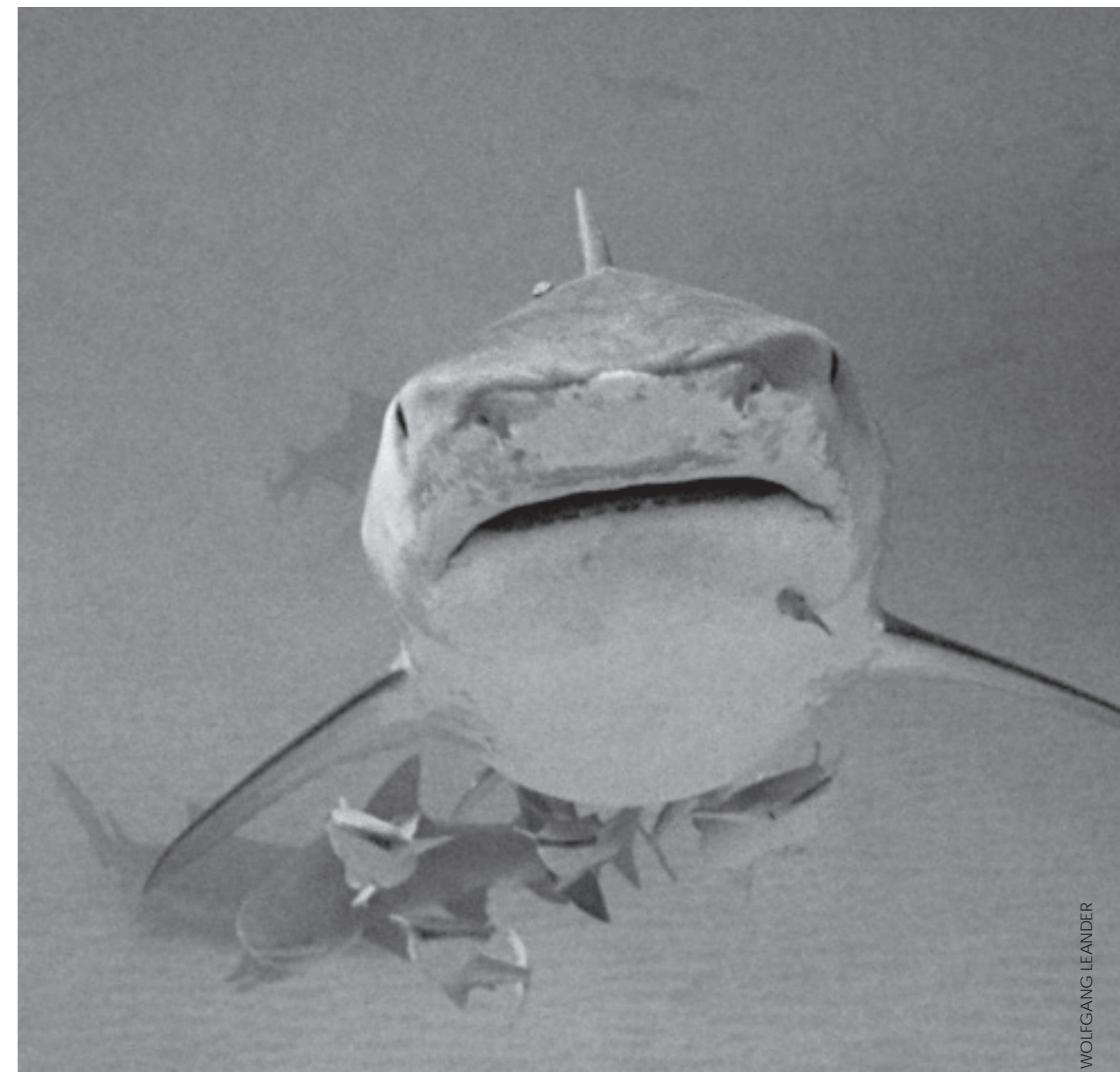
The culprit

Naidoo is denying that he did anything illegal. He did not catch the sharks in a protected area, he says. Naidoo is forgetting that he is not allowed to transport these animals within an MPA, and he has broken the law even in his own version of the facts. He transported them and landed them within an MPA. For this, Naidoo should be prosecuted.

Despite certain international

media having indicated that Naidoo has been charged and his home raided, this is not the case. Why, after one month has already passed, has Naidoo still not been charged—even if it is initially with at least the crimes to which he has admitted? Naidoo is out on the water each day hunting sharks. His belief that he has not committed a crime grows stronger with each day that passes. What is his next step whilst the authorities delay?

All is not well along this peaceful area termed the Sunshine Coast for its clean soft beaches and clear warm waters. Enforcement appears to be weak. It is a perfect setting for a Chinese triad to infiltrate, as they are an ever-reducing source of shark fin for the infamous soup. I heard suggestions that this has already happened, but that's another story altogether!





Apparently, shark meat is sold in this area for anywhere between R15 and R18 a kilo. Previously, I had heard that Tiger shark meat was inedible, as it contains high counts of mercury. Is it possible that these huge beauties are being targeted just for their fins, and that the rest of the body just goes to waste?

KZN Wildlife say they have completed their investigations, and the matter has been handed over to the organized crime unit of the South African Police Force (SAPS) who will gather evidence for consideration by the senior public prosecutor in the coastal town of Port Shepstone.

We have told KZN Wildlife and the SAPS that the Addisons had had divers in the MPA interacting with Tiger sharks in the morning of the same day when Naidoo killed the sharks. It may be possible to compare photos of the carcasses, and tie them in with pictures taken by the divers. Despite this

evidence being readily available, we are not being allowed access to the freezer.

Evidence

It is clear that a quick and thorough investigation is required in marine crimes. I suggest that there is sufficient evidence that Naidoo caught the sharks in the Aliwal MPA. The evidence against Naidoo is mounting up and includes, but is not limited to, the following:

1. On the same day, he was seen driving his boat in the MPA by various witnesses;
2. On the same day, witnesses saw him fishing in the MPA for extended periods of time;
3. On the same day, he was called via cell phone to an area where a Tiger Shark viewing dive was taking place. He requested that more chum be put in the

water for the sharks (perhaps he wanted to keep the sharks in the vicinity until the divers had gone, and he could fish them out at very little cost to himself);

4. He could not get his anchor and buoy line off the reef where he had been fishing. His fishing area was inside the MPA, in an area where Tiger sharks are dived with regularly, and where the Tiger dive had taken place that very morning. When he left for the beach with his kill, he had to cut the line off close to the surface. The line and two buoys were located still hooked into the reef and inspected by a local dive operator the following morning.

I sincerely hope that the senior public prosecutor will find this, and the statements taken, sufficient evidence to charge Naidoo not only with that which he has admitted to, but also to fishing WITHIN a protected area. Naidoo needs

How many times must it be said? We have made ourselves the custodians of all things natural. The future of sharks is up to us

to be brought to book with the same laws that he so blatantly flouted.

Honoring the dead

Whilst remembering our friends the Tigers, let us not forget the hundreds of Black Tip and Dusky sharks that form part of the ecosystem and the thrilling shark diving experience at Aliwal Shoal. These sharks are not protected within the Aliwal MPA and so are pulled out in much higher numbers every week and should also be mourned.

A recent IUCN indicates that, globally, dusky sharks are going to be afforded an Endangered or Vulnerable status. In South Africa, even WITHIN a protected area, these sharks can be caught with impunity.

I just can't seem to get my head around the bizarreness of this situation. Does man really have the ability to manage his surroundings? Do we really need to wonder why our environment is in such trouble everywhere we turn?

To chum or not to chum...

A troubling thought, to which there is no easy answer yet worries me, is whether or not the chumming and attracting of sharks in this instance may have led them to their death. An opportunistic fisherman saw a "fast buck" and an easy catch. I am very much on the side of agreeing with shark diving with no cages. I think there is no better way to interact with and really learn about these fish. I also believe that it is also about changing perceptions of sharks as just being monstrous killing machines.

There is the argument that the fisherman may have taken the sharks out anyway. Its just that

all the evidence I have found leads to the fact that it was an easy kill for him. It appears that the sharks in this area MAY be "conditioned", as they gain significant and predictable food rewards. This is something that the operators are going to have to consider.

Working together

It is so easy to blame others. This incident will hopefully show the operators in the area that they need to pull together in whichever way is appropriate for them.

I do think it is important that the industry grows strong and healthy for many reasons. The operators will need to find a

way to co-operate with each other, if they want it to continue. With incidents like the Abernathy shark fatality case in the current press, and with all eyes on the industry, it becomes increasingly important that operators and dive businesses come together and present a unified front.

Of course, it often takes something this sad to get "good" people to sit up and take notice. Positive action can flow from this situation, and already we are talking about local monitoring programs and vital training, not only for the enforcement agencies, but also for the SAPS and the legal teams who need to ensure that marine crimes no longer go unpunished.

Those in enforcement with

whom I have spoken say that these crimes do not go unpunished. Well, then I say, let's show this to the public and to those who are concerned. Let's get a conviction of Naidoo, and if necessary, his "team". Let's show the world what we care about and what happens when laws are broken.

These sharks need not have died in vain.

These Tigers, due to their immense beauty and inquisitive natures—our ambassadors for the area—are gone, but we need to make sure that they are not forgotten.

How many times must it be

said? We have

made ourselves the custodians of all things natural. The future of sharks is up to us. It's not too late, but only just! Please join the global fight for increased protection of sharks and control of all shark fisheries.

You can immediately help by adding your

voice to the petition started by a South African shark conservation group AOCA. Please go to <http://www.aoca.org.za/petition.php>. Please add your signature to the 1000 people out there who have already done so. We need MILLIONS of you—not just 1000! If you are still undecided, then consider this sobering statistic: in the next five minutes during which you consider the petition, 1000 more sharks will die. Just do it! ■

Despite certain international media having indicated that Naidoo has been charged and his home raided, this is not the case. Why, after one month has already passed, has Naidoo still not been charged—even if it is initially just with the crimes he himself has admitted to?





Edited by
Fiona Ayerst

"We started calling it the café because that is where you might go to have a snack or maybe just to 'see and be seen.' We are not sure which."

'Superhighways cafés and hotspots'

Researchers using sophisticated tracking system have found that there are two distant destinations the white sharks favour, which they visit on a regular basis each year, migrating quickly along "super highway" routes and congregate at established "stepping stone" sites.

White shark café

Each winter, the white sharks move away from the California coast, with the minority choosing to go to the Hawaiian islands, and the majority travelling to the middle of the Pacific Ocean. The latter location is about 1,300 miles from the mainland and has been dubbed the

"white shark café" by researchers. When the sharks return to the mainland, they go to the same area each summer.

Salvador Jorgensen from Stanford University's Hopkins Marine Station said "Once they leave the café, they return year after year to the same exact spot along the coast, just as you might return to a favorite fishing hole. The white sharks "appear again and again at very specific areas".

Although there are white shark populations off South Africa and Australia, the populations do not appear to mix, instead sticking to consistent routes and destinations.

"This is really important in terms of management, so that management can focus on these population units," Dr Jorgensen said. "And this really sets the stage for us to census the population, now that we know it is a confined population in the eastern Pacific."

Jorgensen, and his colleagues continue to map out the migration routes and gathering sites of highly mobile sharks, including some of the most threatened species. As this information becomes available, it can direct conservation efforts by helping fisheries managers to focus on protecting these sites. ■



Cosmetic Change

Cosmetics giants agree to stop using shark oil

International companies L'Oreal and Unilever have agreed to replace the compound squalene—found in shark livers—in their cosmetic brands with other oils from plant sources. Deep-sea sharks have large reserves of squalene, widely used as an emollient in various creams, lotions and glosses, as their livers comprise up to one-third their entire body weight.

In what is seen as a significant victory for the campaign group Oceana, Unilever said it had stopped using shark oil in high street brands such as Pond's and Dove some years ago, and is withdrawing its use from the entire European range by April 2008. "This is part and parcel of becoming as responsible as one can in our supply chain," a spokesman for Unilever said. L'Oreal is now completing the phase-out of shark oil in skincare products. However, 12 make-up formulas, including eight lipsticks under the Shu Uemura brand name, which is owned by the company, remain unaltered. In a letter to Oceana, L'Oreal spokesman Pierre Simoncelli wrote: "We hope to finalise this substitution programme for these remaining formulas in 2008."

