X-ray mag

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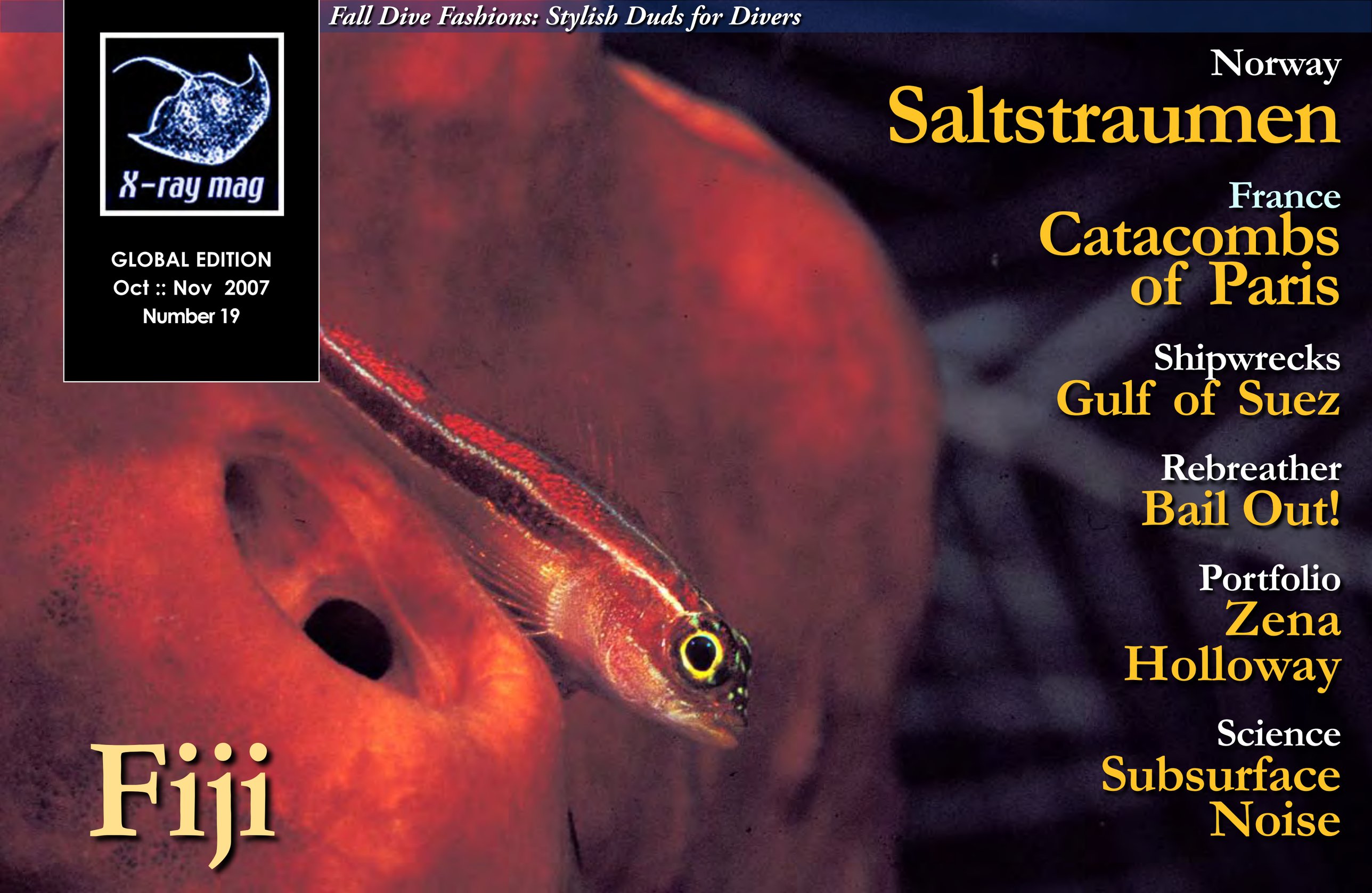
Number 19

Fall Dive Fashions: Stylish Duds for Divers



Fiji

Norway
Saltstraumen

France
Catacombs of Paris

Shipwrecks
Gulf of Suez

Rebreather
Bail Out!

Portfolio
Zena Holloway

Science
Subsurface Noise

DIRECTORY

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COVER PHOTO
"What's up?"
CORAL GOBY BY PETER SYMES

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Stylish Duds for Divers... page 58 ▶

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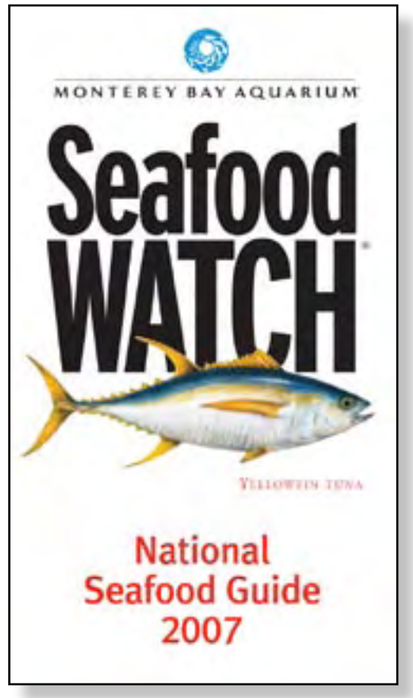
Goby on Coral. Photo by Scott Johnson

You are what you eat



Pamphlet from Monterey Bay Aquarium's Seafood Watch program

What kind of irony is this?

When I was a little boy, I just hated it when my grandmother served us boiled cod with washed out veggies. I still recall how we always got our mouths full of these tiny spiky bones that were like needles that you had to somehow fish out of your mouth while it was still full of half-chewed dinner. Yuck! But at that time, cod was a cheap stable food, a working man's diet and a typical dinner for the working class on the weekly "fish day". It was cheaper than meat. I also remember how salmon used to be an exclusive delicacy reserved for the better off, or for rare special occasions.

Not any more.
Cod is now precious and costs an arm and a leg, whilst salmon is cheap and regularly on special at the local supermarket.

Times have surely changed. Over-fishing of cod and other common species for consumption, even in the highly regulated industrialised nations, went pretty much unchecked for decades. Thanks to short-sighted politicians catering only to the selfish needs of their local constituents, widespread cheating on the scales and loopholes in the quotas were being invented in an already inefficient system, only half-heartedly policed and eventually abused to the maximum. Now, we have to pay the price. The stocks have collapsed and there is no sign that they will recover in the foreseeable future.

But perhaps that was bound to happen. The simple but inconvenient truth is that the human population can't feed itself from purely natural resources anymore. We actually pretty much ate the fish out of the ocean—us, our pets and our livestock.

Then, there is the matter of the salmon. It is cheap now. But is also not wild. Fish and crustaceans are now reared in fish farms of some sort,

Cod, *Gadus Morhua* STEIN JOHNSEN

editorial

from closed aquaculture, ponds or oceanic fish farms to meet our demand for protein. In essence, it is not unlike what we do with cattle, pigs, sheep and other land animals. It has been a really long time since we hunted buffalos. Fish farms make cheap foods, and if it can save and preserve wildlife, then it is a good thing, right?

Well, the snag is that fish farming, like farms with livestock are highly polluting. All these animals have to have something eat—and producing their fodder is in itself quite energy consuming—but all that stuff has to come out again as—yes, let's call a spade a spade—loads of crap and urine. This has to go somewhere.

Aquaculture in open water has been known to leach excessive amounts of nutrients into the sea from excreta, and the constant drizzle of fodder pellets which just pass right through the water and sink to the bottom. There have also been issues previously with the use of antibiotics in the fodder.

But if we have to choose between two evils, there is no doubt that we will have to rely more on farmed fish in order to preserve the wild stocks. We just have to regulate and police the production better and have a proper check on both waste treatment as well as food safety.

As a recent investigation showed, farmed fish has as good nutritional value as the wild ones—that is, as long as the farmers don't put all kinds of weird additives and chemicals into the fish fodder.

I want clean and safe food! That is not to say that we should forsake wild fish all together. It does have a better taste I think.

But do "eat smart". Pay a visit to Oceans Alive, *The Seafood Watch Program: A Consumer's Guide to Sustainable Seafood* or any of the other good guides around.

There is still good seafood around to be had.

Just think about it. ■

www.oceansalive.org
www.mbayaq.org
(SeaFood Watch)

X-RAY MAG is distributed six times per year on the Internet (eight in 2008).

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NAUI WORLDWIDE DIVE SAFETY THROUGH EDUCATION

X-ray mag

News edited
by Peter Symes &
Michael Symes

NEWS

Viper fish
Chauliodus—
from 400-500m

The jew-
elled squid,
Histioteuthis,
from 200-500m

Photos by David Shale

‘New Continent’ and Species Discovered in Atlantic Study

A contribution to the global Census research programme Census of Marine Life

news

Edited by
Peter Symes

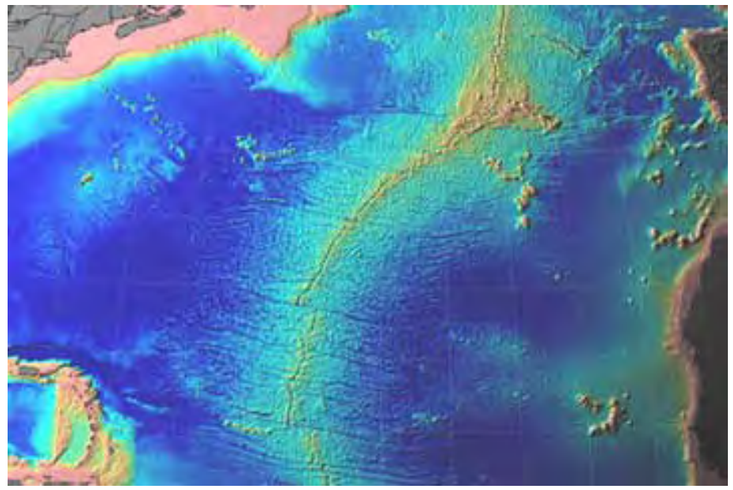
A small cranchiid squid

Professor Monty Priede, from the University of Aberdeen, UK, is leading a team of international researchers whose work will continue our understanding of life in the deepest oceans, and contribute to the global Census of Marine Life.

After exploring life in the North Atlantic Ocean at various depths of 800 to 3,500 metres, a team of 31 scientists has returned from a five-week scientific expedition along the Mid-Atlantic Ridge between Iceland and the Azores on board the Royal Research Ship James Cook (image next page). A wealth of new information and insights has been obtained with stunning images and marine life specimens, and with one species thought to be new to science.

It is like surveying a new continent half way between America and Europe. The creatures can be recognised but familiar ones are absent and unusual ones are common. Species are being found that are rare or unknown elsewhere in the world.

The team of scientists mapped over 1,500 square miles, exploring the deep sea creatures living in the depths of the Mid-Atlantic Ridge. They used the latest technology to learn more about what is living in this remote and relatively unexplored deep-sea environment using remotely operated vehicles equipped with digital cameras.



The Mid-Atlantic Ridge

Professor Monty Priede is the Director of Oceanlab and responsible for a worldwide programme of marine research specialising in use of unmanned autonomous lander vehicles to carry out experiments and make observations with both stills and video cameras on the deep sea floor

With a suite of eight deep sea cameras they were able to capture images of life on the peaks and valleys of very rugged terrain. Colourful sponges and corals encrust rocky cliffs, whereas areas of soft sediment are populated by starfish, brittle-stars, sea cucumbers and burrowing worms. Fishes, crabs and shrimps forage over the ridge exploiting whatever they can find. Trawls, traps and corers have brought back thousands of specimens for study back in the laboratory.

Professor Priede said that they were trying to imagine what the north Atlantic would be like without the ridge that literally cuts it in half, as it is thought that it has a major effect on ocean currents, productivity and the bio-diversity of the North Atlantic Ocean.

The aim of the voyage is to contribute to the wider MAR-ECO project studying bio-diversity along mid-ocean ridges (www.mar-eco.no) and to the global Census research programme. Census of Marine Life is a ten-year global scientific initiative to assess and explain the diversity, distribution and abundance of life in the oceans. The team already think they may have discovered a new species of Ostracod (or seed shrimp) that was found swarming in large numbers on the western side of the ridge. Specimens are being sent to Southampton where world-renowned expert Professor Martin Angel will ultimately determine whether this is a ►

news

Edited by
Michael Symes

new species, and if so, describe it and allocate a name.

The Mid-Atlantic Ridge is still relatively unexplored so this voyage will have played a vital role in expanding our knowledge of the bio-diversity of the region.

Water currents and tides over the ridge were studied intensively and daily measurements were made of productivity in surface waters. The team left behind automatic equipment on the sea floor at six observing stations that will continue measurements and photography over the next two years. Further voyages are planned in 2008 and 2009 that will include retrieval of the gear.

The expedition is run under ECOMAR, an affiliated project of EuroCoML. It is a £2 million consortium project funded by the UK Natural Environment Research Council, led by the University of Aberdeen with participation from: National Oceanography Centre, Southampton, University of St Andrews, Scottish Association for Marine Science, Plymouth Marine Laboratory, University of Durham and University of Newcastle. It provides a contribution to the wider MAR-ECO project co-ordinated by Odd Aksel Bergstad of Norway and the Census of Marine Life, a global project involving over 2,000 scientists. ■

FOR FURTHER INFORMATION VISIT:

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RRS James Cook in dock at the National Oceanography Centre, Southampton.

news

Edited by
Peter Symes

View across the Gulf of Aqaba towards the Jordanian port of Aqaba

Israeli-Jordanian team set up first artificial coral reef in the Red Sea

Off the coast of Eilat now sits a huge yellow concrete and wire construction that stretches four yards up from the seabed, is four yards wide, and is full of holes. This is going to be the first artificial coral reef in the Red Sea.

The reef is a unique new approach to conservation in the Red Sea and part of a joint co-operative project between Israel and Jordan.

The reef was first installed in May this year and has already attracted a great deal of marine life. There are now 32 species of fish swimming through or living on the reef—half the number normally found in the reefs of the Red Sea. These include bass, sea goldfish and butterfly fish. Sea urchins, fan worms, tunicates and tubeworms can also be found there.

At present, no coral has been planted on the reef, and that's why some of the fish are still missing. If the scientists were to let nature take its course, it would take between 80-100 years for the corals to flourish. Dr Nadav Shashar, the supervisor of the research project, and a marine biologist at the National Center for Mariculture does not want to wait that long, so the team has a nursery in Haifa where they are growing 13 different types of coral.

These corals will be planted in the specially prepared holes in the reef structure and the work begins in the fall. There are 1,000 colonies to plant, and this will be the first time in history that a team has tried to do this. Shashar is very excited at the prospect.

"This gives us a very unique opportunity to understand what makes a reef and how the corals interact with each other," he explains.

"In the natural world corals grow in a certain order, replacing one another in a specific sequence until they reach the climax community, which you find in mature reefs. We want to discover if we have to plant the corals in that order or whether we can go straight to the climax community." ■

VIA PRESSRELEASE, ISRAELI MINISTRY OF FOREIGN AFFAIRS

"In the 50 years of our generation we may lose half the world's corals on our watch."

EXECUTIVE DIRECTOR DAVE VAUGHN,
MOTE TROPICAL RESEARCH LAB

In the last three decades, 25 percent of the world's corals have been lost, primarily because of rising sea temperatures and increased carbon dioxide levels caused by global warming.

Singapore Now Has a Coral Nursery

Off Semakau Island on Singapore's southern coast, a coral nursery has been founded with the aim of conserving and growing the country's natural corals. It is estimated that three-fifths of Singapore's reefs off its southern coast have been lost over the past 200 years because of rapid economic growth.

It is focusing on using fragments of naturally-broken hard coral to protect existing reefs and scientists hope that after a year, the corals can be transplanted to reefs around Singapore's southern coast. The corals are then placed about three metres under the seawater at mid-tide on the seabed. ■

Supporting Coral Research to Save the Florida Reefs

To fund some of the research of growing corals, the State of Florida is now offering a special automobile license plate. Scientists at Florida's Mote Marine Laboratory are also studying the effectiveness of coral planting. ■

Desalination could aggravate climate change, says the World Wildlife Fund

Desalination has become a growing trend worldwide to handle water shortages, but the WWF said its study has found that desalination uses large amounts of energy, emits greenhouse gasses and destroys marine life in some coastal areas.

Making more drinking water with the help of desalination plants "creates a wasteful attitude to water use," said Jamie Pittock, who heads WWF's freshwater program. People should set up more water-effective technologies in houses and businesses, reduce the leakage in pipes and recycle waste water, he said. "In most cities desalination plants are not required."

Marine life is also put at risk by desalination plants. As the seawater is taken in, small life forms such as plankton, eggs and fish larvae are also removed. The brine—the highly concentrated saline water discharged from the plants—is mostly sent back into the sea where it increases the salinity of the water, posing a threat to sea life and disrupting the ecosystem. ■

PADI Europe sacks CEO

In a move that was met with wide spread surprise in the industry, PADI EUROPE Ltd. has chosen to part ways with its long-standing CEO, Jean-Claude Monachon, stating in a public newsletter that the board of directors has decided to terminate the working relationship "solely as a result of internal differences in communication and work styles".

Jean-Claude Monachon, who was with PADI for over 17 years will be replaced by Jürg Strasser, CFO / COO of PADI EUROPE taking the lead as director.

The move has been widely questioned by the industry, and his successor greeted with some scepticism. It has been a public secret that there has been, for some time, a strained working relationship between Monachon and the chairman Jürg Beeli.

Monachon just briefly stated, "Let's just say that we decided to part ways."

PADI would like to assure all their business partners and associates that all ongoing work and negotiations entered into their office under Monachon will continue in the same spirit and with the same goals: "PADI EUROPE remains in an excellent state of prosperity and development and is expecting to finalize this current year with its best results ever." ■

3D Entertainment"s Mantello Brothers to Present Daryl Hannah with Reef Check's Reef Rescuer 2007 Award

The Reef Rescuer Award was awarded to Hollywood star and environmentalist Daryl Hannah for her dedicated support and advocacy of reef and ocean conservation at Reef Check's 5th annual Reef Rescue gala on Sunday, September 16th.

"It's a great honor for us to present this award to such an accomplished actress and environmentalist as Daryl Hannah, whose sole motivation is a genuine passion for and appreciation of the world's surviving ocean communities and ecosystems," said the Mantello brothers. Francois Mantello is chairman of 3D Entertainment Ltd, and Jean-Jacques Mantello, the director

of the company's unique ocean conservation-themed film trilogy for IMAX 3D theatres. "We are also very pleased to support Reef Check in their noble and vital cause three years after the tremendous support they showed us during the launch of our highly successful film SHARKS 3D presented by Jean-Michel Cousteau."

Internationally renowned marine biologist, former chief scientist of the US National Oceanographic Atmospheric Administration (NOAA) and current National Geographic "Explorer-in-Residence" Dr Sylvia Earle will also be honored at the event with the Poseidon Award for her lifetime achievements in marine conservation. ■

Dave Mullins from New Zeeland has, with 244 meters, set a NEW WORLD RECORD in the dicipline, Dynamic With Fins, extending his old record by 18m. This fantastic swim was done in Wellington, New Zealand on September 23rd. Total dive time: 4'02"

Tanzania sorcerer dies in failed underwater spirit stunt

A traditional medicine man in Tanzania drowned after jumping in a river and promising to resurface three days later with relevations from ancestral spirits, regional police commander Daudi Siadi told AFP.

Dozens of villagers chanted and drummed as the fortune-teller, a local witch doctor named as Nyasio Alfonso, dived to confer with the riverine spirits, he said.

Four days after Alfonso threw himself into the river his decomposing body was fished out several metres downstream. ■

Perhaps he should have worn an AGA?

Man surprised by shark, stabs own arm with harpoon

A 26-year-old man, diving without any diving equipment some 30 meters off the coast in Yonago, Japan, was surprised by a shark and accidentally stabbed himself in his left arm with a harpoon inflicting a wound that is expected to take two weeks to heal, the Sankei Shimbun reports. ■

Lifeguard saves baby shark

A lifeguard had to save a baby shark from a mob of panicking swimmers off a beach on New York's Coney Island, reports the New York Daily News.

"There must have been 75 to 100 people circled around the shark in the water," said Mr Mironescu, 39, of Brooklyn. "They were holding on to it and some people were actually hitting him, smacking his face. Well, I wasn't going to let them hurt the poor thing."

He carried the shark—a baby and harmless to humans—to a less populated area and started backstroking out to sea, dragging the shark with one hand.

"He was making believe like he was dead, then he wiggled his whole body and tried to bite me. He didn't get it," added Mr Mironescu. ■

Australians Discovers Ocean 'Missing Link'

Australian scientists have identified one of the last missing links which shows how the world ocean system is interconnected in governing global climate

The Southern Ocean, which swirls around the Antarctic, has been identified in recent years as the main lung of global climate, absorbing a third of all carbon dioxide taken in by the world ocean system.

New research shows that a current sweeping past Australia's southern island of Tasmania toward the South Atlantic is a previously undetected part of the world climate system.

IMAGE COURTESY OF CSIRO AUSTRALIA

The newly discovered Tasman Outflow, which sweeps past Tasmania at an average depth of 800 to 1000 metres, is classed as a "supergyre" that links the Indian, Pacific and Atlantic southern hemisphere ocean basins. In each ocean, water flows around counter-clockwise pathways, or gyres the size of ocean basins.

Ridgeway and co-author Jeff Dunn said identification of the supergyre improves the ability of researchers to more accurately explain how the ocean governs global climate.

"We knew that the deep ocean pathway currents could move from the Pacific to the Indian Ocean through Indonesia. Now we can see that they move south of Tasmania as well." ■

Weakening of Gulf current is probably a normal variation

A perceived slow down in circulation, linked to global warming, may actually have been normal variations in the flow pattern.

A massive ocean circulation pattern that plays a crucial role in shaping the world's climate may not have been slowing down over the last few decades as scientists previously believed, according to a study published in the journal Science.

The ocean flow has been a focus of global warming debates. Some computer models of climate change has suggested this Atlantic Meridional Overturning Circulation, of which the Gulf Stream is the best-known component, would weaken severely or even stop completely as global temperatures rise, a scenario taken to extremes in the Hollywood movie The Day After Tomorrow.

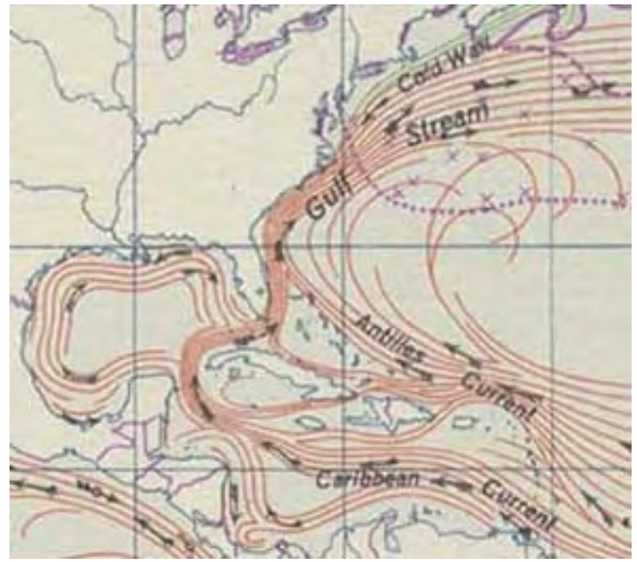
The perceived slowdown had been considered alarming support for computer predictions that global warming would disrupt the planet's heat regulation. The Atlantic circulation brings warm water to Europe, keeping the continent 4-6°C warmer than it would be otherwise. As the water reaches the cold Arctic, it sinks, returning southwards deeper in the ocean.

Using instruments strung out across the Atlantic, a UK-led team shows that its circulation varies significantly over the course of a year. In these data the scientists have found enough normal variation in the pattern to suggest that previous studies were premature in asserting a long-term trend.

The most astonishing event occurred in early November 2004 when the southward, colder flow of deep water essntially stopped completely.

Last year the same UK-led team published evidence that the circulation may have weakened by about 30% over half a century. But that was based on historical records from just five sampling expeditions, raising concerns that the data was not robust enough to provide a clear-cut conclusion.

The key for scientists, then, has been to actually measure and understand how the circulation varies naturally, making it much easier to pick out any changes related to man-made global warming. "The Atlantic Ocean carries a quarter of the global northwards heat flux, so having the information to plug into climate models will be a major addition," Stuart Cunningham from the National Oceanography Centre (NOC) in Southampton has told the BBC News website. ■

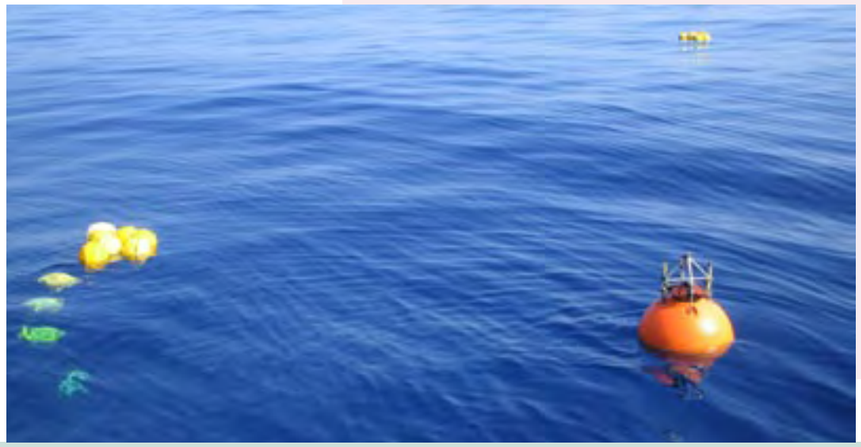


Unique monitoring system for the Atlantic circulation proves its worth

Making the measurements has been everything but trivial. Early in 2004, UK researchers deployed 19 sets of instruments across the Atlantic from the northwestern coast of Africa to the Bahamas. US investigators subsequently installed further moorings on the western side of the ocean.

Each set of instruments is strung out along a cable, which is tethered to the sea floor at the bottom end and to a float at the top. This array of instruments has for the first time enabled researchers to continuously monitor the daily variations in flow, salinity, temperature and water pressure.

Since then, the instruments have provided a continuous record. In combination with current measurements of the Gulf Stream in the Straits of Florida provided by scientists from NOAA's Atlantic Oceanographic and Meteorological Laboratory in Miami and satellite measurements of the wind-driven flow across 26°N, the Meridional Overturning Circulation has been calculated on a daily basis. ■



News from NAUI

& Pressreleases

NAUI Pro Career Training Institute Launched

Commercial Diving Academy launches the "NAUI Pro Career Training Institute".

Commercial Diving Academy of Jacksonville, Florida has officially launched its new division: The NAUI Pro Career Training Institute. In keeping with the company's mission, the NPCTI strives to produce the best professional divers worldwide. The candidates attending the Scuba Instructor Program will receive the same world-class training and education that has been the key to the success of the commercial diving program. "There is a lack of quality educators in the recreational diving industry," says Captain Ray Black, company president. "We train high-quality employees to meet the needs of dive operators."

The four-week Total Immersion program is intensive and unmatched. During this three-phase program, students eat, sleep, and breathe diving education. Upon completion and passing the final review, the certified instructors are ready for their successful new career.

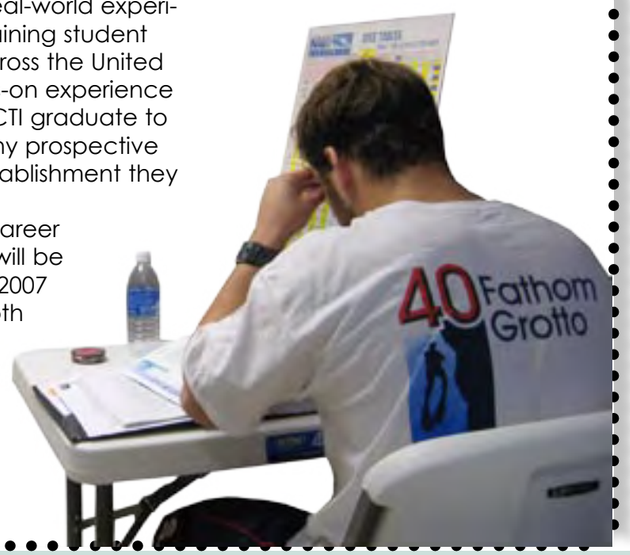
This program is made possible by CDA's acquisition of 40 Fathom Grotto, the ultimate diver training facility (the deepest freshwater diving facility in the Southeast). The facility is going through extensive renovations; among the completed projects are all new docks, bathhouse and the Diver's Lodge.

Students reside full-time at the facility allowing them to focus on becoming professional diving educators. The real-world experience includes training student divers from all across the United States. This hands-on experience prepares the NPCTI graduate to be an asset to any prospective resort or retail establishment they choose.

The NAUI Pro Career Training Institute will be exhibiting at the 2007 DEMA Show, booth (#1092) and launching their new referral program, the Gold Star Program.

This program is exclusive to dive retailers, and is designed to help grow their overall business. Scott Evans, Division Manager stated, "Many retailers spend so much time running the business they find there isn't a lot of time left for training their own staff members. Our goal is to develop a strong partnership with retailers and help them create instructors who make a difference in the bottom line." When a retailer refers a student for the program, the Institute trains student instructor to become competent, qualified dive professionals—plus sends the referring retailer $1,000 referral bonus. ■

For more information about the NAUI Pro Career Training Institute visit: www.NAUIpro.com
For more information about Commercial Diving Academy visit: www.commercialdivingacademy.com. For more information about 40 Fathom Grotto visit: www.40fathomgrotto.com
Questions? Call Toll-Free 888-974-2232



Were Dinosaurs Able to Swim?

Ancient footprints have provided compelling evidence that some dinosaurs were able to swim, scientists report. They were left by a large, bipedal, carnivorous dinosaur. The shape of the scratch marks suggested the beast was swimming.

The 15m trackway that reveals one animal's underwater odyssey was discovered in the Cameros Basin in Spain, once a vast lake. The marks are about 125 million years old, dating to the Early Cretaceous, the team writes in the journal *Geology*.

The S-shaped prints suggest the beast clawed at sediment on the lake floor as it swam in about three meters of water. ■

SOURCES: BBC NEWS WEBSITE. GEOLOGY VOLUME 35, ISSUE 6 (JUNE 2007) PP. 507–510

GUILLAUME SUAN, UNIVERSITE DE LYON 1

Where did the oceans really come from?

Most scientists think they came from water-rich asteroids and comets raining down on the planet in its youth. Just after the Earth formed, it was very hot and dry. Prevailing theory suggests that millions of water-rich comets and asteroids bombarded our planet around 3.8 billion years ago, neatly explaining why oceans later appeared.

Also, the ratio of deuterium—or "heavy hydrogen" because it contains a neutron in addition to a proton—to hydrogen in our sea water matches the value found in water-rich asteroids, suggesting a common origin.

But now planetary scientists from the Tokyo Institute of Technology suggest the oceans were actually created by Earth itself—they may have formed because the young Earth had a thick blanket of hydrogen, which reacted with oxides in the Earth's mantle to form lakes and seas.

If the water on Earth did form from a thick hydrogen atmosphere, however, it should have originally had a far lower value of the deuterium-to-hydrogen ratio than we see in sea water today. But Genda and Ikoma have got around this problem. Their calculations show that the ratio would have naturally drifted upwards over time.

Several effects would have contributed to this rise, including leakage of hydrogen into space. Energy from the sun would have made most of the hydrogen escape, but the heavier deuterium would have escaped less easily, so it would have become more concentrated. ■

SOURCE: NEW SCIENTIST

news

Edited by
Willy Volk

Fishing 'destabilises Black Sea'

Excessive fishing in the Black Sea has triggered major changes in the marine ecosystem. The collapse of fish stocks altered the sea's food chain, triggering a "regime shift" that allowed a species of invasive jellyfish to bloom, scientists report in the Proceedings of the National Academy of Sciences. ■

Seafood giants join forces to combat pirate fishing in the Barents Sea

PÅL JULIUS SKOGHOLT

The trawler *Arosa Quinze* docked in Tromsø after being arrested by the Norwegian Coast Guard for illegal fishing

In a joint letter to the Norwegian government, eight of Europe's largest and most influential seafood companies have committed themselves to do their best to avoid illegal Barents Sea cod and have called on the Norwegian government to provide up to date black lists, so companies can live up to this commitment.

Last September, the European Fish Processors and Traders Association (AIPCE) adopted a set industry guidelines to avoid Illegal, Unregulated and Unreported (IUU) Barents Sea cod and haddock.

The signatories include some of Europe's largest seafood processors and purchasers such as restaurant chain McDonalds as well as Espersen, Royal Greenland, Youngs Seafood and Iglo/Birds Eye, Frosta/Copack.

The commitment also entails refusing all fish from vessels blacklisted by Norway or relevant regional fisheries management organizations like the North East Atlantic Fisheries Commission (NEAFC). Figures published by the International Council for Exploration of the Seas (ICES) last year indicated that every fifth cod from the Barents was illegally fished. ■

SOURCE: WEBWIRE

Europe bans bluefin tuna fishing

The European Commission has banned the fishing of endangered bluefin tuna in the eastern Atlantic and Mediterranean for the rest of the year.

The move was taken to curb over-fishing and dwindling stocks of fish, after the EU reached its 2007 quota. An EU official said it would move to prevent under-reporting of catches and unequal sharing of the quota. "Clearly there are problems both of over-fishing a stock already threatened with collapse and of equity between the member states concerned," said EU Fisheries Commissioner Joe Borg.

The ban affects Cyprus, Greece, Malta, Portugal and Spain. Italy and France have closed their fisheries for 2007. ■

NOAA

Fighting Breast Cancer

How Deep Would You Go for the Cure?

Text by Cindy Ross

This October, divers along the west coast of the U.S. will be gathering in Seattle and San Diego, to raise monies for and awareness of breast cancer. Sponsored by Mares North America and GirlDiver.com, the event encourages women to become involved with the recreational sport of scuba, while supporting programs designed to assist young women diagnosed with breast cancer.

On October 5, the Seattle event will hold a dinner/auction gala with live music for divers from Washington and Oregon. October 7, will find divers gathered along the shores of the Puget Sound where a Discover Scuba into the chilly waters will start the day, followed by new divers doing their final certification dive at the event, and finalizing with a "Big Splash" event, showcasing divers entering the waters from dive charters, dive kayaks and inflatable watercraft.

The following weekend, a similar event will take place in La Jolla, California. With a mass dive of up to 100 divers entering the water, donning pink ribbons on their tanks in honor of loved ones, to do a single dive for the event.

Breast cancer is a disease that affects both men and women. One in seven women will be diagnosed with breast cancer in their lifetime. And while many men will be touched by the diagnosis of a female loved one, the American Cancer Society estimates that in the U.S. alone, 1450 new cases of male breast cancer are diagnosed, and approximately 470 die annually from the disease.

The five-year survival rate for women with breast cancer is 86%. (The survival rate is the percentage of women who are still living a period of time after they are diagnosed with breast cancer.) The ten-year survival rate is 76%. These rates include women at all stages or levels of severity of breast cancer.

Women with cancer that has not metastasized—that is, the cancer has not moved to the lymph system or other parts of the body—have a five-year survival rate of 96%. Women whose breast cancer has metastasized to other parts of the body have a five-year survival rate of 21%.

This shows the importance of early detection in the fight against breast cancer.

In 2008, Dive for the Cure plans to increase the size and effectiveness of the original two venues, and eventually take the event to four locations in 2009. Organizers hope to inspire and assist local dive clubs and shops to hold smaller events in their locales.

For more information on how you can bring Dive For The Cure to your neighborhood, please visit: ***www.diveforthecure.com*** ■

Raise the U-boat

The council of Derry, Ireland, hopes to recover one of the many German vessels scuttled off the Irish coast and put it in a museum.

Sixty years ago, the Nazi U-boat fleet that menaced wartime Atlantic convoys and threatened Britain with starvation was scuttled off the north-west coast of Ireland. The sunken hulls and rusting torpedo tubes are encrusted with coral.

Salvage plans are now being explored to see whether one of the German submarines could be raised from the deep and brought ashore. The vessel and its wartime technology could be put on display as the central attraction for a new maritime museum in Derry. ■

Japanese submariners remembered in Australia

Relatives of two Japanese sailors who died when their M24 midget submarine was lost during World War II attended a memorial service at sea off Sydney on Aug 6.

The submarine disappeared after an attack on Sydney Harbour in 1942 and was found late last year by a group of amateur divers, about 5km off Sydney's northern beaches. ■

Gallipoli sub salvage under way

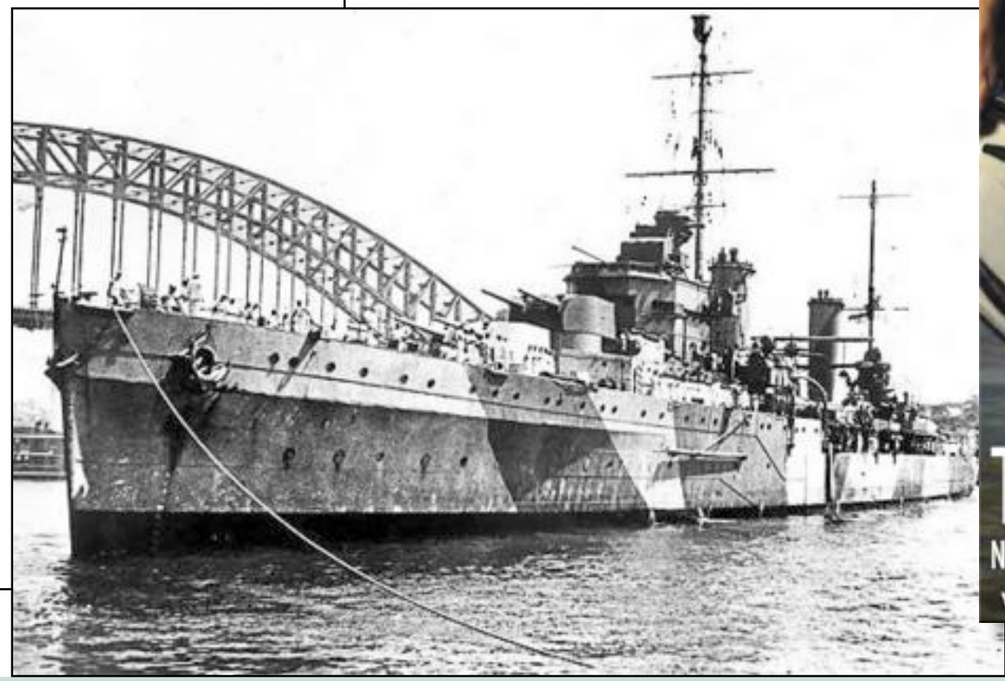
The Australian AE2 submarine which played a pivotal role in the Gallipoli campaign during WW1 may be raised

The submarine, which was scuttled in 1915, five days after the Gallipoli landing, might not have the archaeological status of Greco-Roman finds, but it has become the new touchstone of the modern relationship between Turkey and Australia. Almost a century on, Gallipoli continues to be a sensitive issue on both sides.