Beiersdorf (which makes Nivea products), Boots, Clarins, Sisley and La Mer have all either made the decision to stop using animal-based squalene some time ago or had a policy to never use it in the first place.

Rebecca Greenberg, a marine scientist with Oceana, said: "Some of the biggest names in the cosmetics industry are recognising their corporate social responsibilities and choosing not to contribute to the extinction of these important animals. ■

Two new shark species found Down Under

Two new species of wobbegongs, otherwise known as carpet sharks, have been found in Western Australian (WA) waters. WA Department of Fisheries shark researcher, Justin Chidlow, said there were now eight known wobbegong shark species in Australia.

The new floral banded wobbegong has been spotted between Geraldton and Augusta, and the new dwarf spotted wobbegong was found in shark fishery catches between Green Head and Mandurah.

"It's amazing to think that the new species have been present off our coast, but that it's only now that they have

been formally identified as separate and been added to the list of known wobbegong species," Mr. Chidlow said.

The colour of the floral banded species is mainly dark brown with yellowish blotches on the upper surface and white on the underbelly, whereas the adult of the dwarf spotted wobbegong was a lighter yellowish brown with large white blotches on top and creamy coloured underneath. ■



The related spotted Wobbegong (file photo)

Nine More Shark Species Face Extinction

Nine more species of shark are to be added to the endangered list as scientists warn that oceans are being emptied of the fish by overfishing and finning.

The scalloped hammerhead shark, which has declined by 99 percent over the past 30 years in some parts of the world, is particularly vulnerable and will be declared globally endangered on the World Conservation Union (IUCN) list.

All three species of thresher sharks, known for scythe-like tails that can be as long as their bodies, were listed as Vulnerable globally. The bigeye and pelagic thresher sharks were assessed for the first time, while the "common" thresher was uplisted from the Data Deficient classification made in 2001.

The global threat status was heightened for shortfin mako, a favorite shark among commercial and recreational fishermen, from Near Threatened in 2000 to Vulnerable today.

The blue shark, the world's most abundant and heavily fished pelagic shark, stayed in the threat category Near Threatened. Scientists noted declines of 50-70 percent in the North Atlantic and concern over the lack of conservation measures, but could not reach consensus that the species is Threatened with extinction on a global scale. ■



Young mako shark

Reporting from the Zambezi Shark Discovery Project

Text by Fiona Ayerst

We decided to start the exploration and research with the Zambezi Shark population on pinnacles reef in Southern Mozambique as there is a seemingly large population of Zambezi Sharks inhabiting that area. The warm waters, moderate currents and good visibility also make Pinnacles an attractive and relatively stable study area.

So, in January 2008 a team representing Sharklife and SAMPLA set out for an adventure in Southern Mozambique to begin a long overdue and crucial study of the Zambezi or Bull Shark, *Carcharhinus leucas*. On the team we had a marine scientist, Ryan Johnson from SAMPLA, three directors from Sharklife and a host of excited underwater photographers ready to capture the action. We took acoustic transmitter tags and a frequency synthesized ultrasonic telemetry receiver that enables tagged sharks to be tracked. Ryan is now finishing a report to enable Sharklife to present the information to prospective sponsors needed to continue the research. The

SHARKLIFE is a conservation organization that has the ultimate aim of addressing the alarming over-exploitation of shark populations (and ocean fisheries) in Southern African waters. **SAMPLA** is the acronym of the South African Marine Predator Lab. This is a research and exploration institute working on uncovering the hidden lives of sharks and other marine predators in Southern Africa. SAMPLA is run by a quartet of marine scientists who are dedicated to increasing our understanding and inspiring our passion for the underwater world. ■



photographers also played a crucial role as individual sharks could be clearly identified in the photographs taken allowing Ryan to approximate the size of the shark population living in the area.

As a group, we had decided we did not want to "fish for" and hook a shark to the side of the boat in order to tag it. We agreed that we preferred not to place the shark under any unnecessary stress, so Ryan undertook to tag the shark underwater. The tag Ryan would be using, a continuous pinger, would be inserted into the base of the dorsal fin where it would lodge and stay for a period anywhere between nine months to a year before dislodging. This would allow the shark to be tracked for a 9-12 month duration. Ryan has extensive experience in the tagging and tracking of Great White Sharks, but Zambezis were an extraordinarily tough adversary, much tougher than we had expected.

Ryan is a free diver and decided to initially try and tag the sharks whilst on breathhold. The team used bait to assist Ryan with this task. This method allowed the research team to get close enough to study the animals without having to use invasive capture techniques. Sharklife does not support the unregulated use of bait to attract Zambezi sharks outside of controlled research and education initiatives. This project aims to provide data to both the Mozabiquan and South African governments for improved protection and management of the species.

This method of attraction would also assist the photographers in capturing the images Ryan had asked for. However, we still found it difficult to get close enough the sharks. In particular, I found that it is true that if you swim after a Zambezi shark, it will swim away from you much faster! Underwater, these sharks all looked remarkably similar. I truly felt sorry

A specially adapted underwater video camera with parallel high intensity green laser beams to enable us to calculate the size of individual sharks.

for Ryan having to sift through all those i.d photos and to try and make some sense and structure out of it.

But I needent have worried, as Ryan had his own particular brand of problems to deal with. He didn't have any success in tagging whilst on breathhold as the sharks were cautious of the divers and would move out of reach of Ryan whilst he was descending on breath hold. Ryan then switched to scuba, which proved more successful when he was approaching the sharks. Ryan was using a

Hawaiian sling method to insert the tag i.e he had a tag on the end of a metal pole with a rubber bungie attached. The bungie propelled the pole toward the shark, and theoretically would embed the transmitter head into the cartilage base of the sharks dorsal fin. However, due to the water resistance and thickness of the sharks skin, this method proved unsuccessful. Ultimately, and as a last resort, Ryan ended up placing the tag in a fish head and feeding it to our target specimen. The negative part of this method was that the tag would probably only remain in the shark's system for a period of one week if we were lucky. Sharks have been known to regurgitate foreign objects from their stomachs with relative ease, and we were concerned that this may happen. Unfortunately, we were unable to launch for the next two days due to inclement weather. On the third day after our shark had ingested the tag, we found him at his usual spot

For information of projects please see

www.sharklife.co.za
www.sampla.org
www.sharkconservancy.org

near the Pinnacles and Ryan hauled out the VR-60. Unfortunately, our fears had manifested, and our shark had expelled the tag one way or another. No signal was being transmitted from the shark. We learned much for our next tagging attempt on Zambezis.

Fortunately, the photographers saved the day. The sharks were hungry and greedy, and they were able to capture hundreds of images of sharks from every angle. Ryan got the identification pictures that he needed to complete the first part of his report to present to sponsors. Ryan found that there is a healthy population of nine different Zambezi sharks inhabiting study area, and this is a viable population for further study. Ryan was also able to study pictures that I had taken at exactly the same spot in January 2007 and to compare the two years. Three sharks were readily re-identified, giving a first hint that a resident population may exist there.

Currently, the Zambezi shark is not given any protection in South Africa. Sharklife is of the view that the Zambezi requires protection due to its low reproductive capacity and the threats to its habitat, especially in river mouths where it is known to pup. Sharklife has been advised by government that there is insufficient information on this shark to warrant protection. The ultimate aim of this joint study is to gather sufficient evidence in as short a time as is possible to advise and confirm our concerns to government. These concerns all point to the ultimate conclusion that the Zambezi shark needs help. The dynamic combination of Sharklife and SAMPLA and their combined passion and energies are committed to changing this situation and to protecting this much maligned shark before it is too late. ■

Controversy Over Cageless Shark Diving Ensues As Diver Is Fatally Wounded By Bull Shark Off Bahamas



On February 24, 2008, Austrian diver Marcus Groh was fatally bitten by a shark in the Bahamas while on a shark diving expedition aboard the *M/V Shear Water*. He was flown via Coast Guard helicopter to Jackson Memorial Hospital in Miami for treatment, where he later passed away.

The debate that ensued following this tragic accident has been marred with controversy and accusations between rivaling dive operators over practices and safety of diving with big sharks without cages. The fronts were drawn up hard between the operator of *Shear Water*, Jim Abernathy, and Florida-based operator and president of the Bahamas Diving Association, Neal Watson, who condemned these interactions as dangerous and questionable.

Meanwhile, large parts of the dive community stepped in in defense of Mr. Abernathy and his operation, which is held in high regard by many as being conscientious and competent.

Our friends and colleagues at Wetpixel.com outright found Neal Watson's criticism harsh and unfair and initiated a petition in support of shark diving in the Bahamas, which they will deliver to the Bahamas Diving Association. On their blog, Tony Wu stated that "Jim and his crew are absolute professionals".

Eric Cheng wrote on Wetpixel's blog that "During my time in the water with him, Jim always wanted to have fun, and he seemed to be driven by a need to enjoy life. However, that desire for adventure was always secondary to his dedication in keeping his clients safe. I have never seen a better run shark diving operation, and full boats year after year show that I am not alone in my feelings. I vouch for Jim; he is a close friend, and I support him fully.

In **an open letter on Oceanic Dreams blog**, Mark Addison of Blue Wilderness, pioneer of Tiger Shark diving in South Africa, makes a forceful plea for cage-free shark diving in support of Jim Abernathy

and other professional shark operators who believe that educated divers who take personal responsibility need not be patronized:

"The reason for this letter is to place on record my support for Jim Abernathy and the like-minded 'cage-less' operators of this world. First and foremost, my sympathies to Mr. Groh's family and friends on his untimely passing. Secondly, my sympathies to Jim and his team—this is a traumatic time and despite the unnecessary distractions contained in the vitriol of Mr. Neal Watson.

"I live and work in South Africa. My business has crystallized around 'cage-less' shark diving over the last twenty years. My efforts span the entire eastern seaboard of South Africa, which brings me in contact with many wonderful shark species and some fantastic locations and marine settings. The privilege of working with these many species over such a prolonged period of time in no way makes me an expert, but I have experienced the gamut of this strange world's people.

"As a pioneer in this field in South Africa, I have been accused of many things, as no doubt Jim is being accused of now. As safe as I believe the 'cage-less' experience to be and as successful as the experience has been for my clients—I would never consider a cage dive as an option—and yet, I am always aware of the potential risk that any client is exposed to in the 'cage-less' environment.

"I am acutely aware that we have managed all risk out of our lives and to me; 'the cage' promotes this soul-

less experience. The connectivity to nature in a 'cage-less' environment is a freedom of individual choice and in the case of many species of shark on our coast, the only way to experience them in their world and on their terms.

"This experience is under threat from ill informed opinion and extractive abusers worldwide. Much of this justification for Jim and his chosen method of working with sharks will probably seem lame to many people, but it is what it is. I do not ascribe to the bravado/machismo thing and have used my experience and that of the many thousands of people who have enjoyed South Africa's shark product with me, to the positive benefit of sharks in South African waters." (Shortened by ed.)

Shark Savers petition

Shark Savers "represent a cross-section of divers, conservationists, shark enthusiasts, scientists, and professional photographers and filmmakers who strongly support conscientious and responsible cageless shark diving operations including Jim Abernathy's *Scuba Adventures* in the Bahamas. Such operators have allowed tens of thousands of divers to safely go beyond the constraints of cages and experience compelling shark interactions.

"We urge The Bahamas Diving Association to preserve current shark diving policies and resist overreaction to this horrible, but isolated, tragedy." ■

Link to Shark Savers petition to Bahamas Diving Association

The recent death of Markus Groh is truly an unfortunate tragedy. We are both saddened and shocked by this, the first fatality ever caused by a shark bite during an organized shark dive. Our hearts go out to his loved ones.
—Sharksavers.org

Press Release from DEMA

DEMA (The Diving Equipment and Marketing Association) is deeply saddened by the recent events that led to a diver's death after participating in a shark dive in the Bahamas last weekend. This tragic incident is an unusual occurrence, yet serves as a reminder of the importance of following guidelines put in place for specialty dives such as shark diving.

Shark diving has been practiced safely and successfully for the last 25 years without major incident. Guidelines were formalized in 2001 by the Global Interactive Marine Experiences Council in the "Florida Guidelines and Management Programs for Interactive Marine Experiences", which are available industry-wide. These guidelines include: safe environmental practices; staff training for interactive marine experiences; marine animal feeding practices; participant preparation and education; marine animal conservation efforts; safety considerations for interactive marine experiences; location of interactive marine experience program sites; risk management and awareness; establishing an emergency procedures plan; and appointing an administrative officer and safety officer for interactive marine experience programs.

DEMA strongly encourages dive operators to review their interactive marine experience practices to ensure their adherence to the guidelines that have been established to reduce the likelihood of an accident happening in the future. While any type of diving inherently involves some level of risk, pursuing safe, recreational diving experiences will greatly reduce that risk. This particular incident last weekend appears to have been an extreme form of the sport involving some of the more aggressive shark species.

For more information about interactive marine experiences, or to receive a copy of the safety guidelines, please contact DEMA at 858-616-6408. ■

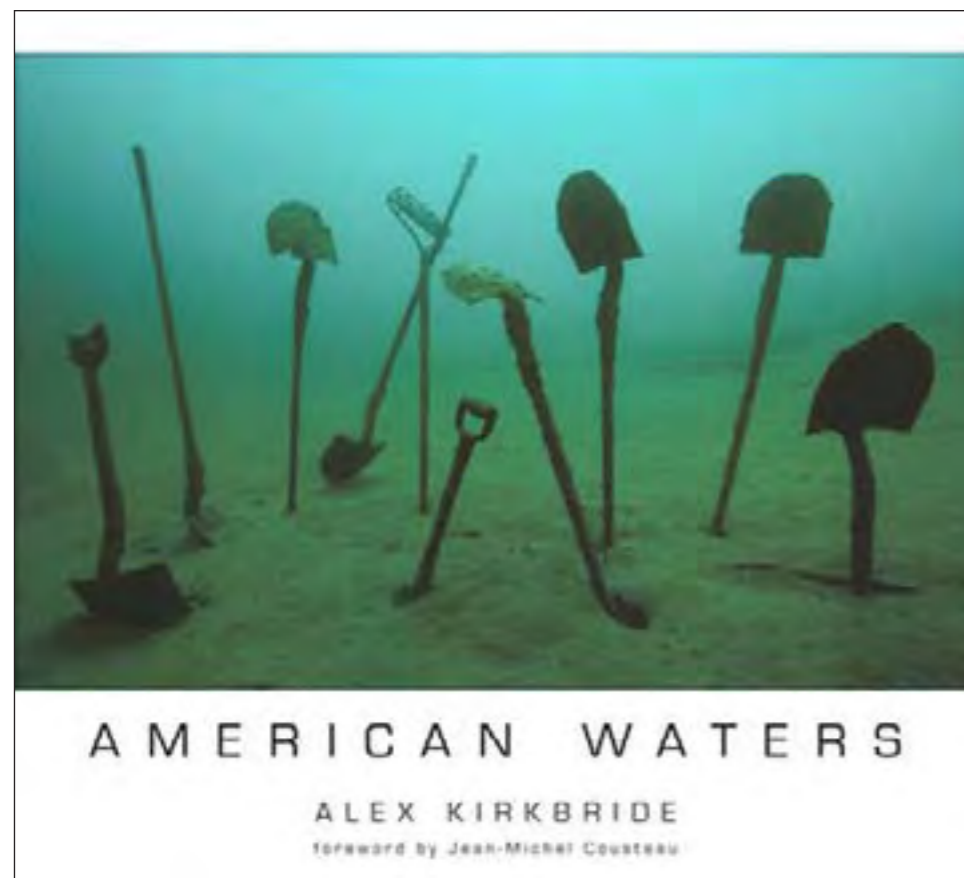




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Edited by
Catherine GS Lim

**POINT & CLICK
ON BOLD LINKS**



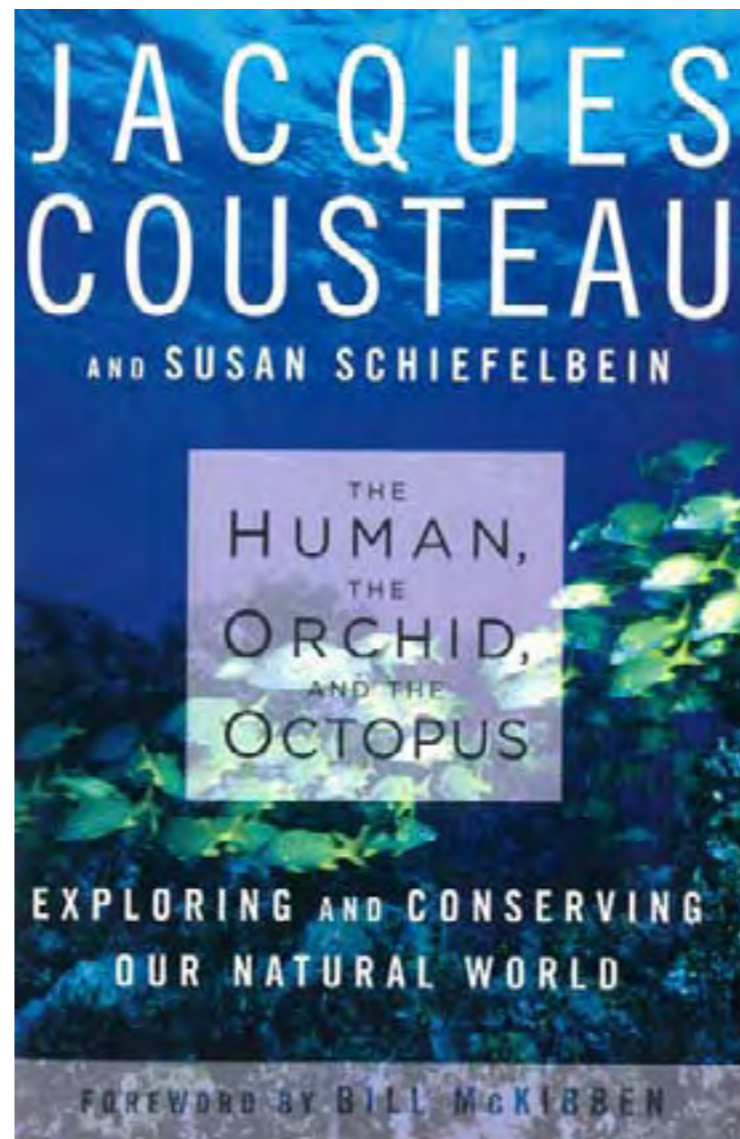
American Waters

Just from a quick glance at the cover you can tell that Alex Kirkbride's *American Waters* is something different. As much as we all love colourful animal life from exotic locations, Alex found a way to make compelling images out of some surprising mundane things. An underwater odyssey that spanned over three years and 945 dives took him and his wife to be through the 50 United States where they photo-

graphed at least one water feature in each state. From flooded quarries to freezing Alaskan waters, from cranberry bogs to Elvis's swimming pool, not to mention a puddle in Manhattan. Images from deserts and prairies over bogs in the forest to the open ocean and captured throughout any of the seasons Kirkbride's book is a very refreshing look at a subject matter that tend to be reproduced in a repetitive and homogenous matter

This may be one of the last books shot exclusively on film. Kodak was one of Alex's sponsors, and the odyssey ran from 2002 through 2005. By that time the digital revolution was in full force, but he persevered despite the 36 shot limit.

www.alexkirkbride.com



Cousteau explains

In this magnificent last book, Cousteau describes his deeply informed philosophy about protecting our world for future generations. Weaving gripping stories of his adventures throughout, he and co-author Susan Schiefelbein address the risks we take with human health, the overfishing and sacking of the world's oceans, the hazards of nuclear proliferation, and the environmental responsibility of scientists, politicians, and people of faith. Cousteau's lyrical, passionate call for action to protect our earth and seas and their myriad life forms is even more relevant today than when this book was completed in 1996. Written over the last ten years of his life with frequent collaborator Schiefelbein, who also introduces the text and provides an update on environmental developments in the decade since Cousteau's death, this prescient, clear-sighted book is a remarkable testament to the life and work of one of our greatest modern adventurers.

The Human, the Orchid, and the Octopus: Exploring and Conserving Our Natural World by Jacques Yves Cousteau and Susan Schiefelbein

Hardcover: 320 pages

Publisher: Bloomsbury Publishing PLC (30 Oct 2007)

Language: English

ISBN-10: 1596914173

ISBN-13: 978-1596914179 ■

Wii

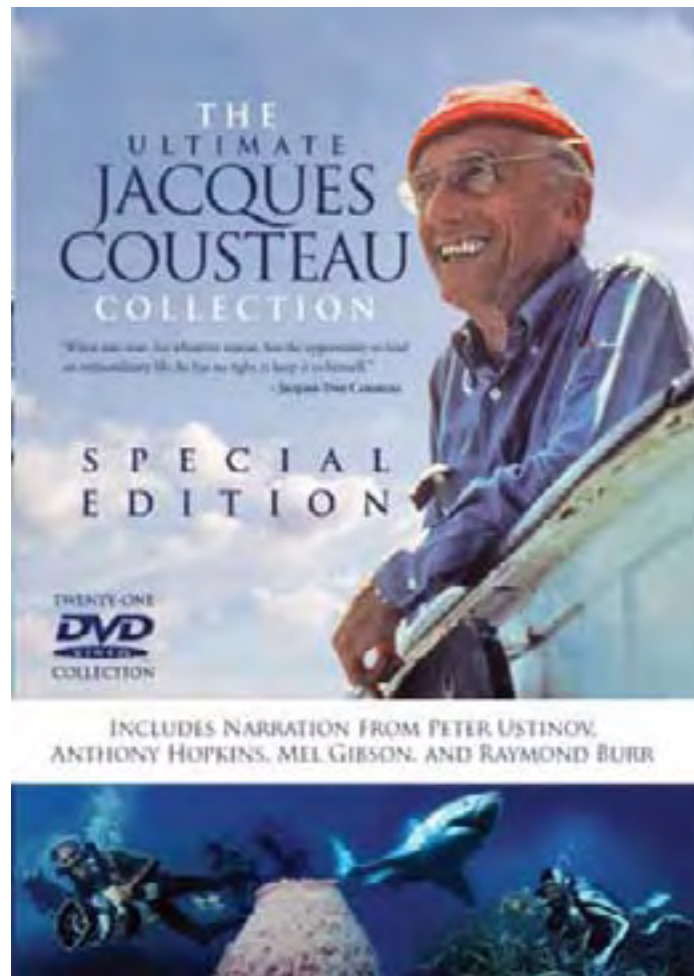
Is it a game, an interactive encyclopedia of the ocean's depths, or virtual exploration in scuba gear? Whichever the case, Nintendo's *Endless Ocean*, available exclusively on Wii, will paddle its way into stores this week. In the game, players will seek out a variety of treasures and record more than 230 different animal species. All of this is made possible via point and click swimming with the Wii Remote.

In what's slowly becoming more common on Wii, divers can go online and cooperatively explore an area with a friend via the Nintendo Wi-Fi Connection. "Endless Ocean is a siren song for adventurers, family gamers and the just plain curious," says Cammie Dunaway, Nintendo of America's executive vice president of sales & marketing. "Kids will love meeting and cataloguing all the sea life they meet, while their parents can lose themselves in a seemingly unlimited underwater landscape."

www.amazon.com



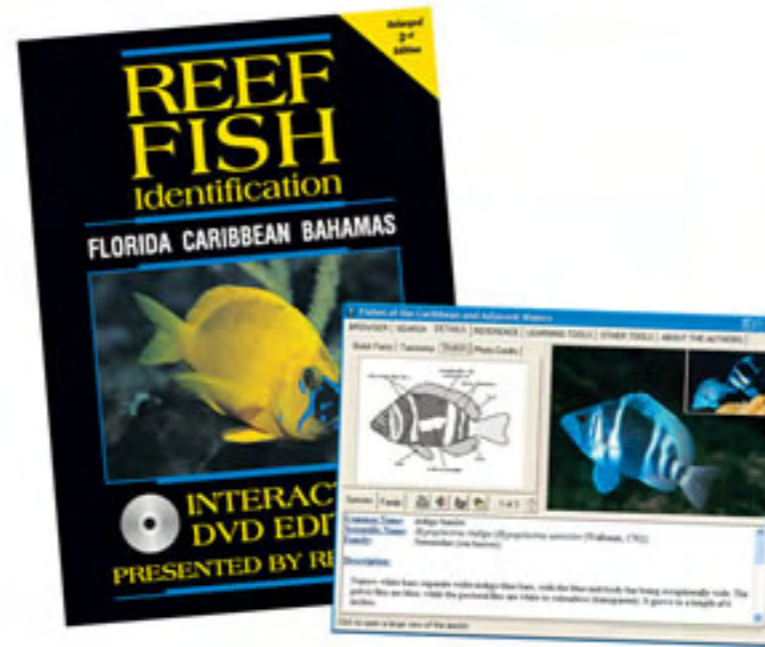
The Ultimate Jacques Cousteau



Fans of sea life, underwater oceanic photography and adventure will be glad to know there is a new release of a 21 DVD box set depicting outstanding moments during the career of the intrepid, famous undersea explorer and conservationist Jacques Cousteau.