Technically, the submarine presents a challenge: Should it be left 73 metres down on the floor of the Sea of Marama as a "living natural museum", or raised, restored and put on display so future generations can appreciate its significance in Gallipoli's shaping of Australia's national identity?

Crucial to the future of the submarine is the state of the hull, and whether it could withstand any attempt to move it, possibly to a public viewing tank at Canakkale, close to Gallipoli.

The Turks are keen. A memorandum of understanding between Turkey and Australia, signed in 2002, suggests the Turkish Ministry of Culture could provide the viewing pool near Canakkale. Revenue from an admission fee would pay for maintenance. There is no suggestion the submarine will be brought back to Australia. Canberra has made it clear that if the submarine is raised, or moved, it has no claim on it. ■



The Search for *HMAS Sydney*

(The continuing story —cf previous Wreck Rap)

The Australian Navy has sent the survey ship *HMAS Leeuwin* to examine a wreck that a private search team believes could be *HMAS Sydney*, the cruiser sunk in 1941 with its crew of 645. The find was reported in previous issue of *X-RAY MAG*.

HMAS Leeuwin has high-definition equipment that includes a state of the art side-scan sonar. Similar equipment was used this year to produce images of the Black Hawk helicopter lost in waters off Fiji. The new search will employ two submersibles that helped to locate the liner Titanic in the Atlantic Ocean. ■

Wreckhunter joins search

Internationally renowned shipwreck hunter David Mearns—who found the lost WWII battleships *HMS Hood* of Britain and the *Bismarck* of Germany—has joined a new AU$5m search for the *HMAS Sydney*. The month-long deepwater operation is expected to begin next January.

The government said the search for the Sydney was a matter of national importance. It warned the private group that it would be breaking the law if it did not hand over any evidence it had to the authorities so the find could be confirmed. ■

wreck rap

Rediscovering the legend of the lake dwellers. Five sites vie for heritage status. Painting by August Bachelin

Switzerland: Rediscovering the legend of the lake dwellers

Archaeologists have discovered traces of Switzerland's oldest known building. It lies underwater in the middle of Lake Biel, northwest of the Swiss capital, Bern and is almost 6000 years old

Since it was made of wood scientists used dendrochronology —tdating by tree rings—to give a precise figure of 3863 BC.

The find has as described as "sensational" by Albert Hafner, who is in charge of underwater archaeology in the region.

Divers working for the cantonal archaeological service came upon the site in the winter of 2006 when they were investigating prehistoric villages built on piles in the once densely populated area of Sutz-Lattrigen. ■

SOURCE: SWISSINFO

Artificial Reefs

Two decommissioned foreign naval ships are poised to be simulaneously sunk in Malaysian waters next year to create artificial reefs, the first of its kind here. The ships, between 110m and 160m in length, will come from the United States and Canada and are scheduled to be sunk off Pulau Redang here and Pulau Tioman, Pahang.

The project, estimated to cost about RM20 million, will be undertaken by the Kuala Terengganu Rotary Club and the B&J Diving Centre Sdn Bhd as well as the state government.

The Rotary club and B&J are looking to choose two from the three options made available, namely a US navy ship, a Canadian destroyer or a Canadian MARS class ship to be either donated or purchased with a minimal fee. ■

Red outlines have been added to an image of a granite rock found at 40 feet in Lake Michigan. The markings outline what divers say is an etching of a mastodon

Possible Prehistoric Carving of Mastodon Found 40ft Underwater in Lake Michigan

Archaeologists believe they have found a prehistoric carving of a mastodon, with a spear embedded in it's side, carved into a boulder underwater in Grand Traverse Bay. The mastodon was an elephant-like creature, which once inhabited North America, writes Discovery Channel website.

The carving is in a granite rock 40ft underwater. Archaeologists found the rock while searching for shipwrecks. They are waiting for an expert to verify the find and specialists who have been shown pictures want more evidence.

"Experts in petroglyphs generally don't dive, so we're running into a little bit of a stumbling block there," said Mark Holley a scientist with the Grand Traverse Bay Underwater Preserve Council. ■

SOURCE: DISCOVERY CHANNEL

Century Old Shipwreck Found in Lake Superior (USA)

Explorers have discovered the wreckage of an ore carrier that mysteriously sank during a storm on Lake Superior 100 years ago the *Cyprus*, an ore carrier that mysteriously sank during a storm Oct. 11, 1907. Only one survivor made it to shore as the ship went down not to be located again for a century. Last month, a team with the Great Lakes Shipwreck Historical Society found the wreckage of the Cyprus about 460 feet below the surface. In August 2007, the crew of the Society's *R.V. David Boyd* was doing seach passes using sidescan sonar unit out of the port of Grand Marais, Michigan, on Lake Superior's Shipwreck Coast.

Just beginning a second day of searching, crew member Tom Farnquist, saw a target that was clearly a shipwreck. In a few short minutes, the target began to look more and more like a long, steel freighter, very deep at 460 feet. Further carefully positioned passes with the sonar provided clear acoustic imagery, showing hatch openings and a debris field among mounds of lake bottom stirred up by the wreck's impact.

Initially believed to be the *D.M. Clemson*, mysteriously lost with all hands on December 1, 1908, a ROV enabled the wreck hunters to read the ship's name positively identifying her as *Cyprus*. ■

GREAT LAKES SHIPWRECK HISTORICAL SOCIETY

A team with the Great Lakes Shipwreck Historical Society found the wreckage of the *Cyprus* about 460 feet below the surface

Red Sea: Ferry wreck located off Hurghada

A team of divers in Egypt have found, dived and positively identified the wreck of the *Al Qamar Al Saudi Al Misri*, a 125m-long ferry, which caught fire, capsized and sank near Shadwan Island on 19 May 1994, with the loss of 21 lives. It was divers from Tekstreme Diving who found the ferry lying at a depth of between 64 and 83m. ■

wreck rap

"Cyprus is a crossroads and is very rich in ancient shipwrecks."

PAVLOS FLOURENTZOS, DIRECTOR OF CYPRUS' DEPARTMENT OF ANTIQUITIES

Cyprus in search of ancient shipwrecks

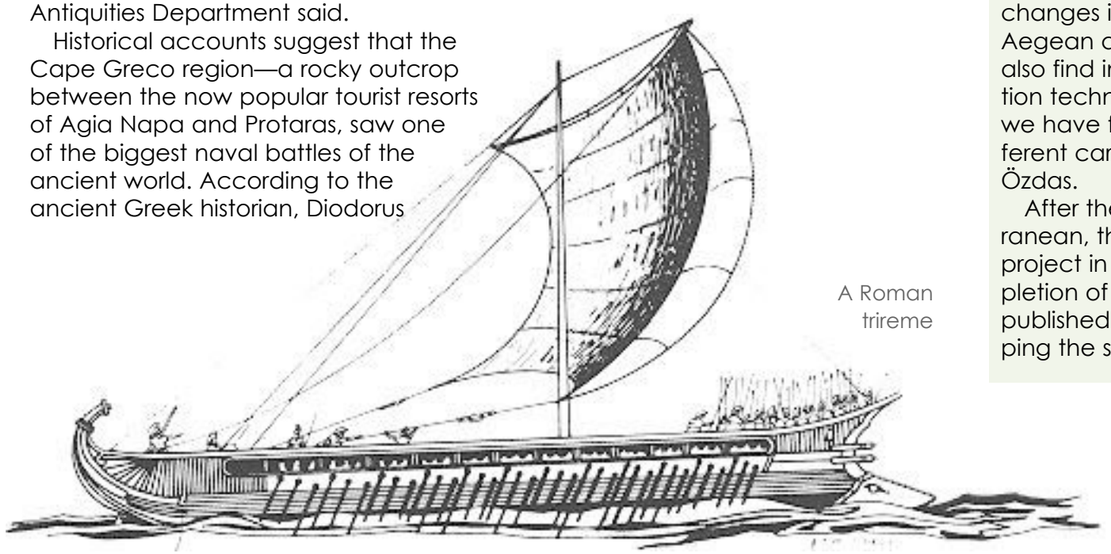
Cyprus is to survey areas where dozens of vessels led by warring successors to Alexander the Great are believed to have sunk in battle for control over the island in 306 BC, Reuters reports

Cypriot archaeologists recently found a Roman wreck dating from the first century A.D. off the south-east tip of the island, known as Cape Greco. The extensive wreck, dating from the early Imperial Roman era, carried a mixed cargo of several amphora, predominantly jars from the southeast Aegean area.

Encouraged by the discovery, a further survey slated for the summer of 2008 will extend into deep waters, the island's Antiquities Department said.

Historical accounts suggest that the Cape Greco region—a rocky outcrop between the now popular tourist resorts of Agia Napa and Protaras, saw one of the biggest naval battles of the ancient world. According to the ancient Greek historian, Diodorus of Sicily, in 306 BC, Demetrios the Poliorketes (Besieger) triumphed over Ptolemy I of Egypt in a naval engagement off Cyprus, with dozens of vessels sunk as the result of combat.

Further mapping of the wreck would take place in 2008. Searches for better preserved shipwrecks would extend to the deeper sandy seabed, which was suited to remote sensing techniques, the antiquities department said. ■



A Roman trireme

Turkish archaeologists map country's sunken heritage

Archaeologists from Dokuz Eylül University (DEU) have set out on a five-year project to map Turkey's underwater history: *The lost underwater history of the Aegean and Mediterranean.* The project, which started in May, is the first of its kind ever to be carried out by a Turkish university, which has 12 scientists assigned to the project including archaeologists, biologists and geophysicists.

The project has already located over 20 shipwrecks, eight underwater ruins and six sunken locations dating back to the Ottoman era.

Harun Özdas, project manager and assistant professor of Underwater Archaeology at DEÜ, told Asian News International, "Our goal is to find the sunken heritage of our country. We focus on the commercial route of old times. So far, we dived to 15 sunken areas between Anamur and Izmir." Findings discovered in Alaçati belonging to 5 BC sites in the Gulf of Gökova have been placed within the Hellenistic and Roman period.

"Underwater remains provide important information about the life in the past, as well as about geological changes. The remains reveal the changes in the water level of the Aegean and Mediterranean. We can also find information about construction technologies employed. So far, we have found plates, tiles and different cargo ships," said Professor Özdas.

After the Aegean and Mediterranean, there are plans for a similar project in the Black Sea. Upon completion of the project, the data will be published in geography books mapping the sunken history of Turkey. ■

Travel News

Edited by Scott Bennett

Galapagos Update – September 2007

By Dominick Macan

We owe many of you a large debt of gratitude for taking the time to write letters and sign petitions in support of the campaign to stop shark finning in Ecuador and Galapagos. The first battle was won when on August 27, diving permits were restored to many boats to dive Darwin & Wolf, that had been prevented from doing so in a Presidential ruling of July 10. These permits only apply until December 31, 2007, after which all vessels will need a special permit to dive this area. Although we don't yet have all the details, it appears more than likely that it will mean fewer dive boats will be offering charters to Darwin & Wolf in 2008, and while vessels such as the *Aggressors* and *Sky Dancer* already have full dive permits, other dive yachts such the *Deep Blue, Lammer Law, Galex* and *Reina Silvia*, will have to go though the new permit process to obtain these permits. Whether other boats will do it remains to be seen.

Why the re-instatement of these permits has been so important is that more dive vessels now have access to Darwin & Wolf, which means they exert a controlling influence to stop the fishing boats that are illegally fishing in the National Park.

Although the island of Darwin & Wolf have no ranger station and no navy patrols to stop the fishing, the fishing boats do not want to be seen by diving boats, as they risk being reported to the authorities and serious actions taken against them. ■

Trend: Underwater Hotels

Originally built in the 1970s as a research laboratory *Jules' Undersea Lodge* became the first underwater hotel. Located off the coast of Florida, it caters mostly to scuba drivers and can hold up to six guests. But that is just the beginning.

Hydropolis, near Dubai in the United Arab Emirates (UAE), is under construction at a cost of US$500 million. The hotel sits 60 feet below the surface and has 220 rooms, a shopping mall and three bars.

Poseidon Undersea Resort is a competitor in development off the coast of Fiji. Situated about 40 feet below the water's surface, according to Poseidon's website, it is much smaller than Hydropolis but boasts a view of some of the world's grandest coral reefs. ■

Poseidon Undersea Resort. Promotional image from press kit

Gökova Gulf

Turkey: Gökova's Underwater Caves to Be Explored

The underwater caves of the Gulf of Gökova, one of Muğla's most spectacular coastal towns, will be discovered and utilized for tourism thanks to a project by a group of underwater researchers.

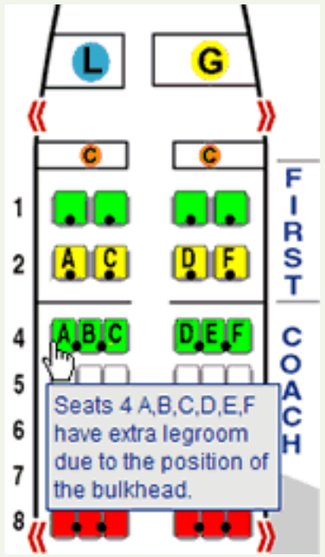
The project is a joint initiative to be carried out by the Cave Diving and Research Group (MAGAD) and ODTÜ Underwater Research Society on August 12-30 along the Gökova coast. The project anticipates the ecological, geological, archaeological and anthropological examination of over 40 underwater caves in the Gökova Gulf. ■

SOURCE: TURKISH DAILY NEWS

Insights - Travelling Tips

Which airline seats to book?

Don't you just hate being seated beside the lavatories, in a seat that can't recline or have some hardware stowed in your overhead compartment?



What If you could check in advance? In October 2001, frequent flyer Matthew Daimler launched SeatGuru.com with a single color-coded interactive airplane seating chart.

Having realized the vast differences between airline seats, he was determined to build a repository of this useful information and share it with other travelers.

Easy colour coding and explanations show you which seats are the best available and which ones to avoid.

Over ten million visitors later, SeatGuru has enjoyed incredible success and has expanded to over 275 airplane seatmaps from over 40 different airlines.

www.seatguru.com ■

Underwater Adventures for Gap Year Students

SportSkool, the creator of SnowSkool and PoloSkool, is offering an exciting new experience this summer with the launch of ScubaSkool.

Students travel to the tropical island of Utila and go from beginner to dive-master in just seven weeks. Students are encouraged to stay on and participate in the four week conservation project. With modules in whale shark and dolphin research as well as coral reef protection, the course provides a valuable learning opportunity and an experience students will never forget.

The base price for the seven-week programme for 2007 is £3250. ■

New York State establishes diving trails for scuba enthusiasts

"Dive the Seaway Trail!
...and you'll enjoy some of the Northeast's finest freshwater diving sites, with a full complement of wreck, shoal, drift, deep and historical diving. For over three centuries, Great Lakes Erie and Ontario and the Niagara and St. Lawrence Rivers have been major shipping thoroughfares. Today, the waters along the Seaway Trail are the final resting place of hundreds of ships, dating back to the late 1700's."

Typically regarded as a paradise for hikers, climbers and campers, upstate New York also offers some of the finest freshwater scuba diving in the United States—a cloistered natural attribute state officials and scuba enthusiasts are trying to promote through the creation of two "diving trails."

Dive the Seaway Trail offers exploration of five diving sites along the 730-kilometre Seaway Trail Scenic Byway, which runs along the St. Lawrence River, Lake Ontario, Niagara River and Lake Erie waterways filled with shipwrecks, rock formations and aquatic life.

The other trail is the Underwater Blueway Trail, a project in its pilot year in six communities. It is designed to provide diving access to shipwrecks and supply maritime heritage information to divers and non-divers.

While a handful of states have created underwater parks for diving, they are located on ocean water, said Doug McNeese, president of Scuba Schools International, one of the country's leading diving certification organizations. New York is the first state to link a series of freshwater sites into a 'trail,' and could become a model for other states. ■

BOSINTANG

Where Niagara River meets Lake Ontario

Dive Site marker bouy

Alexandria's lighthouse was one of the Seven Wonders of the world. The remains were rediscovered on the seafloor in Alexandria's habour in the 1990's

Lighthouse and Cleopatra's Sunken Palace Set Lure More Tourists to Egypt

After 15 years of hauling priceless relics from in and around its harbor, Alexandria municipal officials and Egyptian antiquity authorities are trying to figure out how to make thousands of artifacts still at the bottom accessible for viewing by the public.

Municipal officials want to create an underwater archaeological park. Proposals under consideration include construction of an underwater bubble auditorium, conversion of the harbor into a giant pool with filters to remove silt and pollution and a submarine on rails to ferry visitors around.

Last year, Alexandria's underwater glories burst into international view with a touring exhibition called "Egypt's Sunken Treasures", which opened in Berlin, showed in Paris and is currently on display at Bonn's Kunst und Ausstellungshalle der Bundesrepublik Deutschland museum. In 2008, it goes to Madrid. ■

Australian spotted jellyfish, *Phyllorhiza punctata*

Australian Jellyfish Invade U.S. Waters

Swarms of invasive Australian jellyfish have been reported from east Texas to Florida in the Gulf of Mexico and along the Atlantic coastlines of Florida and South Carolina.

The jellyfish are only mildly venomous and do not pose a threat to humans who may come in contact with them, experts say.

But some commercial fishers and shrimp trawlers in the Gulf are finding their nets fouled with the gelatinous blobs, which may weigh up to 11 kilograms.

Interference with fishing operations can result in a reduced catch. But an even greater concern for biologists and fisheries managers is that the invaders may harm native fish and other marine species. ■

SOURCE: NATIONAL GEOGRAPHIC

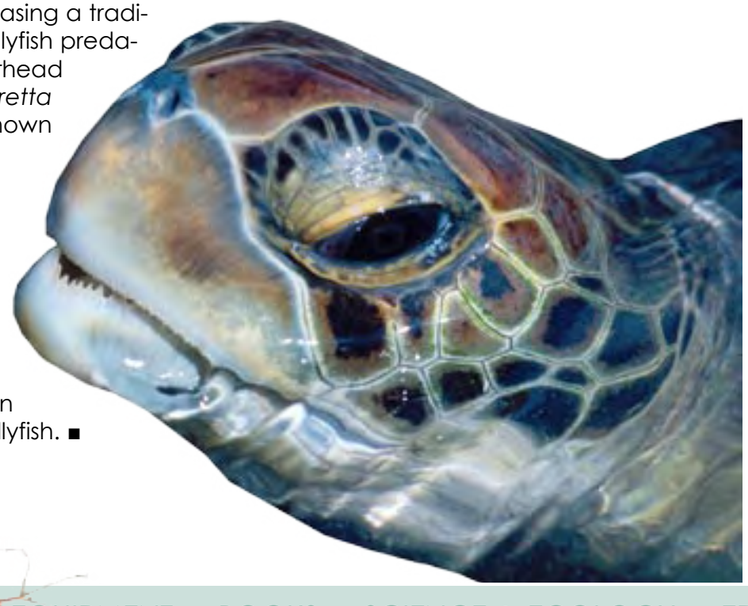
Spaniards deploy turtles to combat jellyfish invasion off Granada

In Spain, turtles are being bred and released in an effort to control jellyfish numbers, which are expected to be high this year.

In the past few summers. thousands of holidaymakers in the Mediterranean have been stung by jellyfish as huge swarms of the gooey creatures invaded coastal waters and fouled beaches and fishing gear in the area. The jellyfish populations exploded because of overfishing,and higher temperatures and higher salinity near the coast.

The invasion closed some Spanish beaches with beaches in Sicily and North Africa also reported to be badly affected. But now the Spaniards have had it. While the central government in Spain has warned that it cannot stop the arrival of jellyfish on beaches, in Málaga, the local government is attempting to fight fire with fire by releasing a traditional jellyfish predator—loggerhead turtles (*Carretta Caretta*), known locally as the Tortuga Boba.

Armed with a budget of €400,000, a plan to breed the turtles in captivity has been started, and a search is underway for sites where they can breed naturally. Also, a network of volunteer boats has been set up to warn bathers of the presence of jellyfish. ■



What's this?

Nudi Pixel is an online resource for nudibranch and sea slug identification that uses photographs. This is a useful resource for all nudibranch enthusiasts like scuba divers, snorkelers, underwater photographers, naturalists, dive guides and educational institutions. It is basically a repository of nudibranch photographs from all over the world. Nudi Pixel processes the data further to make it suitable for species identification. Read suggestions on how to use this web site for nudibranch and sea slug identification.

You are invited to submit nudibranch or sea slug photos (of course, you must be the photographer and the photos are taken in nature, not in captivity). Another way to contribute is simply helping Nudi Pixel by identifying some unidentified nudibranch species or correcting misidentified species.

In its early age, Nudi Pixel has become one of the resources for many nudibranch experts like Dave Behrens, Neville Coleman, Helmut Debelius and Rudie H. Kuiter to collect nudibranch photographs for their soon to be released books. ■

SEACAM

silver

www.seacam.com

Fabulous Fiji

Shark diving & vibrant reefs in Beqa Lagoon

Text and photographs by Scott Bennett

Fiji

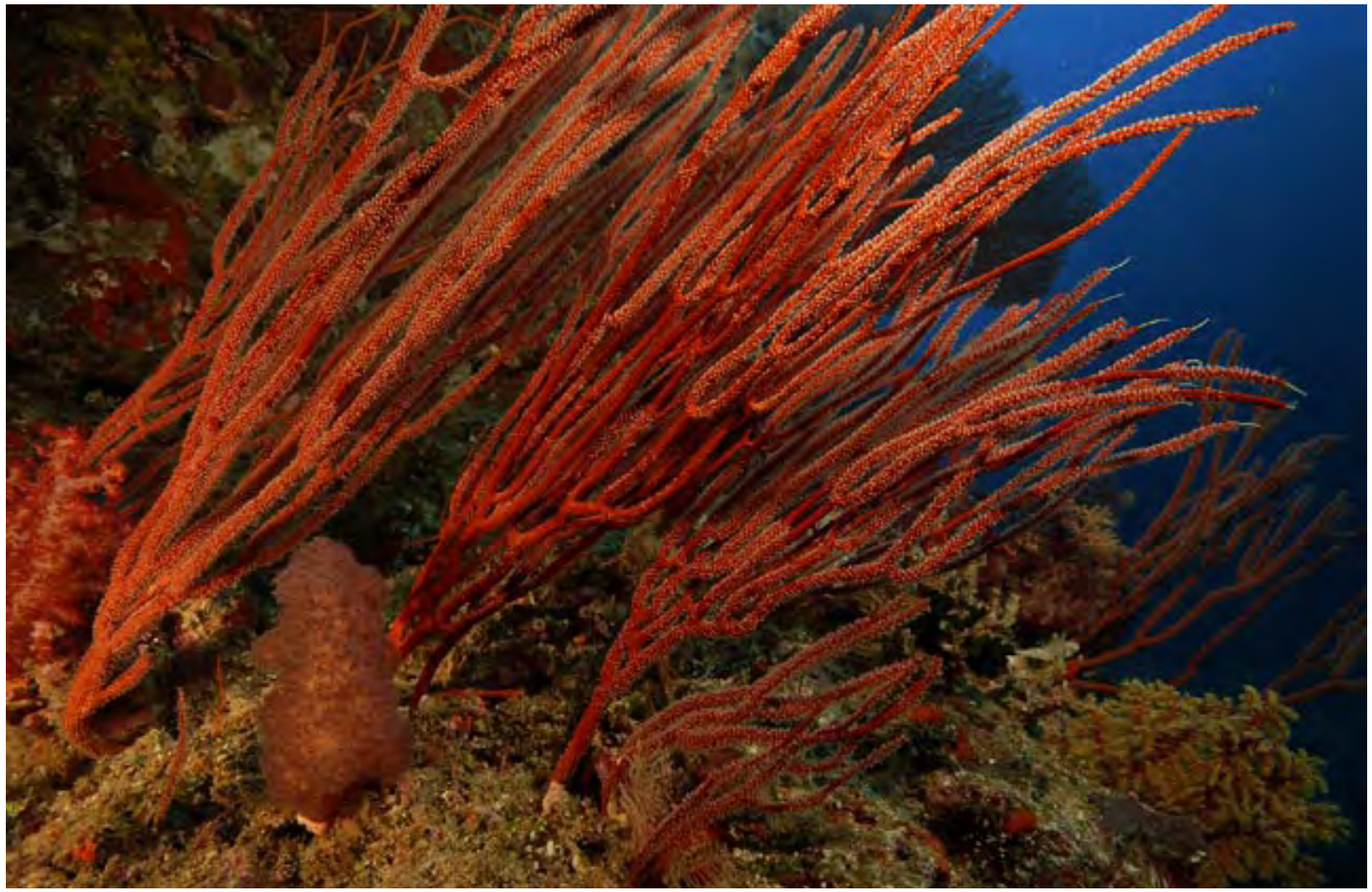
"I'd like to introduce you to some of our friends " enthused our guide Manasa, AKA *Papa*, as he held aloft a well-worn loose-leaf binder. The photographs within produced nervous laughter and a couple of anxious glances amongst a few of the divers. Then again, with names like Scarface, Hook and Big Mama, these were no ordinary friends. They were sharks, and we would soon be making their acquaintance.

Lying at the crossroads of the South Pacific, the Fiji Islands have long been famous as an idyllic tropical paradise. While famous for its vibrant coral reefs, Fiji's Beqa Lagoon (pronounced *Benga*) on the main island of Viti Levu is rapidly gaining fame as a world-class shark diving destination.

Two flights and 15 hours after leaving my home in Toronto, I arrived at Nadi's international airport on the island of Vitu Levu. Stumbling bleary-eyed into the arrival hall, I was greeted by an energetic group of local musicians performing traditional Fijian music. Their level of enthusiasm at 5:15AM was nothing short of astonishing! It was infectious too, and soon, everyone standing in the customs queue forgot his or her fatigue. Feeling somewhat energized, I collected my gear and stepped out into the cool morning air.

Waiting outside was my driver and after loading up the van, we set out for the journey to Pacific Harbour. Soon afterwards, the first rays of dawn bathed the landscape with golden light, revealing immense fields of sugar cane spreading to the horizon. For many years, sugar cane was the mainstay of the Fijian economy, although nowadays tourism has replaced it as the primary source of income. Sadly, that industry is now hurting, as the December 2006 coup dealt tourism a severe blow. As usual, the media exaggerated everything well out of proportion. In actuality, the entire incident was pretty low-key,

Bull shark at "The Den"; One of Shark reef's friendly Java morays



without a trace of violence. Outside of Suva, you wouldn't have known anything had happened at all. Life carried on as usual with one notable exception; nervous tourists cancelled trips. Not THIS tourist, as it takes more than a coup to keep me away from a good diving destination!

Along the way, we passed Hindu temples and mosques, a testament to the country's large Indian population. Descendents of workers that were brought over by the British in the 19th century to work the cane fields, they now comprise a large percentage of the country's population. After an hour of driving, the never-ending fields of sugar cane were replaced with rolling hills cloaked in lush vegetation. The southern coast of Viti Levu receives abundant rainfall, resulting in a landscape so green it would make Ireland envious. Two hours after departing the airport, we arrived in Pacific Harbour and headed straight for Beqa Adventure Divers, situated on the grounds of the Lagoon Resort aside the Qara-ni-Qio River that empties into Beqa Lagoon.

The Eagle has landed

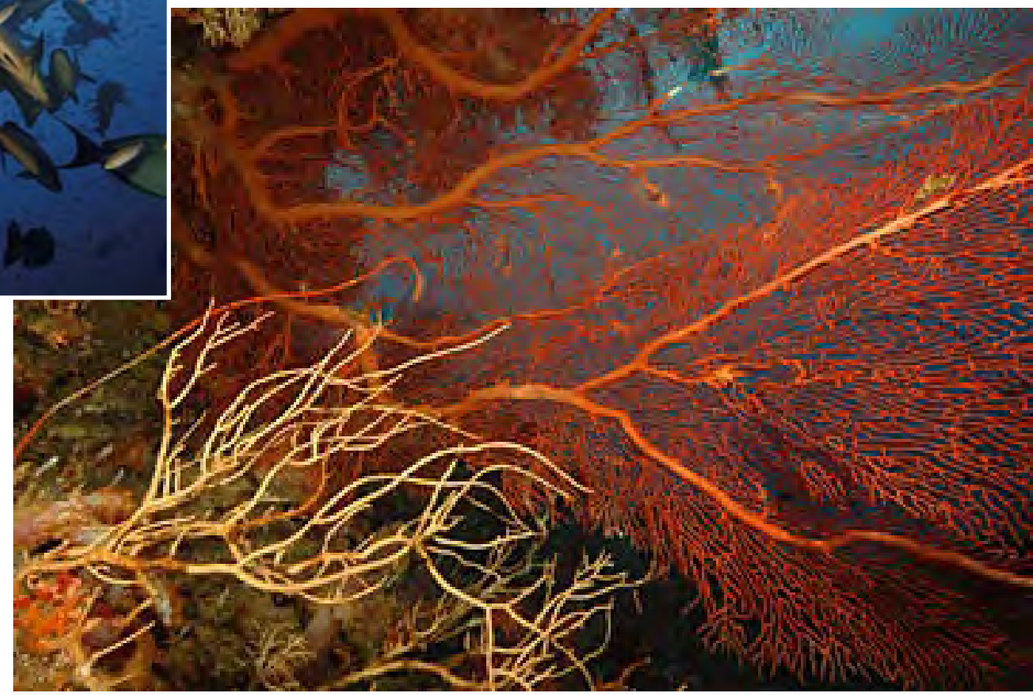
On hand to greet me was Andrew Cumming, the shop's easy-going manager. No stranger to sharks, Andrew arrived in Fiji by way of the Bahamas, where he worked in Walkers Cay for shark conservationists Gary and Brenda Adkison. Unfortunately, I'd arrived a tad late to partake in the day's shark dives, so the day was spent recuperating and getting my camera gear ready.

Early the next morning, I was picked up for my first dive via the shop's courtesy shuttle. As the shark dives are held four days a week on Mondays, Wednesdays, Fridays and Saturdays, our destination was Carpet Cove, situated close to Beqa Island. To get there, we boarded the *MV Predator*, the shop's sleek and spacious hydrofoil catamaran. Along with our guide Eliki, there were only two other divers on board. Most people come to Beqa just for the shark dives, but the lagoon's broad expanse boasts more than 20 dives sites.

After departing the jetty, the boat headed downriver for the lagoon. The lush tropical vegetation fringing the river soon gave way to extensive stands of mangroves. Coupled with the forest-clad hills on the horizon, the entire scene resembled the location of a jungle movie, which, I found out later, it actually was. A few years

LEFT: The lush countryside is dotted with clearings planted with cassava; ABOVE: Whip corals adorn the walls at ET

LEFT TO RIGHT: Some of the dazzling soft corals to be found at Carpet Cove; Hungry diners greet the dive guides are Shark reef ; Fan corals line the entrance to ET's subterranean passage



previously, "Anacondas: Hunt for the Blood Orchid" was filmed here, where Fiji stood in for Borneo. (Anacondas in Borneo??? Don't ask.) The dilapidated ship constructed for the film, "The Bloody Mary" now graces the grounds of the resort near the dive shop. With nary an anaconda in sight, we safely negotiated the river and reached Beqa Lagoon after a pleasant ten-minute trip. After another 15 minutes, we arrived at our destination.

Surprise

The beginning of the dive featured a somewhat unexpected surprise. Resting on the bottom at a depth of 30m was a large wreck, a Chinese trawler measuring 25m in length. Sunk in 1996 to create an artificial reef, she rests upright at depth of 30m in the middle of a large sandy area populated by legions of undulating garden eels. While the sides of the vessel were fairly devoid of growth, ascending to the upper deck revealed a myriad of coral growth. Schools of fish darted about while feather stars decorated railings like undersea floral arrangements. After a bit more exploration, we headed for shallower water. Beqa Lagoon is often dubbed "The soft coral capitol of the world", and Carpet Cove more than lives up to its name. Rising to within eight metres of the surface, a series of pinnacles were shrouded with coral growth of unparalleled luxuriance. Innumerable basslets and coral trout swarmed amongst soft corals garbed in vivid colours of red, orange and purple so vivid it almost hurt the eyes! I was so engrossed photographing the corals, I nearly missed a trio of great barracuda swimming past. On the bottom, abundant ribbon eels twitched spasmodically in the gentle current.

"Follow me"

The second dive was also made at Carpet Cove but at a different set of pinnacles. If anything, it was even more spectacular than the first, with more corals and even more basslets. At one point, a friendly batfish approached. Then, as if saying, "Follow me", he led me over to a rocky overhang where an obliging cleaner wrasse performed a full tune-up.

My home for the week was the newly opened Uprising Beach Resort. Set back from a palm-fringed beach offering expansive views of Beqa Lagoon, twelve bures surrounded by lush tropical gardens provide an elegant blend of traditional Fijian architecture and modern sophistication. Each comes with a balcony and ocean views as well as an outdoor shower.

A newly constructed dorm at the rear of the property caters to those on a budget. Owner Rene Munch, resort manager Alfie Christoffersen and the enthusiastic staff ensure the atmosphere has the relaxed feel of a small family run resort offering a taste of real Fijian ambience. A wide selection of activities is available, from water-skiing, kayaking and snorkelling to white-water rafting, horseback riding and cultural shows at the nearby Arts Village Pacific Harbour.

Despite the empty food containers, the ever- hungry fish still hope for one last-minute tid-bit ; Trevalley feeding frenzy, Shark Reef; A short distance inland is the lush vegetation of the Serua mountains

Sitting by the pool with a cold drink was enough to inspire terminal laziness! However, there was diving to be done!

In marked contrast to my first day of diving, the Shark Dive trip was jam-packed! Something was fishy too. Literally. The three large wheeled garbage bins conspicuously parked at the stern were brimming with 600kg of fish parts, courtesy of a fish processing plant in Suva. The wafting aroma from the containers provided an appropriate backdrop for our dive briefing. On board was a crew of eight including the two senior shark feeders, Manasa and Rusi. Prior to the advent of Christianity, the residents of Beqa Island worshipped sharks and made a covenant with the Shark God. In return, they were promised that sharks would never harm them, and they could forever swim without concern. As both Rusi and Manasa hail from Beqa Island, this was a good omen indeed!

Marine Sancturary

Established in April 2004, the Shark Reef Marine Sanctuary is the first of its kind in Fiji. Working closely with the Fiji government and the reef's traditional owners, Beqa Adventure Divers has designated the waters of Shark Reef as a protected marine reserve. The reserve wouldn't be possible without the co-operation of the villages of Wainiyabia and Galoa, which are Shark Reef's traditional owners. Both have relinquished fishing rights in the reserve. In return, a fee of FJ$20 is collected from each diver who participates on the Shark Dive. Each month, the money is deposited into each village's community bank account. Conservation won't work without the direct involvement of the local people, who have to see the benefits from protecting the reef as opposed to fishing. Depending on the season, up to eight shark species can be seen here, including grey reef, blacktip, whitetip, lemon, sicklefin lemon, silvertip, bull and tiger sharks.

One of the greatest challenges facing the reserve is the prevention of illegal fishing. Reef wardens trained and recruited from the local community vigilantly patrol the area on a boat provided by the Shark Foundation in Switzerland. The crew is on call 24 hours a day to perform random checks to ensure illegal fishing doesn't occur. In addition, ongoing research studies are carried out to learn more about these majestic yet misunderstood creatures.

Diving with the sharks

After descending to 30 metres, the divers assemble behind a wall constructed of rock. Situated on a ledge next to the drop off plunging into the depths of Beqa Passage, this is The Arena, the first of three feeding sites visited during the first dive. The large wheeled garbage containers had already been sent down and placed in position and the first of the day's customers had already showed up.

Giant trevallies, some a metre in length, swirled about, eagerly joined by a multitude of fish including red bass, rainbow runners, Napolean wrasse, spotted eagle rays and a myriad of reef fish. At last count, over 267 species have been seen observed here.

Reef scene, Carpet Cove. NEXT PAGE: Lavish coral growth earns Beqa Lagoon "The soft coral capitol of the world"

Elsewhere, trevallies are usually found in pairs or small schools, but more than a hundred can be found at Shark Reef. The sound of the boat engine brings them out en masse, excitedly encircling the shark feeders like an underwater tornado. Anywhere else, they would be an attraction on their own, but here, are but a prelude to the main event.

"...the first dim silhouettes patrolled past, coming closer with each pass. The sharks had arrived!"

While Manasa or Rusi have never been bitten by the sharks, both men bear an assortment of scars from the unrelenting trevallies. Divers are instructed to keep their hands at their sides, lest one of the over-eager trevallies mistake an errant finger as a fishy morsel!

With unbridled anticipation, everyone waited for the star attractions. We didn't have to wait for long; out in the blue, the first dim silhouettes patrolled past, coming closer with each pass. The sharks had arrived!

After a few minutes, Manasa motioned for everyone to join him down in the arena. The Shark Dive must rank as one of the easiest dives of all time; just take a seat and watch the show!

First to arrive were a few bull sharks including one massive specimen that turned out to be "Big Mama." They were soon joined by a trio of tawny nurse sharks, with one specimen easily four metres long. They all knew the drill and were soon over to investigate the containers. Within moments, their heads were right inside, greedily gobbling the contents like big grey vacuum cleaners. The number of fish was simply overwhelming; you almost didn't know where to look!

After 17 minutes at The Arena, it was time to head to shallower water and the second feeding station called The Den. Here, the feeders were engulfed by the smaller shark species. Whitetip and blacktip reef sharks, along with the occasional grey reef, approached for a handout, completely oblivious to the divers. After approximately ten minutes, everyone ascended to the reef top and the final feeding station. Yet more—in a seemingly limitless supply of sharks—appeared, along with hordes of rainbow runners, yellowback fusiliers and sergeant majors.

Camera batteries exhausted, I reluctantly surfaced after 50 enthralling minutes. And this was just the first dive!

During the surface interval, the initial unease of some divers had all but evaporated and everyone couldn't wait to get back in the water. By the time the hour was up, everyone was suited up and eager to go.

The second dive is called The Take Out. Situated at a depth of 16m, this is where the big fish action is! Bull sharks, unmistakable with their blunt heads and stocky builds, were already circling in the blue as everyone took their positions. Photographers get a prime position at the end of the wall near the feeders.

In order to get fed, the sharks must follow a very specific procedure, approaching the feed-

ers from left to right. Failure to do so means missing out! Even the new arrivals learn the drill very quickly and the entire operation runs like a well-oiled machine. Dive guides armed with pokers take position behind the guests, lest any of the sharks get too close.

The next 35 minutes were spellbinding, as an endless procession of bull sharks swooped by only metres from my camera. I watched in awe as the massive jaws opened to take the bait, often swallowing it one bite! Unfortunately, I missed out on the tiger shark. He was around though, having made an appearance a few days before my arrival. Still, with more than 20 bull sharks on one dive, I'm not complaining!