During his long career, Cousteau, who died in 1997, was rightly recognised as a pioneer. More than anyone else in history, he introduced us to the beautiful and mysterious world beneath the surface of our oceans, co-inventing the Aqualung during the Second World War, and then making award-winning films and scores of underwater documentaries for television.

This is ultimate collection of his lifetime's work spans a period of 40 years plus. This box set consists of 21 DVDs, almost 64 hours of marvellous filming, and is a rich and detailed production of his best work. ■



Reef Fish

Reef Fish ID: Florida, Caribbean, Bahamas - Interactive Edition is the most comprehensive scientific reference of its kind—the product of nearly ten years of scientific research, photographic expeditions, and collaboration with academic experts. Whether you're a beginning fish watcher looking for a learning tool or an ichthyologist looking for an accurate reference, this electronic field guide is for you.

At the core of the interactive edition is a database of 842 unique species known to inhabit the Caribbean, the Gulf of Mexico, and adjacent waters. Each species is described in meticulous detail and is accompanied by a giant library of visual material. reefnet.ca ■

Review

"Five Bells", Job Done

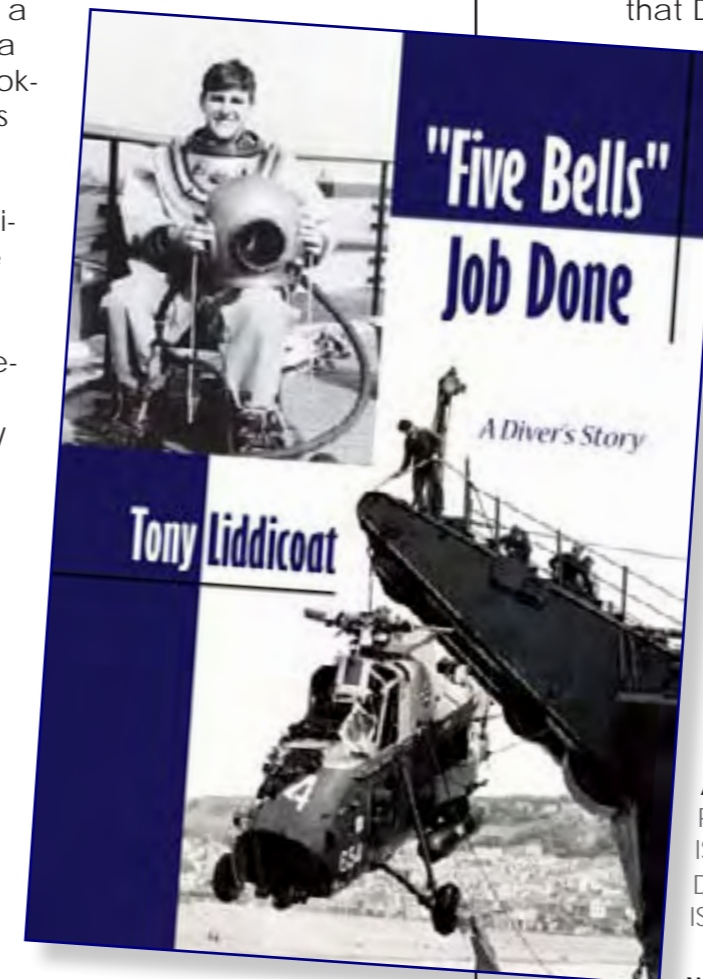
As so many times before, reality beats fiction when it comes to captivation and sheer entertainment. This tale takes us back to some of the early diving days, starting in 1963 when the author joined the British Army, to be precise. The autobiographic narration is generously illustrated mainly with old grainy black and white photographs, like from an old family album. But that only adds to the realism. I can hardly believe the equipment they had—or didn't have—back then. It certainly puts things in perspective. Not only does one begin to appreciate the technological advances we can now all enjoy, but also how different the life of a military or commercial diver is from that of a recreational diver. During almost five decades of diving, Tony Liddiard has seen it all—from military assignments all over the world to excavating wrecks, searching for bodies in sewers and diving into nuclear reactors, to the more recreational aspects of diving taking place on tropical islands. It's a "boys' book" I guess, being full of adventure and bravado, military and hardware, but highly entertaining, and it gives you an insight into diving and sides of it that Discovery Channel cannot. So, if you don't want to

save it for a long flight overseas, or for your live-aboard, switch off the telly and put on the kettle and make yourself comfortable with "Five Bells", Job Done.

Tony Liddicoat hails from the West Country, England. He left school at 14 and joined the army, initially stationed at Dover in Kent, where his passion for underwater adventures began. He became a military diving supervisor, a commercial diving instructor and an advanced sports diver. He was nominated "British Diver of the Year" in 1981 for his rescue of an American recreational diver who was gravely ill after decompressing too quickly. He also took part in 16 major marine archaeology, scientific research and other expeditions around the globe. Liddicoat currently lives in Germany, though he remains an active member of the Folkestone Sub Aqua Club. "Five Bells" Job Done is his first publication. ■

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Think and plan ahead



Text by Cedric Verdier

Do you plan to explore a deep virgin wreck? Is it your dream to discover a unique cave system deep in the jungle? Have you heard about a Blue Hole miles off shore and want to give it a try? In any case, chances are you'll be diving in a remote location where emergency medical systems are not much more frequent and up-to-date than traffic lights in the Himalayas.

Anybody who engages in an expedition has to consider following essential questions first: Is the necessary infrastructure to handle emergencies present on location?

What constitutes an emergency and what kind of emergency may I face?

What do I need to bring in order to reasonably deal with possible emergencies?

In other words: How remote is *remote*, and is it necessary to have a physician present 24/7?

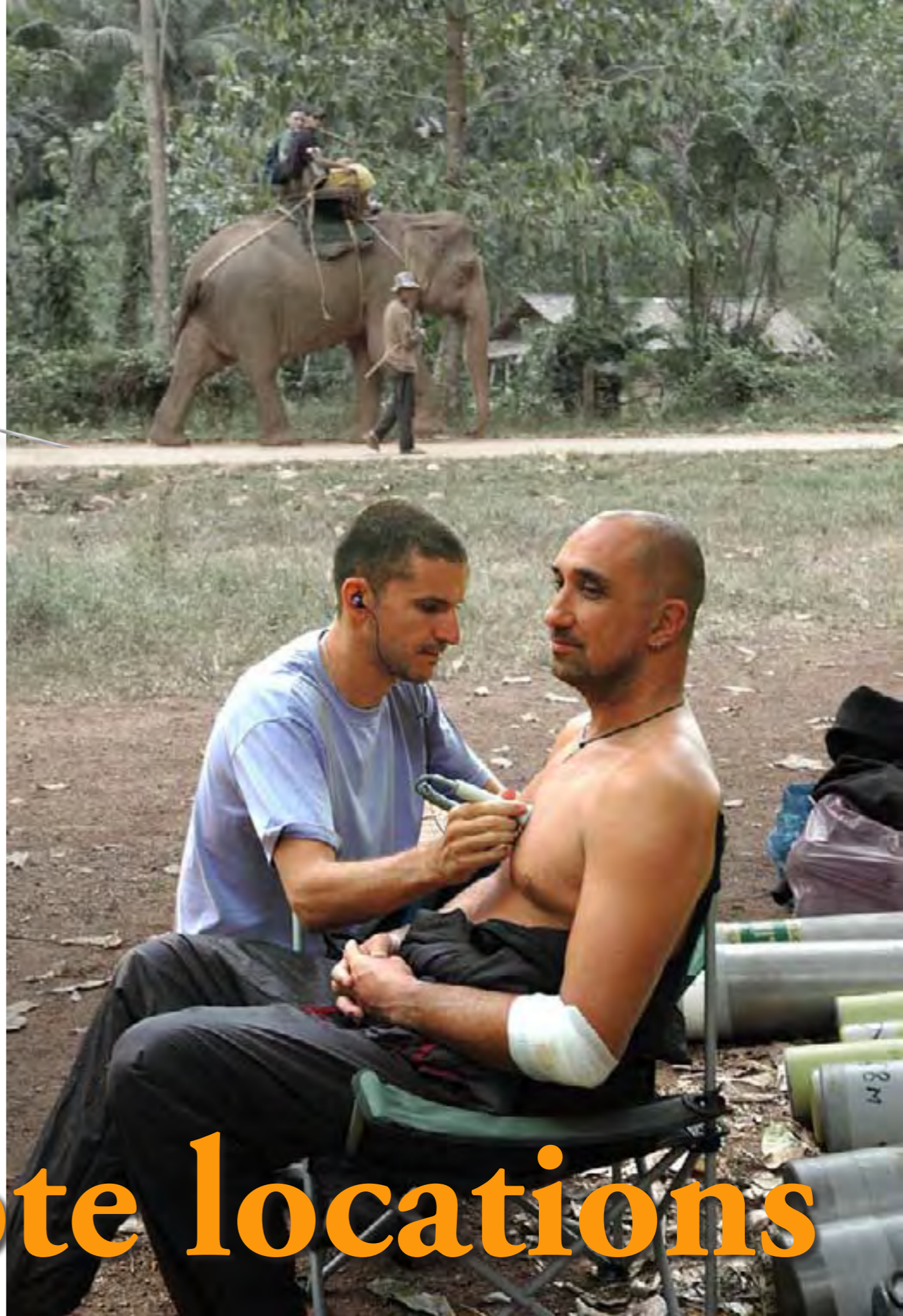
If you travel a lot, chances are you will come to discover that, unfortunately, quite a few medical facilities around the world will bear a resemblance to a hangar during a bombing campaign, with medical staff being overworked and people running around as if the news of Armageddon coming just broke. So, a first reaction would be to think about how to become self-sufficient should an accident occur. However, in the real world this is rarely possible. So, we have

to find a compromise, and proper planning is a good place to start.

Emergency planning includes several steps...

Risk assessment

Any technical diver has been exposed to "What if" scenarios. For a remote exploration, the best option is to lock down all the team in a small room with only filthy sandwiches to eat until they come out with a comprehensive list of all imaginable problems that could happen during the exploration, underwater as well as at the surface. You then have to review this list and remove what you can't really deal with anyway such as tropical hurricanes, tribal riots, terrorist attacks, outbreaks of



Cedric Verdier gets a physical in a remote area

Dealing with Rescue in Remote locations



Ebola, and so forth. Realistic problems range from cuts and wounds to decompression illness. They can be caused by:

- The equipment we use. (Engine, propeller, ropes, etc.)
- The dive we plan to do (dive profile, number of dives per day, number of days diving, etc.)
- The environment where we dive (off shore reef or wreck, overhead environment, etc.)
- The location of the expedition (tropical climate, local food, etc.)

Available resources

Wherever you dive, even in the most remote locations, there are always some resources you didn't think about. As is often the case with technical diving, it all comes down to using what is available and to be creative about it.

Rescuing an unconscious diver underwater has nothing to do with pure luck or imagination. Only properly trained divers can do a proper rescue. Read some of the articles cited in the reference list and practice, practice, practice.

In case of an accident, you need:

People to handle the emergency.

The best guy for the job is you. The fact that you actually plan for any potential accident makes you the perfect choice. But the whole team should be involved. A simulated emergency training exercise could be run prior to the expedition, or even better on the first day of the expedition.

Consider taking training courses to better deal with an accident. The obvious choice is a technical rescue course, but this is not commonplace. You can sign up for a CPR/first aid course, O₂ provider course or even better, a DMT course (Diver Medic Technician, see references at the end of this article).

Prepare and practice some procedures (rescue, evacuation, etc.) and make sure everyone knows them. And think about what local medical staff, Navy and search and rescue teams could be called in to help even recreational divers.

Specific equipment.

The first things people think about are the first aid kit and the oxygen kit. A complete first aid kit is probably the most essential piece of equipment to bring along to a remote location, as the most common accidents are not diving-related, but rather related to the location or equipment such as cuts, wounds, burns, food poisoning, etc. In regards to administering oxygen, deco tanks can often replace dedicated oxygen kits, as long as they have an appropriate regulator for both conscious and unconscious patients. Closed-circuit rebreathers can also be used when nothing else is available.

Technical

The best option but sometimes too far away!

divers who don't have two left hands with ten thumbs can easily build other equipment such as stretchers, deco stations or habitats out of garbage and junkyard stuff. Except for the most gifted ones, recompression chambers are seldom part of an expedition and the team will mostly have to rely on local facilities. A pre-dive visit is always a good idea in order to inform the medical staff and to organize the most efficient evacuation and treatment.

Evaluating additional needs

As we said, even people with just basic first aid skills can efficiently handle most of the accidents a diving team would encounter. However, most divers will not be capable of treating more severe injuries, except those who have been trained by Harry Potter.

The best choice is obviously to have a hyperbaric physician participating in the expedition, either as a diver or as a member of the surface support team. A physician will come in quite handy when it comes to on-site treatment of an injury or a diving-related condition. If your expedition is so remote and the dive profiles really over-the-edge, it might become necessary to consider a portable recompression chamber. It's obviously the tool of choice if a decompression illness occurs, and you are so far away from the nearest recompression chamber that you need to hire a space shuttle to make it there in time.



Inmarsat satellite phone system

But a portable chamber (even a foldable one) is big and a logistic nightmare to transport. It is also quite an investment, so renting one might be the most, or only, affordable option. Some models can be easily folded and do not need a huge amount of gas to be operated. However, even the best chamber is of no use unless you have people capable of operating it. And don't forget that these kinds of chambers are mainly for evacuation purposes, so you obviously need to arrange for adequate transportation, too.

You might also need some communication tools as well. Calling for help in remote locations sometimes means the only options are using satellite phones, long range radio transmitters, or emergency radio beacons (EPIRB). Technology develops fast, and options that were extremely pricey only a few years back, could now be affordable.



US NAVY



Setting up emergency procedures

All sorts of problems can happen when you're in a remote location. However, many small injuries can easily be treated on-site. No need to call in a medivac helicopter and team of paramedics for a small cut or a hangover.



WWW.AMBULUSA.COM

Therefore, only four main emergency procedures should really be considered:

► **A missing diver.** In this difficult situation, the first step is usually to determine if a diver or a team of divers are lost at the surface or underwater. Being lost at the surface often means a long wait and an extensive search pattern in a rough sea (as if this ever happens in calm seas and perfect weather!). Being lost underwater often means facing strong current and no SMB deployed, or worse, having to rescue an unconscious diver. The actual emergency procedures and the related training depend, to a large extent, upon the location. Being lost in a cave deep in the jungle, or drifting on the surface at sea by night, are completely different scenarios.

► **An unconscious diver.** There's no magic here! Rescuing an unconscious diver underwater has nothing to do with pure luck or imagination. Some of the techniques are simply too complex to be invented on the spot while under a high level of stress. Only properly trained divers can do a proper rescue. Read some of the articles cited in the reference list and practice, practice, practice.

► **A decompression illness.** Tools are of paramount importance when divers get bent. But oxygen, fluids and drugs are just tools. Some divers in very remote locations might also consider In-Water Recompression procedures (IWR), if such things do exist. IWR is obviously not the best way to treat a diver, but it has probably saved some lives in the past. Some remote expeditions include the techniques and the related tools such as Full-Face mask, Deco seat, etc., in their emergency procedures. Some IWR protocols are cited in reference at the end of this article.

► **An urgent evacuation.** There's not much good in attempting a surgical operation while equipped with only a spoon and a Swiss army knife when your training is made up of watching "Survivor" on TV. When you're dealing with severe injuries, DCI or life-threatening conditions, you must have planned a fast evacuation procedure beforehand. You can't improvise a fast transportation and a smooth evacuation when every minute counts.

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cations of technical diving practices for in-water recompression. Richard Pyle, Bishop museum, Hawaii

Hazardous marine life. Bill Clendenen and Dan Orr, DAN. Download at www.diversalertnetwork.org

Training as a Diver Medic Technician (DMT): Many training centers all over the world, the most famous ones being in Australia, DDRC in the U.K., Dick Rutckowsky in the U.S.

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Diving São Paulo Style —

Laje de Santos

Its proximity to São Paulo makes this a very popular weekend dive site for urban Brazilian divers. This part of the Brazilian coast doesn't offer really good diving unless you get out onto the open ocean. And it will take best of 12 hours of your day to get two dives done.

The area around of Santos, especially to the south is heavily populated, and several large rivers empty into the ocean along this part of the coast. Laje de Santos is about 45 kilometers from the mainland, in open ocean. The dive site is really just a few small rocks that pierce the surface, inside an 550 meter times 183 meter state marine park. Divers

from the bustling concrete jungle of the 18 million people metropole São Paulo go in hordes to dive these islets. Living in São Paulo about 70 km's from the coast leaves you no other choice than to get up early to go diving, very early. We left São Paulo at 6 am to avoid battling the worst traffic. But even at this hour it took almost 1,5 hours from the center of the city to the pier in São Vicente. Getting from there to the divesite was indeed

Text by Arnold Weisz
Topside photos by Arnold Weisz
Underwater photos by Alcides Falanghe





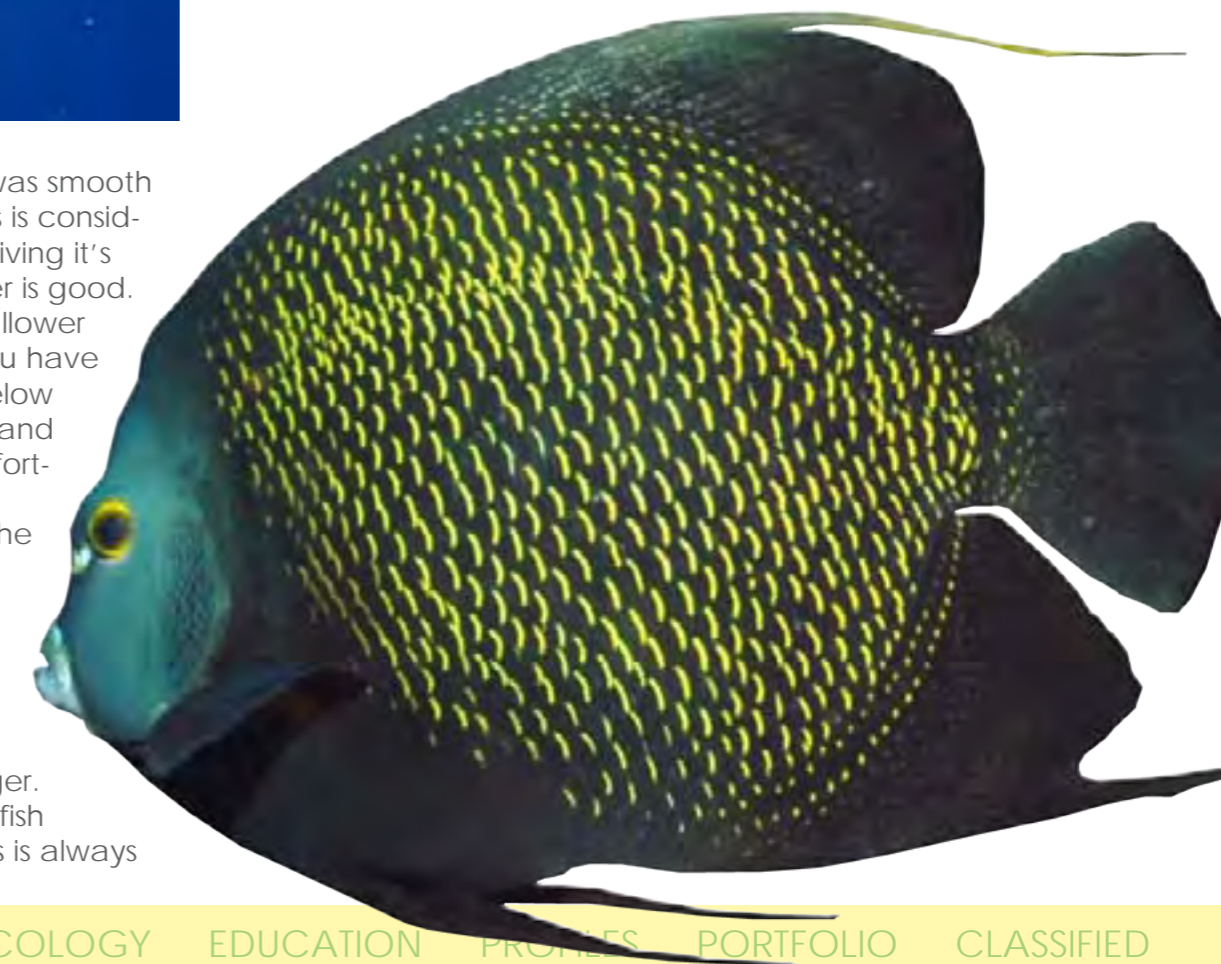
Laje de Santos

The urban divers love swapping the concrete jungle for the tranquility of an underwater paradise

The fishlife is the reason to dive here. The lack of large coral formations doesn't deter a number of fish species to concentrate around the islets

a delight. A bit more shy than the parrotfishes which abundant here, are the groupers. Some of the very nicely camouflaged in the same colours as the surrounding rocks.

Having a closer look between the rocks will reveal murrays. I saw at least five of them within a few metres. Who blames them for gathering here. The rock formations are great hideouts. And hunting rounds as well I guess. There are a

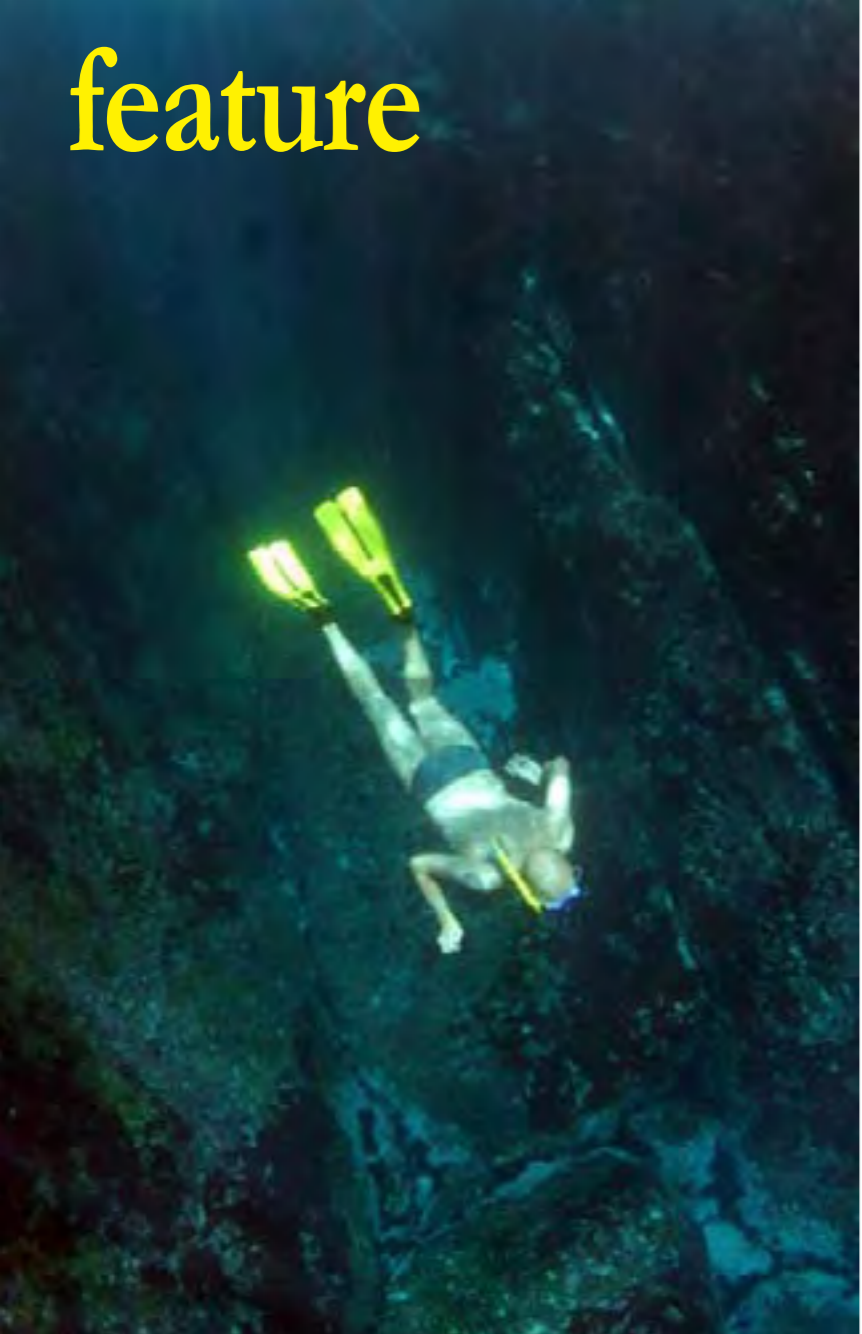


a very pleasant trip as the sea was calm which gave us a smooth boatride for about one hour. Twenty divers on the same boat is a lot, and it always get's very hectic when we arrive at the divesite, everyone being eager to get into the water. Most onboard were experienced divers so one pair after another went in the water without to much confusion and we spread out as much as the first divesite allowed us to.