CLOCKWISE FROM TOP LEFT:
A myriad of fish swarm amongst the soft corals at Carpet Cove; Uprising Beach Resort's expansive pool ; It's easy to overlook Beqa Lagoon's abundant macro subjects such as this colourful flatworm; Uprising Beach Resort's palm-fringed shoreline overlooks the lagoon and distant Beqa Island

Giant groupers

Subsequent dives at Shark Reef were nothing short of exhilarating, with each dive providing a totally different experience. On the second day, we were treated to an additional visitor. Swimming amongst the seemingly endless hordes of trevally was one of the resident giant groupers, complete with a little entourage of juvenile golden trevallies. It was only when a nurse shark swam by that the scale become apparent. This was one seriously big fish!

I found out later from Manasa that this individual hadn't been seen for some time and weighed in excess of 200 kilos. Apparently, this wasn't even the big one! That honour belongs to the aptly named "Ratu Rua". Translated as "Big Chief" in Fijian, this behemoth tips the scales at an astonishing 600kg! Despite having a mouth big enough to swallow your head, he's fortunately benign. Still, he's the chief around these parts, and the sharks will give him a wide berth.

Macrofest

After several days of shooting wide-angle shooting, I was eager to indulge in some macro photography. Unfortunately, the ripping current in the lagoon prevented us from visiting the sites Manasa had in mind, so we headed for the protected waters of Shark Reef. As this was a non-feeding day,

I'm sure the sharks, trevallies and red bass were somewhat baffled by our presence. I could imagine them asking, "What are you doing here, it's only Thursday!" After a quick inspection, they soon realized there would be no handouts and we were left in peace.

With all of the big fish swimming around, it's very easy to overlook the little things. It was almost comical searching for nudibranchs when bull sharks could be seen patrolling the waters just off the wall!

Wealth of critters

Close scrutiny of the wall revealed a wealth of critters, as a plethora of nudibranchs and

CLOCKWISE FROM TOP LEFT: A hungry whitetip looks for a handout, Shark Reef; Fan coral at ET; A pair of whitetips resting in the shallows at Shark Reef; A friendly tawny nurse shark with it's entourage

Pinnacle ET

In marked contrast to the full boat on the previous day's shark dive, the boat was remarkably empty for the next day's diving. With Manasa as our guide, today's dive consisted of a grand total of two: Michael, a photographer from Australia and myself. After checking our gear, we headed out under somewhat foreboding skies for the morning's first dive site. Once in the lagoon, the water got progressively rougher during the 40-minute trip. Our destination was ET, a lone pinnacle thrusting upward 25m from the seabed and bisected by a 10m long passage.

As we were gearing up, Manasa came to the unfortunate realization that his mask had been left behind. Without a spare on the boat, I thought our dive was going to be over before it had begun! He quickly assured us that the dive was very straightforward and we could easily do it on our own.

Descending from the choppy surface, the pinnacle's huge silhouette quickly came into view. We promptly discovered the passage and decided to check it out. It is actually quite wide and will comfortably accommodate several divers at once. In the centre, a chimney ascends towards the surface, illuminating the passage with dancing beams of light. The rocky interior is home to a variety of shrimps, crabs and nudibranchs.

Exiting the opposite side, I surprised a small whitetip who made a hasty retreat before I could snap a photo. Every square metre was cloaked with exuberant coral growth. Lacy veils of cascading fan corals competed with vivid red and yellow whip corals. Large fans sprouted from the rocky walls, while copious overhangs provided shelter for abundant soldierfish, squirrelfish and a host of well-camouflaged scorpionfish. The ensuing hour flew by at a rapid clip and my

flatworms crawled amongst the rocky overhangs. One of the more curious subjects was an incredibly lop-sided starfish. One disproportionately large arm was surrounded by a quartet of much smaller ones. Manasa told me later the big arm was probably the original and the others had re-grown from it.

Shortly afterwards, he motioned me over to a crevice under a large rock. Hiding underneath was one of Shark Reef's resident Java morays. It was a big one too! For the next ten minutes, he played a game of hide and seek with my camera. Moments after retreating into a crevice, curiosity would get the better of him and would cautiously peer out to check on my whereabouts.

Lovo?

Later in the day, I had a drink with Courtney, the resort's affable food and beverage manager. While perusing the dinner menu, I was intrigued by the heading *Lovo* that was accompanied by an enticing list of dishes. She went on to explain that a Lovo was a traditional Fijian feast. A variety of dishes are cooked over hot stones in a makeshift underground oven. "We can put one on this week if you'd like" she offered. As a diehard foodie, my arm didn't have to be twisted!

The rocky interior is home to a variety of shrimps, crabs and nudibranchs.

TOP LEFT TO RIGHT: Feather star and coral, ET ; Dining area, Uprising Beach Resort. BOTTOM : A friendly farmer offers up some fresh-sliced watermelon

camera was exhausted by the endless photo ops. Unfortunately, the weather had worsened by the time we finished the dive, so we had to make our final dive of the morning at Shark Reef. It's a rough life diving in Fiji!

Lovo day

Back at the resort it was Lovo day. I wandered over after lunch to discover preparations were well underway with the involvement of most of the resort's kitchen staff. The light drizzle that started falling did nothing to dampen everyone's enthusiasm. "Just how many people were you expecting?" I enquired, gazing at the mountain of food that was laid out by the already blazing fire. Above it, heaped on a platform of wooden planks, was a mound of hot stones, superheated by the intense flames.

First up, an enormous *walu* (also know as *wahoo*) had to be cleaned and prepared for cooking. Another lady was busy at work making the fresh coconut milk, squeezing and straining clumps of the grated coconut flesh from a massive bowl. Taro leaves were stuffed with the coconut milk, onion and corned beef before being folded into neat parcels. Whole chickens were marinated in garlic, ginger and soy sauce before being meticulously wrapped in palm leaves. If that wasn't enough, a couple of lobsters were added along with unlimited numbers of taro roots.

When everything was ready, a bed of shredded cassava long sticks was laid out above the hot stones and the various items added in layers. Everything was enclosed under a layer enormous taro leaves before being covered with a heavy tarpaulin and partially buried under a layer of earth. Incredibly, everything was ready a mere 90 minutes later. By this time, the drizzle had turned to a downpour. Removing the tarpaulin, thick clouds of smoke laden with enticing aromas wafted into the rainy night, revealing tantalising glimpses of the feast.

Finally it was time to eat. As it turned out, a sizable number of people had arrived from around the area. Word had been sent out via the "Coconut Wire" (word of mouth) and by notices put up in the shopping centre in nearby Pacific Harbour.

There were enough meat dishes on the table to make any die-hard vegetarian run for the door screaming. The centrepiece of the meal was the walu, still wrapped in the palm leaf and served with *miti* (onion with coconut milk) In addition, plates were piled high with chicken, lamb shoulder and lamb neck and raw fish in coconut milk "cooked" with limejuice. Vegetable dishes included cassava, taro and *palusami* (taro leaf with corned beef.) The meal was incredible; by the end, I was so full I almost had to punch a new hole in my belt!

Country excursion

On my final day, I wanted to see some of the surrounding countryside. Joji, one of the barmen, agreed to take me out for a spin in the resort four-wheel drive. A torrential downpour started as we headed out early for the morning market in the nearby town of Navua. A wooden structure covered the major portion of the market, but a number of vendors were huddled outside under a canopy of colourful umbrellas.

Everyone was extremely friendly and posed readily for photos. I can imagine what they must have thought of this crazy foreigner taking pictures of them in the rain!

We then ventured indoors and wandered amongst the myriad of stalls.

CLOCKWISE FROM TOP LEFT: The Chinese trawler's colourful propeller; Market vendor, Navua; Red-lined flabellina; Jane, one of Uprising Beach Resort's ever-pleasant staff; Soft coral, Beqa Lagoon

The tables groaned under a bountiful selection of colourful produce, spices and fresh fish. On a series of tables near the back were objects resembling large brown highway pylons constructed out of gnarly roots. Pulverized into powdered form and mixed with water, they make *kava*, Fiji's national beverage. Long playing an integral role in traditional Fijian society, it is consumed in ceremonies as well as a social beverage and a cure-all for various ailments. One of the fellows I'd been diving sampled a glass during a day trip to a local village. He likened it to brown dishwater that makes your lips go numb. One of the vendors asked if I'd like to partake in a glass. The prospect didn't sound particularly appetizing, especially at 7:30 in the morning on an empty stomach, so I politely declined.

The rest of the morning was spent exploring the back roads through the district's verdant-forested hills. Interspersed throughout the greenery were cleared areas sporting patchwork fields of cassava and taro. Stopping by one farm, we were given huge chunks of freshly cut watermelon, the perfect antidote to the humid morning.

Before I knew it, it was time to leave for the airport. I'd come for the sharks but discovered so much more. With its exhilarating blend of sharks, stunning coral reefs and superb macro, Beqa has it all! During my six dives at Shark Reef, I saw more sharks than I've seen during my entire 500+ logged dives!

Shark feeding doesn't come without a degree of controversy. Some argue that feedings promote un-natural behaviour and the sharks become dependent on it. On the other hand, the establishment of the marine reserve not only protects the sharks but the host of other fish found in the area. Sharks are more numerous now than before the reserve was established, and the local villages are earning a good income as a result, so this is clearly a win-win situation.

After all the close proximity to the sharks, what was the worst thing that happened? A spider bite, and that occurred aboard a domestic flight from Vancouver to Toronto on the way home!

Getting there

Fiji's Nadi airport is serviced by more than 85 flights a week, with direct flights from Asia, Australia, New Zealand and Japan and the Pacific. From North America, direct flights are available from Los Angeles. Transfers to Pacific Harbour can be arranged by Beqa Adventure Divers or the Uprising Beach Resort Taxis are also available at the airport, but are more expensive than pre-booked transfers. Visitors from most countries are issued a four-month tourist free of charge visa upon arrival. All visitors must have a return ticket.

When to go

Due to the moderating effects of the surrounding ocean, Fiji enjoys a mild climate for most of the year with temperatures hovering around 25 degrees Celsius. Humidity is generally high. The rainy season extends between November and April. It's wise to book the shark dives well as far in advance as possible. For bull sharks, the largest congregations can be found between January and May. Be sure to book the Shark Dives before leaving home, as they are becoming extremely popular and the trips fill up very quickly. On one day, several people who showed up at the dive shop at the last minute were turned away. ■

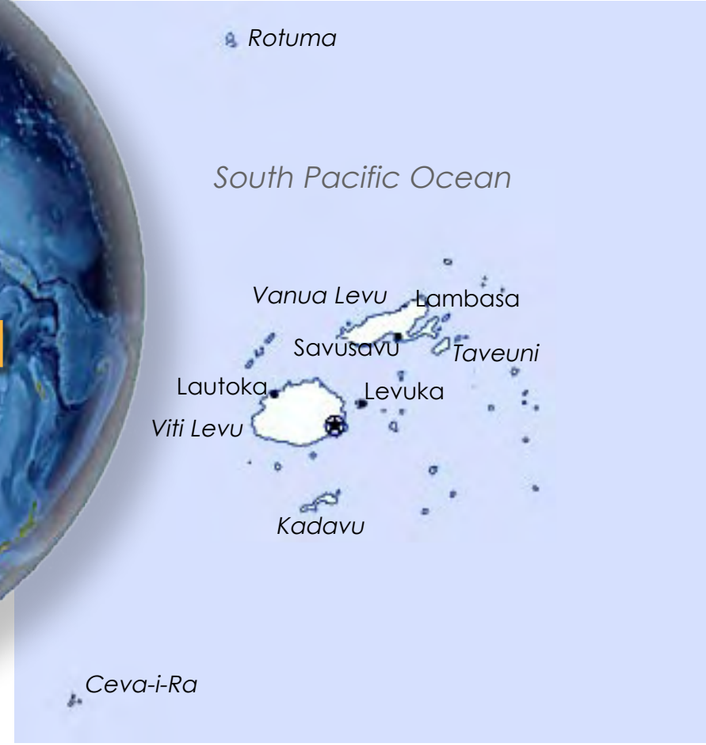
fact file

Fiji

NASA WORLD WIND

RIGHT: Location of Fiji on world map

FAR RIGHT: Map of Fiji and its islands



History In 1970, Fiji became an independent nation, after being a British colony for almost a century. Two military coups in 1987 interupted a Democratic rule. The coups were spurred by concern over a government that was thought to be dominated by the Indian community made up of descendants of contract laborers who were brought to the islands in the 19th century by the British. Heavey Indian emigration followed the coups and a 1990 constitution that cemented native Melanesian control of Fiji. The loss of population caused economic difficulties, while ensuring that Melanesians became the majority. In 1997, a new more equitable constitution was enacted. In 1999, free and peaceful elections resulted in an Indo-Fijian government. However, in May 2000, a civilian-led coup brought with it a long, drawn out period of political turmoil. In 2001, parliamentary elections provided Fiji with a democratically elected government led by Prime Minister Laisenia Qarase who was re-elected in May 2006, only to be ousted in a December 2006 military coup led by Commodore Voreqe Bainimarama, who then appointed himself acting president. Bainimarama was finally appointed interim prime minister in January 2007. Government: republic. Capital: Suva (on Viti Levu)

Siblings hug on the friendly islands of Fiji

Geography Fiji is part of Oceania. It is an island group in the South Pacific Ocean, located two-thirds of the way from Hawaii to New Zealand. Fiji includes 332 islands; about 110 are inhabited. Terrain: mostly mountains developed by volcanic activity. Lowest point: Pacific Ocean 0 m. Highest point: Tomanivi 1,324 m. Coastline: 1,129 km

Climate is tropical marine with only slight seasonal temperature changes. Natural hazards: cyclonic storms may occur between November and January.

Environmental issues deforestation and soil erosion. Fiji is party to several international agreements including Biodiversity, Climate Change, Climate Change-Kyoto Protocol, Desertification, Endangered Species, Law of the Sea, Marine Life Conservation, Ozone Layer Protection, Tropical Timber 83, Tropical Timber 94, Wetlands

Economic Fiji has forest, mineral, and fish resources and is one of the most developed of the Pacific island economies, yet it still has a large subsistence sector. Major sources of foreign exchange include tourism (with 300,000-400,000 tourists annually), sugar exports, and remittances from Fijians working abroad. Fiji sugar enjoys special access to European Union markets, but will suffer from the EU's decision to cut sugar subsidies. One-third of industrial activity in Fiji is sugar processing, but it is not efficient. The 2006 coup damaged Fiji's tourism industry. The length of the industry's recovery time is uncertain. Long-term problems range from low investment and uncertain land ownership rights to the government's difficulties in managing its budget. However, increases in overseas remittances from Fijians working in Kuwait and Iraq are significantly. Natural resources: timber, fish, gold, copper, offshore oil potential, hydropower. Agriculture: sugarcane, coconuts, cassava (tapioca), rice, sweet potatoes, bananas; cattle, pigs, horses, goats; fish. Industries: tourism, sugar, clothing, copra, gold, silver, lumber, small cottage industries

Currency Fijian dollar (FJD)
Exchange rates: 1EUR = 2.75FJD, 1USD = 1.63FJD, 1GBP = 3.30FJD, 1AUD = 1.35FJD, 1SGD = 1.07FJD SOURCE: XE.COM

Population 918,675 (July 2007 est.) Ethinic groups: Fijian 54.8% (predominantly Melanesian with a Polynesian admixture), Indian 37.4%, other groups 7.9% (European, other Pacific Islanders, Chinese) (2005 estimate). Religions: Christian 53% (Methodist 34.5%, Roman Catholic 7.2%, Assembly of God 3.8%, Seventh Day Adventist 2.6%, other 4.9%), Hindu 34% (Sanatan 25%, Arya Samaj 1.2%, other 7.8%), Muslim 7% (Sunni 4.2%. other 2.8%), other or unspecified religions 5.6%, none 0.3% (1996 census). Internet users: 80,000 (2006)

Languages English (official), Fijian (official), Hindustani

Deco Chambers

Suva Private Hospital
Emergency numbers:
999 3500 Hyperbaric Doctor:
Dr Ali Husnoor, Lami, Suva
999 3506 National Coordinator:
Curly Carswell, Savusavu
recompression@connect.com.fj

Colonial War Memorial Hospital
Suva, Fiji Islands. Operated by Ministry of Health, contact: Dr. Frances A. Bingwor,
fbingwor@health.gov.fj

SOURCE: SCUBA-DOC.COM

Web sites

Fiji Tourism Board
www.bulafiji.com ■

Macro life abounds.
LEFT: Most of the rockfaces are well covered with a variety of marine life. These soft corals are quite common in nordic waters.

Wet'n wild at the Arctic circle

Saltstraumen

Text by Christian Skauge
Photos by Stein Johnsen
Translated and edited by Arnold Weisz

The current grabs you as soon as you enter the water. Your first thought, this is going to be a wild one! The adrenalin is flowing as fast in your veins as the currents is flowing past kelp covered rocks. Diving the strongest malstroem on the planet is not for the faint-hearted. It is extremely fun though!

The excitement is felt already one the plane as we fly north an hour and half from Oslo, the capital of Norway. Passing over our final destination on-route, clear blue skyes gives us the first glimpses of our divesites in the days to come. We can see the white waters rushing through narrow sounds as the tide drags the ocean into the deep fjords. A few minutes later we are landing in Bodø, the regional capital in northern Norway, just north of the Arctic circle. Our accomondation and the divesites are about a 30-minute drive from the airport. The scenery on our drive to Saltstraumen, which basically is a bridge and a few houses, is nothing but spectacular with snow-covered mountains raising out of the fjord.

Tidal current

The difference between high tide and low tide in the area around Saltstraumen can be as much as three metres. The currents force about 400 cubicmetres of water through a sound, which is barely 150 metres wide and three kilometres long. The force of gravity creates enormous forces, which the water transforms into one of nature's many wonders—the malstroem, or whirlpools. The current sweeping through the sound creates the malstroem, which makes the water boil. They appear as sudden as they vanish—huge sucking whirlpools, with a diameter of up to 10-12 metres, sucking in water just like a black hole sucks in surrounding stars.

A lot of stories circulate about boats that have vanished in Saltstraumen. And when you person-

There are numerous divesites in the Saltstraumen area, most reachable only by boat, but there are also some shoredives

Saltstraumen Dive Center conveniently situated just a few minutes boat ride from most dive sites

ally encounter the raw forces of this mighty natural phenomenon, it is not hard to understand and respect the awe and fascination it inspires in any person. Although flying many hundreds of metres above sea level, we could clearly observe the awesome forces in play. My dive buddy and I gave each other an awe-filled glance. This is where we were going to be diving over the next few days.

The drive east from Bodø took just about half an hour. We hardly had time enough to unpack and put our equipment together before it was announced that the dive boat was ready to depart. As the excitement had already built up a great amount of adrenalin in both of us, we were quick to respond. In no time, we were both suited up in drysuits. The dive boat always leaves on time. Not just because the dive captain is well organized, but also because you have to dive precisely between the low and high tides when there is no current, and it is safe to dive. If you miss the window of opportunity, the currents get way too strong, and you have to wait for the next chance, which will be six hours later.

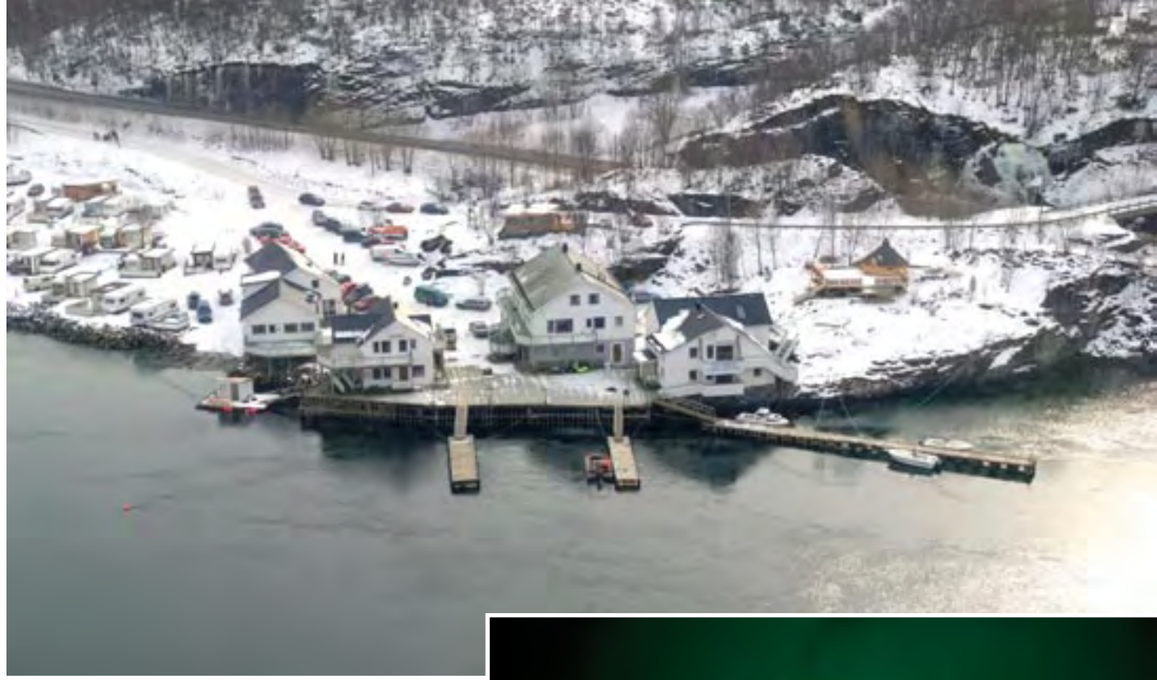
In a squeeze

The boat maneuvered through the current, which was still going strong. Not to worry, as our guides knew exactly where to go. They gave us a thorough briefing about the first dive site—the tunnel! We were told what to expect from the current, what we could expect to see and also where to shelter from the current to get good photo-ops. The casual conversation slowly died down, and we waited for the signal to role into the water. As we quickly descended to a depth of 20 metres, the visibility got better the deeper we got.

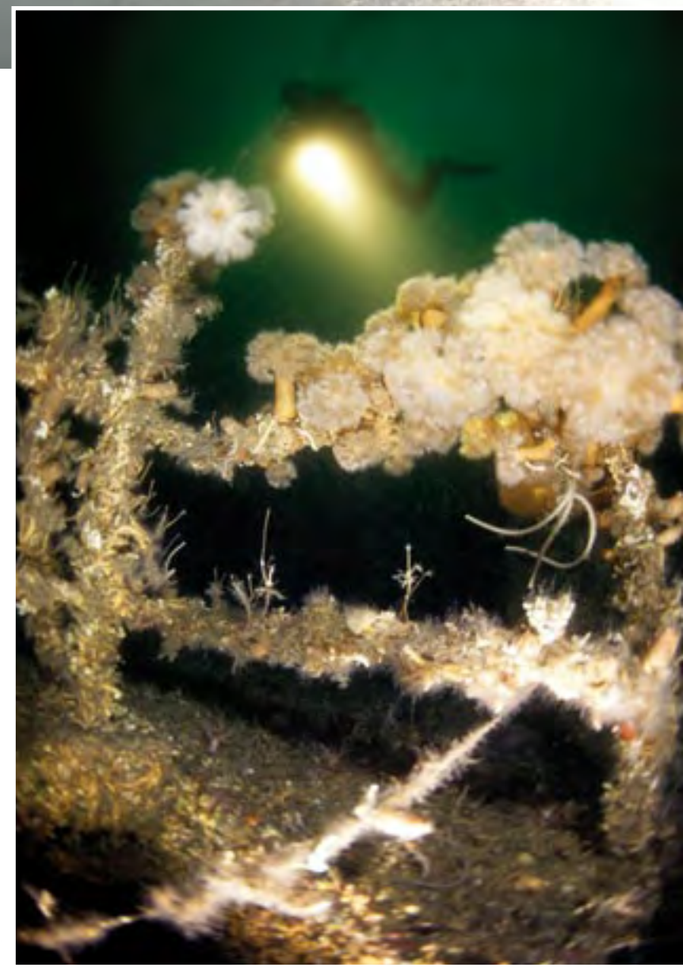
When we approached the bottom, it became very clear which direction we had to swim: *with* the current. The other direction was simply not an option. We adjusted our positions and floated along with the current and concentrated on avoiding crashing into rocks or other divers.

The marine life was incredible. We observed wolffish resting on the stony seafloor and long leaves of kelp waiving in the current. Turning our eyes to the blue water, we could see schools of coalfish turned against the current and standing so tightly together that the mass of fish looked like a massive steel object.

Sometimes, we found calm waters behind some rock formations, which ena-



ABOVE: Seen clearly from a helicopter, the current rips past the small island in the middle of Saltstraumen creating whirlpools dangerous for even ship traffic



Saltstraumen

bled us to take some pictures, but most of the time, we cruised along with the mighty forces of nature.

When we started the dive, just before the tides were turning, the current had became weaker. Eventually, it stopped completely. After a short break, the current started to pick up slowly in the opposite direction.

We were on our way to the rock-formation which gave name to the dive site: the Tunnel. Over thousands of years, ice and water had carved its way through the rock and made a pothole. We swam through and came out a few metres deeper. The tunnel was just wide enough for a diver to squeeze through. What an experience this dive turned out to be!

Night dive in the coffee pot

The evening was spent reliving the past day's events in conversation and preparing our night diving equipment. A dive during the day in Saltstraumen is an unforgetable experience; we were therefore full of expectation for the up-coming night dive.

It was calm and dark since we were diving in the month of March. The summers here are dominated by the midnight sun, hence real night diving is restricted to the rest of the year.

The captain dropped us off in a small bay by the name of *Kaffekjelen*, which is Norwegian for coffepot. As we descended, we went through several metres of red algeas, which actually resembled coffee grounds! Fortunately, the visibility improved greatly, as we sank deeper into the fjord.

Sweeping our dive lights across the bottom revealed a spectacular array of marine life. An amaz-

A small hermitcrab klings to a kelp leaf

Sundstraumen to the left, and Saltstrauemen to th right. The huge exchange of water provides excellent conditions for the marine life, and especially anemones thrive here

You may stumble over Wolf fish (*Anarhichas lupus*) in Saltstraumen

ing diversity of animals and corals of different colours past through our beams of light. Now and again, some fishes crossed our path as well. And we could sense, if not always see, that there were many more out there in the dark waters. The dive went on without any big surprises, and we took a lot of photographs to save the memories.

The land of the Vikings

The next day we headed for some new dive sites in Sundstraumen. This sound is on the south side of the Saltstraumen. Sundstraumen is more narrow than its bigger brother, and the tidal currents are as strong, if not stronger, and make the dive site resemble a river. The diving conditions are not as unpredicable as in the Saltstraumen as the seafloor is less wild.

The boat ride there gives you a combined exprience of nature and history. If you look carefully, you can see the notch made by the viking king, Olav Tryggvason, when he threw his axe into the sound in anger because the strong currents prevented him from entering the calm waters inside.

Olav Tryggvason was on his way to Christianize another viking chief-of-tribe, Raud den Rame. He was believed to control the forces of wind and weather. As Olav Tryggvason's men were not strong enough to row his ship through the sound, he summoned bishop Sigurd to break the magic of Raud den Rame. With the bishop standing at the stem wearing his chasuble, and with the help of holy water and God's strength, they forced their way through the strong current. The story further cites that the tribal chief did not allow himself be Christianized, so Olav Tryggvason cut it short, killed the tribal chief and stole his ship.

The mighty viking chief turned out to be as self-willed and unpredictable as the currents where he resided. That is a fantastic story to accompany a fantastic dive.

High velocity diving

Sundstraumen can be dived from both ends. We started our dive as the currents were travelling into the fjord. We rolled into the fjord and descended down a steep wall, which was completely covered with colourful anemones. In the begin-

The bridge gives you a greate vantage point to study your divesite before the dives. Saltstraumen is situated in Northern Norway above the Polar Circle, hence dry-suits are required all year

TOP RIGHT: Saltstraumen is a fisherman's paradise, so you will find a lot of fishing hooks

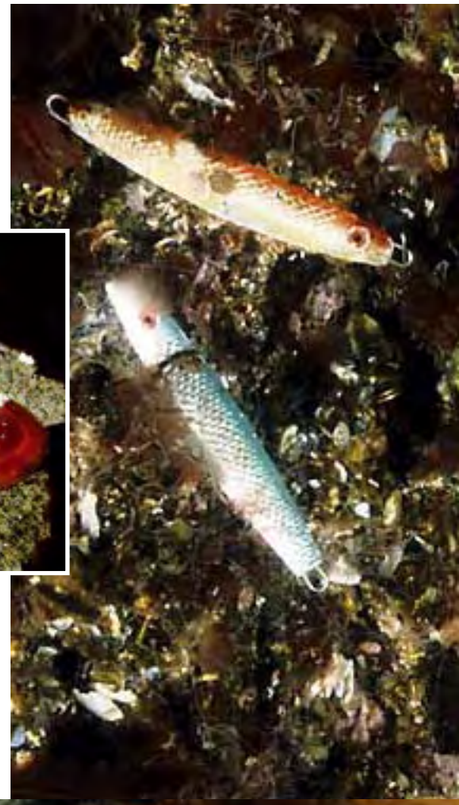
ning of the dive, when the currents were rather weak, we could take our time and observe the many small creatures, which made their living amongst the anemones. At first, the current led us slowly along the wall, but after some time, it started to pick up. What started out to be a quiet drift became a much wilder ride. We just went along with it, for what turned out to be an awesome drift dive. Near the end of the dive, the marine life just swept past us in a foggy blur of colours.

We managed to fin ourselves into a quiet backwater, where we did our safety stop. When we arrived at the surface, the dive boat was waiting for us. In the diveboat, we realised what a great distance we had drifted during our dive. Still, we had to go another kilometer further into the fjord to pick up the other two divers. These guys were locals and knew how to get the most out of the dive.

Safe & fun diving

It might seem a bit fool-hardy to dive currents like Saltstraumen and Sundstraumen. On the other hand, it can be made safely. The dive operators in the area have a long history of experience and know where and when to dive safely. These are amongst some of the best dive sites in Norway, and possibly in the world. As always in dealing with strong currents, dive with people who knows the area and have a reputation for good safety. A safe dive in Saltstraumen and Sundstraumen comes down to knowing the tide table, safe entry- and exit points both for shore- and boatdiving. This will ensure you a lifetime experience, submerged as well as onshore. ■

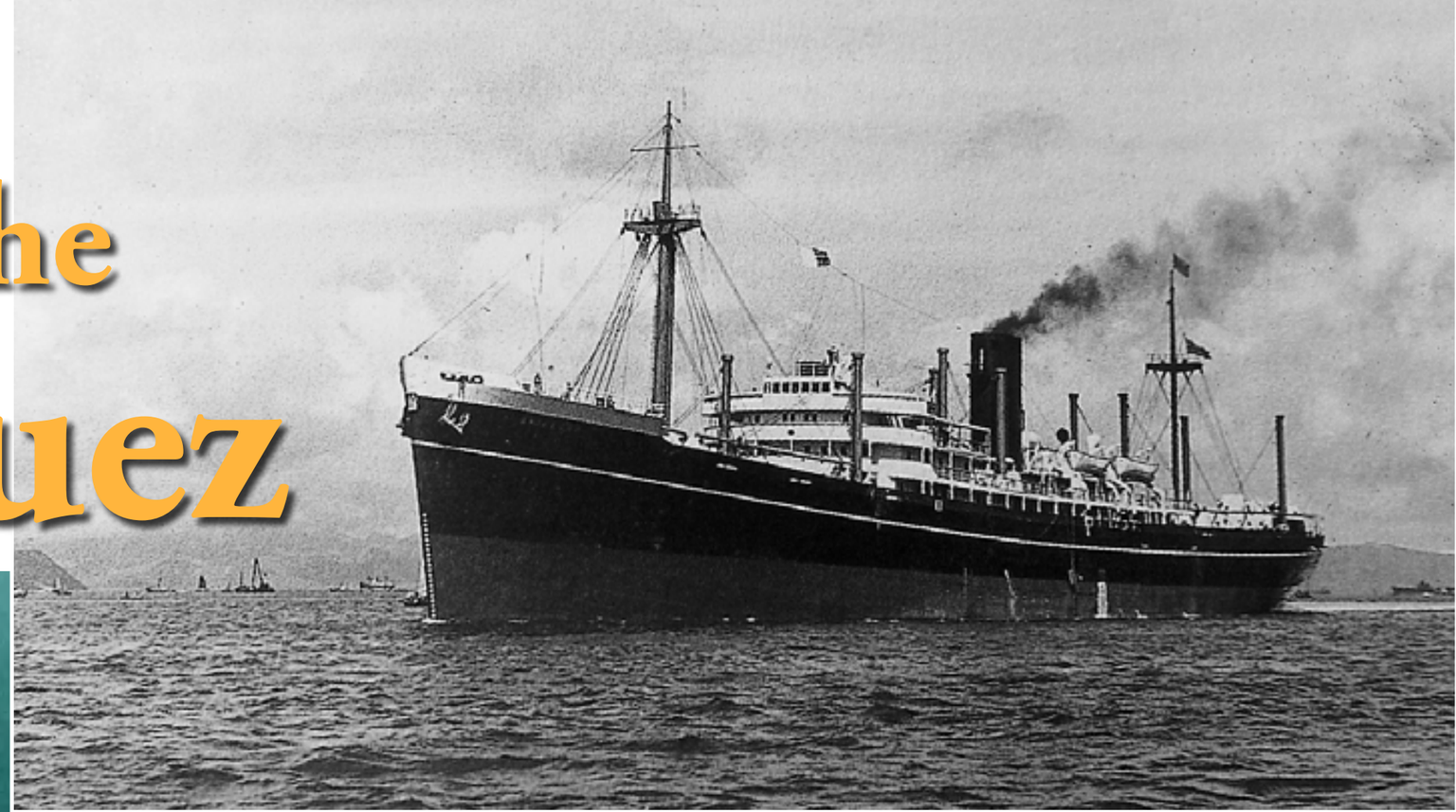
Saltstraumen



Text and photos by
Peter Collings

The wreck of the *Shillong* lies at 223m just north of the July Oilfield, and at the time of writing has not been dived

Shipwrecks of the Gulf of Suez



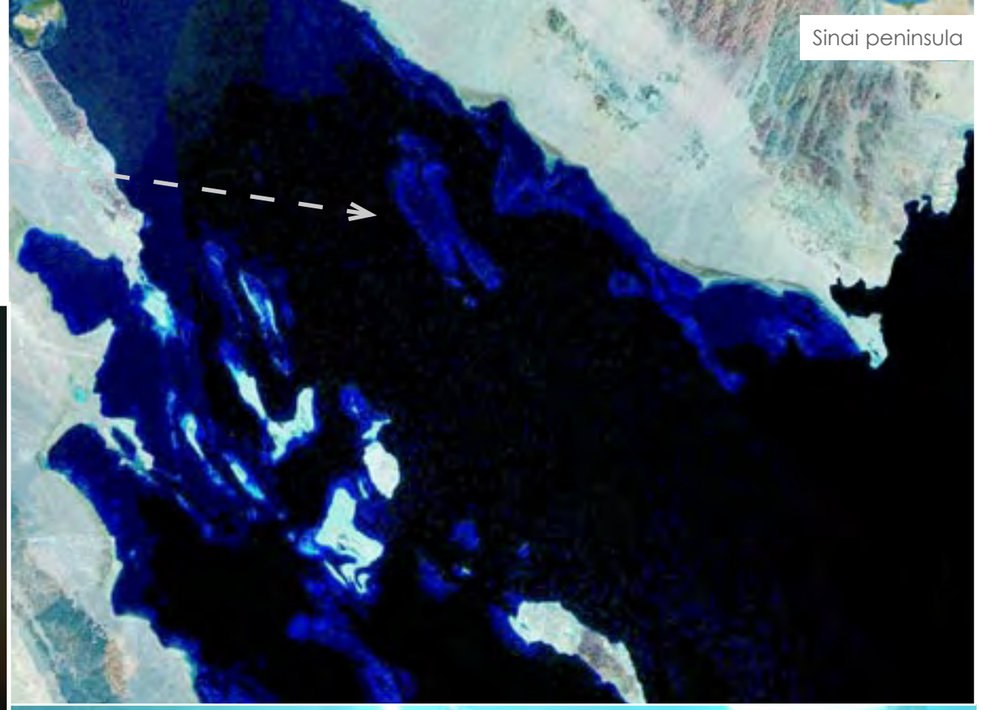
As the Red Sea narrows at its northern extreme, a long thin arm of water stretches north towards the Mediterranean. It is the Gulf of Suez. Squeezed between the Sinai Peninsula and the Egyptian mainland, the entrance to the Gulf is marked by a treacherous finger of reef known as Sha'ab Ali. A busy, narrow and important seaway dating back beyond the opening of the Suez Canal, it is a vital and important trade route linking east and west. It is also a hive of industry, with oilfields dotted along its length, and refineries along its banks. Here, we have located a series of new wrecks.

Not much diving takes place here. The coral reefs die away as the water becomes shallower and indeed less clear due to the presence of sand and silt. Water temperature, too, plays a part in the ecology, with temperatures plummeting to 16°C in winter. While it is not a viable tourist area, it is a haven for new unexplored shipwrecks—with the added bonus of some unusual marine life.

Heading north past Sha'ab Ali the first headland, Ras Dib, heralds an area rich in shipwrecks. First, are the *Attiki* and the *Muhansia*—both visible from the surface, well salvaged and well "dispersed". Lying in only a dozen meters of water, they are home to many shoaling fish and very large examples of the endemic species of nudibranchs found elsewhere in the Red Sea but in greater numbers and larger than text books would suggest.

Once more, there is a captain on the bridge of the *Birchwood*

Wreck of *Lara Security* near Ras Shukier



Satellite photo of the southern entrance to the Gulf of Suez. The shallow reef structure in the middle is the infamous Sha'ab Alo where so many ships have foundered

It is hard to stop even when the day comes to an end. Zodiac searching for a wreck in the very last rays of sun

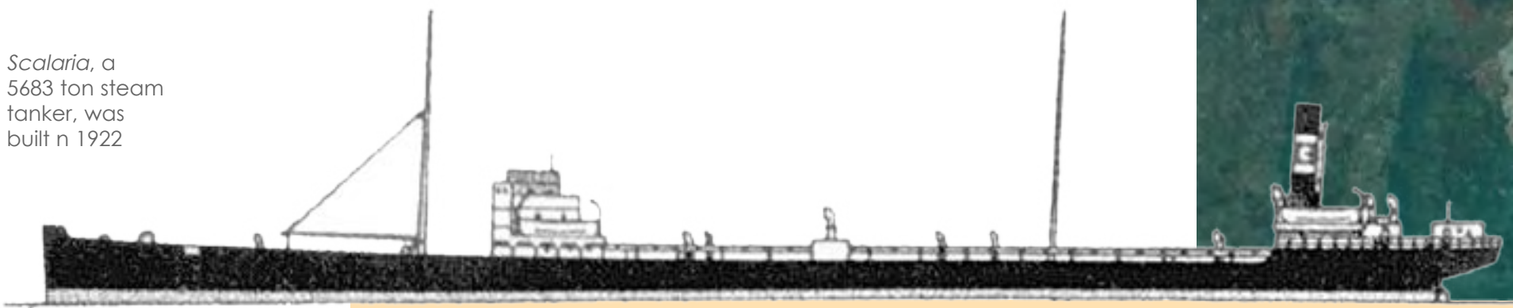
The wreck in the northern Red Sea still remain virtually untouched. There may well be less coral in the Gulf of Suez, but there is still plenty to explore

Rounding the headland, we find the *Elliot*, her superstructure above water is well embedded into the reef, her headlong grounding evident from the attitude of her rudder. Divers can enter the hull, swim through and into the engine room and take a walk around. Half a mile offshore where the water is deeper and clearer, lie three modern merchant ships—as yet unidentified—in less than 50 meters of water. Discovered during the 2004 *Geoserve/SSS Expedition*, their secrets are yet to be unlocked and their stories yet untold.