Vale pena

The first impression of the divesites here was blue water, 20-25 metres visibility and a prolific fish life. With a almost flat ocean for the first dive, diving through a tunnel or really an

underwater canyon it was smooth sailing. Even though this is considered real open water diving it's fairly easy if the weather is good. Passing through the shallower parts of the divesites you have to go with the swells. Below 8-10 metres it was nice and calm and you could effortlessly enjoy the marine life. As soon as we left the surface we were swimming through schools of Sargeants major's. As we sank deeper and came nearer the rock formations the amount of species became larger. Watching French angelfish going about their things is always



Laje de Santos also offers great bluewater snorkeling and freediving. Especially after a few days of calm weather, the visibility allows for those without air on their backs to enjoy the mystery of the depths

The treat at Laje de Santos is the fishlife. As these waters are semi-tropical where the water temperature peaks at 23-25 °C during the summer months from December to March and dips below 15 °C during the winter, there isn't any coral reefs here. There is also an thermocline here. We met it first at 19 metres, so we had no reason to go below. But this may change along with the currents. Even without any coral garden, what also makes this divesite definitely «vale pena»...worthwhile in portuguese, are the seaturtle encounters. On my first three dives here I met turtles on all. And just to add some to that, a sunfish came out of nowhere on our safety stop. Thats always a surpricing treat!

Easy come, easy go
Most dive centres in São Paulo, Santos and São Vincente do trips to Laje de Santos. Some rund minibuses from Sao Paulo, others rely on you making it to the pir on your own. There is secure parking at the pir. We made our dives at Laje de Santos with Orion Divers. They run a 48 foot fast boat from São Vincente. The «Orion Diver» takes maximum 20 divers to Laje the Santos in about one hour. The 2-dive trip takes all day from 8 in the morning with return at around

The islets are bird sanctuaries



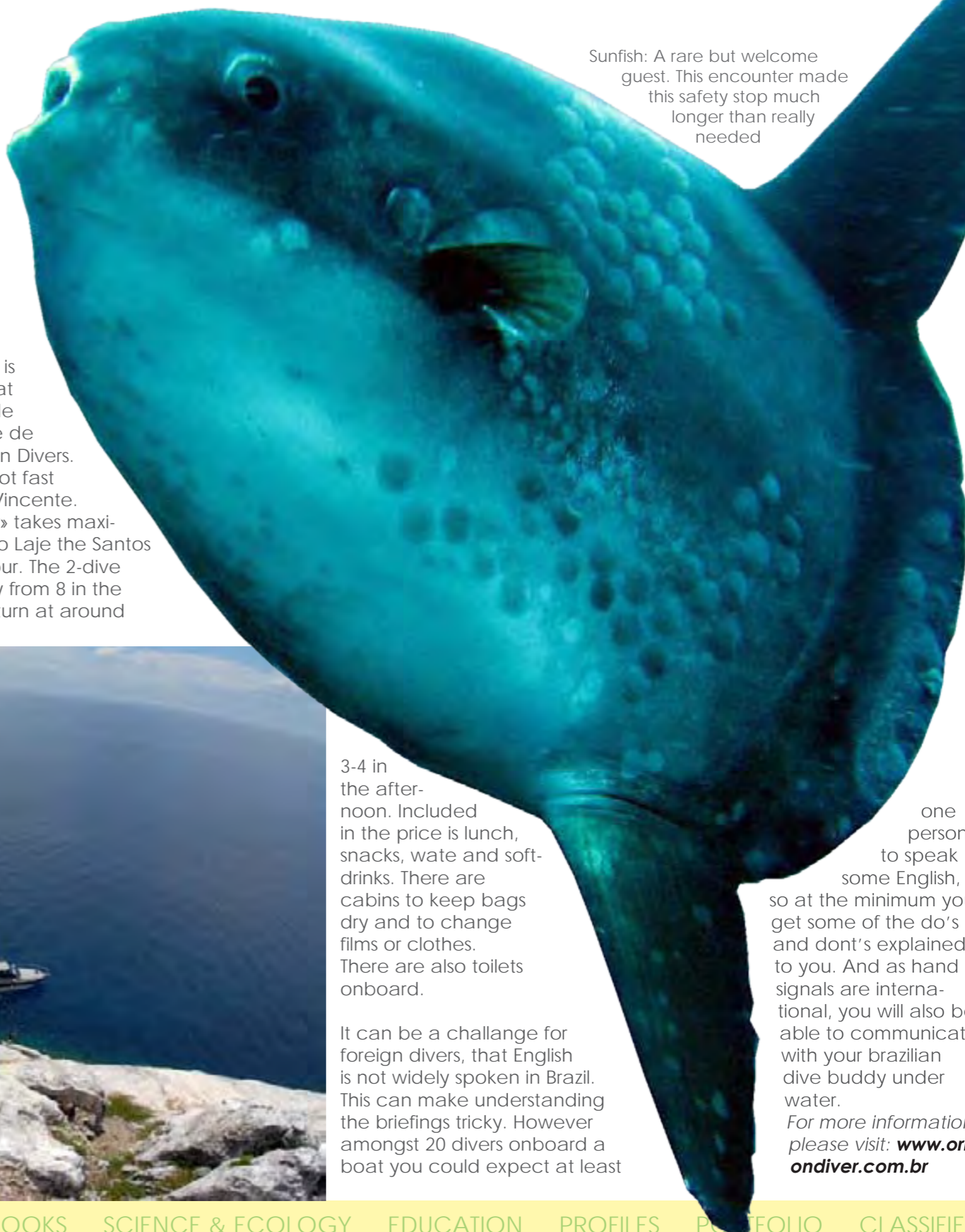
couple of swim-through as well. The only thing you have to watch out for are the spiny sea urchins. They are of the painful sort, so keep you hands to your self if possible. For those diviers that thrive on rusty bulkheads and mysterious cargo hulls, will be disappointed. There aren't relly any wrecks here. Well, you can have your worst abstineces cured at the little wreck «Moreia». This is a small fishing vessel which was brought her and sunk in 1995 to attract some marine life, and make another dive site. At a maximum depth of 22 metres it's a fairly easy dive. Although currents keep the wreck clean and make it a good place for gogonias and anemones. Groupers are also making the wreck their home.

3-4 in the afternoon. Included in the price is lunch, snacks, wate and soft-drinks. There are cabins to keep bags dry and to change films or clothes. There are also toilets onboard.

It can be a challenge for foreign divers, that English is not widely spoken in Brazil. This can make understanding the briefings tricky. However amongst 20 divers onboard a boat you could expect at least

Laje de Santos

Sunfish: A rare but welcome guest. This encounter made this safety stop much longer than really needed



RAFAEL ESTEVES, WWW.CAPTAINDIVE.COM.BR

one person to speak some English, so at the minimum you get some of the do's and dont's explained to you. And as hand signals are international, you will also be able to communicate with your brazilian dive buddy under water.
For more information, please visit: www.oriondiver.com.br





Protecting the marine environment in Brazil

An uphill battle

When talking about conservation projects in Brazil, the rainforest in Amazonia is always what springs into mind first. In any context a very important issue. On the other hand there are also other important projects, on a much smaller scale. When it comes to the protection of the marine environment Brazil still has a way to go.

By Arnold Weisz

There exists a few national and state marine parks protecting off-shore islands. But most of its more than 7.300 kilometres of coastline remains unprotected. As in many other nations there are conflicts between coastal settlement, tourism, commercial fishing, the petroleum industry and the need to protect the marine environment. We had an opportunity to go out with the Secretario Meio

Ambiental's boat «Sterna» on one of their patrols. Their main task is to enforce fishing regulations along the coast of São Paulo in south eastern Brazil. The state marine park Laje de Santos which protects a couple of islets not far from the states main port Santos, was created in 1993. But it wasn't really properly controlled before the local environment agency got an inflatable in 2005. Up to then the marine park was more or less in the hands of the fishing industry. At least during the week days.

- In principle the control of the non-fishing zone was relying on dive operators, the fire department, the police or even the navy whenever they had some vessels in the region, says Julio Vellardi, director of the Laje de Santos marine park.

The first few trips with their hard fought for RIB they caught 36 fishing vessels, fishing illegally within the park boundaries. Last year they could finally require a 38 foot boat to properly control the park and other non-fishing areas along their stretch of the Brazilian coast.

A good example on lack of protecting the marine environment is the coast of São Paulo state in southern Brazil. Just 0,5 % of the coastal waters of the state of São Paulo is protected, says Vellardi.

Today there is a good cooperation between the state government and private entrepreneurs in the region. Together with a group of local dive operators, they have set up an organization called AOM (Assosiation of Dive Operators) to work together in protecting the marine environment. ■

National parks in Brazil

Bahia: National marine park Abrolhos, created in 1983 with 91.300 ha. protected. **Rio Grande do Norte:** National marine park Fernando de Noronha, created in 14/09/1988 with 11.270 ha. protected.

State parks

Ceará: State marine park Pedra da Risca do Meio Maranhão: State marine park Parcel do Manuel Luis. **Paraíba:** State marine park Areia Vermelha. **São Paulo:** State marine park Laje de Santos

Links

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Instituto Laje Viva

A group of unpaid volunteers organized in a NGO called Laje Viva is the driving force behind the conservation work in a small state marine park off the São Paulo state, Brazil. Pay-off: They are diving with mantarays, sea turtles and many other fantastic creatures of the sea.

Parque Estadual Marinho da Laje de Santos (PEMLS) was created 27 September 1993. This state marine park lies about 45 kilometres off the São Paulo state coast in southern Brazil. The port city of Santos serves as the main exit point for the marine park. Attached to this park is and actively working on conservation issues connected to the marine park is an NGO named Laje Viva Institute (Keep Laje alive Institute. Editors remark).

Laje Viva Institute was a result of indignant divers who saw illegal fishing within the park boundaries. A group of sports divers therefore gathered and established this non-profit organization in 2003, says Ana Paula Balboni Pinto, one of the founders and the vice-president of the institute.

One of the projects undertaken by Laje Viva Institute is to identify, count and register the manta rays (*Manta birostris*) that come to the waters around these islets. Since the start of this project in 1993, they have registered 61 individual manta rays. Another ongoing project is the registration of fish species and invertebra that inhabit the marine park. All this is done on volunteer basis. ■ www.lajeviva.org.br

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Photo & Videography

Edited by
Kurt Amsler
& Peter Symes

A matter of balance

Shooting Wrecks

Text and photos by Kurt Amsler
Translation by Peter Symes





PREVIOUS PAGE: A wreck is too big to illuminate. You have to work with the ambient light

LEFT: Use a dive torch to add colour and point out structures

There is no flash unit in the world that can illuminate a complete wreck. This is why the exposure must always be calculated on the basis of the ambient light

must match the focal length of the lens if the corners of the resulting images are not to be out of focus.