At *Ras Shukier,* the hustle and bustle of the oil industry becomes very evident. Close to shore are two shallow wrecks, while again offshore there are several deeper wrecks.

Birchwood 11 (Plastics Wreck)
Lying to the north of the port in a large bay with three other wrecks there is a small 50 meter motor cargo ship lying on its starboard side in 12m of water. Totally intact, light streams into the holds and bathes the entire wreck. A shoal of juvenile barracuda circles her mast, which is complete with radar array and aerials.

Just forward of the superstructure itself at the aft of the vessel is an intact crane, obviously used to service the hold. The criss-cross framework of the jib is covered with encrusting life. Superb swim-throughs from the weather deck into the holds are easily accomplished, her cargo bags of polythene granules float hard against the port hull. The fo'c's'le is easy to access and explore, and her winch gear, like many parts of the wreck is covered in



Scalaria, a 5683 ton steam tanker, was built n 1922

Gulf of Suez Trivia

The Gulf of Suez is the arm of the Red Sea, 300 km long and 50 km wide, that extends between the Arabian Desert and the Sinai Peninsula of Egypt. Along the mid-line of the Gulf lies the border between the continents of Africa and Asia.

The Gulf of Suez is a relatively young rift basin, dating back 40 million years. It is a shallow flat bed basin with depths ranging between 50 and 75m with depths increasing in the southerly direction but stays under the 100m mark at the confluence of the Red Sea.

The Red Sea lies between arid land, desert and semi-desert, and is unique among the seas of the world as no river flows into it. Since there is absence of rivers and permanent streams, terrigenous (derived from the erosion of rocks on land—ed.) material is only supplied to the Red Sea by rain-torrent. The scarcity of rainfall and no major source of fresh water to the Red Sea result in the excess evaporation as high as 205 cm per yearr and high salinity with minimal seasonal variation.

The main reasons for the better development of reef systems along the Red Sea is because of its greater depths and an efficient water circulation pattern. The Red Sea water mass exchanges its water with the Arabian Sea, Indian Ocean via the Gulf of Aden. These physical factors reduce the effect of high salinity caused by evaporation and cold water in the north and relatively hot water in the south.

Strong currents and atmospheric pressure gradients control the influx of less saline and colder water from the Gulf of Aden through the Street of Bab al Mandab during winter. The north-heading current mixes with a south-heading wind-driven surface current from the northern Red Sea.

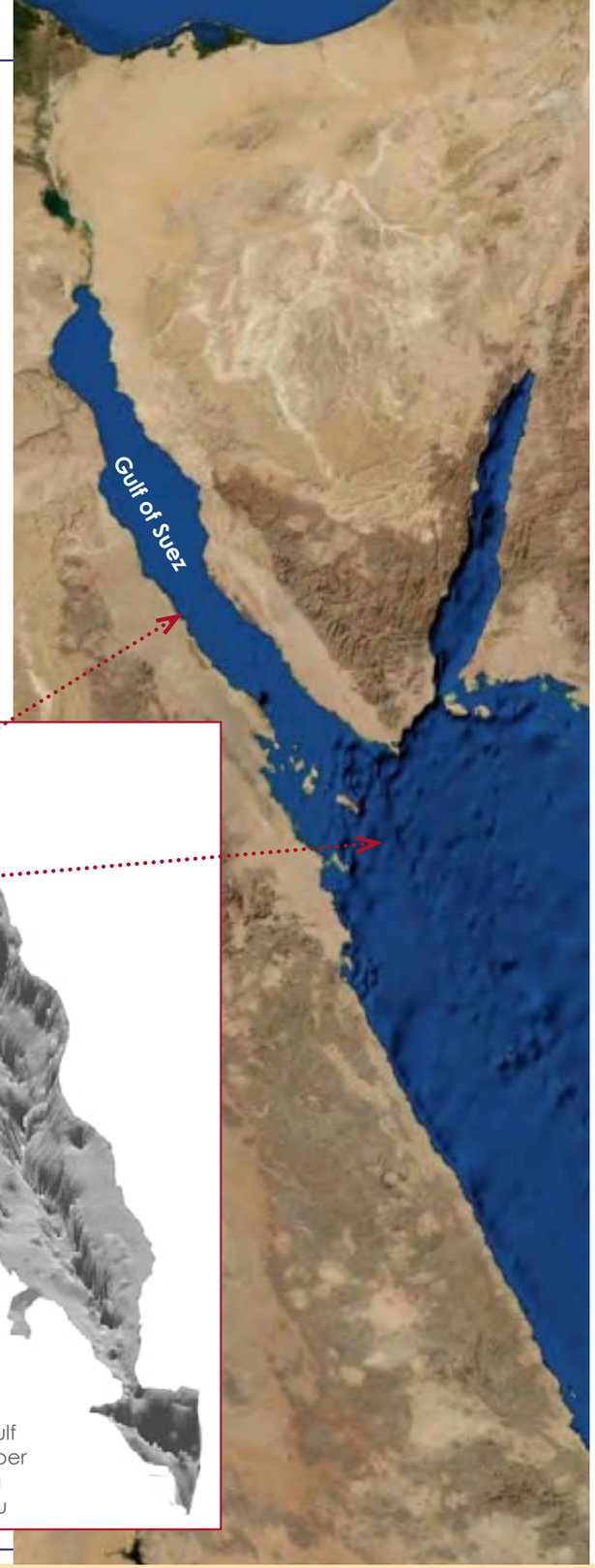
A thermocline at a water depth of about 200-400m separates the mixing water zone from Red Sea Deep Water at relatively stable temperature and salinity conditions. The maximum turbulent mixing zone is probably in the central Red Sea.

Suez

Both the Suez Gulf and the Suez Canal get their names from the city of Suez, which is situated on the shores of the Gulf of Suez to the west of the Suez Canal in Egypt.

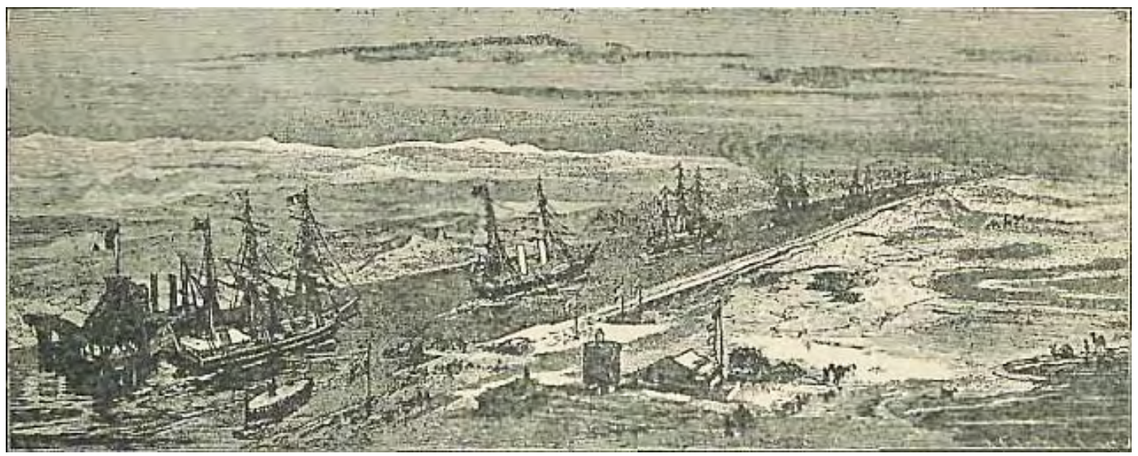
The Suez Canal offers a significantly shorter passage for ships than passing round the Cape of Good Hope. Today, the canal is a vital link in world trade, and contributes significantly to the Egyptian economy. There was a canal from the Nile delta to the Gulf of Suez in ancient times, when the gulf extended further north than it does today. This fell into disuse, and the present canal was built in the nineteenth century.

The construction of the canal was proposed by the engineer and French diplomat Ferdinand de Lesseps, who acquired from Said Pasha the rights of constructing and operating the canal for a period of 99 years. Construction took 11 years, and the canal opened on the 17th of November, 1869. ■



Gulf of Suez lies between the Sinai peninsula and the African continent on the left. The gulf itself is relatively shallow as compared to the rest of the Red Sea

Depth profile of the Red Sea. On this map, one can see that the Gulf of Suez sits (upper left corner) in a shallow plateau



X-RAY MAG Expands

Harald Apelt joins the team

HAMBURG, GERMANY

Former editor-in-chief of Tauchen, Europe's biggest monthly dive magazine, Harald Apelt has joined *X-RAY MAG* as an associate publisher. In this capacity Harald will work with both editorial matters and oversee sales and marketing.

In 2008, *X-RAY MAG* will be published eight times a year

The *Scalaria* was sunk in 1942 as a result of an enemy aerial attack; eleven lives were lost. She lies in shallow water, with only the lower hull remaining having been dismantled below the waterline

Exploring the remains of the *Scalaria* on a good day with great visibility can be a rewarding experience. Image is from the bow section

About the author

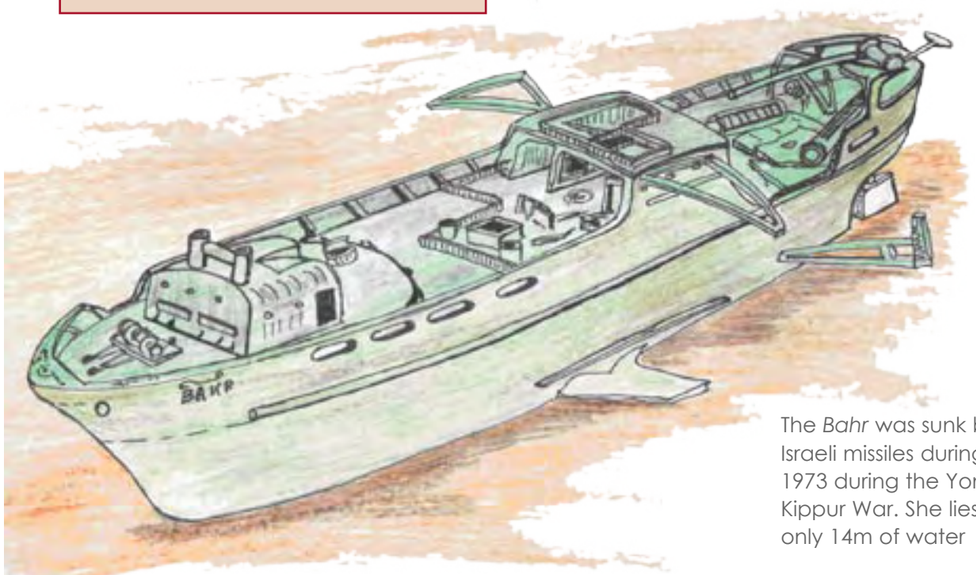
Peter Collings has been escorting wreck safaris in Egypt since 1993. He is the author of no less than nine dive-related books including *Shipwrecks of the Egyptian Red Sea*. His work has been published internationally since 1983. Peter and his team, the Red Wreck Academy, have been responsible for locating and identifying over 30 wrecks in Egyptian waters the latest being the Greek steamer *TURKIA*.

sponge and encrusting corals. Her bow appears intact and a deep scour ran along her keel, becoming circular by her prop and rudder. Her starboard running light lies protruding from the sand.

Hundreds of nudibranchs smother the red sponge fingers found throughout the wreck. Shoals of rabbit fish huddled together everywhere. Snowflake morays, again a rare occurrence on a coral reef, are common place here. Almost every surface of the wreck is alive with anemones, sponges and small crustaceans. The brilliant reds, oranges and greens highlighted by torch beams.

Laura Security (The Eagle Wreck)
Close by, this 40m long vessel sits upright with its bridge out of the water. It is named after the eagle, which made its roost on top of the wreck. Many of the hull plates have fallen to the seabed allowing sunlight to stream through its vertical supports highlighting shoals of fish.

The strong sunlight, afforded by the shallow depths, provides endless photo opportunities. With the hull intact, the bow and stern are very photogenic, and the supporting fish life is quite amazing. Due to its location, the wreck is blessed by the afternoon sun and the long beams of light shine through many holes in the wreck. Those who are not put off



The *Bahr* was sunk by Israeli missiles during 1973 during the Yom Kippur War. She lies in only 14m of water

by the lack of depth are well rewarded.

The "Pd" Wreck.

(D.b. Gemini)

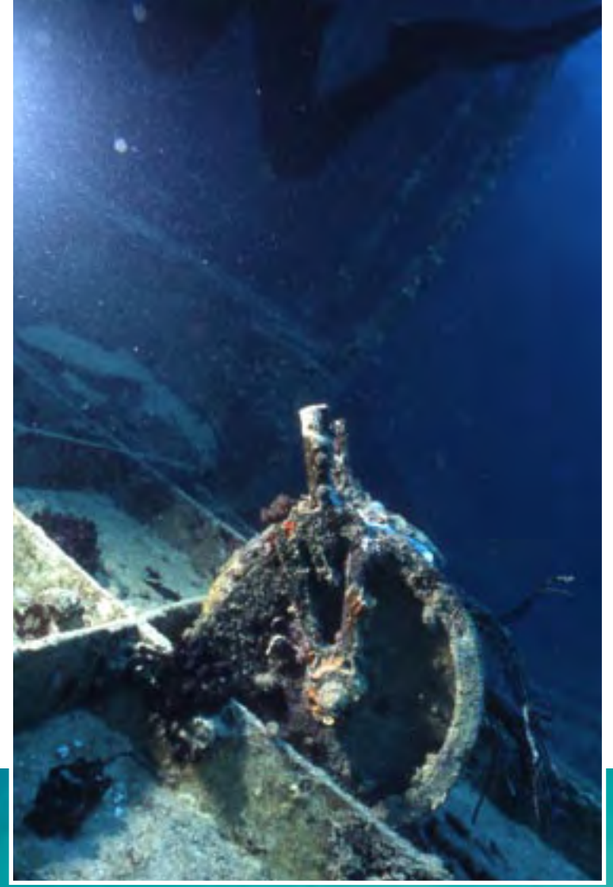
The target area of the SSS survey revealed some strange wreckage on the seabed, including a large circular depression. No wreck was ever found but winches, ladders mooring cleats, ventilation cowls covering a vast area—all attracting a reef's population of fish—was all that could be seen.

The aforementioned depression is complety round some two meters deep. it seems man-made and full of snapper and jacks so perhaps this is the answer.

The American jack-up drilling barge *Gemini* was damaged while drilling off *Ras Shukier*. The sea bed collapsed under one of the legs on October 8th, 1974. Eighteen people died. During salvage operations, it rolled over almost capsizing, bending all its legs. It was written off as a total loss at a cost of £4.1 million, removed and broken up.

Crane or boom on the survey vessel *Bahr*

Hitting pay dirt. Just look at those hapy grins. The name plate from the *Scalaria*—depicted in a cleaned condition on page 37—is brought to the surface



Reversing wheel in the engine room of the *Scalaria*

Wreck of the *Shillong*

Built at Vickers Armstrong, Walker Mar 1949, for the P&O LINE, the *Shillong* was 8934 tons and 522 ft long. She was captained by E.J. Spurling and on a journey from London over Hamburg to Tsingtao with 87 crew and six passengers and carrying general cargo, when she collided with the *Purfina Congo*.

She now rests in 223m, just north of the *July Oilfield*, in the separation channel, and at the time of writing, has not been dived. Hopefully, our forthcoming expeditions will locate her.

Ras Gharib

This headland again is a terminal for the oil industry and marks the limit of diving exploration. To the best of my knowledge, no one else has ever been diving this far north. But there is evidence to suggest at least another 20 wrecks are lying in these waters. Again, there are several very interesting wrecks in shallow water with more lying in deeper water.

Lost in 1988, the *Aboudy* is still virtually intact. The entire wreck, which is teeming with life, can be explored

Aboudy

A small aluminum hulled, 400ton cargo ship 76m long, sank May 7th, 1988. She was carrying a cargo of cattle, aluminum extrusion and thousands of 300ml bottles of cough medicine! Laying on her side totally intact, her masts running horizontal towards the shore, her stays still in place, she is slowly succumbing to the invasion of marine life. The entire wreck can be explored, sheltered from any swell from the exposed open sea. Remnants of the cargo lie in the holds spilling out onto the sea-bed, and a diver can swim from the fo'c's'le through her holds to the bridge section at the stern, where the engine room can also be found.

Thousands of bottles of cough medicine lie around the *Aboudy*

Marine life includes shoaling barracuda and fusiliers, emperor angle fish, crocodile fish, torpedo rays and encrusting corals and sponges. Visibility is subject to swell, as the seabed consists of sand.

Bahr

The motor survey vessel belonged to the United Arab Republic General Petroleum Co was sunk at Ras Gharib by Israeli missiles on October 14th, 1973, during the Yom Kippur War. Russian built, she was 416 tons, 147 ft long. She lies in only 14m of water.

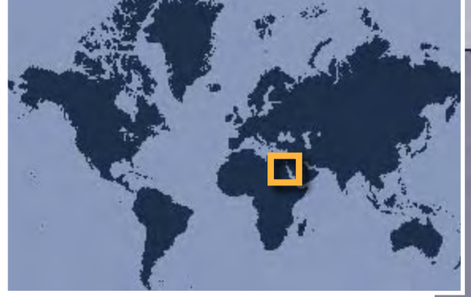
Scalaria

Built in 1922 for the Anglo-Saxon Petroleum Co at Swan Hunters, this 5683 ton steam tanker was attacked by enemy aircraft using aerial torpedoes and bombs while off *Ras Gharib* with a cargo of dirty oil. She was sunk on October 19th, 1942, with the loss of 11 lives. Her captain, J.Waring survived.

One of the ships officers, Mr Armatage, was awarded the George cross and the Lloyds medal for his actions in saving the lives of his fellow crewmen as they clung to her anchor chain, surrounded by burning oils. She was 411 ft long, 55 ft beam and 30 ft draught, capable of ten knots and fitted with triple expansion engines. She lies in shallow water, with only the lower hull remaining having been dismantled below the waterline. ■

fact file

Red Sea, Egypt



World map and map of Egypt

SOURCE: WWW.CIA.GOV

History One of the world's great civilizations was born on the banks of the Nile. Due to the richness and regularity of the annual flooding of the Nile River as well as the semi-isolation of the valley created by the surrounding deserts, the rise of a unified kingdom around 3200 B.C. brought a series of dynasties into power in Egypt for the next three millennia. In 341 B.C., the last native dynasty fell to invading Persians who in turn were replaced by the Greeks, Romans, and Byzantines. It was the Arabs in the 7th century who introduced Islam and spread the Arabic language and religion throughout the region over the next six centuries. Around the year 1250, a local military caste, the Mamluks, took control. They continued to govern the country after the Ottoman Turks conquered Egypt in 1517. In 1869, the Suez Canal was completed and Egypt became an important center for world trade. However, it also fell heavily into debt. In order to protect its investments, Great Britain seized control of Egyptian government in 1882. However, some allegiance to the Ottoman Empire maintained influence in Egypt until 1914. Egypt gained partial independence from the UK in 1922 and acquired full sovereignty following World War II. The time-honored place of the Nile River in the agriculture and ecology of Egypt was altered by the completion of the Aswan High Dam in 1971 and the resultant Lake Nasser. Even so, dependence on the Nile continues, and with a rapidly growing population—the Arab world's largest—and limited arable land, resources and society continue to be stressed. The government has initiated economic reforms and massive investments in communications and physical infrastructure in an effort to ready the economy for the new millennium. Government: Republic. Legal system: Based on English common law, Islamic law and Napoleonic codes. Capital: Cairo

Geography Egypt occupies the northeast corner of the African continent. It borders the Mediterranean Sea—between Libya and the Gaza Strip—and the Red Sea north of Sudan, and includes the Asian Sinai Peninsula. Coastline: 2,450 km. Terrain: Vast desert plateau is interrupted by the Nile River valley and delta. Lowest point: Qattara Depression,133 m. Highest point: Mount Catherine, 2,629 m. Egypt controls the Sinai Peninsula—the only land bridge between Africa and the remaining Eastern Hemisphere. Egypt also controls the Suez Canal—a sea link and major trade route between the Indian Ocean and Mediterranean Sea. Becuase of its size and juxtaposition to Israel, Egypt plays a major role in Middle Eastern geopolitics. However, Egypt does continue to depend on upstream neighbors and deal with the dominance of Nile basin issues. The country is also prone to influxes of refugees.

Climate Desert—hot, dry summers with moderate winters. Natural hazards: periodic droughts; a hot, driving windstorm called *khamsin* occurs in springtime; dust storms, sandstorms; frequent earthquakes, flash floods, landslides

Environmental issues Desertification—agricultural land is being lost to windblown sands and urbanization. Soil salination below the Aswan High Dam is increasing. Oil pollution is threatening coral reefs, beaches and marine habitats. Additional water pollution comes from agricultural pesticides, raw sewage and industrial effluents. There are very limited natural fresh water resources away from the Nile River, which provides the only perennial water source. Rapid population growth is overstraining the Nile River and other natural resources.

Economic In the last three decades, the Egyptian government has reformed the highly centralized economy handed down from President Nasser. Energy subsidies, and personal and corporate tax rates were reduced, and several enterprises were privatized in 2005 by Prime Minister Ahmed Nazif. There was a stock market boom, and GDP grew by about 5 percent for the next two years. Unfortunately, living standards remain the same for the average Egyptian despite these achievements, compelling the government to continue to provide subsidies for basic necessities. These subsidies have helped increase a growing budget deficit continue to be a significant drain on the economy and foreign direct investment continue to be low, however, export sectors—especially natural gas—show positive prospects. Agriculture: cotton, rice, corn, wheat, beans, fruits, vegetables, goats, sheep, cattle, water buffalo. Industries: textiles, food processing, tourism, chemicals, pharmaceuticals, hydrocarbons, construction, cement, metals, light manufactures. Natural resources: petroleum, natural gas, iron ore, phosphates, manganese, limestone, gypsum, talc, asbestos, lead, zinc.

Currency Egyptian pound (EGP). Exchange rate: 1EUR=7.69EGP, 1USD=5.69EGP, 1GBP=11.25EGP, 1AUD=4.69EGP, 1SGD=3.73SGD

Population 80,335,036 (July 2007 est.). Ethnic groups: Egyptian 98%; Berber, Nubian, Bedouin and Beja 1%, Greek; Armenian and other European (primarily Italian and French) 1%. Religions: Muslim (mostly Sunni) 90%, Coptic 9%, other Christian religions1%. Internet users: 5 million (2005)

Languages Arabic (official), English and French is understood by educated classes

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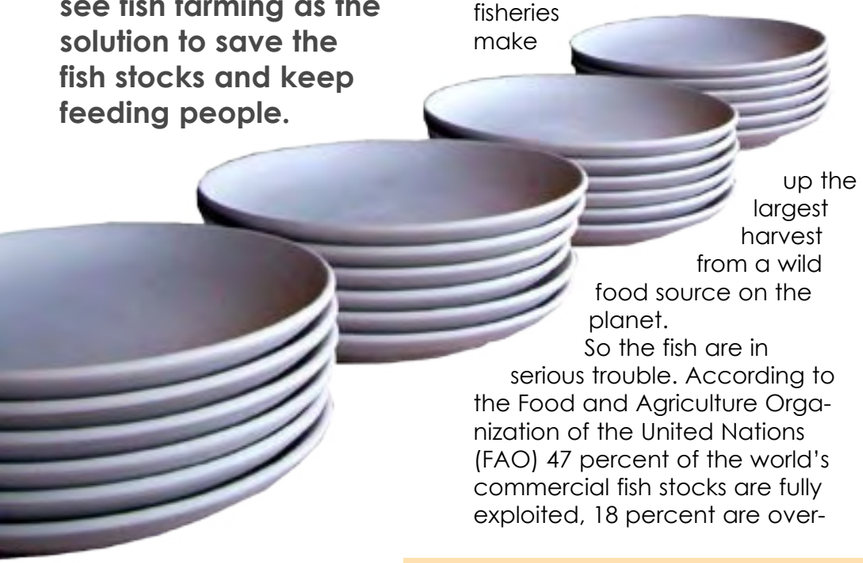
Salmon (*Salmo Salar*). Food for kings. Now commonly being bred in aquaculture

Text by Arnold Weisz

Fish for all – Or maybe not

Fish stocks are depleted world-wide. Over fishing, pollution and coastal development is putting the aquatic resources under strain. Eco-friendly tourism battles against the need for food. Scuba divers rage against dynamite fishing. The oceans struggle to sustain human activities. Many see fish farming as the solution to save the fish stocks and keep feeding people.



Fish contribute a significant amount of animal protein to the diets of people worldwide. It is estimated that between 15 and 20 percent of all animal proteins come from aquatic animals. This means that enormous amounts of fish have to be taken out of the ocean daily. Contrary to most of the land animals, which are farmed or domesticated animals, fisheries make up the largest harvest from a wild food source on the planet.

So the fish are in serious trouble. According to the Food and Agriculture Organization of the United Nations (FAO) 47 percent of the world's commercial fish stocks are fully exploited, 18 percent are over-exploited, nine percent are depleted and one percent are slowly recovering. Only one-quarter of stocks are considered under-exploited or moderately exploited.

Industrial fishing

Fish is not only a vital food supply, it is also a source of work and money for millions of people around the globe. In 1996, an estimated 30 million people were deriving an income from fisheries. An overwhelming majority of them—some 95 percent—were in developing countries. Dwindling fish stocks are therefore not only depriving many people of their daily meal, but also cutting them short on income. Many countries have turned to aquaculture to solve both the problem with lack of wild fish, and to create ways to giving people job opportunities.

Fish farming

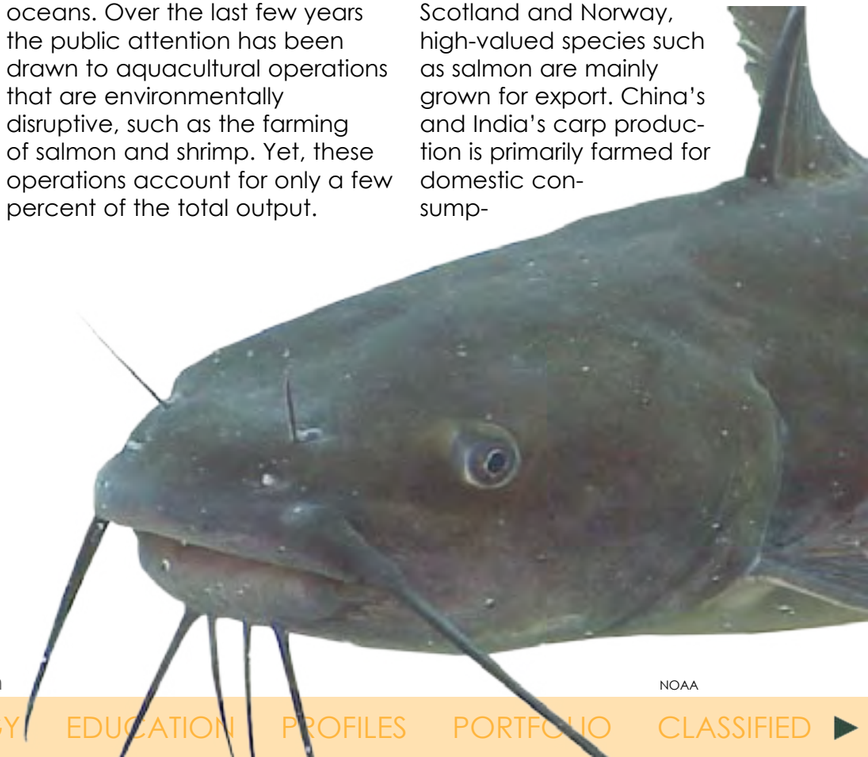
Aquaculture has, can and will play an important role in human nutrition. Aquaculture is the world's fastest growing source of food, outpacing terrestrial meat production. Today, nearly one-third of the fish we eat is not captured in the wild, but raised in a fish farm. However, as aquaculture gains importance in the modern food supply, there are growing concerns about the damage that it can cause to water quality, biodiversity and ocean fish stocks.

Over the last few years the public attention has been drawn to aquacultural operations that are environmentally disruptive, such as the farming of salmon and shrimp.

Environmental concerns

Farming fish is not however completely without problems. Correcting one problem, like substituting the catch of wild fish, doesn't necessarily save the oceans. Over the last few years the public attention has been drawn to aquacultural operations that are environmentally disruptive, such as the farming of salmon and shrimp. Yet, these operations account for only a few percent of the total output.

World aquaculture is dominated by shellfish and by mainly carp in China and India, but also catfish in the United States and tilapia in several countries. In cold water countries like Chile, Scotland and Norway, high-valued species such as salmon are mainly grown for export. China's and India's carp production is primarily farmed for domestic consump-



Catfish

NOAA

NIALL CROTTY

Tilapia. Because of their large size, rapid growth, and palatability, a number of tilapiine cichlids are at the focus of major aquaculture efforts. Like other large fish, they are a good source of protein and a popular target for artisanal and commercial fisheries

tion.

Salmon farming in Norway has created two major concerns. Pollution in the waters around fish farms from heavy concentrations of fish faecal, uneaten food, and other organic debris. The other major concern is runaway farmed salmon. There are real fears that escaped salmon might out-compete the native fish for the available habitat, adding another threat to wild salmon. There is also a concern about transmitting contagious disease and infestations of parasites, from farmed salmon over to wild salmon.

Waste

Shrimp farming in ponds also creates large amounts of waste and demands large amounts of fresh water. When that water is flushed from the ponds into surrounding coastal or river waters in exchange for fresh supplies, its heavy concentrations of fish faeces, uneaten food, and other organic debris can lead to oxygen depletion and contribute to harmful algal blooms. Many countries have implemented regulations to reduce the harmful effects of seafood farming. Aquaculture techniques and technology do continue to improve, but there is still a way to go before it can be labelled as environmentally friendly.

Fish fed to fish

One great paradox is that some aquaculture production also puts more pressure on ocean fish stocks, rather than relieving pressure. Carnivorous species like salmon and shrimp depend on high-protein feed formulated from fishmeal—a blend of sardines, anchovies, pilchard and other low-value fish. Marine scientists and conservationists are therefore concerned about the immense volumes of wild ocean fish that must be caught to feed these farmed fish. Some reports even suggest that fishmeal resources could be depleted by 2030. It is therefore vital that a balance between the need of marine food, can be combined with a sustainable harvesting of these resources. The depletion of many fish stocks around the world makes it even more important to find environmental friendly solutions to fish farming, to feed the ever growing population of our planet. ■

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NOAA

Shrimp hathery. The total global production of farmed shrimp surpasses a value of ten billion U.S. dollars. About 75 percent of farmed shrimp is produced in Asia, particularly in China and Thailand

PETER SYMES

Tiger prawn (*Penaeus monodon*) is the most widely cultured prawn species in the world, although it is gradually losing ground to the whiteleg shrimp, *Litopenaeus vannamei*. About one million tonnes are consumed annually—two-thirds of it coming from farming, chiefly in south-east Asia

Edited by
Millis Keegan
& Peter Symes

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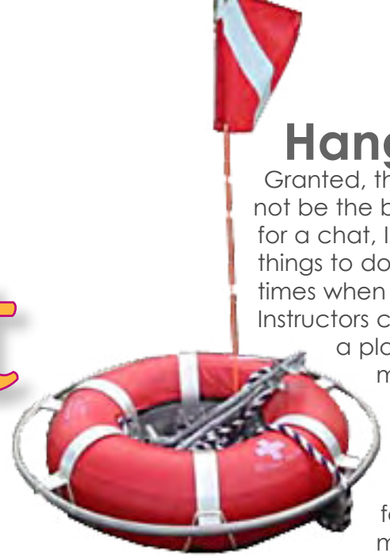
Atomic ST1

Choose for the environment?
Many environmental specialists classify stainless steel as the "green" metal of the future. It is 100 percent recyclable. That, and the fact that the rather environmentally harmful chrome or nickel plating have not been used in the making of the regulator, makes the Atomic ST1 first stage a green choice. **www.atomicaquatics.com**

Hot and dry

It looks like a wetsuit, it feels like a wetsuit, but it is dry and warm like a proper drysuit should be. White is presenting their new drysuit technology in the Hot Fusion model. It is a two layer suit: the first layer is a loose fitting membrane with latex seals and dry zipper, and the second oversuit is made from a stretch fabric, which allows easy movement. But even with all this new technology, will it hide the love handles? **www.whitesdiving.com**



Hang around

Granted, the middle of the ocean might not be the best place to hang around for a chat, I mean, there are better things to do out there! But there are times when dive signs aren't enough. Instructors can make good use of a platform like this for a last minute briefing, and so can marine biologists and marine archeologists, and that is just for starters. Not to mention that it is a great place from which to hang tired divers and extra equipment, like weights.
www.thediversplatform.com

OK Shark Fin

Just because we are banning shark fin soup doesn´t mean we are banning shark fins out of the kitchen entirely. This thing may be more cool than handy, but it does open your bottle and it is colourful. It also has a magnetic core for a good fit on the fridge door.
www.hotflamingo.com

A matter of wisdom?

The Wisdom2 from Sherwood is their latest air integrated computer with a large display and very large numbers for an easy read during the dive. Bar graphs on each side of the display make it easy for the diver to monitor the nitrogen and oxygen level. The optional quick disconnect fitting is a great feature, as are the alarms you can choose to set, such as a warning when you are getting low on air, or when you close in on the no-deco limit.
www.sherwood.com

Shark Shield 2.0

Just read in the paper that shark bites are up in Florida. So, for diving in shark populated waters, may we suggest this personal shark deterrent gizmo designed with scuba divers in mind? The Shark Shield SCUBA7 creates an electronical wave form that causes a very unpleasant sensation in the shark's snout. When the shark comes near, he will get uncontrollable muscular spasms, which hopefully is enough to make him leave the area without snacking. **www.sharkshield.com**

U/W Boom Box

Sound travels well in water. With a BoomBox for my ipod, I can hang it off my kayak when I kayak dive, and listen to my entire music collection while diving. Or, if the sound is as good as the Ego people promise, I can sound pollute the ocean on my day off. I love it! Give me one! **www.lovemyego.com**

Recall

M&J Engineering is recalling about 1,500 AGA swivels for scuba diving masks because of potential drowning hazard.

The swivel, which is attached to a diving mask, could separate while diving. This will result in a sudden loss of the diver's air supply, causing the diver to engage in emergency ascent. This poses a risk of decompression sickness due to rapid ascent or drowning.

The products recalled are SW-3000 second stage 360-degree swivels for scuba diving masks that were manufactured from January 2004 to February 2005. *Click here for* **More info**

Dye Marker

In this waterproof container, rated to 330 feet, is a highly visible fluorescent dye. When lost at sea, the diver can release the dye, which will be visible from aircraft from over a mile. The dye slick lasts for about 30 minutes. However, current, wind and waves can affect the pattern of the slick, as well as the duration, so a strategic release is recommended. The dye is environmentally friendly. **www.omsdive.com**

Handsfree

A handy dive light holder is not only for tech and cave divers—leaves your hands free to control your dive. The hand mount is made out of neoprene material and attaches with velcro strap. **www.saekodive.com.**

Fly in Silence

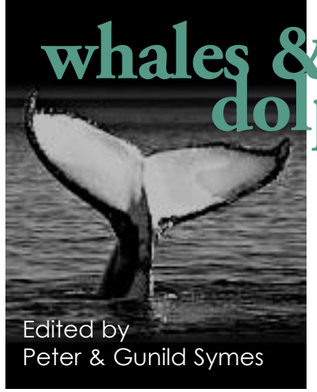
Sennheiser PXC 300 headset combines good noise reduction on aircraft with a very small case, light weight, and reasonable price. The headset requires two AAA batteries for noise canceling, and allows music to pass through even when the batteries are dead. **www.sennheiser.com**

Be D-Synchron-ized

From SeacSub. Features: dive/pre-dive settings; a large exhaust valve eases exhalation; "safety lock" ensures stability and perfect functioning of the diaphgram; asymmetric lever optimizes the air supply and deep water performance; new ergonomic mouthpiece. Available as D-SYNCHRO with balanced diaphgragm first stage and P-SYNCHRO with compensated piston first stage. **www.seacsub.com**

Bag on wheels

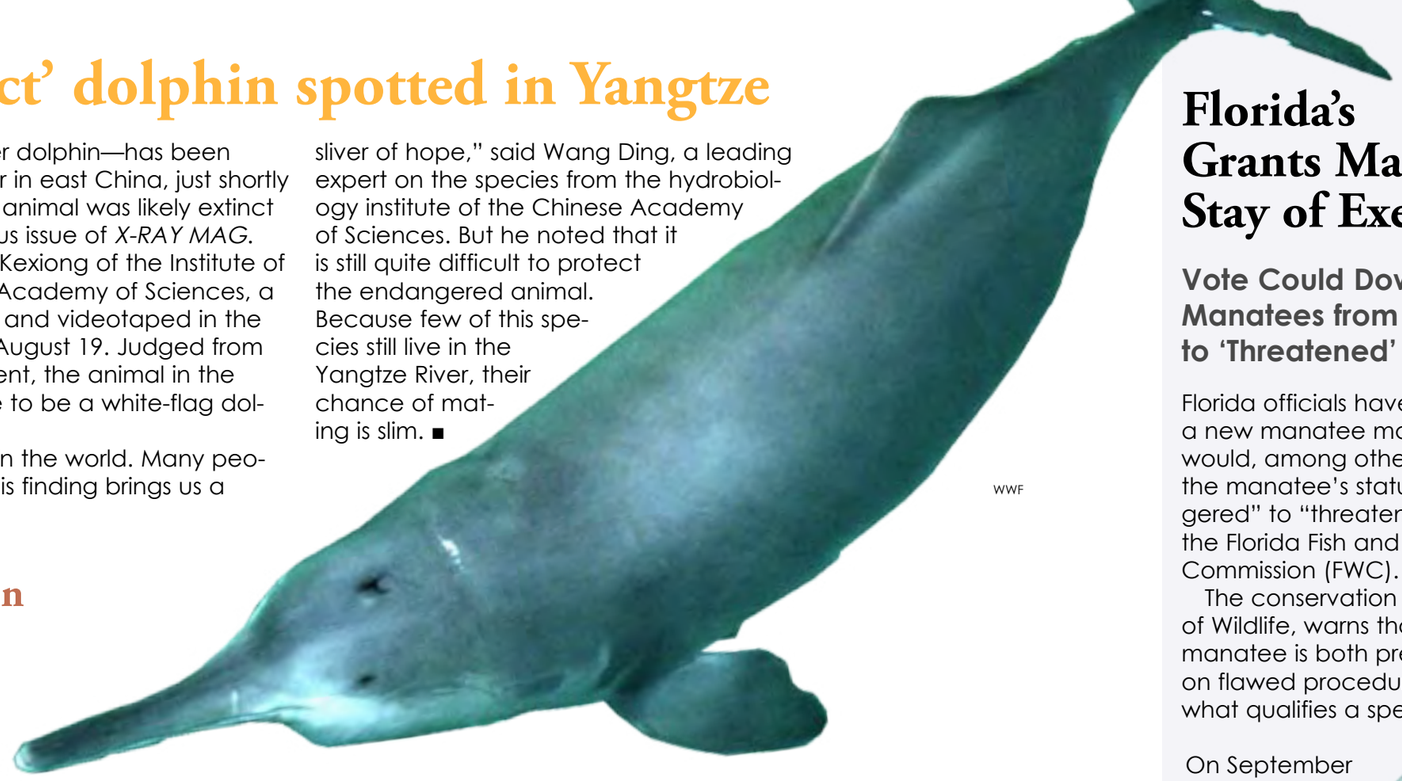
Rugged, durable, water and stain resistant, this bag will carry your gear to your next dive destination. The structure is reinforced, so it will keep its shape and protect your belongings. The wide compression strap around the bag keeps it all together, and for an easy time at the luggage belt, there are plenty of grab points. **Akona.com**



'Extinct' dolphin spotted in Yangtze

A baiji—a blind river dolphin—has been seen in Yangtze River in east China, just shortly after scientists said the animal was likely extinct as reported in the previous issue of *X-RAY MAG*. But According to Dr Wang Kexiong of the Institute of Hydrobiology of the Chinese Academy of Sciences, a "big white animal" was spotted and videotaped in the river at Xuba ferry in Tongling, on August 19. Judged from its appearance and living environment, the animal in the footage was confirmed by the institute to be a white-flag dolphin known in Chinese as "baiji".

"We are very glad to see baiji still exist in the world. Many people believed that the baiji was extinct, and this finding brings us a sliver of hope," said Wang Ding, a leading expert on the species from the hydrobiology institute of the Chinese Academy of Sciences. But he noted that it is still quite difficult to protect the endangered animal. Because few of this species still live in the Yangtze River, their chance of mating is slim. ■



WWF

Australia: Whale sanctuary decision may be soon

The Australian Federal Court is about to make a ruling regarding Japan's annual whale hunt in Australian Antarctic waters. Animal welfare group, Humane Society International, has sought an injunction against Japanese whaler, Kyodo Senpaku Kaisha Ltd., saying it was responsible for the deaths of about 1260 whales since 2000 in Australia's whale sanctuary near Antarctica. The society launched the action in October 2004, but in May 2005, Justice James Allsop refused it permission to proceed with the case, after federal Attorney-General Philip Ruddock controversially raised concerns it could spark a diplomatic incident between Australia and Japan. However, the Federal Court overturned Justice Allsop's decision, allowing the Humane Society to continue with their actions. ■

Blue Whales are making a comeback

The magnificent blue whale—the largest animal ever to live on Earth—appears to be on the rebound writes BBC Online. Scientists have collated data showing that the number of marine mammals in the Southern Hemisphere has increased from a few hundred to a few thousand. Before the commercial hunting era, there would have been hundreds of thousands in the oceans. "The abundance is still very low; it's about 2,300 for the whole Southern Hemisphere, so it's a tiny fraction of what it used to be, but it's good news they're increasing," said the IWC's head of science, Greg Donovan. Numbers of other large species, such as fin whales and humpbacks, are also rising in many parts of the world. "The most recent data is really encouraging," said the IWC's head of science, Greg Donovan. "Blue whales have now been increasing by about seven to eight percent per year for the last ten years at least, for which we have good data." ■

Florida's Governor Grants Manatees a Stay of Execution

Vote Could Downlist Manatees from 'Endangered' to 'Threatened'

Florida officials have been set to vote on a new manatee management plan that would, among other actions, change the manatee's status from "endangered" to "threatened," according to the Florida Fish and Wildlife Conservation Commission (FWC).

The conservation group, Defenders of Wildlife, warns that downlisting the manatee is both premature and based on flawed procedures for determining what qualifies a species as endangered.

On September 12, Florida Governor Crist asked the Florida wildlife commissioners to postpone a vote on whether to change the status of the manatees from endangered to threatened.

In a letter to the commission chairman, the governor said the state needs a better method to estimate the manatee population.

There were a record 417 manatee deaths in 2006.

The governor was also concerned that new members of the commission do not have enough time to review the information and make an informed decision. ■

An Historic First: Pilot Whale Observed Eating Giant Squid

Investigators from the Society for Cetacean Study have filmed a whale eating a giant squid. Such scenes have never been captured on film before, and they were obtained in an area where a deep underwater ravine exists in which it is believed the giant squids live and breed. Vidal Martín, president of the society, said the observation was made in June when he and a team of researchers were watching a group of pilot whales. They were astonished to see one of the animals emerge from the water and appear to "jump about". "We looked hard and saw a tentacle of a squid hanging from its mouth, and there were other pieces of squid stuck to the whale's body. It made a number of brusque movements on its side in the water to free the tentacle to eat it—and there we were filming and photographing it all." ■

SOURCE: TENERIFE NEWS ONLINE

GREENPEACE

Virus threatens Mediterranean dolphins

Dozens of dead dolphins washing up along the Spanish Mediterranean coast have alerted environmentalists to a virus they fear will become an epidemic.

The region's striped dolphins, a protected species, are apparently being infected with a virus, which has not been identified and has so far killed several dozen animals along the coast and may spread, a government report stated, quoting environmental experts.

"We are at the start of an epidemic," said Javier Pantoja, a marine conservation official at the Spanish Environment Ministry.

Another Environment Ministry spokesman confirmed that a meeting on the issue would be held in September to try to coordinate action between Spain's autonomous regions, but could not give details of the virus and its effects.

The virus is the latest in a series of difficulties facing the Mediterranean environment. This summer, beaches have been hit by a plague of jellyfish believed by climate experts to be due to warmer sea temperatures as well as over-fishing of predators such as tuna. ■

SOURCE: EL MUNDO NEWSPAPER

Solomon Islands Lifts Ban On Dolphin Exports

The Solomon Islands has lifted a four-year ban on the trade of live dolphins and may allow more than 100 to be exported each year because of demand from tourist resorts and marine parks in places such as the United Arab Emirates.

"The government sees dolphins as a good business for local people," a government spokesman, George Herming, said. "We've had interest from some resort owners in Dubai and from businessmen in other countries as well." ■

SOURCE: INTERNATIONAL HERALD TRIBUNE

FAO

Editted by
Michael Symes

Text by Michael Symes
Shrimp images courtesy of
Southeastern Regional Taxonomic Center

Snapping Shrimp Sound
(link to waw-file)

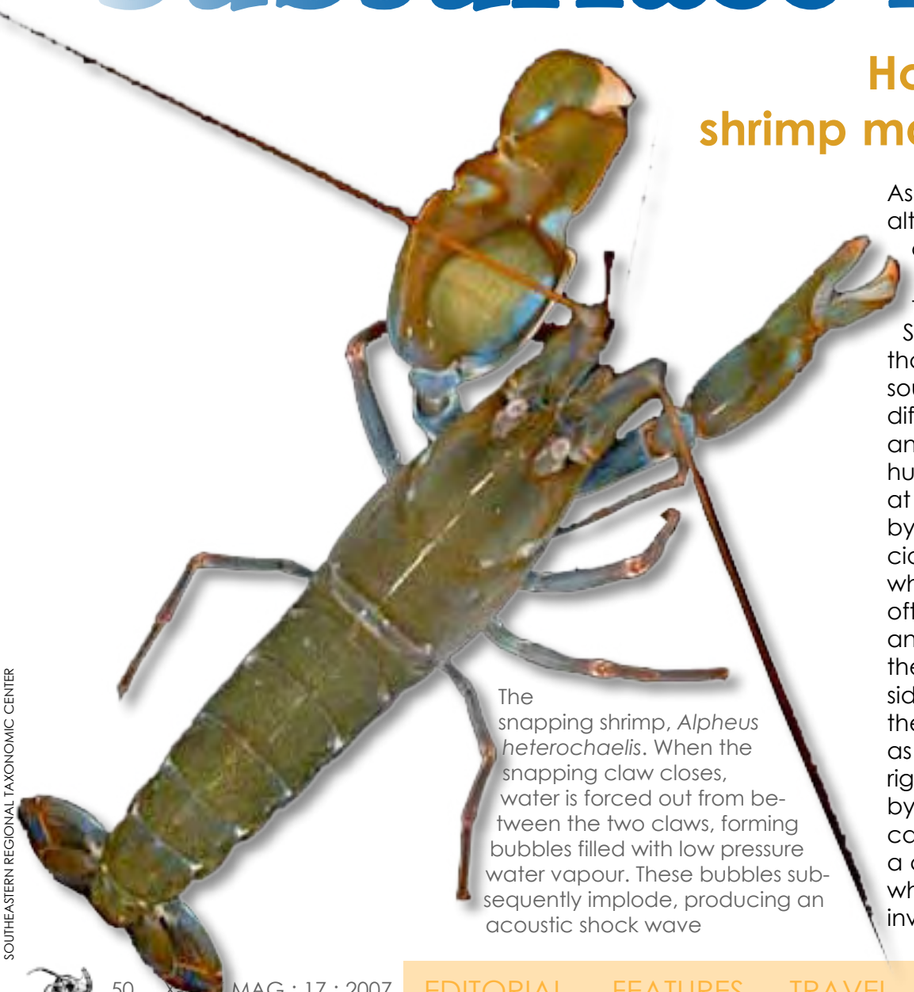
SOUTHEASTERN REGIONAL TAXONOMIC CENTER

Fish farting

At night, herrings squeeze bubbles out of their swim bladders through an anal pore. The sounds are distinctly fart-like. As they tend to 'fart' more in the company of others it would appear that they play a social function! Hm! However, they may perhaps use the sounds to ward off predators.

Subsurface Noise

How the snapping shrimp makes itself heard



The snapping shrimp, *Alpheus heterochaelis*. When the snapping claw closes, water is forced out from between the two claws, forming bubbles filled with low pressure water vapour. These bubbles subsequently implode, producing an acoustic shock wave

As we said in our previous issue, although you might expect the oceans below the surface to be a quiet and still place, they are far from being so.

Submerged hydrophones show that there is a cacophony of sound, which arises from many different sources, both natural and anthropogenic i.e. made by humans. Previously, we looked at the sounds made under water by the marine mammals, especially the songs of the Humpback whale. Although these songs are often very harmonious and pleasant even for humans to listen to, there is also a lot of what we consider just plain noise. If we ignore the anthropogenic noises such as those made by ships and oil-rigs, and the natural noises made by waves and surf, earthquakes, calving icebergs, etc, there is still a considerable amount of noise, which emanates from the aquatic invertebrates and fishes.

Source of the noise

Among the more than 25,000 species of living fish, it is claimed by Dr Rodney Rountree of the University of Massachusetts, USA, that there are more than 700 known vocal fish species in the world. It is not only in the tropical waters that these vocal fishes are to be found. More than 40 species exist in the cool waters around Cape Cod, for example, including the toadfish, sea robin and the striped cusk-eel. The cusk-eel produces croaking sounds of between 500 and 1800 Hz, and the toadfish, *Porichthys notatus*, produces a humming noise at 80 – 100 Hz, which is so loud that it can even be heard on the shore. Even the male haddock, *Melanogrammus aeglefinus*, advertises for a mate using a series of increasingly rapid low thumps.

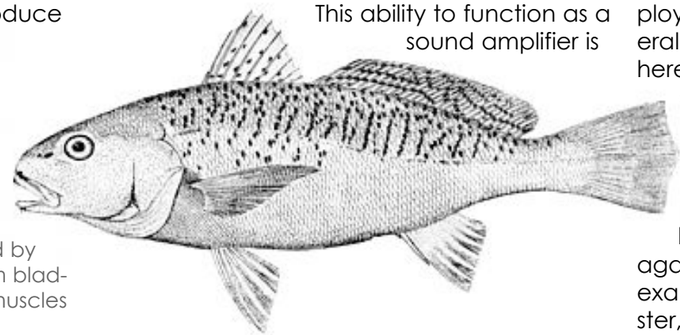
So, all these fish can be very noisy indeed but how do they actually produce their sounds?

Sound production in fishes

Some fish noises from the Croakers (*Sciaenidae*) are made by muscles that stimulate the animal's swim bladder, which then amplifies the sound. The toadfish, mentioned above, rapidly contracts muscles in its swim bladder at 100 times per second to produce the loud humming. Other fish, for example the Grunts (*Pomadasyidae*), grind teeth close to their pharynx, the sound from which again is amplified by the swim bladder.

The swim bladder or, more accurately, the gas bladder, is a gas-filled sac located in the dorsal region of the fish. It contributes to the ability of the fish to control its buoyancy, and thus enables it to stay at a given depth. It also enables it to ascend or descend without swimming, and thereby conserving energy. Fish like the sole, though, who live on the sea bed, don't have swim bladders.

This ability to function as a sound amplifier is



Atlantic croaker, *Micropogonias undulatus*. The croakers and drums characteristically produce a drumming sound by vibrating their swim bladders with special muscles

Most marine invertebrates produce sound by stridulation i.e. the rubbing together of

yet another example of an organ developed by evolutionary forces for one purpose, that of efficient swimming, becoming available to use for another, that of amplification of sound. Gas bladders are evolutionarily related to lungs.

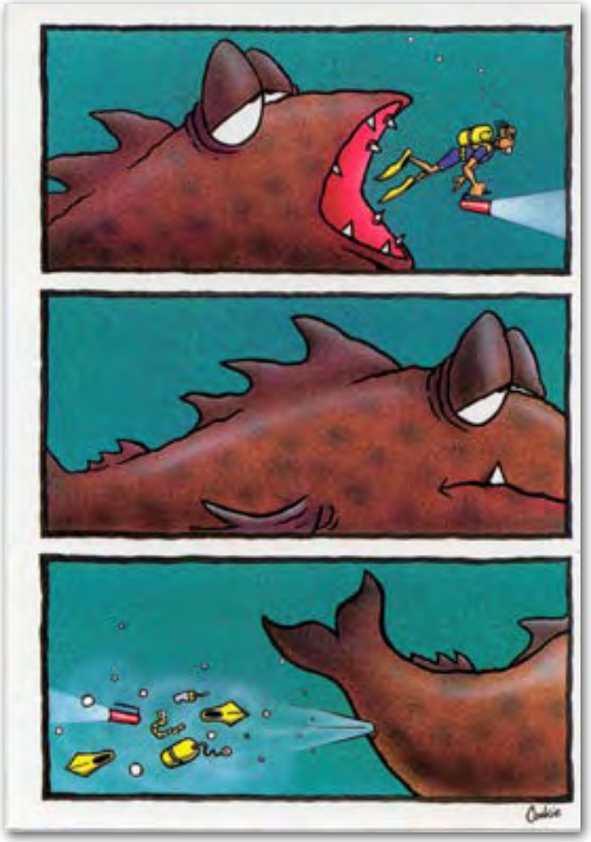
Noisy though the fishes and aquatic mammals are, it is perhaps the invertebrates that are the greatest noise makers of them all.

The noisy invertebrates

Among the marine invertebrates, the crustacea are those that employ strong sound signals in several different ways. We are talking here of the crabs, lobsters, shrimp, etc. Most marine invertebrates produce sound by stridulation i.e. the rubbing together of two parts of the body, just like grasshoppers do on dry land by rubbing their hind legs against the leathery forewings. An example of this is the spiney lobster, *Palinurus elephas*, which rubs its attennae together to produce

SOUTHEASTERN REGIONAL TAXONOMIC CENTER

On another 'note'...



Postcard and T-shirt motif by cartoonist Simon Cooke. Check out his hilarious other designs at **www.thecartoonery.com**

a grating sound. Male fiddler crabs can also produce sound by striking various parts of their body with their enlarged claw, with *Uca rapax* producing rapping sounds at between 300 Hz and 600 Hz.

But probably the most noisy one of them all is the snapping shrimp, which produces sound in a quite different, and unique, way.

Snapping shrimp

The snapping shrimp, *Alpheus heterochaelis*, is a member of the *Alpheidae*, a diverse family, which is distributed world-wide.

There are more than 600 species within some 38 genera. Snapping shrimp are common inhabitants of coral reefs and oyster reefs. Not only do they inhabit tropical and temperate waters they can, like *Betaeus*, also live in cold seas, and even in freshwater caves (*Potomalpheops*). The sounds of the snapping shrimp can thus be heard in many places all over the world's oceans, and is the dominant sound of the background noise. Snapping shrimps are capable of drowning out submarine sonar and seriously interfering with military and scientific sonar used to detect underwater objects. The noise is so great that hostile submarines can use colonies of snapping shrimp in which to hide.

At 30 ms^{-1} (over 100 Km/h), the speed of a jet is so great that it more or less rips holes in the water, forming bubbles filled with low pressure water vapour.

In all species of snapping shrimp, both males and females have one large "snapper claw" used primarily to capture prey. It is this claw, which can be up to half of the body size, that produces the powerful sound. It has to do with the extremely high-speed closure of the snapper claw, which produces cavitation. It is not the sound from the two claw halves clashing together.

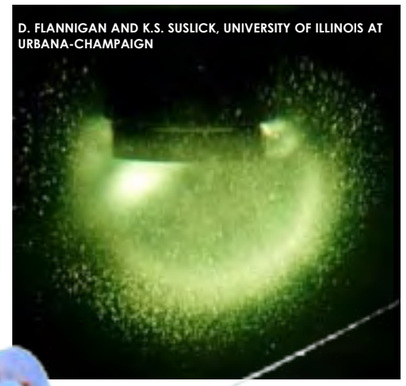
Cavitation

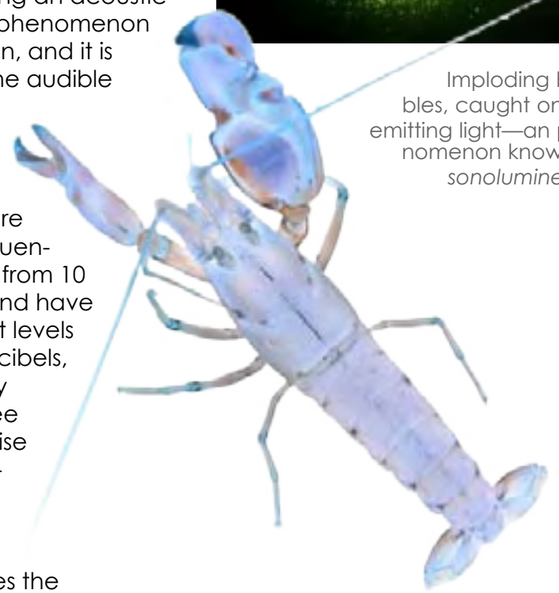
When the snapping claw closes, water is forced out from between the two claws, and a high speed water jet is produced. At 30 ms^{-1} (over 100 Km/h) the speed of the jet is so great that it more or less rips holes in the water, forming bubbles filled with low pressure water vapour.

These bubbles subsequently implode, producing an acoustic shock wave. This phenomenon is called cavitation, and it is this which gives the audible click or snap the duration of which is less than 1 ms. The sounds created are in a range of frequencies of anywhere from 10 to 200 000 hertz and have been recorded at levels as high as 200 decibels, which is extremely loud. However, see box regarding noise measurement under water.

Towards the end of the implosion of the bubbles the temperature of the vapour within the, now very small, bubbles can be up to several thousand K, with a pressure of hundreds of atmospheres. Light, known as sonoluminescence, can also be produced.

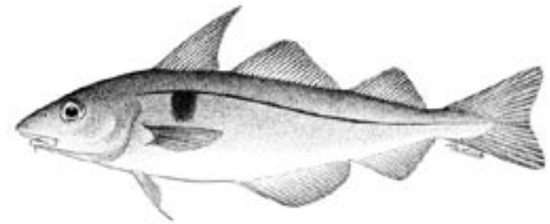
Due to these extreme conditions within the small bubbles cavitation is, in general, undesirable when it occurs in connection with ships, for it can cause serious damage to their propellers and hulls. It is obvious, then, that this is a very powerful weapon for the shrimp, for the cavitation generates acoustic pressures that can stun, and even kill, crabs, fish and worms.





Imploding bubbles, caught on film emitting light—an phenomenon known as *sonoluminence*

Even the male haddock, *Melanogrammus aeglefinus*, advertises for a mate using a series of increasingly rapid low thumps



The decibel

Most people are familiar with the concept of the decibel as a measure of sound levels under normal conditions in air. We seldom appreciate, though, what an extremely sensitive organ the ear is.

A decibel is approximately the smallest change in the volume of sound that can be detected by the human ear.

Humans can detect sound waves of extremely low intensity. The faintest intensity that can be detected by the normal human ear is 10^{-12} Wm^{-2}, corresponding to a sound which displaces air particles by 10^{-11}m. This is an incredibly small amount.

Humans can detect sound waves of extremely low intensity.

In comparison, the radius of an atom is typically 10^{-10}m, i.e. some ten times bigger. This faint sound is called the threshold of hearing and is the internationally agreed upon reference standard for sound perception in air.

The most intense sound, which the ear can detect without suffering damage, is about 10 Wm^{-2}, which is more than a billion times greater than the threshold value.

In the description of sound we use a logarithmic scale of intensities because the sensitivity of the ear is roughly logarithmic. Thus, to perceive a sound as being twice as loud its intensity must be ten times greater.

The intensity level **I** for a sound of intensity I_1 given in dB is therefore given by the equation:

$$\mathbf{I} = 10 \log_{10}(I_1/I_0) \text{ dB}$$

where I_0 is the intensity of the threshold of hearing, and 10 is the conversion factor from bels to decibels.

A decibel is approximately the smallest change in the volume of sound that can be detected by the human ear.

Some typical values for intensity levels **in air** are given below:

Threshold of hearing	0 dB
Whisper	20 dB
Normal conversation	60 dB
Threshold of pain	130 dB
Perforation of eardrum	160 dB

For sound **under water**, a different reference standard is used, which has consequences for the calculation of dB values. It would be too detailed to go into here, but it can be shown that to convert from water into air simply subtract 62 dB from the value in water. So, 200 dB in water would be equivalent to only 138 dB in air which, however, is still well above the pain threshold. ■

PETER SYMES

Fish are known to call out to potential mates with low "grunts and buzzes", produced by wobbling the swim bladder, which is located in the abdomen

A very useful tool

Although the snapping shrimp is the noisiest of them all, contributing to up to 70 dB to the ambient noise level, other crustacea can also use cavitation as a tool. An especially interesting example is the tiny peacock mantis shrimp, *Odontodactylus scyllarus*, which uses cavitation to help break open snails. It first hits the snail with a great force using its front leg, and then half a millisecond later cavitation finishes the job. (See S. N. Patek and R. L. Caldwell, *Extreme impact and cavitation forces of a biological hammer: Strike forces of the peacock mantis shrimp Odontodactylus scyllarus* (2005). Journal of Experimental Biology. 208 (19), pp 3655-3664)

Snapping shrimp use both the water jet and the powerful noise the bubbles make not only to stun prey but also to defend territory and communicate with other shrimp. The force with which the bubbles collapse is so great that prey such as worms, fish or crabs are injured by the powerful blast. Snapping shrimp can also communicate through highly sensitive hairs on their claws that can sense pressure changes caused by the bubbles.

Due mostly to the snapping shrimp, coral reefs are very noisy places. It has been found that this noise, which can be heard many kilometres away, helps young fish find their way home from out in the ocean. Larvae of the cardinal fish and the damsel fish, for example, get carried out to sea by ocean currents. After growing and becoming good swimmers they can then head back to the reef by following the noise.

Other subsurface noise makers

There are many other marine creatures that contribute to the background noise of the oceans. Even the charming seahorses (genus *Hippocampus*) rub two bones together near the top of their heads to give a clicking sound. This behaviour is probably some sort of mating ritual.

As exemplified by the mussel *Mytilus edilus*, barnacles and other molluscs can produce noise when the byssal threads, which attach the mussel to a hard substrate, stretch and break. However, like the sounds from many other creatures, such as the sea urchins, these appear to be contingent noises without any apparent function either as a tool or for communication—although, of course, we can never be sure.

Problems with anthropogenic noise

Like the 'cocktail party effect' where, in spite of the great ambient noise from other peoples' conversations, one can pick out quite clearly what your neighbour is saying, marine animals can sift out the signals that are important to them from the background noise.

However, the increase of noise pollution is having an effect on aquatic creatures. It can disturb their ability to find food and also to find a mate; and it can also cause stress like that induced in humans in an ever increasing noisy society.

Although this noise pollution arises from many different sources much could be done to reduce it. The noise from the propulsion systems of large tankers, could be reduced by using different propulsion systems, for example. And more care could be taken when developing and utilising sonar and similar systems for military purposes. Such developments cost money, of course, a great deal of money. The question is: are we prepared to pay the price to preserve the health of one of our most important resources—the species living in the oceans?

One would hope so, but it is difficult to be optimistic. ■

Byssus threads are long fine silky filaments excreted by several mollusks (particularly *Pinna nobilis*) by which they attach themselves to the sea bed

STEIN JOHNSEN

By
Arnold Weisz

Saving the

Cold Water Coral Reefs

While We Can

Different conservation groups have the last couple of decades brought our attention to the destruction of the world's tropical coral reefs. These reefs are visited by millions of tourists and are the livelihood for many more millions of people. However, some of the largest coral structures in the world are found in the cold and gloomy waters of the deep-sea. These are also under increasing threat.

Over the last few years, cold water corals have been discovered all around the world. These reefs are often found in deep water, which means they are inaccessible to all but scientists. Cold-water corals, just as their warm-water relatives are under serious threat. These mysterious and generally deeper living than their better known warm-water cousins in the tropics, are far more widespread and numerous than had previously been thought.

Cold-water coral findings are not confined to waters in the northern hemisphere off places like Canada and Scandinavia, as many would think. Scientists have found thriving cold-water corals in waters off the coasts of more than 40 countries including Spain, Surinam, Brazil, Angola, Indonesia and the Seychelles.

Man-made threats

It seems odd that corals, which usually are found at depths between 200 and 1000 metres, should be in danger. In contrast to the shallow reefs in the tropics, deep water reefs are not directly threatened by, for example, tourism or pollution. The biggest threats to these deep cold-water reefs are still man-made, as most of them show signs of damage from heavy deep-sea fishing gear. Pipelines and petroleum exploration also poses a threat to these delicate reefs. As oil prices and profits are on the rise, and the world gets ever hungrier for oil-based products, the search for more oil is increasing. This will put a further strain on many coral reefs, both in cold and tropical waters. Warm-water coral reefs have a recreational value, too, for example, for scuba divers,

Deep water crab

NIWA

Scouring marks from trawl on the seabed

and are often a good source of income for poor nations, by providing a focus for tourism in their area. Cold-water reefs also have economical value. They are important to fish stocks, and therefore, to the fishing industry, which makes it self-contradictory to continue with the use of destructive gear, for example, bottom trawlers. Both warm and cold-water coral reefs are important feeding grounds for fish, and provide habitat for numerous marine creatures.

Protected

Norway was the first country to implement protection measures for cold-water corals in European waters. In Norway, especially large amounts of the cold-water coral *Lophelia* have been detected. The presence of coral reefs along the Norwegian coastline has been known for quite a long time. The existence of these deep-water coral reefs has been known for centuries both by Norwegian fishermen and scientists, but it was not until recently that the scientists and the government became aware of how widespread and large the reefs were.

Some of the cold-water coral

USGS

Closeup of Landsat image showing mud trails from bottom trawling off the Louisiana coast

Cold water corals grow very slowly and are just as vulnerable to environmental impact as their tropical cousins. Human activities, such as trawling in the fish-rich reefs, have already left their mark and have devastated many coral assemblies before scientists have had a chance to assess their full distribution and ecological role

reefs are huge structures. The largest Lophelia reef, which was discovered in the North Atlantic, is on the Sula Ridge off the coast of Norway. This reef is more than 13 km long, 15 metres high and up to 400 metres wide.

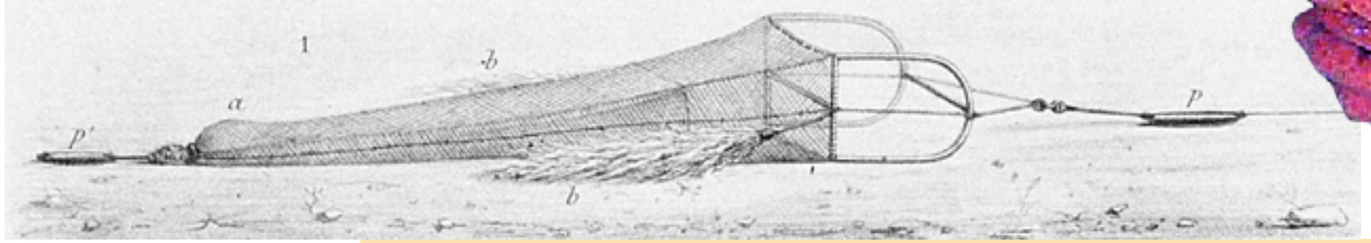
Research on deep-water coral reefs by the Institute of Marine Research (IMR) in Norway started with a pilot project in 1997 to test methods for detection and mapping of the reefs. They have documented that about 30-50 percent of the Lophelia reefs in Norwegian waters have been damaged or impacted by trawling.

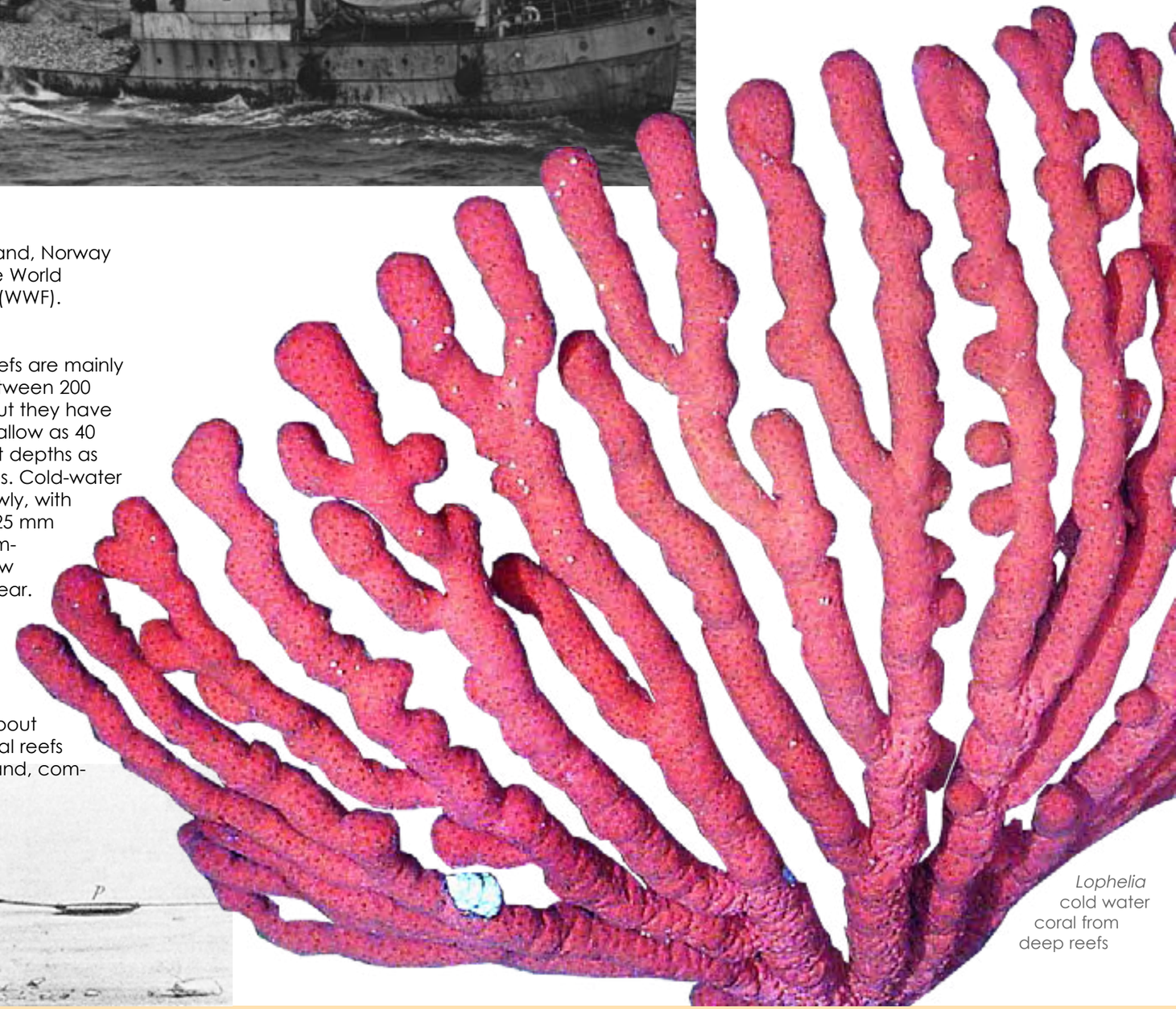
The rising awareness of the necessity to protect the cold-water reefs has reached international organizations, and the movement has gained momentum. The International Coral Reef Initiative (ICRI) arranged its third symposium on deep-sea corals in December 2005. These ongoing scientific missions have shed light on the global significance of this overlooked ecosystem. The symposium and other gatherings of scientists will help foster exchange of information and research results about the deep-sea cold-water coral reefs. In addition, the UN has engaged in work of protecting this valuable resource.

In 2003, the UNEP Coral Reef Unit (CRU) established a cold-water coral reef initiative with the governments of Ireland, Norway and the UK, and the World Wildlife Foundation (WWF).

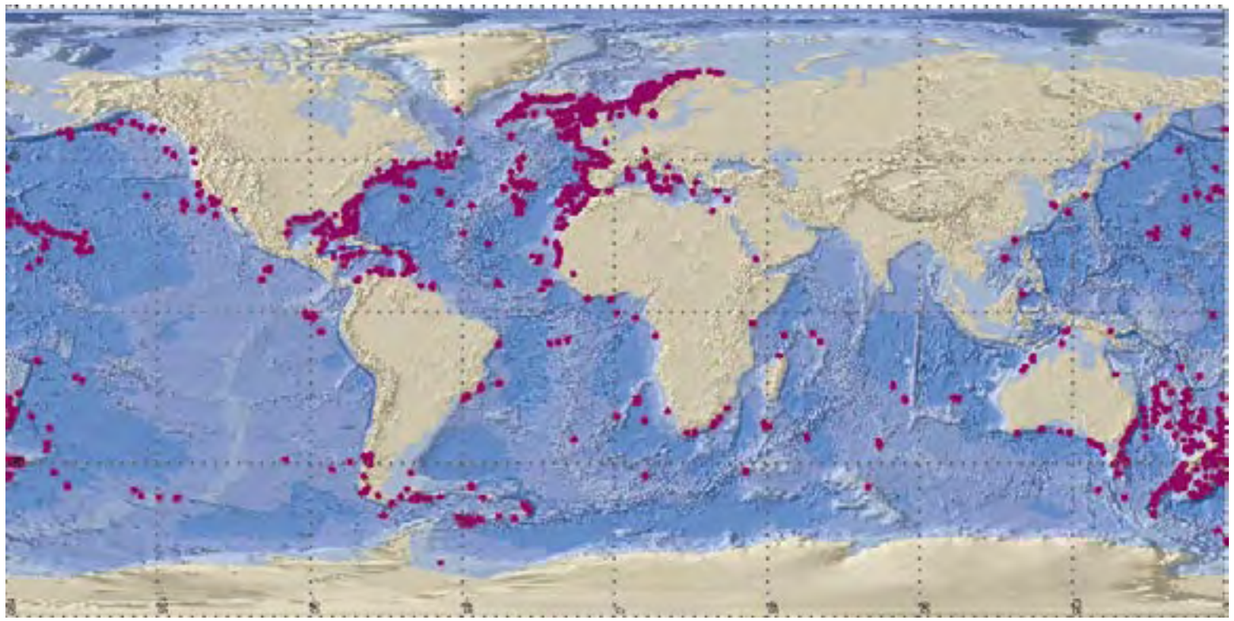
Slow builders

Cold-water coral reefs are mainly found at depths between 200 and 1,000 metres. But they have been located as shallow as 40 metres, and in great depths as deep as 6300 metres. Cold-water coral reefs grow slowly, with a growth rate of 4–25 mm per year, while warm-water reefs can grow up to 150 mm per year. Additionally, the composition of the cold-water reefs consists of only a very few reef building species—only about six. Warm-water coral reefs are, on the other hand, com-





Lophelia cold water coral from deep reefs



Global distribution of cold water reefs (as of 2004). The maps shows where reefs have been identified, but the red dots do not refer to actual size or stage of development of each reef

posed of up to 800 different species. Cold-water corals do not possess symbiotic algae as their counterparts do that live in the shallow reefs, which are exposed to sunlight. These corals feed on plankton and other organic matter. Even though they are out of reach of the sun, the cold and gloomy waters of the deep ocean are not void of living creatures. In addition to fish, crustaceans, fish, sea urchins and brittle stars also form a part of the rich and diverse community, which thrives on cold-water coral reefs. ■

SOURCES: UNITED NATIONS ENVIRONMENT PROGRAMME (UNEP), INSTITUTE OF MARINE RESEARCH (IMR), NORWEGIAN FISHERIES AUTHORITIES

NOAA / MARK AMEND

What is cold-water coral?

Cold-water coral reefs are similar to coral reefs in tropical seas except that they don't need sunlight to survive and so can live in the depths of the North Atlantic Ocean. Unlike their tropical relatives that mainly rely on microscopic algae in their tissues for sustenance, cold-water corals feed by capturing food particles from the surrounding water.

Lophelia pertusa is the most common cold-water coral species and is formed by a colony of organisms called polyps that produce a hard carbonate skeleton. It is normally found at depths of between 200 and 1000 metres.

On average the coral structure grows at the rate of 1mm in height per year, and the highest reefs found so far have been measured at an impressive 35m at Sula Ridge off the Norwegian coast. Reef structures take centuries to form and fragments taken from the reef at Sula have been dated as being 8500 years old. ■

SOURCE: ICES

Medical

David Colvard, M.D.