Owners of SLR cameras have for a long time been spoilt for choice, with a huge selection of super wide-angle lenses with the recent addition of wide-angle lenses dedicated to digital cameras with their smaller CCD-sensors picture. When it comes to compact cameras, the possibilities are more limited, though some wide-angle lens attachments or converters have been put on the market—foremost through Sea & Sea and Inon—which enable image angles of up to 165 degrees.



cinema of dreams



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A photographer's heart always seems to beat a little faster when it comes to taking pictures of sunken ships and aircraft. So, how do you become successful in shooting wrecks? Granted, it is not entirely straight forward, but if you take the following advice and guidelines to heart, you will surely achieve good results.

Wreck diving is without question one of the most fascinating disciplines in diving, though it requires a bit of experience and sometimes also special equipment. This is also the case with wreck photography.

The challenge in shooting wrecks is that it often involves shooting at large distances, and that the circumstances are rarely optimal when it comes to current, visibility and depth. With the right equipment and good planning it is, however, possible to get a handle on the challenge. The objective is to portray as

much of the wreck as possible, which is why the picture angle of the lens should be as large as possible. At least 90 degrees is necessary, but 180 degrees is more desirable.

The "Rolls-Royce" lenses for wreck photography are the so-called "Fisheye" lenses that are capable of capturing angles of 180 degrees or more. This, in turn, requires another piece of equipment: all wide-angle lenses must be housed behind a dome port, which is characterised by a dome-shaped spherical front glass. The curvature of this port



Nikon 10.5mm f/2.8G IF-ED AF DX Fisheye Lens, a frame-filling fisheye lens for exclusive use with Nikon DX-Format digital SLR



Canon Powershot wide converter (for a compact camera). Turns a 36mm lens into a 27mm by 0.75x magnification



When photographing wrecks, make a combined dive and shooting plan that takes you to the deepest parts first i.e. the propeller

Shooting Wrecks

must always be calculated on the basis of the ambient light.

In these cases, adjust the camera's exposure controls from readings using the built-in exposure meter in the old-fashioned manual manner. This could, for example, at a depth of 30m be aperture f:4.5 and shutter speed at 1/30 sec.

To properly balance flashlight with daylight, we know how to calculate the settings the flash unit should be set at for a given distance using f:4.5. Correctly balanced, the images will show infinite depth in the background and the foreground illuminated by just the right dose of light.

All the general rules for using flash also apply to wide-angle lenses, with the additional rule that on or inside a wreck, there is a much larger risk of stirring up particles. Good buoyancy and moving around carefully are of even greater importance to wreck photographers! The further away from the camera the flash is mounted, the less the risk is that the particles floating in front of the lens will reflect the light.

On wrecks, you can find marine life that you rarely see elsewhere, as they take up refuge in the structure

The road to good wreck photography, as the ambient light always will be dominating, is to use flash to freeze the moment and bring colour to the foreground as well as enhance overall contrast in the image. That aside, you can only capture whatever reflected light the wreck is willing to give off.

There is only one way to go about it. In wreck photography, both flash automatic or TTL is taboo. Because you will usually be shooting in open water, the built-in programming will lead to

wrong exposures. If the camera is equipped with a super wide-angle lens, the flash must also be capable of illuminating the same full image angle as that of the lens. Modern flash units usually cover at least 100 degrees, and that will suffice for most wide-angle lenses. If the coverage is insufficient, for example, when a fisheye lens is used, it can be necessary to use two flash units.

Most important is the correct aim of the flash or flashes. If the light has to pass through

too much of the water between the camera and the object, the risk also increases that it will also bounce off suspended particles in the water and produce hazy images. It is therefore imperative to observe the following: at distances of more than 1.5 meters, the flashes must aimed straight ahead. Only if you get any nearer to the object should you consider any repositioning.

There is no flash unit in the world that can illuminate a complete wreck. That is why the exposure





When moving inside wrecks long flash arm can be a challenge to handle. Be very careful not to stir up particles. They will both ruin your shot and, worse still perhaps also the view to the exit. Do not penetrate wrecks without appropriate training and adequate equipment



Plan the shoot

The images resulting from a wreck dive will often fail to meet our expectations if we don't work out and follow a plan for the shooting. Once on the wreck, the time will only run by too quickly, so it is important that the photographer and the model knows exactly where to go and take up position already from the beginning.

To maintain a classic dive profile, start shooting at the deepest parts and work yourself upwards going gradually shallower. Start, for example, at the propeller and move towards the bridge. Determine which subjects you want to shoot and also how much time you want to spend photographing each, so you can

estimate air consumption and stay within the decompression limits. Always be safe when diving and use the buddy system. In regards to penetrating wrecks, there are also training, equipment and psychological issues to be considered.

Here is another tip: If you want to photograph in the murky and dim interiors of a shipwreck, a pilot light or focus lamp mounted on the flash will come in very handy when you have to position the flash.

Wreck diving is very fascinating, and being able to bring back images only makes it more interesting. It only takes a bit of determination. The path to great images is not wide.

Tips

- Shooting wrecks requires prior planning. Only when the photographer and model have a prior understanding of the task ahead will good images result. Dive plans can be drawn up on a sketch of the wreck.
- Once on the wreck, the time will race by. Don't plan too many shoots on one dive; it is better to do more dives.
- When diving below 30m, little ambient light will remain, and shutter speeds longer than 1/30 sec will come into use. Under these circumstances, it will be necessary to keep the camera very still. Good buoy-

A strobe can only illuminate the foreground but used wisely it can add colour and texture

Wrecks comes across as being very static objects but their structure can be highlighted by working with the silhouette





Open your eyes. Sometimes the ambient light just does the job all by itself

ancy skills and ability to maintain a steady hover makes this less of a problem.

• It is the ambient light that constitutes the background light on wrecks. A flash can only supply fill light to brighten the foreground. As is the case with underwater wide-angle photography in general, use flash on a

manual setting to avoid wrong exposures.

• It is no simple task to photograph the insides of a wreck. The long strobe arms are often in the way when moving through narrow corridors, and the risk of stirring up sediment is considerable. A well-balanced photo equipment setup that is absolutely neutral

will considerably ease the task of working under such conditions.

• Sunken ships or aircraft will in no time turn into 'artificial reefs'. You must dive these locations with the same understanding and consideration that should be giving to natural reefs.

• Wreck photography is captivat-

ing, and therein lies the danger. Always monitor time, depth and gas supply. Rule of thumb: 50 percent of the focus should be on the photography, 50 percent on the dive plan.

• Wrecks are often photographed at distances of more than 1.5 meters. It is therefore important that the flash, or flashes, be

parallel to the optical axis of the lens, otherwise it will produce faded pictures and capture suspended particles in the images

• On wrecks, you can find many animals that you don't or rarely find elsewhere. It often pays off to bring another camera fitted with a lens of longer focal length

in case any of these subjects should emerge.

• Wrecks often come across as very static objects. Therefore, divers swimming into the picture can add something important. A dive lamp can bring out beautiful effects. ■



Ikelite Sony a700

Ikelite has introduced an underwater housing designed for the Sony Alpha DSLR-A700 camera. Constructed from clear polycarbonate, the housing includes TTL conversion circuitry that operates perfectly with current model Ikelite DS SubStrobes. Controls provide access to most camera functions, and everything is kept watertight with Ikelite pioneered Quad-Ring seal glands. A wide selection of dome and flat ports accommodate most macro, wide-angle and zoom lenses. Expected cost: Around US\$1,500. www.ikelite.com

Aquatica Nikon D3

Aquatica has announced the release of its new housing for the Nikon D3. Constructed from lightweight aluminum and loaded with features, this state-of-the-art housing is sure to please demanding professionals and discerning amateurs alike. Aquatica D3 ports, extensions and lens gears are compatible with all other bayonet mount Aquatica housings. In addition, all ports are now oversized to allow compatibility with the new Nikkor 14-24mm lens.

www.aquatica.ca



MDX

Sea&Sea has announced the release of their newest and most technically advanced digital SLR housings to date. Named MDX for Machined Digital, the housings are purpose-built for the latest Nikon D300, D3 and Canon's EOS 40D and 1D/1Ds Mark III cameras. Rated for a depth of 200ft/60m, each housing is precision crafted from solid block aluminum alloy and protected with a corrosion resistant anodized coating. Two Nikonos type (5-pin for Nikon, 6-pin for Canon) connectors are provided, although TTL strobe photography is possible with the addition of an optional TTL converter. seaandsea.com

YS-17 TTL slave strobe

SEA&SEA has announced the release of their newest strobe, the YS-17 TTL slave strobe. The compact design features a guide number of 14, beam angle of 70°x53° and a recycle time of 3 seconds, making it an ideal accessory for many of the compact digital cameras on the market today. Powered by a pair of AA batteries, the unit offers a 2-step light level control, TTL capability and a consumer friendly price of US\$349.00. www.seaandsea.com



Modular

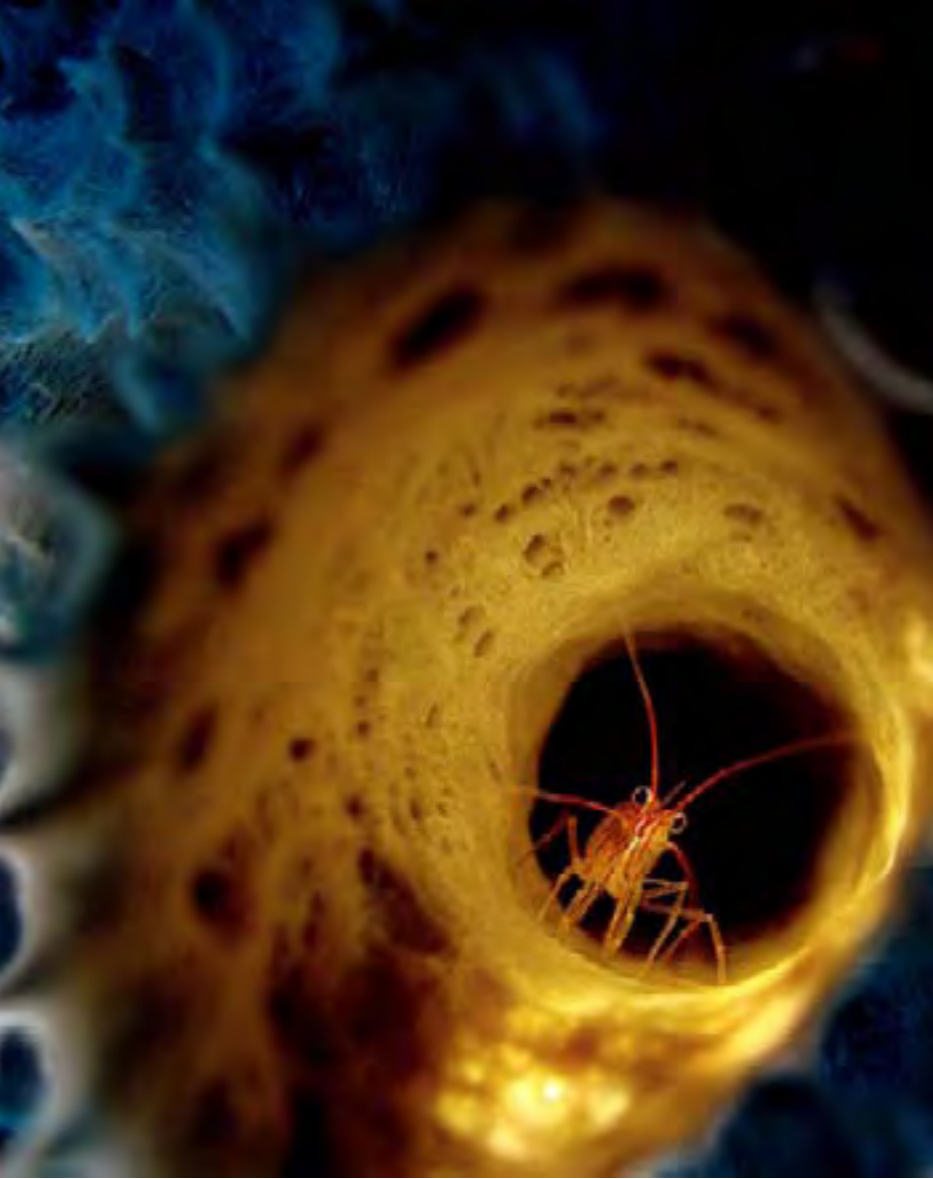
Ikelite's modular port system enables you to build a port out of universal components to accommodate a variety of macro, zoom, and wide-angle lenses. Port bodies are offered in a variety of lengths for use with different lenses. Using the interchangeable port bodies and extensions enables the photographer to create infinite combinations for maximum versatility and performance. When using a dome, image sharpness is very sensitive to port length, while the optics of a flat port are much more forgiving. The appropriate port body should be based upon the wide-angle or zoom lens to be used. A special extension is available for use with Nikon 105mm VR Macro and Canon 100mm USM Macro lenses.