PETER SYMES

Peer Pressure, or Disappear Pressure?

"No, David, I'm not diving five hours before we have to fly back!"

Most of us have had the experience of being on a dive boat, or standing at water's edge, with a buddy who turns to us at the last minute and suggests that we do something marginally appropriate—photograph each other jumping in full scuba gear off Oil Slick Leap, or going down to the bottom of the reef "just for a minute."

At those moments we are subjected to "peer pressure", which is the social leverage that we feel when someone pushes us to behave in one direction or another. Usually, if we feel a good connection and a sense of balance with the other person (or persons) we are able to have our judgment override the social pressure—"No, David, I'm not diving five hours before we have to fly back!"

But sometimes, particularly when we are feeling a need to prove ourselves or need a sense of approval, it becomes more difficult. Typically, when people think of peer pressure, they are referring to the influence exerted on an individual to engage in "anti-social" (BAD!) behaviors. Peer pressure is often cited as the culprit in smoking, drinking, drug use, dangerous sexual behaviors and eating fast food.

But, there are also "pro-social" (GOOD) forms of peer pressure. For instance, good pressure includes dive buddies or groups who insist on consistent use of precautionary decompression (safety stops), have good reef hygiene, and observe good hydration. The pressure exerted by the group has often made me a safer and more ecologically friendly diver than I might have otherwise been.

How should you deal with peer pressure to engage in risky activity?

Probably the best advice is to dive regularly with a buddy with whom you are comfortable, and who dives at about your skill level. If you are very inexperienced, then diving with or near a divemaster is probably the best idea anyway. If you find yourself having regular concerns in this area (or haven't yet found a set of good dive buddies), taking part in professionally organized activities is a good idea. Dive professionals will insist on things like good reef hygiene, safety stops, and good dive profiles. If you are a woman who has been introduced to diving by a male partner who frequently presses you to move beyond your level of comfort, consider finding another partner with whom to dive, or suggest that your partner dive with another aggressive diver.

Dive professionals will insist on things like good reef hygiene, safety stops, and good dive profiles

Several years ago, I came to Bonaire with my wife (who had become pregnant just before the trip) and another couple. He and I dove often and enthusiastically, sometimes by ourselves and sometimes with his wife. My wife and I took frequent snorkels on that trip (1000 Steps was her favorite) and everyone was happy.

I have another dive buddy (who shall remain nameless, although his name usually appears on this column) who has a hard time finding buddies who will dive frequently enough to satisfy him and whose wife often refuses to accompany him when he goes on dive trips!

In reality, peer pressure in diving is similar to the effect that most people feel about drinking, smoking and eating hamburgers.

The final answer is always;

"Get better peers." ■

For more information, please visit ***www.divepsych.com***

An online survey done by David Colvard, MD, in 2004, found that 4 percent of women divers (of 413 female divers polled) and 2 percent of male divers (out of 1415 male divers polled) had experienced a negative encounter with peer pressure.

Most of these experiences fit the "Hey, let's…." category, where a buddy (or a group of buddies) pressures someone into taking part in a dive-related activity that was marginal or worse.

The data suggested that for men, the pressure seemed to be related to competition.

But for women, it was related to pressure to accompany their dive buddy on an activity that the buddy was already comfortable with. These last interpretations are largely speculative, but do make sense. ■

ALL PHOTOS COURTESY OF THE MANUFACTURERS OR VENDORS

POINT & CLICK
ON BOLD LINKS

Fall Dive Fashion

Dive 44 is an apparel company which seeks to promote a positive image in the diver's mind about the amazing world beneath the waves. They say, "Diving is an attitude and a lifestyle as much as it's a hobby or profession." Dive 44 designs can be worn on boats, at the beach, or in the mountains. The popular boat coat is priced at US$150.00 **www.dive44.com**

Combhard

Neoprene Design creates stylish neoprene jackets and bags. The company was founded in 1996 by designer Thomas Renaud in a small garage in Biorritz located in the Basque Country of south western France. Renaud's designs are now selling in New York City and major European cities. Combhard also creates designer pieces such as sofas and furniture, wine bottle jackets and neoprene party and evening dresses. **www.combhard.com**

No Gills Required

Limited edition 100% silk jacquard tie reminds us of the deep. The design is inspired by the underwater photography of Walt Stearns. Vibrant ocean colors are enhanced by the jacquard wave pattern of the fabric. An eye-catching conversation piece. Price: US$19.95
www.nogills.com

Dive Fashion

Henderson Hot Skins

With a toasty layer of Lycra®, these rash guards by Hendersen are some of the warmest in the industry according to the manufacturer. The skins help prevent UV, sun burn and rashes from activities in and around the water.
www.hendersonusa.com

Fourth Element

With each sale of the 100% cotton Shark Art and Shark SOS t-shirts, £3 will be donated to the Shark Trust and related shark conservation projects. Price: GB£19.95 LEFT: Shark SOS on Denim. CENTER: Shark Art on Slate. RIGHT: Water Nymph on Red.
www.fourthelement.com

Dive Junkie

The DJ Star is a tube top, popular design that is now is available in new stylish colours including fresh White with Gold foil print, hot Pink with Silver foil print, Island Green with Yellow flock print, or Army Green with Orange flock print. **www.divejunkie.com.sg**

Chammyz

Wrap Skirt is a quick and easy aprés dive cover up for women. Added comfort and size adjustment results from an elasticized waist and buttons on the side. The wrap skirt can be worn over a bathing suit, work out gear, or for those leisurely walks along the beach at sunset. Comes in several colours: Storm Gray, Natural Sand, Surf White, Sunset Red, Seaform Green, Sunrise Gold, Denim Blue, Ocean Blue, Deep Purple and Midnight Black. Price: US$25.00.
www.chammyz.com

Seven Tenths

The classic Zen Wave design printed on a premium heavy-weight T-shirt of 100% ringspun cotton with taped seams, comes in a new colour this season: Misty Green. It also comes on a new Skinnyfit Tee for women. Price: €29.25
www.seventenths.com

Dive Fashion

Dive Dive

Large orange Braille print on black Fruit Of The Loom shirt, says "Dive Dive!" You might like the band's music, too. Price: GB£10.00
www.divedive.co.uk

GirlDiver Sox

Just Jellies and Octo's of the Night. All ankle socks are 100% cotton. Jellyfish dance across a black backdrop of the deep sea in one pair. Pull on the other pair, and brilliant octopuses wrap around your ankles and feet. Price: US$8.00. **www.girldiver.com**

Scuzzy

Cool designs. The Five Star Long Sleeve T-shirt has a charcoal body with combat sleeves, 180gm Ringspun Cotton Body, 230gm Rib Arm charcoal. The logo has a high build rubberized print and combat print to match sleeves. Price: GB£17.50.
The Seahorse T-shirt has a green body with dirty yellow raw edge hems, white print on sleeve and back, 160gm Cotton Jersey. Price: GB£14,99
www.iamscuzzy.com

Designated Diver

Sportswear, a leading designer of Dive and sports apparel, expands their popular SEA BONES™ line by introducting many new designs, such as SHIP HAPPENS as shown here. Their entire collection will be featured at DEMA 2007 and can also be seen at
www.designateddiver.com

Fathom Divewear

The Black Mark 5 Helmet Tee is a 100% Cotton Tee with Mark V helmet printed in Copper ink and the Fathom Logo in Tan on left shoulder. Price: US$21.50
shop.fathomdivewear.com

"The problem is with the high expectations that tourists have"

Sharks In Class

Are they learning to link people to food?

Shark tour operators in Gansbaai South Africa hosted a Great White weekend festival to persuade the local population that there is no proven link between attacks on humans and the cage-diving industry.

The local population were given the chance to cage-dive or view the sharks from the safety of the boat at discounted prices. For younger customers, there was a shark play hosted by conservationists on shore.

The Great White has made Gansbaai, its operators and shark wranglers famous. I myself have seen the transformation shark tourism has brought. Great Whites have created job opportunities and wealth creation beyond what Gansbaai could ever hope to aspire without these sharks. This, in turn, has raised the profile of this much misunderstood animal and helped bring about a better understanding to the population at large.

Though critics of the cage-diving industry argue that the close interaction between the caged divers and sharks in chummed and baited waters condition the sharks to associate people and food, but the boat operators follow a code of conduct which states that an animal must not be rewarded with food. A number of operators have admitted, though, sometimes the shark gets the bait by accident.

Although one person is killed on average only every two years by a shark in South African waters, experts argue this is indexed in proportion to how many people are swimming in the ocean, and not linked to the cage-diving industry, though a number of locals and South Africans do blame the cage-diving industry despite a lack of evidence to support their claim.

"The problem is with the high expectations that tourists have," said Alison Kock of the University of Cape Town's Shark Research Unit. "They are not happy with just seeing the sharks, but want them to leap out of the water or go right against the cage. Great Whites don't regard people as natural prey." ■

Dead Sharks on Oregon's Shores

Several juvenile sharks have recently washed up onto Oregon's shores during this summer, though researchers are uncertain why.

Reports of dead sharks washing up on the shores first surfaced in mid-August. One theory is that warmer water has lured tuna and other bait fish closer to shore, with the sharks following in hot pursuit. When a shark dies in the open ocean, other predators and scavengers consume it, but if through natural selection these sharks are dying from nothing more than natural causes near to the shore, then their remains are likely to be washed ashore creating a false alarm.

"I've had more reports this summer than I've had since 1993," said Bill Hanshumaker, Public Marine Education specialist at the Hatfield Marine Science Centre. "There have been reports from California of dead sharks testing positive for encephalitis, which can be caused by ether viral, bacterial, or protozoan infections," said Jim Burke, Director of Animal Husbandry at the Oregon Coast Aquarium.

The body count to date is seven, the sharks are usually reported as Great Whites, but usually turn out to be juvenile Salmon sharks, which do look similar to a Great White. With Salmon sharks giving live birth close to shore, it is not uncommon to see newborn sharks washed up ashore. "This year there definitely have been quite a few more than usual. It's hard to tell if there have been more born or if there is something that has gone wrong." Marine experts at this moment are concerned and watchful. ■

Equador: Hundreds Slaughtered to Win Votes

Since a ban on the sale of shark fins was lifted, hundreds of sharks are being slaughtered on a daily basis off the coast of Ecuador. The bloody image of shark fins piled upon the piers has triggered a political row with two opposing camps emerging; the government, who lifted this ban, and the fisherman against what seems like the rest of the country!

"It is a big mistake. More than 400 sharks are being caught every day—that changes the whole food chain," said Esperanza Martinez, spokesman of the Ecological Action.

Rather depressingly, some estimates are up to 1,000 sharks being caught and finned per day.

Illegal or what?

Though shark fining remains illegal in Ecuador, the President, Rafael Correa, legalised the sale of shark fins that were caught accidentally, arguing the extra income would help impoverished fisherman. Mr Correa, a left-wing economist was elected to office on the promise of alleviating poverty. With no clear way to determine when a shark has been accidentally or intentionally caught, the fishermen have taken this move as a green light to kill as many sharks as they can within Ecuador's waters.

An ominous sign of things to come was the return of two tonnes of illegally caught shark fins, caught by local fishermen, that were confiscated by police prior to the ban being lifted. Each fin can fetch up to $100—a huge sum to subsistence fishermen—though the price has fallen due to a glut on the market! The world just may be changing to become a better place, leaving countries like Ecuador as environmental pariahs.

In the previous Sharktales, an article "The Plight of the Whale Shark" stated depressing figures on the decline of Whale shark numbers within the Pacific Rim with Whale sharks only enjoying protected status in Australian and Taiwanese waters.

Diplomatic issue

After media reports aired news of a six metre Whale shark being caught by Zhejiang fisherman and sold for $8 per kilo to resteaurants, the Western Australian Premier Alan Carpenter wrote to his counter part Lu Zushan, governor of the Zhejiang Province. The Premier expressed the affection Australians have for Whale sharks and the protection these sharks enjoy. To his, and our delight, an investigation has been launched into the death of this shark, and local fishermen have been ordered to immediately release the captured whale shark and report to the local fishery administration. In addition, an education program to educate the local population will soon be in place.

Furthermore Governor Zushan is now considering adding Whale sharks to the provinces list of protected species. ■

Marine Protection Zone to Save Sharks

Record Number of Basking Sharks Visit UK Shores

A record number of Basking sharks have been spotted from the shores of Cornwall, most likely caused by late plankton blooms, which has led to some spectacular sightings off the English coast. With a record 460 spotted in one day, this mass migration of sharks so close to shore has also brought unexpected tragedy.

One shark died after being caught in fishing nets, and another had two fins sliced off by a speedboat, which was ferrying passengers to observe the sharks.

These two tragic incidents have led to renewed calls from the Marine Conservation Society for protected marine reserves to be installed along the coast. First promised in 2005, this Marine Bill has yet to make it to the statue books. "It has not been given the high priority it deserves," said Emma Rance from the Dorset Wildlife Trust's Purbeck Marine Wildlife Reserve, who is urging people to sign the Petition Fish to be presented to the House of Commons on October 10. ■

AQUARIUM OF THE BAY

The tiny new-born angel shark pup from Aquarium of the Bay in San Francisco

First Angel Shark to Be Born In Captivity

Aquarium of the Bay in San Francisco just announced the first-ever Pacific angel shark pup to be born in captivity. The pup is just 23.5 centimeters in length and weighs 125 grams.

The Aquarium of the Bay is the only aquarium in the United States to consistently exhibit angel sharks, which are known by the scientific name *Squatina californica*.

"With so much attention focused on great white sharks, many people are unaware of the lesser known species of sharks that live in the San Francisco Bay and surrounding waters," stated John Frawley, the Aquarium's executive director. "Since very little data is available on these sharks, Aquarium of the Bay is focusing its field projects and collaborative research on gaining a better understanding of their life cycles and distribution patterns. We have recently embarked on a shark tagging program that will help us better understand how sharks fit into the Bay's ecosystem, and what actions need to be taken to ensure they thrive."

Named for their large wing-shaped pectoral fins, angel sharks have flattened bodies and grow to five feet in length. Their gray, brown and black coloring blends with the sandy and rocky Bay bottom in which they bury themselves to ambush their favorite prey: fish, crustaceans and mollusks. Angel sharks, like many other sharks, are ovoviviparous, and give live birth to litters of up to 13 pups.

"The high quality of care we provide to our animals is the key to our successful breeding programs," noted the Aquarium's director of husbandry, Reid Withrow. "The achievements we've made in this area have enabled us to donate hundreds of skates, skate eggs, jellyfish, surf perch and pipefish to public aquariums and educational institutions each year. We are now breaking new ground with the birth of the angel shark pup." ■

SOURCES: NEWS RELEASE ISSUED BY AQUARIUM OF THE BAY

File-photo. Adult angel shark

STATE OF CALIFORNIA. RESOURCES AGENCY OF CALIFORNIA DEPARTMENT OF FISH AND GAME

Edited by
Peter Symes

Text and photos by
Svetlana Murashkina

Mr Seacam

Cleared for take-off

It is an old wisdom that when you think of buying a car, a house or dive equipment, for that matter, one should take a look at who the seller is. This approach has served me well in buying the cars I have had. There is always some of the personality in the product. So when I went to did the story on Seacam, I couldn't help also being intrigued by what the founder and owner was like. Somewhat out of character for an Austrian, Harald Hordosch does not ski. Nor does he dive much for a maker of underwater camera housings, but he pilots his own Cessna, which takes him to the many European dive shows.

When we discussed my visit to Seacam productions, Harald Hordosch cautioned me: "Please, do not expect big workshops, assembly lines and women dressed in white overalls making delicate manufacture. Yes, we are small, but, I hope, effective."

In workshops located in Voitsberg, a small town of about 20,000 situated about 30 km from the city of Graz, Seacam takes care of all the key stages of the production under one roof—from conception to the final product.

In Voitsberg, far from the ocean, is where some of the finest underwater housings in world are manufactured

Translation: "Allowed to fly", or in other words, "cleared for take-off"

manufacturer

Mr. Seacam, the nickname Harald Hordosch goes by, is obviously an effective organiser—he likes to put bits of knowledge together and fit them into a bigger context—organizing it into the whole work process. It shows. He is good at it. Nobody thinks of underwater housings as just simple hermetically closed boxes. But even for specialists, it is difficult to fully comprehend how many components goes into just one 'box', and what a complex device an underwater housing really is.

The first ideas initially take form in drafts and sketches. Nowadays, it is all done with the aid of computers, of course. These first plans are then transformed into physical models, which are cast in a special aluminum alloy, which is resistant to corrosion from salt water. These raw casts are then thoroughly examined before being sent to an outside company who will machine all the necessary holes and what not. The final polish of both outer and inner surfaces is taken care of in their own workshop, where they are also covered with a special coating that gives the surface its characteristic silky spattering. Harald Hordosch used to do this part, too.

Then, the house is fitted with electronics, and the various small components, such as buttons, handles, knobs, levers, cogs and wheels. Many of these components are used across several of Seacam's models. But the majority of the housings and their connections are unique. So, it is not without merit when Seacam claims that their housings are individual and handmade products, "made in Austria".

The role of personality in history

It is not surprising that diving equipment is produced in France and Italy, both of which do not have long coastlines where people can dive. So, why are underwater housings, perhaps the most in demand piece of equipment, located in Austria—landlocked in the middle of the European continent? Because it was here, in Graz, a boy was born, who, being inspired by Cousteau movies, manufactured his first underwater housing at the age of 16.

In his childhood, Hordosch spent a lot of time with his grandfather who was a smith—a man who was not only a respected professional craftsman, but also a person who was capable of doing many things with his hands.

One thing lead to another, and Hordosch also started making housings for his friends. He ending up being so good at it that one day his friend and acclaimed photographer, Herbert Frei, spurred him on to make a business out if it.

And thus, in 1989, the Seacam company came into existence. For starters, it was a one-man operation. Yet, the brief history of Seacam has been very dynamic. Seacam attacked a whole front of the industry, with both new housings for cameras and all the accompanying paraphenalia, such as lights and ports, accessories.

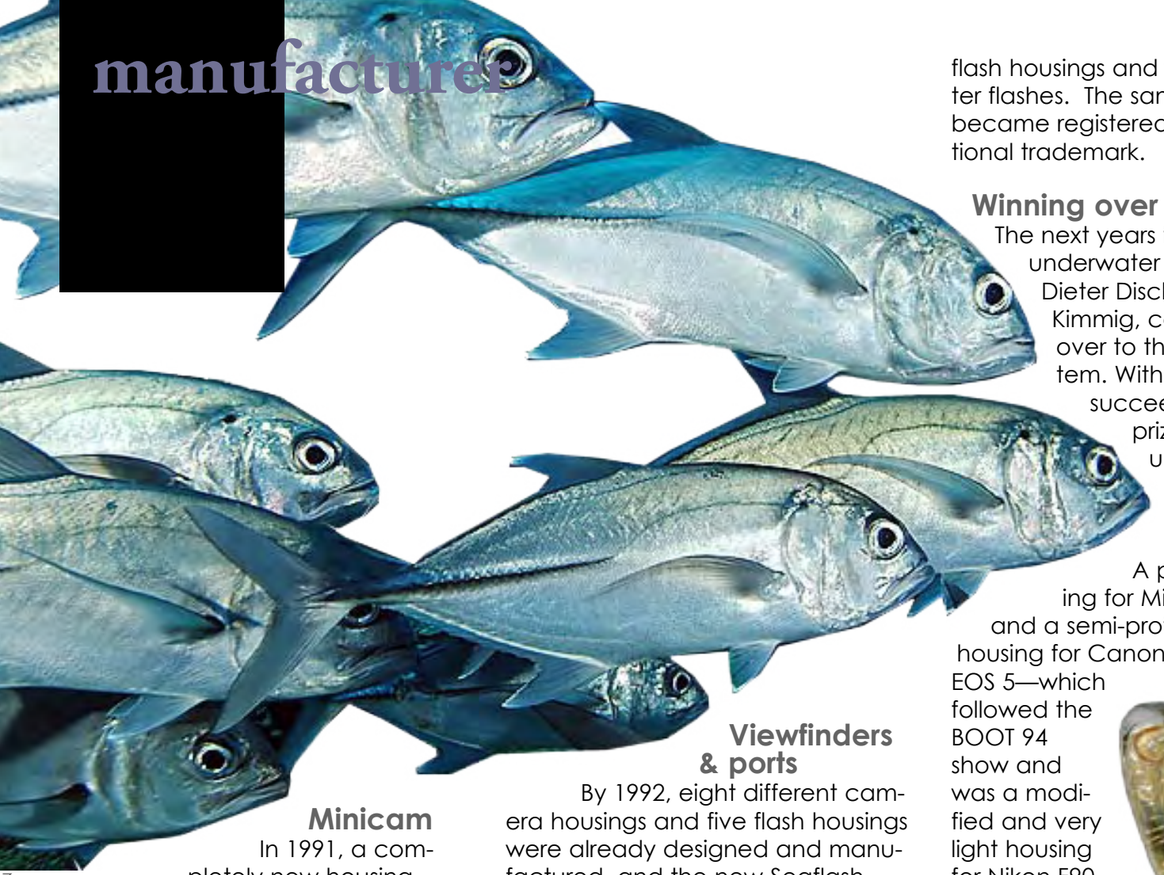
The first production series was simple aluminum housings with integrated hand grips for Canon, Minolta and Nikon all branded under names like Sea Snap, Sea Flash, Sea Arm. These were entry level housings aimed at unproblematic underwater photography.

In 1990, Seacam attracted attention via advertisements and a test report in a German UWF magazine. The review of the first series as well as the presentation of the futuristically styled housings at BOOT '90 dive expo (the leading European boat show, which also presents diving) aroused public interest. At first glance, the Seacam housing looked like a device from outer space.

It probably also helped that Seacam saw the potential in hiring the leading media agency "Lackner-grafik" to design its public profile and advertising. The owner, Erwin Lackner, is member of acclaimed art group Gruppe 77 in Graz.

In the first brochure for their product range, Seacam already had two different housings for five camera models, one flash housing for three system flashguns including accessories, as well as several interchangeable ports of mineral glass, and a flash arm. Then came the second employee (after Hordosch himself), then the third. During the whole process Hordosch' senior, Harald's father, was of invaluable assistance. At first, his father was rather skeptical of the whole enterprise, but continued to assist his son in putting his ideas on paper and drafts. By a twist of fate, he ended up being fully occupied with the production process.

manufacturer



SCOTT JOHNSON

Minicam

In 1991, a completely new housing concept named Minicam was introduced. The housings were very small and tailor-made for the specific cameras, complete with all the important connections and a high quality interchangeable port system with flat and dome ports made of optic glass as well as a removable hand grip. The housings were offered for Nikon F 801, Minolta Dynax 7000i and Canon EOS 600, which already have special housings.

Miniflash

A new invention was the Miniflash system—a flash housing with an integrated pilot light. Designed for system flashguns, these housings allowed independent work underwater for the first time.

Seacam appeared at the BOOT expo in 1991 with a booth of their own, and since then, have occupied the same central space on the show floor.

Viewfinders & ports

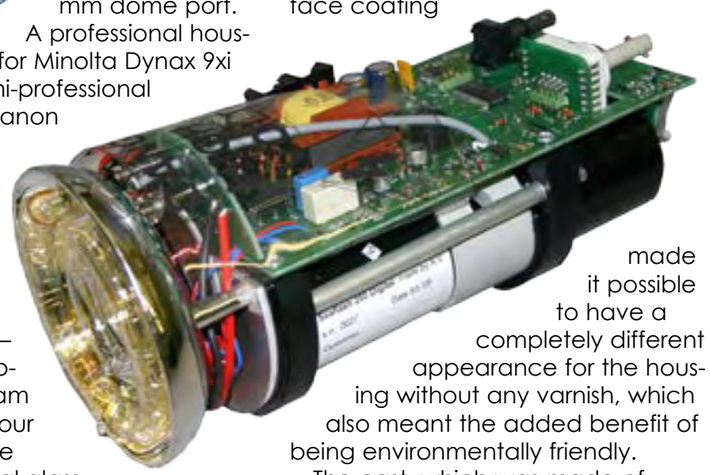
By 1992, eight different camera housings and five flash housings were already designed and manufactured, and the new Seaflash was presented to the public. Here, Seacam relied on the tested and reliable electronics of Subtronic, the renowned flash manufacturer. The cooperation between the two companies has lasted to this day.

Then, the housing, which was neutrally buoyant underwater, was constructed. On the basis of a now forgotten assistant viewfinder, a new and considerably improved viewfinder, the Galilei, was created, which sat firmly integrated into the housing. Units that were equipped with such a viewfinder were named MinicamPro. At this time, the range of ports was expanded by a fisheye port of mineral glass.

In the beginning of 1993, Seacam presented a semi-professional housing for the Nikon F90. Canon received new housings for EOS 10 /100 /1000. The product range was comprised of 13 different special housings for cameras, three system flash housings and three underwater flashes. The same year, Seacam became registered as an international trademark.

Winning over the pros

The next years the two top underwater photographers, Dieter Disch and Claus Kimmig, converted entirely over to the Seacam system. With this, Dieter Disch succeeded in taking prize-winning over-under photos with a specially designed 240 mm dome port. A professional housing for Minolta Dynax 9xi and a semi-professional housing for Canon EOS 5—which followed the BOOT 94 show and was a modified and very light housing for Nikon F90—were also introduced. Seacam now offered four different dome ports of mineral glass for wide angle photos.



Superdome

1995 saw the patenting of new Flasharm. Also the entirely new, especially safe and maintenance-free S6 connectors, and the unique optically polished Superdome with 240 mm in diameter were also presented.

In 1996, Seacam introduced the ultra light weight and still smaller houses for Nikon F90x, F801s, F601, F70 and F50. From this moment forward, plane ports and all dome ports became available with optical coating for considerably improved pictures.

"As if it has not even been touched by a shrimp"

Silver age

From the very beginning, the company has made customer and after sales service one of its tenets. All housings sold in Europe get serviced here, and there are only three other service workshops worldwide. Two of the other places are in USA and one is in Singapore.

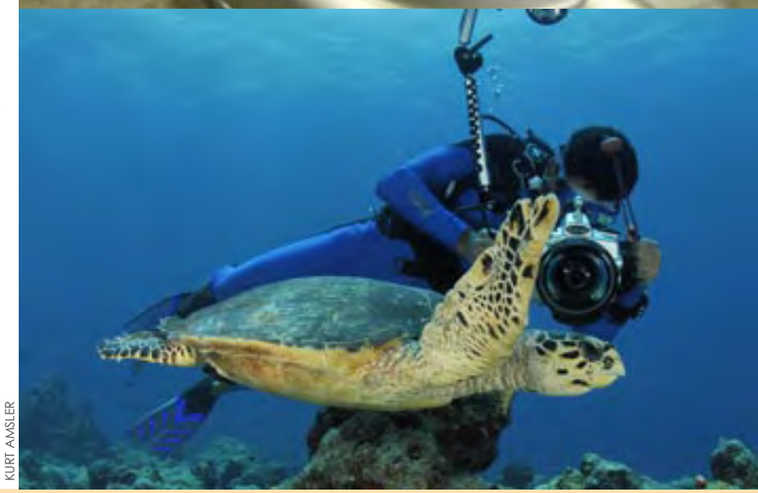
Sometimes people brought housings back for service with chipped paint—an ugly sight that did not please the perfectionist, Mr. Seacam, Hordosch himself.

Out of this issue, came the idea for the now characteristic silver coating. New technology of applying surface coating made it possible to have a completely different appearance for the housing without any varnish, which also meant the added benefit of being environmentally friendly.

The cast, which was made of aluminum, which is resistant to salt water corrosion, was covered with special ceramics and baked creating a surface that was more resistant to both corrosion and mechanical damage. Some of these silver housings, when brought in for service, were hardly distinguishable from new ones—"as if it has not even been touched by a shrimp" said Hordosch.

The signature silver color also has other benefits. Being a natural color for fish and marine animals, it does not intimidate them. The color is also elegant and associated with high-tech.

The new design and silver generation of housings were presented at the BOOT 97 show. On display for the first time were housings for the



KURT AMSLER

Canon EOS 1N and the Minolta Dynax 700si. The most interested visitors could also take a look at the pre-production housing for the Nikon F5.

Innovation

Later, a groundbraking innovation, the first swivelling 45° sports viewfinder cameras were presented. The viewfinder image was bright and showed the image in real size. In 1998, Seacam introduced the real professional housing for the Nikon F5 generating worldwide attention. In the following years, Seacam also developed a semi-professional housing for the Nikon F100, which came with all the features seen on the Nikon F5 housing.

The introduction of a new production process bettered the production of the front and back side of the housing fitted to a new level of perfection, and the main O-ring groove ran absolutely centered.

In 2001, Seacam anticipated the developments in digital photography and became the only manufacturer in the world to introduce the housings for the professional digital Nikon D1/D1X/ D1H cameras. In 2002, professional housings for the EOS 1V, EOS 1D digital and

Nikon D 100 were added to the production range. In 2003, housings for Nikon D100 were introduced, and finally in 2005-6, housings for Nikon D200, Canon EOS D5, Nikon D2X/D2H, Nikon D70, Canon EOS 1D Mark II/ EOS 1DS Mark II were presented.

The creative process never stops at Seacam, and every day sees new innovations come to light.

Seacam Fan-club

During its 15 years of existence, Seacam has produced about 10,000 housings.

The minimum requirement to do a model series is 50 units with the most popular models being manufactured by the hundreds of pieces. Most housings return "home" for service sooner or later. During my visit, I see three housings belonging to the award-winning photographer, Constantinos Petrinos, lying on the shelf waiting for a service overhaul. Another one, which came with a dark brown spattering, had been made especially designed and created for Fred Bavendam, to shoot the most shy fishes. He also owns three Seacam housings.

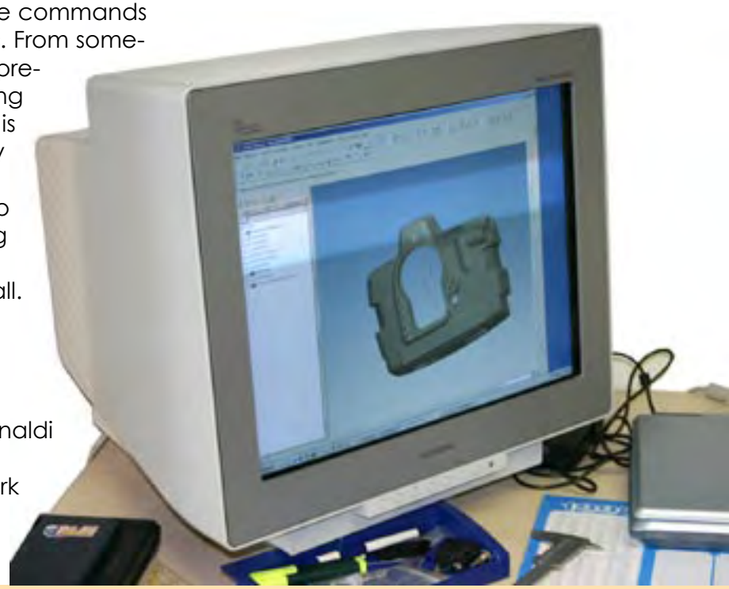
Often the regular professional customers purchase two to three housings, sometimes more. One collector from Bonn owns all the housings.

Today, Seacam is the choice of many professional underwater photographers. Here are a few quotes:

"So far, it is the best housing I have ever had in my hands. With my Seacam housings, it feels like I have the Nikon F5 directly in my hands; all the commands are precise and well done. From something so technical and so precise, one aspects something delicate and fragile. But it is not like that; after so many dives on wrecks deeper than 100 meters, or after so many extreme cave diving expeditions, the two housings have not suffered at all. And every time I go back to the tropical and colorful waters, I can enjoy the stunning quality of the Superdome." —Roberto Rinaldi

"Seacam allows me to work intuitively and fast. Their housings translate design features and philosphy of high-end SLR cameras into outstanding underwater imaging tools." —Christoph Gerigk

"In my opinion, Seacam makes the Aston Martins of housings. They're a work of art, exquisite to look at, and optically perfect!" —Zena Holloway (*see Zena's work in this issue's Portfolio section —ed.*) ■



A Talk With Harald Hordosch

Editted by Peter Symes
Photos by Svetlana Murashkina & Harald Apelt

The company is actually very small. We are only eight people, including father and me, but we have the structure of a big concern

X-RAY MAG: What inspires you? There seems to be a connection to art.

HORDOSCH: The main inspiration comes from nature and from simple and classic design from all around the world. It means design I see in nature but also art and furniture but mostly from nature, for example how fish are formed.

X-RAY MAG: This is clearly something that you use in your industrial designs, but does it also influence you on a more personal level? Which styles do you favour?

HORDOSCH: Yes. I am very interested in contemporary art, but I can't afford the ones I am really a fan of, as they are too expensive. But I collect art from a famous Austrian artist group called Group 77, who do both paintings and sculptures.

X-RAY MAG: You started building underwater housings when you were very young...

HORDOSCH: I was about 16 when I started with my grandfather, who helped me build my own housing made of fiber glass, because I could not afford to buy any underwater housings that were available at that time. I wanted to house a very old film camera that my father owned, and it was very successful, because my grandfather was a very good craftsman. So, he helped me a lot, and I think he gave me the sense of working with materials and tools.

X-RAY MAG: It must have been wonderful to have such a family relationship with knowledge being passed down through generations like that? It must have bonded you closely.

HORDOSCH: It has now been many years since my grandfather passed, but now I work closely with my father. He is a machine engineer, who used to work with irrigation projects in Africa and the Middle East, and when he retired early, I took him in as my partner, which has been immensely helpful. It has also kept him busy, as Seacam is as close to his heart as it is to mine. But his main interest is to help his son.

X-RAY MAG: Do you feel that having so much of your family involved is part of the secret to your success?

HORDOSCH: Well, we are always fighting a little bit. I have ideas, he has ideas, but it is more like a permanent bouncing of ideas off each other in a constructive way. It is a good way to develop new ideas and find the optimal solution. But, as you can imagine, we have a lot on our plate, as we also have to look after the manufacturing and finding affordable ways to administrate—It is not very easy.

The company is actually very small. We are only eight people, including father and me, but we have the structure of a big concern, like Mercedes. Because we have import, export, a lot of distributors to manage, advertising, and the functions of a big company, we have to manage, and that makes it very difficult. For example, we have to send invoices out to all over the world, so our financial system has to cope with all kinds of regulations, and we have to communicate with customers in several regions around the world, such as Australia, Italy and United States.

I talked to my father yesterday and told him: "I cannot believe it. Now, it takes about 70 percent of my time just to talk to people and email." I have less and less time to supervise production and to do innovation and new things, but we try. Essentially, it is a good development.

On a related note, what you might like to know is that everything has been learned by doing. I have no formal technical education, but a good humanistic education, so this is probably also why I am close to art.

X-RAY MAG: But as you have the technical competence around via your father, this must give an very interesting dynamic?

HORDOSCH: My experience is, if you are deeply engaged in what you doing, you can do everything. It is only down to the spirit in you to develop better solutions. If you are a universal person, you should be able to do that. If you concentrate, you can achieve a lot, but you need to be very focused. Only a few years back, I knew very little about computers, or digital photography for that matter, but if you get involved, you go deeper and deeper, and eventually become a specialist.

X-RAY MAG: How do you feel working with your father affects or changes the relationship? When you were a kid, he was the role model and responsible guardian. And later an equal partner? How do you find this change of relationship worked out?

HORDOSCH: I think it is very difficult at times, and sometimes I think is very hard. But if you have your father behind you, you also have a lot of additional things. He is more experienced, because he is older. He rests in himself and knows economics and technical things. But we work closely together now to find the best solution for the company. The advantages do outweigh the disadvantages. The company is actually in my parents' building, though I live elsewhere. It works, because I have a good relationship with my parents.

X-RAY MAG: Do you have a certain business philosophy?

HORDOSCH: I formulated this about ten years ago when Seacam introduced the new silver housing, and I was thinking about how to solve problems and do underwater housings in a better way. And found that the important issues in our business philosophy should be being very innovative and have superior design. Which boiled down to "superiority through innovation". Also, the main thinking was to create elegant design with clear functionality—to make tools for underwater shooters, which they can really work with without having problems with the equipment. Already, when we launched the

silver design ten years ago, we also had the superdome (port) and the 45 degree viewfinder. Only now, have several of the other manufacturers begun to offer such features. Sometimes, I feel that the audience forgets how far ahead Seacam has been with innovation.

X-RAY MAG: When you speak about innovation and making a tool for the photographers, do you have some of your closest photographers giving you feedback?

HORDOSCH: One of our basic ideas was to develop new housing in dialogue with the best photographers. We work very closely with some of the professionals, and there has probably not been anyone more influential than the German photographer, Herbert Frei, who was actually the reason that I started Seacam. He always told me: "Ask professionals what they like, and then make it. You will then see that you will have success." And I have followed his good advice ever since. I always ask the photographers what they need. That has been instrumental in making Seacam what it is now, by being open to these suggestions.

And I never understood why other companies seemed more concerned about cooking their own soup then asking the important questions. But I should be glad that they are not.

Sometimes, the questions or requests I get seem really crazy, but the photographers, like Kurt Amsler, are also leaders in their field and have a good reason for wanting a tool. I try really hard to involve the photographers. Actually, it is also how our distribution works. I am not interested in fancy shops, but in knowledge and competence. There are no better agents than professional photographers doing courses.

X-RAY MAG: Is there anything a housing manufacturer can do to further the evolution of underwater photography, and on a related note, is there anything new you would like to see in underwater imagery?

I think that it is good that everything is changing to digital, because the quality of the images is increasing, and this happens because they have more frames to their disposal. You have more choices. Very good shooters shoot a lot of frames, and art, nature or fashion photographers have always been able to do that. Then you can select the best pictures. Of course, a good photographer always knows when to push the button and how to compose, but the fact that you are able to shoot more pictures without additional cost is a huge benefit. I think there are far more better pictures shown now on exhibitions than just five, let alone ten years ago. Also, the lower prices for beginners' cameras has made it possible for far more people to step into underwater photography. Ten years ago, it was difficult for beginners, because there was much less equipment available at this level.

X-RAY MAG: But your products are not meant for beginners?

HORDOSCH: No, but the interest has to be started, and you should enable people to take up photography. Surely, Seacam is not for beginners, but if somebody then decides to get the right tools to go further, we have these things ready. With the digital evolution, we have seen far more people go into photography and turn their hobby into a profession—that is the most important thing.

X-RAY MAG: What do you tell customers complaining about your prices?

HORDOSCH: You always have to compare and see what you get for your money. Once you take a closer look at the quality that we offer, you realise that we have to charge a higher a price. Anybody with a little knowledge about the design, components and craftsmanship, which is put into the housings, is ready to pay the extra cost, which is usually just a little bit more than other manufacturers. The main thing is the quality, but you should not forget all the service, after sales and handling we offer, too. All these things are highly organised. It is the whole package you get. I would never like to sell cheap stuff, because you have to sacrifice quality and service, which you have to cut to save money.

It is important for me to enter a long term relationship with the customers. If you put a cheap camera into a housing, it is mostly likely going to be outdated within a few years, but the overall combination is still quite an investment, so what is the point? I only go for the higher quality cameras, which you can use for five to seven years and still remain happy with it. If money is an issue, then go for, say, a system at €500, get some experience and then decide for an upgrade on an informed basis later.

"Harald x 2" X-RAY MAG's associate publisher, Harald Apelt, with Harald Hordosch at the Antibes festival

KURT AMSLER

X-RAY MAG: Next plans are?

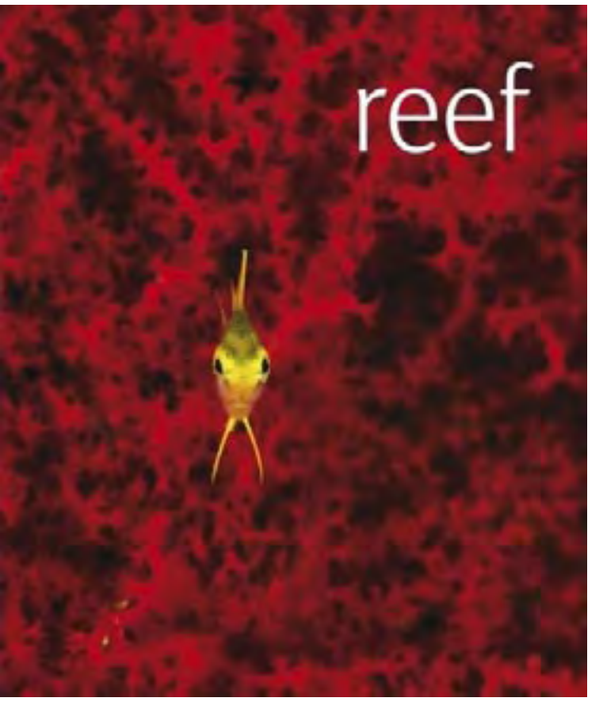
HORDOSCH: We will be introducing several new innovation's at this year's Antibes Festival. Wait and see. ■

media

Books Film DVDs CDs

Edited by
Catherine GS Lim

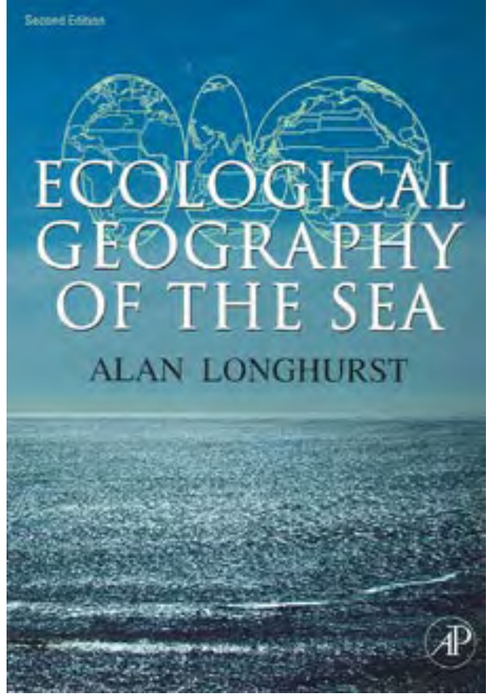
POINT & CLICK ON BOLD LINKS



Reefs in Livin' Colour!

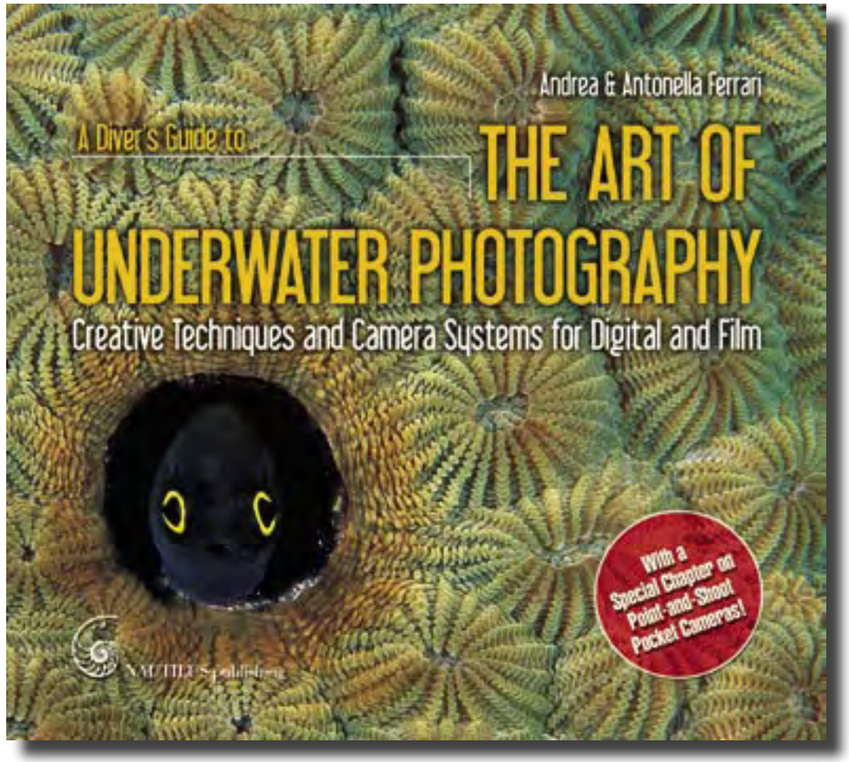
This photographic collection of coral reefs is both comprehensive and stunning. Whether you are a seasoned expert or a coffee-table browser, Reef offers a smoothing yet enthralling journey into the 'rainforests of the sea'. And it's not just the picturesque corals that take centerstage, you'll also savour temperate reefs, kelp forests, seagrass beds, various seascapes, marine animals as well as mangrove swamps. There are also photographic essays, maps and an interesting behind-the-scenes section.

In addition, a 30-minute DVD contains dynamic footage that is the perfect (though short) accompaniment to this photographic treasury of underwater imagery. Photography is by Scubazoo. Proceeds of the book go to the Coral Reef Alliance.
us.dk.com



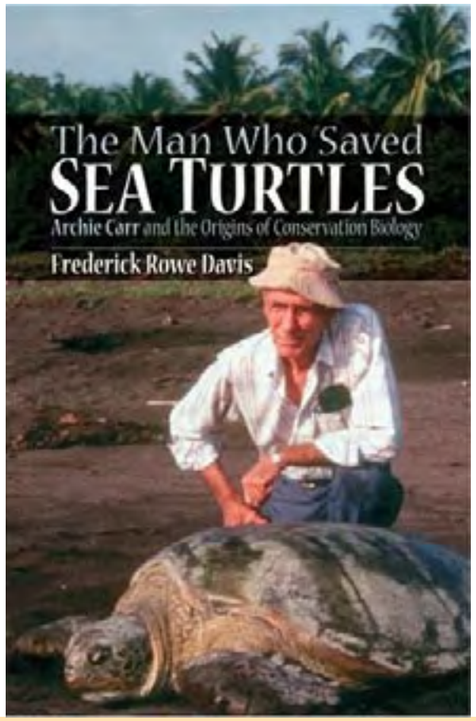
What Your Geography Teacher Forgot to tell you

Ever wondered why geography textbooks seemed to concentrate so much on rocks and vegetation on land even though more than 70 percent of the Earth is underwater? Well, we can't answer that, but we can recommend a book that will remedy the situation: The Ecological Geography of the Sea. This new ebook—a second edition—focuses on our ocean's biological and ecological geography. In it, author Alan R Longhurst has divided the ocean into four compartments (based on patterns found in algal ecology), and these are further subdivided into smaller categories. Local restricted studies are utilised to bring the reader a comprehensive global geography of the ocean. Sounds intriguing? Well, we definitely think so!
www.ebooks.com



The Art of Underwater Photography

This book is by *X-RAY MAG* contributors, Andrea Ferrari and Antonella Ferrari. This statement alone ought to be enough to get out of your seat and on your way to the bookshop in a hurry (at least, until you read further and find out that the book will only be available at the end of the year). What you can expect from this volume is 400 large photos printed on heavy glossy paper. These images are published alongside eight chapters about equipment, housing, technique, macro photography, etc., on 360 pages. There is also coverage on related topics such as motivation, mindframe, philosophy and artistic influences. The photos in the book are taken by the two Ferraris, but you can also savour the photos by other top photographers like Eric Cheng, Charles Hood, Alex Mustard, Doug Perrine, John Scarlett, Takako Uno, Stephen Wong, Tony Wu and many others. Available at **www.nhbs.com** and on Amazon worldwide at EURO 37,00 / GBP 24.99 / USD 51.00.



Turtle Saviour

When it comes to sea turtles, no one knew them better than Archie Carr (1909–1987). His naturalist roots were laid right from childhood, with a backyard full of caged snakes, lizards and turtles. The foundations for his career were then cemented in the form of a doctorate in zoology and research work in taxonomy. A teaching stint in Honduras brought him up close and personal to Central American wildlife—and sea turtles.
www.us.oup.com

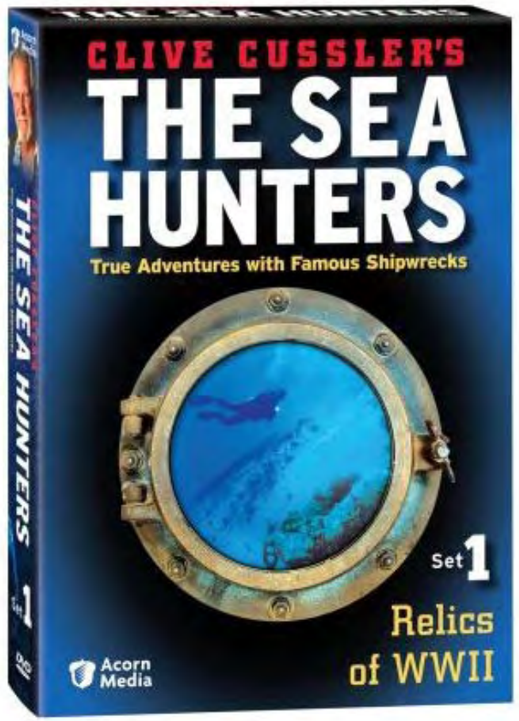
media

Books, Film, DVDs, CDs

Go Diving UK

Welcome to a showcase of the United Kingdom's magnificent underwater heritage. No aristrocratic stiff upper lips here, just a DVD on plain great diving, produced by the folks at the British Sub-Aqua Club (who else?). The footage takes you to dive spots from Cornwall to Scotland, from the serious (the famed *HMS Scylla* wreck) to the funny (seals biting divers' fins). No doubt that producers had fun producing the program, as much as film-maker John McIntyre had fun filming and presenting it. Get up close and personal with the world's second largest shark (the basking shark) as well as the BSAC Chairman Marcus Allen, DIVE's top underwater photographer Charles Hood, BSAC instructor Sophie Rennie, Marine Conservation Society Director Sam Fanshaw and university students Ben and Hollie.

www.aquapress.co.uk



Shipwreck Hunting

The title may make some of you cringe, wondering what blood-speckled spectacle awaited the unsuspecting viewer. But for those in the know, the title is as exciting and invigorating as a hunt for underwater treasure—'treasure' in the form of sunken ships, that is.

The Sea Hunters chronicles the search and exploration of significant shipwrecks of World War II. It's one shipwreck per episode, so viewers have the luxury to delve in-depth into the history, technical challenges, mystery, drama and science of a particular shipwreck in each episode. There are prep sessions to attend, technical problems to solve, exclusive interviews with survivors, witnesses and experts, and of course the dives themselves.

All this is masterfully overseen by host Clive Clusser, an action-adventure writer who used proceeds from his book sales to co-found the National Underwater and Marine Agency, which searches for shipwrecks and other vehicles that have been lost underwater. Famed marine archaeologist James Delgado complements every episode with historical and intriguing snippets of information.

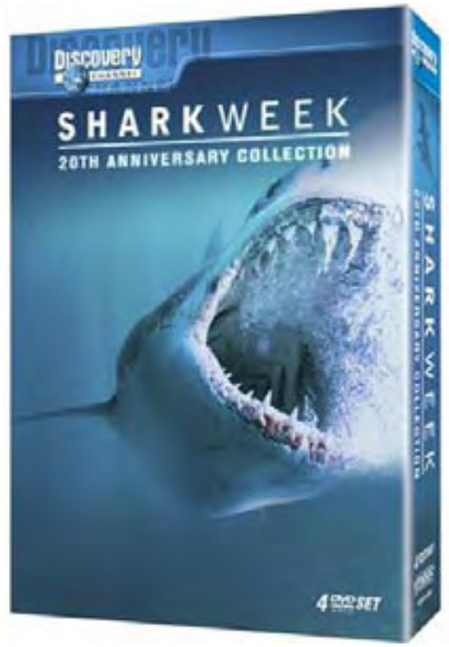
Highlights of this three-disc DVD box set include the search for the *RMS Carpathia*, which rescued more than 700 survivors of the *Titanic*, the relics of D-Day and the remnants of an aircraft carrier that's made entirely of ice. Available October 23rd. Preorder at **www.amazon.com**

Watch Shark Week Every Day!

11 hours on 4 DVDs

For twenty years, the Discovery Channel has dedicated a week every year to the education and conservation of sharks, with the aim of turning fear into fact. It's not your typical flower-power all-sharks-are-great campaign, though. The programmes that air during Shark Week do exalt upon the majesty of sharks, but it also presents stories in which sharks are relentless predators, terrorising their hapless victims.

This year, the Discovery Channel has issued a special four-DVD set to commemorate the 20th anniversary of this special programming. **shopping.discovery.com**



NEW DOCUMENTARY

The Shark is Still Working

According to the American Film Institute, *Jaws* ranks among the fifty greatest movies of all time and the second greatest thriller ever (Behind Alfred Hitchcock's *Psycho*). After three decades, the film continues to intrigue, thrill and frighten viewers. It's become an entertainment mainstay, a timeless classic in a world of fad filmmaking.

The movie's legacy is undeniable and virtually unmatched; it jump-started the summer blockbuster phenomenon, not to mention the illustrious career of one of Hollywood's most influential directors, Steven Spielberg.

Narrated by Chief Martin Brody himself, Roy Scheider, this feature-length documentary focuses squarely on the many ways *Jaws* has helped to shape these elements of pop culture. In addition, *The Shark is Still Working* proudly showcases many of the fans, artists and craftsmen who keep this film alive, examining some of the creative venues through which they express their passion for the film.

It covers the recent events at Jawsfest'05, celebrating the picture's thirtieth anniversary and highlights *Jaws* homages and send-ups from pop culture. Interviews with the cast and crew, and prominent filmmakers whose careers have been duly influenced by the movie will give the viewer some insight as to why *Jaws* has earned a well-deserved place among the greatest classics Hollywood has ever produced. *The Shark is Still Working* promises to be the ultimate retrospective on *Jaws*.

Column by
Cedric Verdier

Rebreather practices

Bailing out

Yes, but *how?*

US AIR FORCE

Bailing out to Open Circuit is like falling in the snow when you are learning to ski. It's a solution when facing a problem—not always the most elegant solution, but always the easiest one, and most of the time, the most efficient one. But Open Circuit bail-out is actually much more than simply going off the loop and breathing from another second stage. There are lots of possibilities.

Sanity Breaths

When dealing with most of the problems that could occur with a rebreather—equipment failure, physiological problem, etc.—one of the first reactions should be to do a ***diluent flush*** to make sure you breathe a safe gas for the few seconds you'll need to switch to OC and take some sanity breaths from a known mix. Four or five breaths should help most of the divers experiencing any kind of symptoms to quickly regaining their ability to think properly and to react in the most efficient way. In case of hyperoxia, hypoxia, mild hypercapnia, or any mechanical or electronical problem, a good diluent flush followed by some sanity breaths can help. Even if this doesn't help, most of the time it doesn't do any harm (if the mix is safe to breathe at that depth), apart from depleting the stock of gas available.

Press the button—one of the first reactions in case of problems should be to do a diluent flush

A bail-out valve is a switch on the mouthpiece that allows changing gas source from closed to open circuit

"Take me to your leadier" —a bail out valve on a full face mask

JAKUB REHACEK, GOLEM GEAR

These sanity breaths can be done in different ways:

BOV (Bail-out Valve)

That's generally the easiest and fastest way. There is no need to remove the mouthpiece, so no stress. The BOV is already in the mouth, so no delay and no risk of drowning or panic. Therefore, a BOV is extremely useful, even required when diving with a Full-Face Mask. Some rebreathers come with a BOV fitted (Kiss, RB80, Cis-Lunar, etc), or it can be purchased separately (Golem Gear, Nemo, etc). The BOV is normally fitted to the on-board diluent but with a quick-connect, all your dreams can be fulfilled…

NOAA

One of the earliest rebreather designs. In 1680, Giovanni Borelli envisioned a diver carrying a large bag of air from which the diver breathed as necessary

Open Loop technique

Still no need to go off the loop. The idea is to use the ADV as a kind of "manual 2nd stage"—obviously less convenient than a BOV, especially in case of a flooded loop. However, it's one of the fastest options and can be so easily done that it should be one of the first skills to be taught to any CCR novice.

Standard 2nd stage

Fitted on a sling tank, it provides the diver with a sufficient and known source of gas. However, lots of rebreather divers simply store the complete regulator on the side of the sling tank. This configuration obviously requires more time than if the 2nd stage is stored on a shock cord loop around the neck. Remember, one of the goals of the sanity breaths is to quickly go off the loop to be able to safely breathe and think about the safest way to fix a problem. Looking for a few seconds for a second stage that is trapped somewhere (or even worse, loose) is not the best choice. Opening the tank valve also takes some time. If the 2nd stage is stored around the neck, the tank valve can be left open and any leak or free flow will then be easily spotted.

Combined regulator/2nd stage

This is another option fitted on some rebreathers like the Inspiration and the Evolution. Some rebreather divers don't like them as it might be difficult to breathe from them at depth. Other divers like the convenience and store them around the neck.

One of the problems with hypercapnia is the often-associated uncontrolled urge to breath. Closing and removing a DSV, then clearing a mouthpiece before being able to breathe is sometimes next to impossible. Because of the risk of water egress in the airway, a BOV is a convenient and safe way to gain control on the breathing pattern for a short period of time. It can only be a temporary measure before switching to a bigger stock of gas (off-board diluent/bail-out tank).

Combined regulator and 2nd stage as they come mounted on i.e. Inspiration CCR

Remember, one of the goals of the sanity breaths is to quickly go off the loop to be able to safely breathe and think about the safest way to fix a problem

Having enough open circuit gas to safely ascend to the surface is not an option. It's a requirement.

Open Circuit Bail-out

As every rebreather diver (either SCR or CCR) learns during their basic rebreather diver course, having enough open circuit gas to safely ascend to the surface is not an option. It's a requirement.

Why go the OC way when you have so many other options with a CCR? Because it's safe! The rule is: if you don't know where the problem comes from, if you don't know how to fix the problem, or if you simply don't know if the mix in the loop is breathable, stay on Open Circuit.

Even if most of the problems can be fixed at the bottom on a CCR, there are three circumstances where there is absolutely no other reasonable alternative than bailing out on Open Circuit:

1. Total Loop Flooding. If divers properly check their units before the dive, there should never be any Total Loop flood. Unfortunately, it happens from time to time, mainly because of a user error (lost mouthpiece, DSV removed while still open, lack of pre-dive positive and negative pressure test, etc).

The golden rule is: If you're not 100% sure about the problem and how to easily and quickly fix it, don't come back to the loop!

2. Severe Hypercapnia. In case of scrubber breakthrough, the signs and symptoms of hypercapnia might be so severe that chances to recover from the CO_2 hit become minimal. Keeping on breathing from the loop (even on an SCR mode) makes these chances even smaller. Ascending (reducing the ambient pressure and the pCO_2), stopping any exertion (no CO_2 production) and breathing from an OC regulator (no CO_2 build-up) could be the best solution.

3. Personal choice. It's like the rule about aborting a dive at any time for any reason. When one doesn't feel comfortable on the loop, there is no shame in bailing-out. It helps to get the stress level down and avoid any further problem.

In any case, the procedure should always be the same, to keep the thinking process as limited as possible. When your brain becomes as small as a peanut and as primitive as an action movie hero, you need simple steps to follow:

1. Start with a few Sanity Breaths. With a BOV, it's extremely easy. Take a few long and slow breaths to clear up your mind and relax somehow. This is one of the reasons why many rebreather divers prefer to always have the same on- and off-board diluent/bottom mixes: they don't mix up their decompression with multiple diluents and bottom bail-out gas.

2. Try to identify the problem and its cause. Different tools are available for that (from the handsets to the SPGs, the HUD, audible or visual alarms, your symptoms, etc).

3. If the problem can be fixed, do it and come back to the loop when—and only if—it's safe to breathe from.

4. If the problem can't be fixed, it's the right time to prepare the bail-out ascent. Don't drain your on-board gas as most of the time, it's also the gas you use to inflate your wing (and sometimes your dry suit); in case of emergency, you might need to be positively buoyant at the surface. Prepare for a 3-step ascent:

- Switch to the off-board regulator. Many rebreather divers prefer to always have this tank valve cracked open (easy to shut off in case of free flow, quicker to breathe in case of emergency).

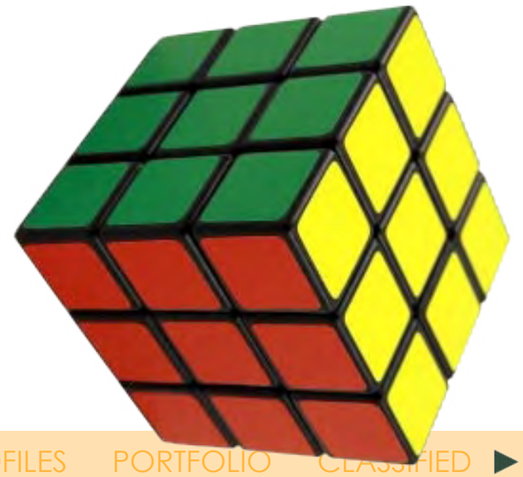
- Communicate with the team mates and check for the dive parameters (depth, time, decompression, navigation)

- Control buoyancy. It's often a tricky part, as the loop will expand during the ascent. The key to success is

1) Slow ascent,
2) OPV fully open and
3) Practise.

Apart from Buoyancy control, there shouldn't be any stress involved in this kind of ascent, as long as one has enough gas to complete the ascent.

The Rubik's cube we had going in our last issue is now completed



"Fun under water" with rebreathers - anno 1946

It might be wise to plan for the worst-case scenario—like having the problem at the deepest depth or the furthest point of penetration while being separated from the team. And make sure you have enough gas with at least a 30m/min SAC rate.

Different BOVs available

The Bail-Out Valve (BOV) is not a new idea. Unfortunately, there are not so many rebreathers on the market that incorporate this extremely useful feature as standard. Switching to OC without removing the mouthpiece sounds really interesting for most of the rebreather divers. Therefore, some BOVs are available, most of them with adapters to fit in all the major rebreathers currently available.

The necessary features are:

► Small and light. You don't want to have a small anvil hanging on your mouth. It would be at least uncomfortable, even dangerous, as it will increase the risk of losing it and flooding the loop.

► Easy to switch. Some BOVs are very stiff and you need the help of a team of weightlifters to operate the lever. Not the best solution when your loop is full of water and your lungs are empty after a few minutes.

► Easy to breathe at depth. When you need to breathe OC, it's because you NEED to breathe! Only high performance 2nd stage should be used in BOVs. Even if your diluent is easier to breathe because of its Helium content, the fact is that one needs a lot of gas when switching to Open Circuit. A hard-to-breathe-at-depth BOV will just make everything worse and increase the stress level.

► Not free flowing. That's where manufacturers speak about compromise. How could an easy-to-breathe 2nd stage not be prone to free flow i.e. at the surface when submerging, or when scootering? One answer is the adjustable knob, designed to avoid losing the precious and limited gas at the beginning of the dive. It should be set "Hard" before jumping into the water, then loosened up during the bottom phase, just in case…

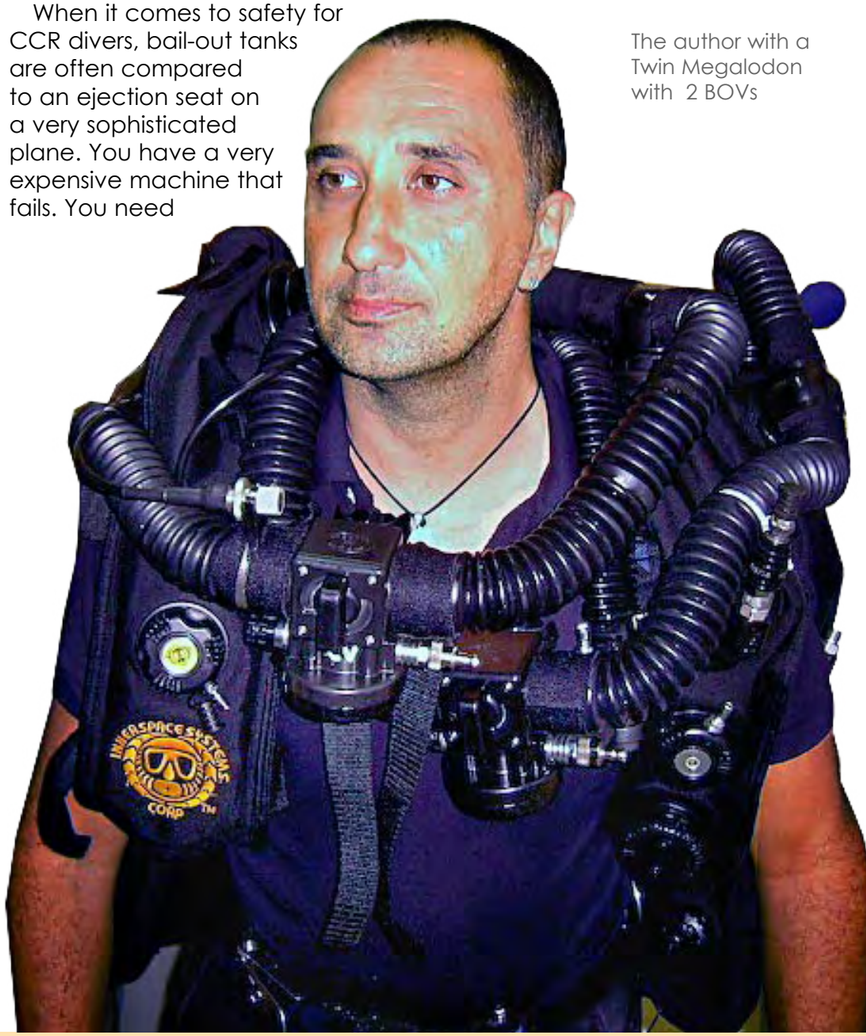
► Air and watertight. That's where some of the BOVs on the market have a lot of problems. I personally experienced a lot of leaks and failures to hold negative pressure with two BOVs that come standard with some popular CCRs. It's a life-support equipment so proper designing and machining are of the utmost importance.

I had the opportunity to try the following BOVs: KISS, Golem Gear and v4tec. I also extensively studied these other models: Nemo, Kirby-Morgan (NATO pod) and Cis-Lunar.

I selected the Golem Gear for my Megalodon CCR, as I found it a reliable and robust piece of equipment that actually meets all the requirements listed above. The design is simple, and the performance at depth more than satisfying. It comes in two flavours that allow it to fit on most of the rebreathers. The lever is a little bit hard to operate when it's brand new but everything becomes easier after a couple of dives. It's also very easy to service and maintain, and a little bit of grease eases up the lever without contributing to any leak. And the LP hose comes from the left hand side, more convenient for my tank configuration.

When it comes to safety for CCR divers, bail-out tanks are often compared to an ejection seat on a very sophisticated plane. You have a very expensive machine that fails. You need a very simple solution that always works!

A proper Bail-out Valve is an easy and quick way to breathe Open Circuit. Who would say that it's not of the utmost importance? ■



The author with a Twin Megalodon with 2 BOVs

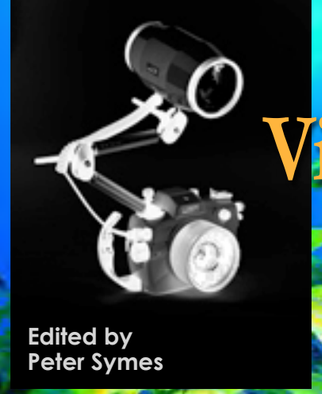


Photo & Videography

Edited by
Peter Symes

Schools of fishes are not easy subjects! To compose such a number of animals in the frame is rather difficult, because they should have a collective position, movement or eye look.

They are two nice ways to have a school of fish on the picture: Static and in action. The techniques are more or less the same. Search for schools in strong currents. Here, they stay close together like walls facing against the current. By approaching them from the front and by shooting as fast as you can, the static image will change in a view second to an action image. A strobe with a fast reload cycle makes it more easy.

Fish Photography

Text and photos by Kurt Amsler

Shooting fish with a camera isn't easy! Unlike people they are perfectly adapted to the aquatic environment, hydro-dynamically shaped and in all their colourful splendour, they are completely ignorant of any directions given by the photographer's end. So, to get that perfect shot, we need a strategy—and the right equipment.

Eye contact is a must in fish photography. Not only does it give a good expression to the viewer, but also, if you approach a fish from the front, it will remain longer at its position, because it wants to see what is going on

This picture was exposed with f:8 / 1/15 of a second shutter speed and the strobe on TTL. The camera was set on the second shutter curtain to have the strobe fired at the beginning of the exposure time. The most important to get a proper blur effect is to swing the camera in the same speed the subjects move! To avoid overexposed background always choose place with low ambient light

Shoot first, think later!

Hardware

Caution is a useful behavioural trait for many inhabitants on a tropical reef. It can be a matter of survival. Trying to capture a full format image of sardine with an ultra wide-angle lens is therefore better left to the experts. The creatures you meet underwater also have a comfort zone which you cannot penetrate—you need to keep a certain minimum distance. This is typically in the range of 0.7 to 1m. This makes the 28mm, 35mm and 50mm focal length lenses the best choice for pictures of fish that are 0.2 to 0.5m long fish.

Getting close enough requires a lot of experience unless you are diving in a much visited spot where fish have become accustomed to divers. And speaking of which, I would like to warn against resorting to feeding to attract them; by doing so, you would be changing their natural behaviour, and your newly won scaly friend may soon enough be facing the business end of a spear gun or a hook before too long. That is, if he survives that bad case of indigestion your breakfast scraps gave him.

Apart from the right lens you need the right flash. TTL- metered strobes are ideal for the subject distances usually seen in fish photography, because at a set "working" f-stop, a wide range of distances are covered, and our usually fast moving subjects will be perfectly exposed anywhere within that range.

Bigger fish require a change of strategy, both for lens and lighting. Once you graduate to larger than diver size, say a whale shark, we once more have to resort to the super-wide angle lenses to improve contrast and definition. In this case, we switch the strobe to "manual", because no TTL-program can correctly compensate for that half of the flash light that just vanishes into the deep blue water instead of being bounced back off a subject.

For any size of scaly subjects, auto focus lenses are an advantage, especially cameras with focus tracking. With focus and lighting being taken care of by technology, the photographer can fully concentrate on fish behaviour and com-

Most the time fish photography is fast and furiuos. This makes it just impossible to create effects with additional strobes. Stationary subjects as this Leaf fish makes it possible to place a small slave strobe on the side or even beyond. TTL-Mode is of course the best setting for such close ups. If you use a regular slave strobe make sure it is always weaker than your main strobe. SEA&SEA makes the famous YS-30 strobe which is only 12X7cm and works as slave strobe in TTL, without cable!

Many photographers never use super-wide-angel lenses for medium or even smaller fishes. Such pictures are spectacular because they show next to the main subject a wide view and great depth of field. The difficulty is just to get close enough!!

Next to good diving skills and camera handling, the knowledge about fish behaviour is—as already mentioned—very important. The picture of this, only 40 cm long, cuttlefish was taken with the 10.5mm NIKKOR fisheye lens

Wetpixel *Quarterly*

What is Wetpixel Quarterly? It's a quarterly printed magazine devoted to high-quality underwater photography. Each issue of Wetpixel Quarterly features interviews, short articles, open photography contests, and, most importantly, pages upon pages of spectacular imagery from waters around the globe. Wetpixel Quarterly also hopes to foster environmental stewardship by highlighting conservation concerns in each theme-based issue.

www.wetpixelquarterly.com

if you're ploughing through the coral like the proverbial bull in a china shop, even snails will resort to a hasty retreat

posing the image.

Software

The ground rule for successful fish photography is: shoot first, think later! In real terms, this means your camera has to be set up before you approach your unsuspecting subject. Once within range, there won't be any time to select programs, focus or set f-stops. And the flash better point in the right direction, too!

With practise and experience, the photographer soon learns what subject distance is right to perfectly frame a fish of a certain size. The camera is then preset for that range, the flash adjusted. The rest is up to the individual's diving skill, and-as always, when shooting wild animals, a good portion of luck.

Example: At a distance of about 80cm, a 50cm long grouper will be reproduced in full frame using a lens with a picture angle of approximately 45 degrees. The photographer then has to sets the camera and flash to that distance before slowly approaching the subject, without rapid movements. "Bubble fright" can be minimised by exhaling through the mask rather than the regulator. This strategy may seem clumsy and wasteful of precious dive time, but ultimately it is the most successful.

But these are only generalisations. To become an outstanding wildlife photographer, it takes more than stealth and preparation. It also requires an understanding of the animal's behaviour and its interactions with its environment.

Etiquette in the reef

The more knowledge the photographer brings to the job, the better he or she will be able to adapt to the situation and predict what the fish will do next. All of which will dramatically increase the odds of excelling. But if you're ploughing through the coral like the proverbial bull in a china shop, even snails will resort to a hasty retreat.

Good diving skills, therefore, are of the essence. You are much more likely to successfully sneak up on some subject when you are neutrally buoyant, breathing controlled and moving slowly.

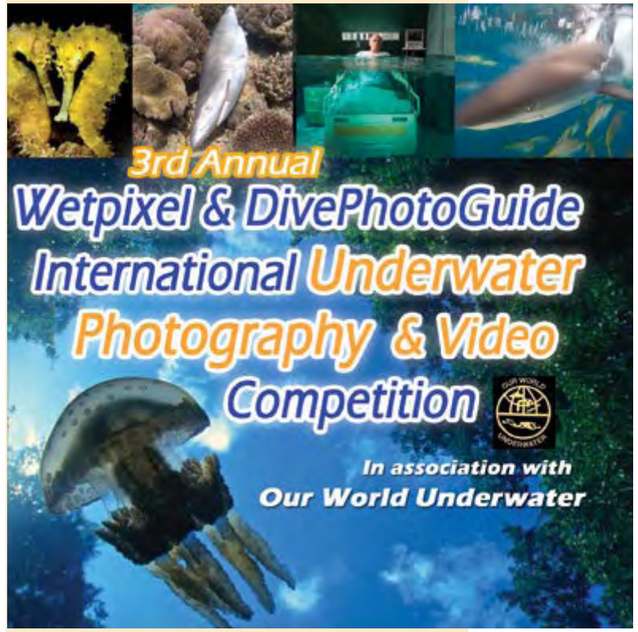
As with land animals, approach from the front, keeping eye contact at all times. This is less likely to trigger flight reflex as the animal sees what's happening, and curiosity may get the better of it. If the fish moves, you freeze. In most cases, it will come back if not pursued, and it is always better to remain patient (and motionless) than give chase. Just wait and keep that camera ready.

Please, show some respect.

Chasing puffer fish through the reef until they pump up with water is as unacceptable as is poking animals out of their crevasse homes with your snorkel, taming moray eels by feeding so you can touch them, or riding turtles or manta rays.

Instead, join the ranks of the true wildlife photographers, who enjoy the challenge of improving their knowledge and techniques to come up with an even better shot, one that shows natural behaviour in all its natural glory. ■

For most of our underwater images, especially with super-wide angle lenses, we should make the most of the sunlight. In contrast to macro, for example, creativity in fish photography is more limited. A way to get some unusual pictures with a strong expression, is to use the ambient light. This picture was taken short before sunset. This time a day, you'll get a nice reflection on the surface and warm soft light



OUR WORLD UNDERWATER 2008
3rd Annual Wetpixel and DivePhotoGuide International Photo & Video Competition

Popular websites Wetpixel.com and DivePhotoGuide.com have teamed up again in association with Our World Underwater to celebrate the beauty and delicacy of the marine environment with the announcement of the 3rd annual international underwater photography and video competition. The competition has become the "Superbowl" of international underwater imagery competitions, with world-class prizes, celebrity judges, and the opportunity to have your images showcased to the world as some of the planet's best.

Over $50,000 in prizes!

MORE INFO

www.UnderwaterCompetition.com

underwater competition.com

Ocean Optics Open Day with Mark Webster

– London, UK, 12 January 2008

Well known photographer and workshop host Mark Webster will be hosting a second open day with Ocean Optics in London on Saturday 12 January 2008.

Mark will make two technique-based presentations during the day with plenty of opportunity to ask questions and get advice on your equipment and technical problems. There will also be a short image critique session for specific issues.

The Ocean Optics day is free, but it is necessary to book your place in advance. If you wish to bring images for critique, please let us know when you book. Time for this session is limited and will be booked on a first come, first serve, basis.

Contact Ocean Optics for full details and to book your place: optics@oceanoptics.co.uk Tel. (+44) 020 7240 8193 ■

Hugyfot D300

Hugyfot, manufacturer of housings with exquisite shape, has a new underwater housing for the Nikon D300 digital SLR camera. The first real housing is expected to be available on October 20th, 2007, and will be on display during the annual Festival Mondial de l'Image Sous Marine in Antibes, France, from 24 - 28 October 2007.

www.hugyfot.com

Universal Housing UM190

for the new Sony Camcorder Generation.