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Underwater Competition Winners

With week-long live aboard trips to exotic places in diving heaven up for grabs in the 3rd Annual Wetpixel and DivePhotoGuide International Underwater Photography & Video Competition, it's no wonder there were a ton of entries. Prizes included trips to Socorro Mexico with Solmar V; to the Solomon Islands with Bilikiki Cruises; to Wakatobi, Indonesia, with Wakatobi Resort & Pelagian Yacht; to Vietnam with Rainbow Divers & Sunrise Beach Resort; to Ambon, Indonesia with Archipelago Fleet; to the Red Sea with Emperor Divers; and gift awards such as Nocturnal Lights SLX Focus Light, signed copies of the photobook "H2O" by Howard Schatz and the new Wyland book; Mares dive equipment, Ikelight flashlights, Sea&Sea strobes and other dive prizes and gift certificates for dive travel.



COUNTER-CLOCKWISE FROM TOP LEFT:

Still Images Compact Camera Silver Medal:
Bill Goodwin (USA)
"Shrimp in Sponge"

Still Images Macro Traditional Gold Medal:
Mike Roberts (USA)
"Urchin Abstract"

Still Images Wide Angle Unrestricted Gold Medal:
Dale Sanders (USA)
"Salmon"

Still Images Macro Unrestricted Honorable Mention:
Beo Brockhausen (Germany)
"Imperator"

And the winners are...
Find a few samples here. For a complete list, visit the Underwater Competition website at: <http://www.underwatercompetition.com/owu2008-winners.php> ■





X-RAY MAG is proud to be a media sponsor of the Annual Wetpixel and DivePhotoGuide International Underwater Photography & Video Competition



CLOCKWISE FROM TOP LEFT:

Still Images Best of Show:
Borut Furlan (Slovenia)
"Shark & Diver"

Still Images Wide Angle Unrestricted
Special Mention: Olaf Veltman
(Netherlands)"Toyota"

Still Images Wide Angle Unrestricted
Honorable Mention: Jeffrey Hartog (USA)
"Lemon Face"

Still Images Macro Unrestricted
Gold Medal: Andres Salesjo (Sweden)
"Shark Egg"





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Howard Schatz



P O R T F O L I O



dancers. I started with dancers first for the underwater work. One day, I called Katita Waldo of the San Francisco Ballet, and asked her, "Can you swim?" She could, and so we worked in the pool on studies that led to the book, *Waterdance*.

So after this book came out, all the dance companies wanted to work with you?
Mostly, individual dancers. I did some advertising shots for companies, however. But dancers don't make a lot of money. We pay them by the hour, and they give their heart and soul to the camera.

Have you worked with athletes, too, and is there a difference between working with athletes and dancers?

Well, there are similarities. Both dancers and athletes are coachable. You can't be a great athlete or a great dancer if you can't take direction. They listen and do what I say. But dancers have much more physical ability. Athletes have great ability in their specific field whether it's running or jumping or throwing or lifting, but dancers can do anything well. They can twist a torso, or bend a leg here, an arm there and the head another direction... They can do anything. They are like puppets. They can fulfill the fantasy. Athletes are much more limited.

How did you start working underwater?
I started working in a swimming pool. We had a home in California with a pool in which I worked. Then we moved to Connecticut, and we built a pool especially for photography. It is specially designed for shooting underwater.

Why the human form?

Are you married? Why did you marry him? You don't know... It's just because of some things inside that moved you. Certain things cannot be explained. Obviously, looking at my work, you can see that I am very interested in human beings and the human form. I am possessed with it.

Do you plan your shots or let them happen? How do you help the model attain what you want?

I direct. It's not so much planned. You climb the creative tree, climb up onto the branches, sometimes onto a branch that's rotten, and you fall down. Other times, you go out onto a branch, and there are cherries to pick on every inch. Just like if you write a sentence and it's bad. You say, "No," and start over. The way to compose something



Text edited by Gunild Symes
All images by Howard Schatz

Howard Schatz is an extraordinary photographer who captures the ethereal fluidity of the human body under water. A dazzling array of his underwater studies are now compiled in a new book entitled, *H2O*. Gunild Symes caught up with the effervescent Schatz to gain some insight into the stunning imagery found within the pages.

*Tell us about your book, *H2O*...*

Well, what happens underwater to a human being is very different from what happens on land. If you blow out a little air, you are neutrally buoyant. One experiences weightlessness. That allows all sorts of interesting things to happen. It could be silly, like astronauts twirling around in the space shuttle showing off their weightlessness. I am more interested in beauty. I work with dancers. The adversary of dancers is gravity. Under water, they are able to do things they cannot do on the stage. It allows for the mystical and the magical to happen. That's what is intriguing about water. The other interesting thing is the point where

water meets air. It's a reflective surface. Where water droplets on a body are reflecting the light, you can see reflections. The underwater surface is not only reflective, it also changes as it moves. It's a place to explore. Shooting underwater has a lot of problems in composition, resolution, clarity, comfort that you don't have to deal with out of the water.

The book, *Passion & Line*, was done with some of the greatest dancers in the world from American Ballet Theater, Alvin Ailey Dance Company, Martha Graham, and many others. I work with dancers all the time. Just yesterday, we were working in the studio with some

Underwater Study #3093, by Howard Schatz

Underwater Study #2727, by Howard Schatz

interesting and unique is to search and look for it. Don't close your mind to what's happening.

I often tell the dancer to bring music to the shoot, which moves them. For example, if something should be really energetic, I ask them to bring really energetic music they like. In this case, I say, "Wow! Look at all that energy expended. Let's play it loud and you perform to the music." But dancers can't just dance, they have to perform for the camera. They have to know how to place their bodies in the right way to get a good picture. But I let them perform and click away. I make 30 or 40 pictures, then I say, "Let's take a look. What's interesting here? You could bend your right foot more this way and twist the left knee more that way... Bring the foot up higher... Take the hand around your head and frame the face, then fling your head back and yell, YEAH!"



What can you tell divers who are underwater photographers about any technical aspects or creative processes you have developed in order to get the images you want?

There're a number of things. If you are not your own worst critic, you are your own worst enemy. You cannot be satisfied with 'pretty good'. You have to push yourself. I shoot in order to surprise and delight myself. And you have to keep working at it. Secondly, we take notes on everything, so if I go back on a shoot, I can start where I left off and continue to

grow and grow. The third important thing is to look at the images of other's and know what's out there. You have to have a vast image data bank in your head, so you can see, "Ah, someone has done this before." You can see it and do it in a way that no one else has done it before. You have to push yourself to make what is unique and valuable. Rather than tricks and specific details about film and cameras, what really makes a picture hap-

pen is the effort, the passion, the heart and soul behind it, and the ability to recognize what is generic and what is common and has been done before.

What is your next project?

I am working on several projects at the same time. These projects are very extensive. It's not like writing a book and you stay on the book until it's finished. I work on five to ten different projects all the

time. One can't work on one project every day because of scheduling, models, etc. Some of the projects I am working on include *Growing Up* in which we are following 100 children, boys and girls, over time; *Pregnancy*; *Boxing*; and other studies. It's continual experimentation. My photo studio is a research laboratory in which to make new things.

Do you teach photography or work with

apprentices or assistants?

Yes, I have assistants and interns — a whole team. Sometimes I teach, but I am really too busy to do it. For our interns, I do one lighting tutorial a year. We have one intern per year. I do a whole day on studio lighting for five to ten photographers. I do most of my work in our Soho studio, which is a regular photography studio with lights, all sorts of gizmos and everything you need for a shoot.



Atlantis #1, by Howard Schatz

You had to learn scuba diving in order to do underwater photography. Did scuba diving lead you to underwater photography or visa versa? And why do you take the kind of pictures you take rather than, say, sea life or marine mammals?
 Yes, I can scuba dive, but I am not interested in documented what's down there. I am interested in directing what's in my mind, creatively, versus document-

ing what's already there. I don't want to be just an observer. I am more of a sculptor—an inventor of images.
Did you start working in commercial photography first or fine art?
 I started in fine art photography first. Then, advertising agencies came to us to make pictures for them. I make enough to support the fine art experiments we



Underwater Study #2778, by Howard Schatz

do. We do the commercial work in order to support the fine art work. Advertising work is like research grants. We only do enough advertising in order to support the fine art work.
How did you first get into photography? Was it school or your parents?
 Not my parents. You get a camera and start shooting, that's how you begin. I



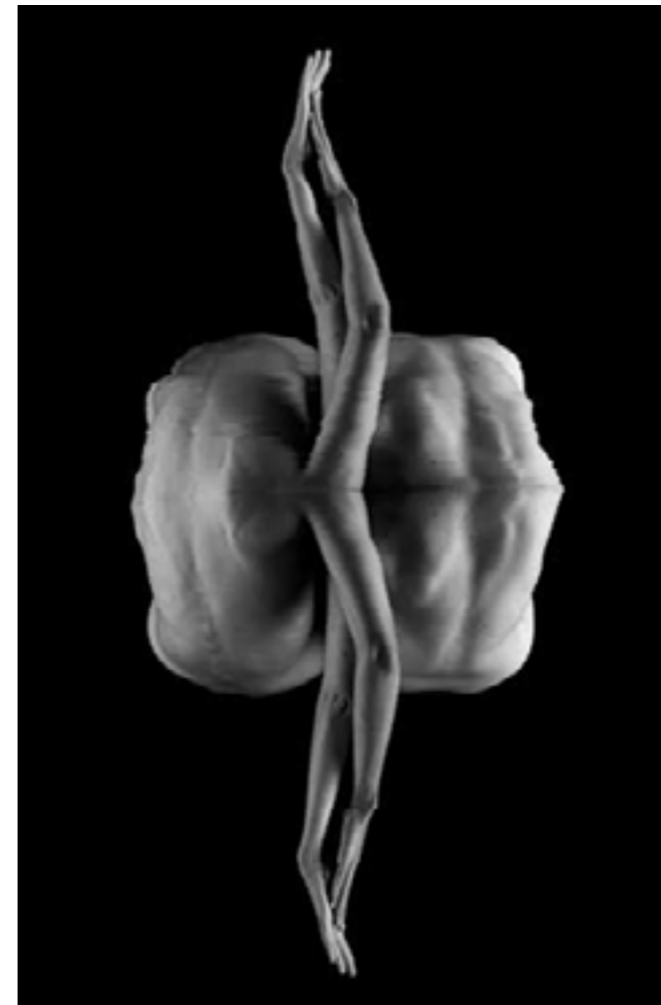
Underwater Study #2696, by Howard Schatz

was a physician, a specialist in the retina—the back of the eye—ophthalmology and retinal disease. On weekends, I made pictures. After our daughter graduated from high school, I became serious about pictures. We came to New York City for one year as a sabbatical from teaching and doing medicine. I came to do photography fulltime and never left.

That must have been a big switch from medicine to photography. Do you miss practicing medicine or have any regrets?
 No regrets. Medicine was very interesting and fulfilling. It was doing something good in the world. I enjoyed the patients, writing papers, and teaching—I was a professor at a university. On the other hand, photography is fun and interesting. I can learn as much in photography



CLOCKWISE FROM LEFT:
Underwater Study #2752,
Underwater Study #2845,
Underwater Study #2830
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Howard Schatz



as I did in medicine. But you have to be perfect when you are taking care of a patient. Everything must be done exactly as is medically appropriate. You cannot make mistakes. In photography, it is okay to make mistakes, to try new things. If you fail in photography, you are not going to lose somebody's life, or a limb, or an eye. It's a very different sort of exploration.

There's no danger.

I take a lot of pictures that don't work. You put it together, if it doesn't work, rearrange it until you get the right moment, and then you say, "Ah!"

What would you tell readers about the making of H2O? Insights or reflections?
In the making of the book, *H2O*, the joy was in the journey. A book is a nice

thing to have. But the great joy and pleasure came in the making of the pictures—in the work. The book is just an extra plus.

A gift from your explorations?
Yes, that's a good way to put it.

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