SEALUX Universal housing will fit more that 100 camcorder models and comes with integrated high-resolving 16:9 color monitor. Depth to 90m depth. All Sony camcorders, which are equipped with a LANC-socket for remote control, can be used if they are maximum 190mm long, 132mm wide and 116mm tall. The result is a solid and reliable universal housing with the highest flexibility and easy handling. With minimal dimensions and the lightest weight, it fulfills the topical requirements. All Sony camcorders equipped with a LANC-socket for remote control can be used with this housing. They must not be larger than 190 mm, wider than 132 mm or higher than 116mm.

www.sealux.de

a700 released

Sony isn't a camera name you hear tossed about by avid underwater photographers—but that could change when Sony's new 12.2MP Alpha 700 DSLR shows up on the docks. New Sony DSLR aims high and should have deep appeal writes Michael J. McNamara reviewing the camera on **DivePhotoGuide**

Very affordable

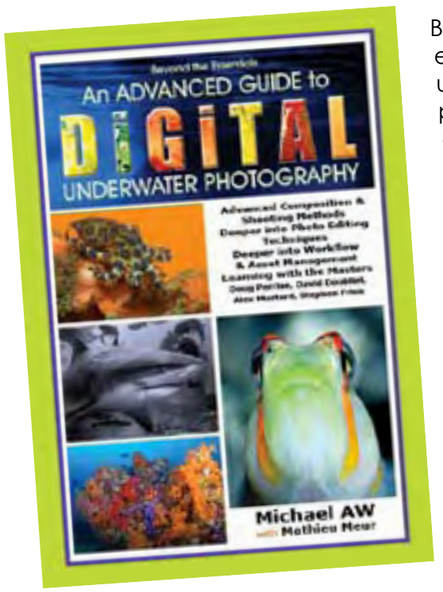
SeaLife has begun shipping its new Mini Wide Angle lens. The Mini Wide Angle Lens is specially designed to fit the the ReefMaster Mini and ECOshot camera lines. The Mini Wide Angle lens increases the camera's viewing angle by 43 percent. It also allows close-up pictures from 12 inches to infinity. The lens also completes the expandable system for the mini series of cameras. With a retail value of only US$79.95, the lens will make the ReefMaster and ECOshot on of the most affordable 6mp Dive camera systems.

TTL Converter III for Nikon

This converter is equipped with a built-in TTL PCB that connects a Nikon digital SLR with SEA&SEA YS-Series strobes and uses the camera's TTL flash adjustment to control the amount of light put out by the strobe. The converter allows quick switching underwater between TTL mode and manual mode from outside the camera. You can use the TTL correction dial after checking the results of a shot in the LCD monitor to adjust the amount of strobe light for the next shot. Because the converter comes with two separate strobe connectors, you can use advanced automatic TTL flash adjustment with two strobes. **www.ikelite.com**

Built for the Global Traveler

The Gates FX7/V1 Housing is packed with pro features for the discerning underwater enthusiast like iris, focus, ND filter and white balance controls, adjustable handle grips, optional EM43 high resolution color monitor and Gates premium ports for the sharpest, clearest HD images. Yet, the FX7/V1 with SP44 port and 1620 Pelican rolling case weighs in under the 50lb/23kg airline baggage limit. The FX7/V1 comes with a two year renewable warranty. **gateshousings.com**



The ADVANCED guide for Digital Underwater Photography

Michael AW with Mathieu Meur

Based on methods employed by professional underwater photographers, the *ADVANCED Guide for Digital Underwater Photography* is packaged with practical techniques and useful information. Whether you are a novice or a serious shooter, this state-of-the-art guide will take your digital imaging proficiency to the next level.

Expanding beyond the basic and essential aspects of digital underwater photography, the content is organised into five modules encapsulating advanced digital imaging knowledge, photographic skills, asset management, and workflow to post production. For the photographer who wishes to appreciate and embrace the art of underwater imagery, techniques for successful pictures are revealed in detail. The structured modules give comprehensive descriptions about the composition and methods for ambient light photography, macro and super macro, wide-angle imagery with and without a model to shooting with filters, over and under images to shooting with HID lights.

Advance yourself with tutorials for the digital darkroom—photo editing, colour and exposure correction. This guide also includes information on digital asset management systems adopted by professional photographers. A generous number of images are used to illustrate the varied form of underwater imaging. A special section features images and secrets from some of the world's top underwater photographers—David Doubilet, Doug Perrine, Alex Mustard and Stephen Frink. This is the most definitive advanced guide available for digital underwater photography—a must have essential for any aspiring digital photographer. ■

US$26 or US$30 postage included anywhere in the world—AU$25 or Singapore S$30. 132 pages, 210mm x 150mm

Aquatica D40X Housing

Part of new line of products aimed at recreational divers, the underwater camera housings are designed and built for newer, smaller and less expensive digital SLR cameras, making high quality underwater photography more affordable for the recreational diver.

Made of anodized aluminum and built around Aquatica's well established bayonet port system, these new Aquatica housings will accommodate all current ports, extensions and gears. As well Aquatica is reintroducing its 6" dome port and has created a newer and more compact macro port for both this new housing and its current line of well established housings.

www.aquatica.ca

Airline Carry-on Camera case with padded dividers

Protect your expensive photo equipment from airline damage or theft by rolling and carrying it on board. The 1510 is airline overhead bin compliant. The 17" retracting extension handle and polyurethane wheels will keep you moving between gates.

www.peli.com

39 Megapixel

Hasselblad—the Rolls Royce of cameras that went with the Apollo mission to the moon and back and the choice of many fashion photographers. As a medium-format camera there haven't exactly been many housings around for this top-end brand, but credible sources in the camera housing industry have hinted that housings for the Hasselblads are under consideration. Talk about upping the ante! The new Hasselblad HD3 boasts a whopping 39 megapixels!

Hasselblad.com

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Tuneffe Island Lodge
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Utila Dive Center, Honduras
Welcome to the Whaleshark experts
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www.diveacademy-grancanaria.com
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www.divingworld.nl
Dykkercenter Langeland, Denmark
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www.dykkercenterlangeland.dk
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Media-Sub, Erstein, France *—Underwater video and photography equipment and service* ***www.mediasub.com***
Profondo Blu, Ustica
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Timuna Sea, London, UK
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www.timunasea.com
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www.westwalesdivers.co.uk
Zapp Divers, Denmark
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www.zappdivers.dk

Dive Operators RED SEA

Emperor Divers, Sharm El Sheikh, Egypt
Your Red Sea dive specialists
www.emperordivers.com
Nemo Divers, Eliat, Israel
Red Sea's best little dive center
www.nemodivers.co.il

Dive Operators AFRICA

Dive Solutions, South Africa *—Diving Mozambique, tech & rec dive educ*
www.divesolutions.co.za

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www.delphis.com.mv
Lumbalumba Diving - Manado
Small, cosy and personalized dive resort in Bunaken Marine Park
www.lumbalumbadiving.com
Sipadan Water Village Resort, Sabah
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www.swvresort.com
Tioman Scuba *—Finest diving at the best price in Peninsula Malaysia*
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www.oceanadventure.com.ph
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www.swanido.com

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www.ningalooreefdive.com.au
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www.nautilusexplorer.com
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www.oceanrover.com
SMY Ondina *—Dive Indonesia*
www.smyondina.com
www.thebestdivingintheworld.co

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www.aasdk.no
Ajax Scuba Club, Ontario, Canada
Serving Durham Ontario since 1975
www.ajaxscubaclub.on.ca
Alberta Underwater Council, Canada
Underwater sports & eco-awareness
ws.albertaunderwatercouncil.com
Barnacle Busters Scuba Club, USA
Los Angeles/Long Beach (Gay/Lesbian)
www.barnaclebusters.org
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Promoting safe diving and having fun
www.bottombunchdiveclub.com
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www.bsac.co.uk
Dansk Sportsdykker Forbund, Denmark
7500 members in 152 clubs in Denmark
www.sportsdykning.dk
Los Angeles Underwater Photographic Society, USA ***www.laups.org***
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New adventures, new buddies
www.ase.tufts.edu/scuba

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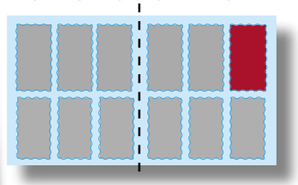
Business Directory changes format effective with the December issue
New format: 61 x 110 mm



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Fourth Element, UK *—High tech, high quality dive clothing and design*
www.fourthelement.com
Nocturnal Lights, CA, USA *—Advanced lighting systems for diving, UWP, video*
www.nocturnallights.com
Reefling Clothing
Divewear that inspires diving
www.reefling.com
Silent Diving Systems, USA
Closed circuit rebreather distribution
www.silentdiving.com

Non-Profit Organisations

International Association of Handicapped Divers (IAHD Foundation)
www.iahd.org
Coral Reef Alliance *—Working together to keep coral reefs dive*
www.coralreef.org
The Manta Network
Help Save the Mantas
www.save-the-mantas.org

Online Dive Resources

Cairns Scuba Diving Australia
Dive training & travel holidays
www.divedirectory.com.au
DiveGuru, Deerfield, FL, USA
When you want answers...
www.diveguru.net
DiveIndex.com *—All links diving related Newest, top-rated, most popular*
www.diveindex.com
DivePhotoGuide *—The essential resource for UWPs & Videographers*
www.divephotoguide.com
Diverlink *—A comprehensive resource for divers and dive businesses*
www.diverlink.com
Divester
Weblong's premier diveblog
www.divester.com
Dykcentralen, Sweden
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www.dykcentralen.se
Lines & Shadows *—Home of the best source of UWP, travel & adventure*
www.linesandshadows.com
NauticFriend.com *—The Ultimate Worldwide Watersports Directory*
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Onderwaterfoto, Netherlands
Digital UWP Forum
www.onderwaterfoto.net
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www.oneocean.com
Patrick Musimu, Freediving Champion
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www.patrickmusimu.com
Scuba Duba *—Online diving resource for news, equipment, buddies & travel*
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Scuba.start4all.com *—Diving directory in cooperation with Diving World*
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Listing Dive Sites Worldwide
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UK Diving *—UK Scuba Diving Resource & Network*
www.ukdivers.com
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www.underwater.com.au
UnderwaterTimes *—A daily journal of life in and around water*
www.underwatertimes.com
University of Michigan, OSEH
Dive links by Larry "Harris" Taylor, PhD
www-personal.umich.edu
WetPixel, USA
Digital imaging for divers
www.wetpixel.com
World-Newspapers.com
Scuba Diving Magazines Online
www.world-newspapers.com/scuba

UWP Competitions

National Wildlife Photography Awards
Deadline: July 15th, 2006
www.nwf.org
Santa Barbara Ocean Film Festival
Deadline: August 30, 2006
www.ocean.com
XARIFA Unterwasser Foto & Film Festival
14-15 October 2006, Germany
www.uwfv.de/xarifa
World Festival of Underwater Pictures
25-29 October 2006, Antibes, France
www.underwater-festival.com

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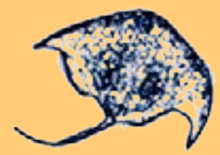
Wet & Weird



News edited by Gunild Symes

Curious shark went beach combing

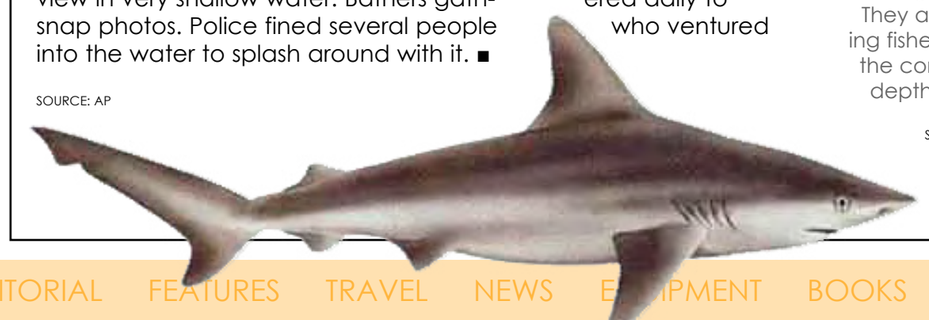
Catching a 2m Shark by Hand

Spain—Biologists from the Barcelona Aquarium have caught a 2m long shark, which had become a tourist attraction by making daily incursions into knee-high water on a Spanish beach, by wrestling it with their bare hands and dragging it ashore.

The 200-pound sandbar shark—not generally associated with attacks on humans—showed up in late August at a beach in northeast Tarragona province, forcing local authorities to close off the water to bathers.

The fish turned into a novelty by swimming regularly into plain view in very shallow water. Bathers gath- ered daily to snap photos. Police fined several people who ventured into the water to splash around with it. ■

SOURCE: AP



Batfishes are a family, *Ogcocephalidae*, of anglerfishes. They are found in deep, lightless waters of the Atlantic, Indian and western Pacific Oceans.

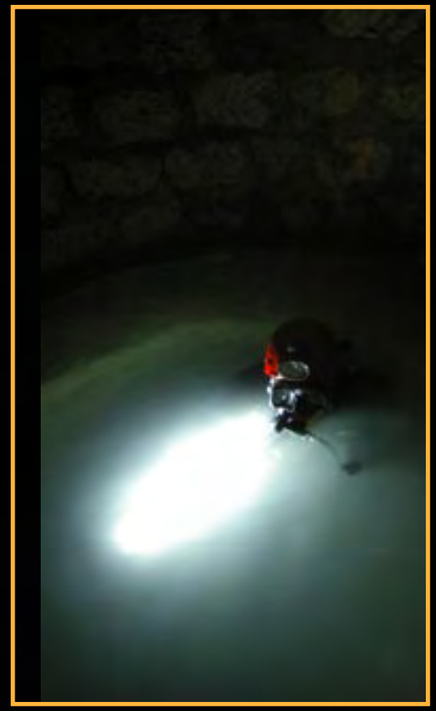
They are laterally compressed fishes similar in appearance to rays, with a large circular, triangular, or box-shaped head and a small tail. The illicium—a modified dorsal fin ray on the front of the head, that supports the esca, a bulbous lure—can be retracted into an illicial cavity above the mouth. The esca is not luminous as in most other groups of anglerfishes, but secretes a fluid that is hypothesized to act as a chemical lure, attracting prey.

They are bottom-dwelling fishes, mostly found on the continental slope at depths up to 4,000 m. ■

SOURCE: WIKIPEDIA

CLARK. COURTESY OF NIWA / CENSEAM.

Unique Dive Site

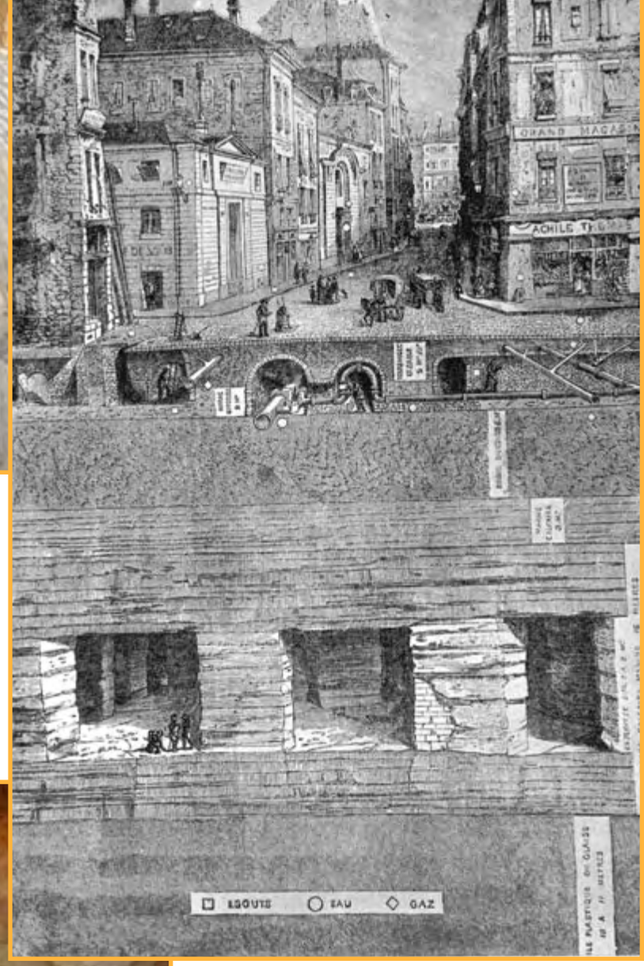


Catacombs of Paris

Text by Michel Ribera. Photos by Axelle Quetier

Translated by Valentin Dosiere

Diving into the history of Paris



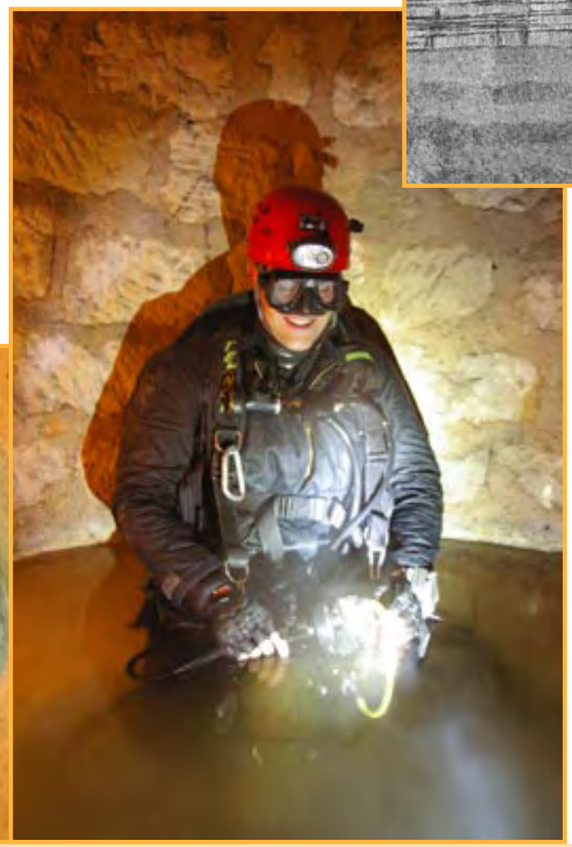
Paris. City of lights, but of shadows, too. The capital has become a sought-out place for urban exploration. With walks across roofs, through the subways and the sewers and the ancient quarries known as the "Catacombs". Diving in this underground network allows access to hidden rooms and galleries. The most ancient ones were built during the 17th century. In these virgin places, we can now discover ancient work and drawings made with charcoal by the quarrymen. It is a dive into the capital's history.

From Roman times to the Middle Ages, open quarries provided the necessary building materials for the construction of the city. During the 12th and 13th centuries, Philippe Auguste (1180-1223) expanded the capital considerably. The Notre Dame Cathedral was built in 1163, the rampart and castle of the Louvers in 1180. This boom in construction created a surge in demand for building materials and the quarrying intensified. Paris kept on growing, becoming bigger and bigger as the centuries passed. The ancient quarry, which was not being exploited anymore—located in the center of Paris as we know it today—was eventually covered by urbanisation. The existence of these quarries went forgotten by everyone until the 18th century when several collapses in Paris made it painfully clear to body how dangerous these ancient excavations were in regards to the stability of the ground.

Thus, in 1777, the "IGC" (General Inspection of Quarry) was created. Its task was to map and catalogue, to investigate by drilling and to consolidate the voids left by the quarries. This network of galleries runs about over 300 km. These galleries aren't officially open for the general public. The official ossuary is the only one accessible to the public, but it only represents an infinitesimal part (1.7km) of the whole network. However, there still remain several other entries, known only by a few, which allow access to the entire network. However, in our time, this large network is likely to be reduced due to the consolidation of the undergrounds.

The creation of the Catacombs is linked to increasing public health risks of Paris' unsavoury graveyards in past times. Eventually, in the 18th century,

The catacombs are a network of subterranean tunnels and rooms located in what were Roman-era limestone quarries. They were converted into a mass tomb near the end of the 18th century



"I have seen the wicked highly exalted, and lifted up like the cedars of Libanus."
— Paris Prose, Psalm 36:34

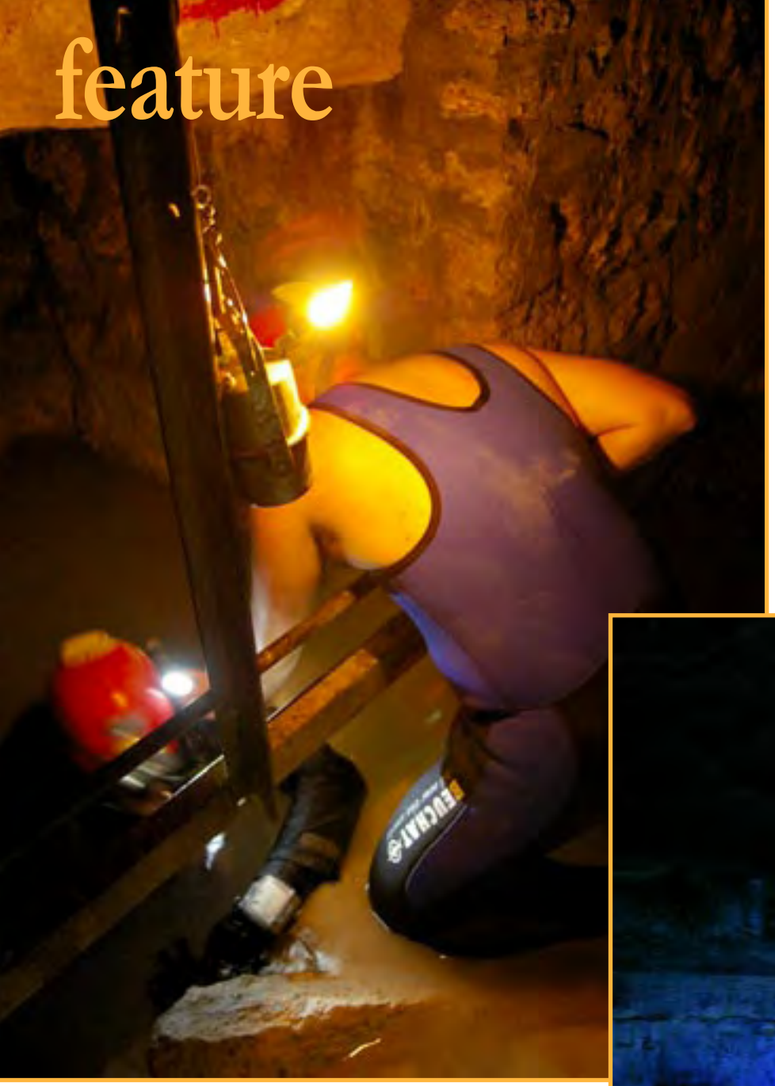
Going through a sump—with zero visibility—can be a harrowing experience

the authorities were left with no other option than to reform the funeral practices of the times. The graveyards of the "Saints Innocents", located in the heart of Paris, include burials from more than 22 churches. Funerals had been taking place here for more than ten centuries. In addition, those who died at the Hotel-Dieu (Paris's hospital) and at the mortuary were sent here. There were so many dead that needed to be buried at that graveyard that it had to be given an additional layer of soil elevating it a further to 2.5m compared to the level of the street.

"Made it!"

Health risk

In 1554, the doctors of the faculty of Paris staged a protest about the place and against the growing risks of epidemics threatening the population of Paris. In 1737, the Royal Academy of sciences confirmed the fears voiced 200 years earlier. The laments of the riverside residents were added to the others. The graveyard has received so many bodies that graves were layered with ground burials and ossuaries and the constant digging kept hollowing out the ground. In 1780, the wall of a cave put side by side with the graveyard collapsed under the pressure from a new grave quickly put in.



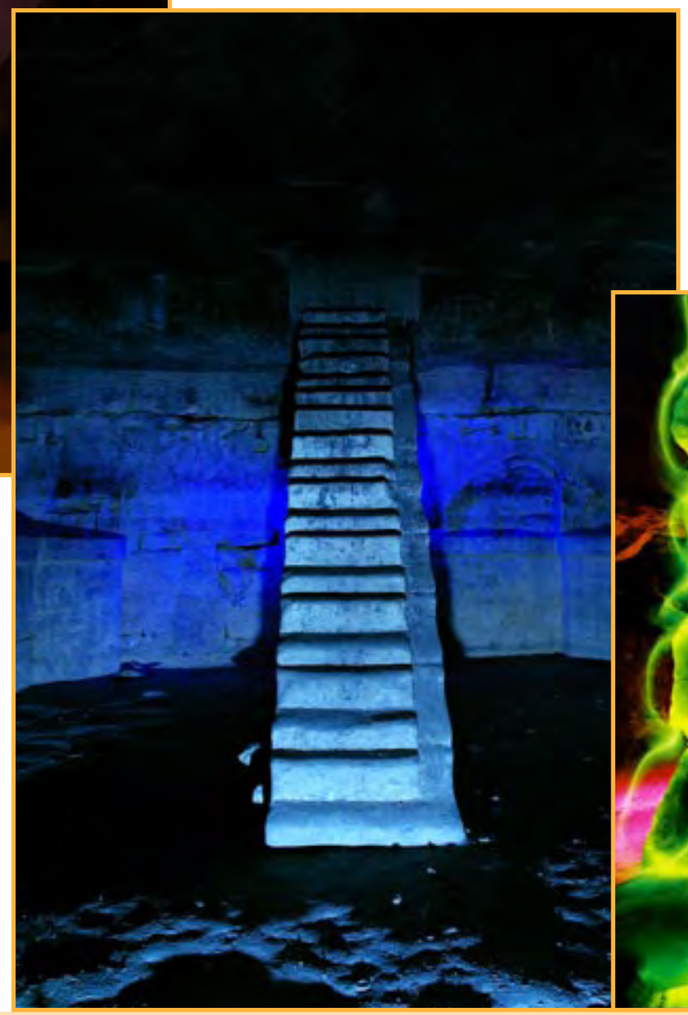
had been cremated and transferred to the quarry. The remains of unknown people were placed together with those of famous people: Racin, the man with the mask of steel, Blaise Pascal, Marat, Danton, etc.

Entering the ancient quarries of Paris has been strictly forbidden by the law since 1955. But these quarries have always been explored by clandestine visitors. From the Middle ages to the 19th century, they were used to secretly stash foods and weapons in Paris. During the German occupation in World War II, the resistance fighters of Paris, had their headquarters in these quarries. The Germans also built a bunker in these Catacombs, but it is not known whether there was ever a battle down there. At the beginning of the 20th century, some conmen made the middle-class people believe that apparitions of the Devil took place here. Since the '80s, the galleries have been explored by many adventure-seeking young people. Unfortunately, they have also left part of the network polluted by graffiti and trash.

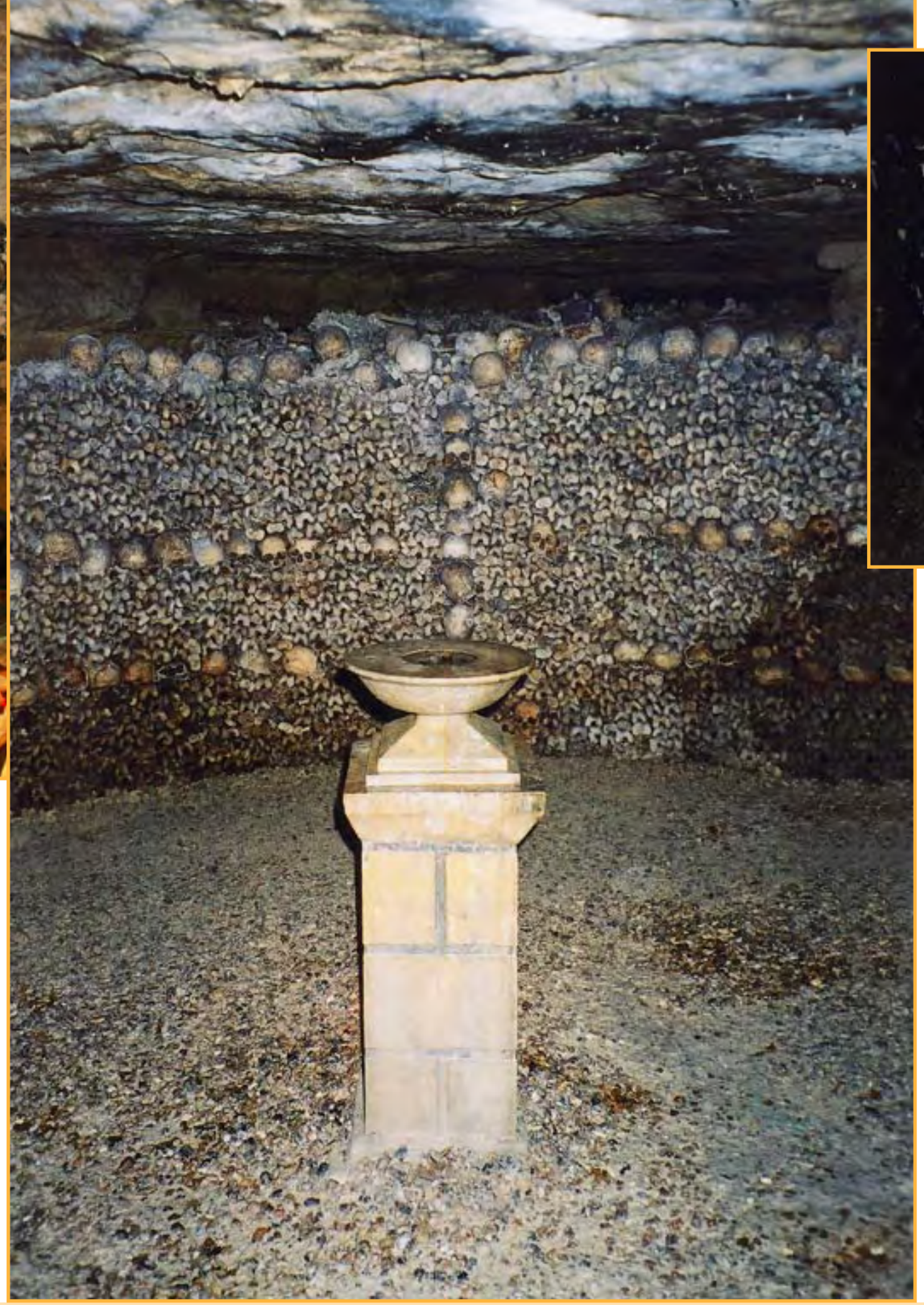
In order to discover virgin places, you have to dive in these wells. The wells give access to second levels drowned by water, after which you can go up again in unfrequented networks. Diving isn't easy or for the faint of heart, it requires cave diving equipment.

Construction of the ossuary. Litograph

Furthermore, going through these narrow sumps takes place with no visibility, because of the rock dust that has accumulated in the



This incident was the last straw. The decision was made to close Paris' graveyards, and the authorities decided to move the bones into Paris' ancient quarry. The spacious quarry was even named after the catacombs of Rome. The place had never been used as a shelter or as a burial place before. The transfer of the corpses were carried out with full religious pomp and honour. At nightfall, a procession with many funeral chariots covered with black drapes, accompanied by people carrying torches and priests conducting a death mass, went to a well connected to the quarry where the bones were put to rest. When it was completed over six million corpses



In places, we come across bones in jumbled piles. But care and reverence for the departed was clearly the order of the day when the depleted quarries for the storage of bones was established in 1786. OPPOSITE: Bodies from the large Saints Innocents cemetery

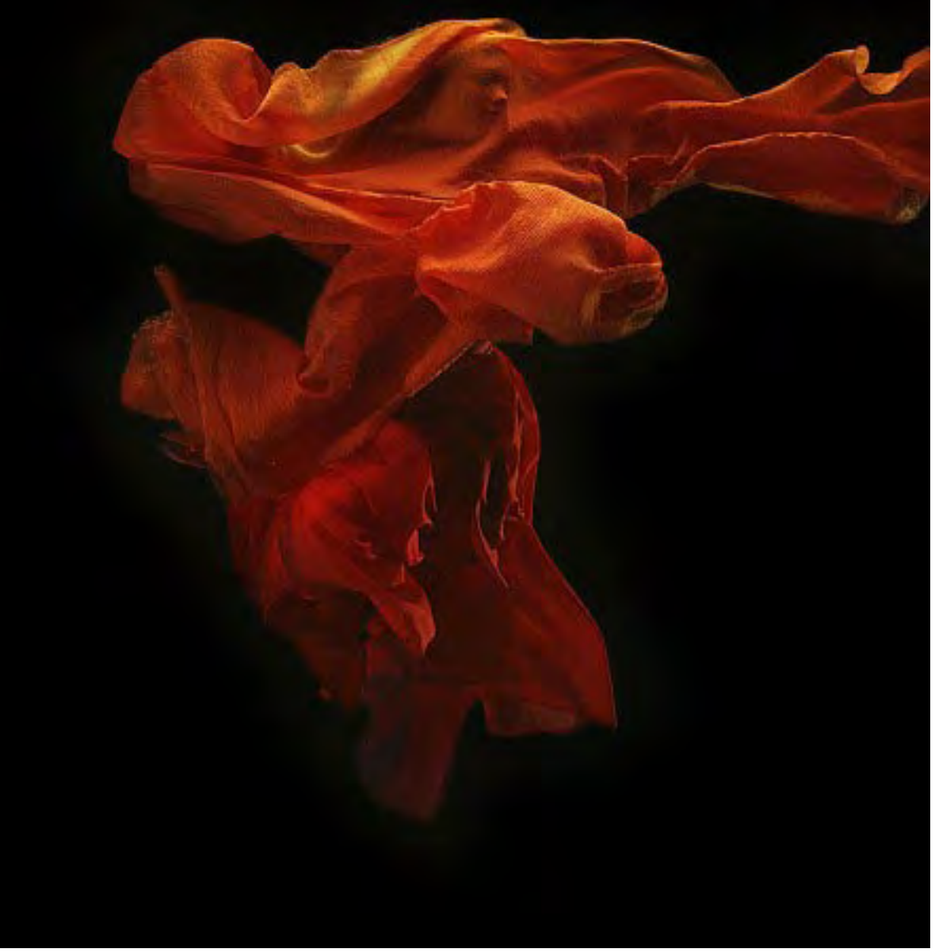
water during all these years.

The water is cold, too, (8-10°C). Moreover, transport of the tanks requires bringing helpers with you. There is not very much depth, between three and six meters, and the distances are typically between 200 and 400 meters. At the end of the sump, we can discover galleries of the 18th century, with gothic vaults, wooden support structures, in which we can find drawings made by quarryman, ancient street name plaques for streets, which do not exist anymore. As well as ruins from times long gone, a mineralogical display and stones, which were supposed to be sold.

It's with the aim of historical research and archaeological exploration that a few passionate divers don their gear in order to make the people of Paris discover the history of their city. New construction takes place constantly in Paris, such as underground car parks, and these works are seriously threatening these locations, which lie hidden out of view. Photo expositions and conferences are staged to create public awareness of these historical locations but they remain at high risk of disappearing, taking with them an important part of the history of Paris. ■


Zena Holloway
PORTFOLIO

portfolio



Zena

LEFT TO RIGHT:
Fire; Rodin; Seahorse; Emma & Rodin

PREVIOUS PAGE:
Angel i and *Angel ii*

All photos by Zena Holloway. Archival limited edition personally signed and numbered prints are available in A2 dimensions (420 x 594 mm). Editions are limited to 150. Prints have a lifetime of up to 120 years and are carefully packed in clear acetate sleeves and shipped in sturdy envelopes via registered mail

Reknown for her extraordinary magical imagery, Zena Holloway is an artist who has taken humanity and the etherial into the underworld to new watery depths.

Born in 1973, this daughter of an airline pilot found inspiration to work underwater behind a camera at the age of 18 while on a diving holiday in Egypt. She became enamored with the underwater realm and eventually came to work abroad as a SCUBA instructor and underwater videographer for several years. She returned to London in 1995 to work as an underwater photographer.

Totally self-taught, Holloway has immersed herself in highly technical aspects of underwater photography and carved out a place in the competitive world of photography and advertising. Initially, work was hard to come by, said Holloway, and she nearly dropped the whole thing on more than one occasion. But a stubborn spirit refused to let her give up, and she finally received her first commission from Faberge in 1997. Thereafter, she received a steady

Text editted by Gunild Symes. Photos by Zena Holloway

CLOCKWISE FROM ABOVE: *Greenpeace; Cyprus; Oceanic.* All photos by Zena Holloway

stream of commissions for both commercials and print.

In the beginning, a lot of people told her it couldn't be done, but specializing in underwater photography ended up playing an important role in her success as the market became saturated with stock photography and digital capture. Holloway managed to combine her two great loves—diving and photography—into one lucrative business.

Some of Holloway's clients include Nike (Next big thing), Herbal Essences (Leo Burnett), Umbro (Exposure), Olay (Saatchi & Saatchi NY), Vogue (Joshua), Bounty (Publicis NY), Jacuzzi (Y&R San Fran), Greenpeace (Saatchi & Saatchi), Dolland & Aitchison (DFGW), Elastoplast (TBWA), Toto (Steele +), Sony (TBWA), EMI/ Parlaphone, GlaxoSmithKline (Ogilvy), Epson (Burkitt DDB), Unibanco (Bates), National Geographic, BBC, Ploydor, The Body Shop, Sunday Times, Dazed and Confused, How to Spend it.

She has collected quite a few awards over the years including the International Photography Awards in which she placed second in both the Advertising Beauty category and the Fine Art Nude category in 2006. She got on the shortlist of the Fashion & Beauty category of the AoP awards for her "Angel" series, which also won the Fashion & Beauty category of the Applied Arts Photography Awards in 2006.

In 2005, her work was chosen for the IV Moscow International Festival Gold Dolphin photography section, and in 2003, she won an Honorable Mention in the Nikon International Photo Contest.

Zena

"I stopped logging my dives at 1,500. That was about seven years ago."
— Zena Holloway

portfolio

That same year she won gold at the 30th Festival Mondial de' L'image Sous Marine in the category of publicity. In 1998, she won silver in the UK at The Royal Photographic Society's International annual print exhibition for "Waterbabies".

Holloway has also collected a number of directors awards including a place on The Reel, UK, in 2007 and a silver in 2003 from Festival Mondial de' L'image Sous Marine for her "Watermark" audio/visual. In 2001, she captured the gold for her "Unibanco" commercials at Festival Mondial de' L'image Sous Marine, which also won recommendation in the Portuguese Film Festival that same year.

"We don't tend to rehearse so much as just shoot tons. The more you shoot, the luckier you get."
—Zena Holloway

Water and light

Holloway sees the underwater world as a unique canvas and manipulator of light.

"The biggest effect that water has on light is to gobble it up. Underwater lighting needs to be very powerful to get anything out of it. Everything tends to take on a cyan cast, and colors can alter a bit, but other than that, the boundaries are set by equipment limitations. I'm frequently trying to simulate interesting-looking lighting that I see on the surface and trying to adapt underwater strobes or lights to see if I can make a similar effect underwater."

She shoots in open water

LEFT TO RIGHT: Lovefield; Epson. All photos by Zena Holloway

portfolio

Zena

At the end of a shoot, my studio looks like a Chinese washhouse—drying dive kit, props, wardrobe, camera, towels, backgrounds….

as well as in the pool, but notes the differences: "You don't have as much control, but you gain an amazing working environment, which can look incredible." Holloway finds working intuitively and literally "going with the flow" In open water, starting with a quick simple set up, allows one to find better alternatives as the session progresses.

However, Holloway does have dreams for a controlled environment in the future: "I wish I had a studio pool. That's on my 10-year plan."

Today, Holloway lives in west London with her partner and their two young daughters, Brooke and Willow.

For more information and to order prints, please visit: ***www.zenaholloway.com*** ■

CLOCKWISE FROM TOP LEFT: *O'Neill; Kaya; Freedivers iv*. All photos by Zena Holloway