Ocean Arts: Fine Arts & Crafts Inspired by the Sea

X-ray mag

GLOBAL EDITION
Aug :: Sept
2006
Number 12

Adventure
Jordan

Bosnian Caves
River Una

Profile
Kurt Amsler

Portfolio
Chihuly

Ecology
Animals With Missiles

Science
Flourescence

Canadian High Arctic

COVER PHOTO BY LOUISE MURRAY

DIRECTORY

X-RAY MAG is published by AquaScope Underwater Photography
Copenhagen, Denmark - **www.aquascope.biz**
www.xray-mag.com

PUBLISHER
& EDITOR-IN-CHIEF
Peter Symes
psymes@xray-mag.com

MANAGING EDITOR
& CREATIVE DIRECTOR
Gunild Pak Symes
gsymes@xray-mag.com

ADVERTISING
Americas & United Kingdom:
Kevin Brennan
sales-uk@xray-mag.com

Europe & Africa:
Arnold Weisz
sales-europe@xray-mag.com

Business Directory
Arnold Weisz
arnold@xray-mag.com

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

Internet Advertising:
Deb Fugitt, USA
DebF@xray-mag.com

SENIOR EDITOR
Michael Symes
science@xray-mag.com

TECHNICAL MANAGER
Søren Reinke
sreinke@xray-mag.com

CORRESPONDENTS
Enrico Cappeletti - Italy
Jordi Chias - Spain
John Collins - Ireland
Jeff Dudas - CA, USA
Tomas Knutsson - Iceland
Marcelo Mammana - Argentina
Yonatan Nir - Israel
Svetlana Murashkina - Russia
Gary Myors - Tasmania
Barb Roy - WA, USA
Yann Saint-Yves - France
Garold Sneegas - KS, USA

CO- EDITORS
Andrey Bizyukin
- *Caving, Equipment, Medicine*
Millis Keegan
- *Opinions and 'DiveGuru.net'*
Michael Arvedlund - *Ecology*
Jason Heller - *Photography*
Dan Beecham - *videography*
Michel Tagliati - *Medicine*
Leigh Cunningham
- *Technical Diving*
Edwin Marcow
- *Sharks, Adventures*
Michael Portelly
Catherine GS Lim
Arnold Weisz

REGULAR WRITERS
Robert Aston - CA, USA
Bill Becher - CA, USA
John Collins - Ireland
Amos Nachoum - CA, USA
Nonoy Tan - The Philippines

CONTRIBUTORS THIS ISSUE
Kurt Amsler
Michael Arvedlund, PhD
Dan Beecham
Andrey Bizyukin, PhD
Dale Chihuly
Leigh Cunningham
Cindy Lou Dale
Lek Fukjeen
Mike Gadd
Jason Heller
Stein Johnson
Millis Keegan
Catherine GS Lim
Louise Murray
Gunild Symes
Michael Symes
Peter Symes
Cedric Verdier
Yann Saint-Yves

SUBSCRIPTION
X-RAY MAG International Edition in English is FREE.
To subscribe, go to: **www.xray-mag.com**

COVER PHOTO
Belugas, Canadian High Arctic, by Louise Murray
(CONTINUED ON PAGE 4)

Ocean Arts Gallery:
Fine arts & crafts inspired by the sea... page 52

contents

Diving for underwater images, Mediterranean. Photo by Kurt Amsler

editorial

Hot Topics

Temperatures across Europe and the US have been breaking records this summer—and so have the prices on fuel.

While many speculate whether the soar in temperatures is an artifact of global warming, or just a peak in natural oscillations, it is certainly an indication of times awaiting us. And when it comes to the hike in fuel prices, at least one good thing about it is that it increases both the pressure and the economic incentives to find alternate sources to fossil fuel for our vehicles.

For example, in this issue, we have a short mention about a Spanish company that might have found a way to make biofuel out of plankton. Is that one possible remedy? Who knows.

On paper, it certainly sounds good and a fanciful solution to more than one problem. Through their photosynthesis, plankton draws $C0_2$ out of the atmosphere too. Maybe we could make extra good use of the problematic planktonic algae blooms that are now results of runoff of fertilisers. Perhaps one day we could even harvest the toxic red tides, scoop it all up and turn it into fuel. Tantalising thoughts, and both the technology and the infrastructure still lies well in the future. Getting this stuff made on the massive industrial scales calls for such vast investments in infrastructure that it requires political and legislative help to stand a chance. And such legislation is possible where there is a will as demonstrated by several South American countries where cars, by law, run on petrol that is blended with biofuels. On another note, I wouldn't mind getting rid of the Western dependence on oil from the Middle East either. Maybe that could spare us a lot of the conflict and agony that is presently coming out of it.

In the mean time, while we await the advent of the magic invention that will solve the energy crisis, you and I need to do a few pre-emptive changes of habit of our own. If the soaring gas prices haven't already made us consider more carefully how much we drive, this is a good time. Just changing our transportation habits, where possible, can

Help us make a better magazine

Do Our Survey And Participate In A Draw For Suunto D6 Dive Computer

We are keen to learn more about our readership. Help us by filling out the questionnaire on: **www.xray-mag.com/survey**

For mere information on the Suunto D6 please visit *www.suunto.com*

editorial

make a major contribution here and now to cutting back CO_2 emissions. Some of us don't really have an alternative to using a car to get to work for example if you live in the countryside. But a lot of us do—especially in Europe where public transportation is plentiful in built up areas. And where distances are small, can't you bike? They do that a lot in Asia and parts of Europe. It would do your health some good too.

Currently, in this country, an oil company is running TV ads about how they want to make petrol that doesn't produce any emissions, branding and heralding their new fuel, which produces 5% less CO_2, "as a step towards that goal". Ya, right. Give the car a rest instead. Use your legs where possible.

But do we really care enough to make any sacrifices? That is the question our colleague, Millis Keegan, asks in this issue and of passers-by on a beach in Florida and individuals in Sweden. Some were divers, some were not, but the responses were overall equally depressing. Do we really care about global warming, about coral dying and the depletion of the oceans' resources? While quite a few did find it quite worrisome, some didn't care—some thought it was all too complex and zoned out completely from thinking about it, because it was just too overwhelming. While others blamed the politicians claiming it was their responsibility. Not so, Bubba. It is also yours. You are a consumer and your choices carry a lot of weight. And please explain to me once more why you didn't vote?

PRIZES FOR YOUR OPINIONS

Just a minute of your time

We also ask your help on one more little matter. This one will only take you a minute.

We want to know your opinion: Which environmental organisation do you consider to be the best, or most efficient, and most worthy of financial donations? Would it be Greenpeace, Ocean Futures, Oceana, Coral Alliance, or someone else? We only need the name. Among the entries received by email on **poll@xray-mag.com** by Sept 20, we will make a draw for a set of Silver Hammerhead cuff links from Reef Jewellery.

In addition, if you also send us 20-100 words stating the grounds for your nomination you will also enter a drawing for a Suunto D6 dive computer. Thank you. ■

Support SOS-SeaTurtles

Sign the petition online, click here ☼

Thousands of sea turtles are being slaughtered often suffering an ugly painful death by being skinned alive. Click **here** to send an email with a "Letter of Protest" to the Governor of Bali and copies sent to other important officials

Click here to visit SOS Sea Turtle's webpage ☼

X-RAY MAG is distributed six times per year on the Internet.

Views and information expressed in articles are those of the individual author and are not necessarily representative of views held by X-RAY MAG or its affiliates. Unsolicited manuscripts, photographs and illustrations should be emailed to: **gsymes@xray-mag.com**

X-RAY MAG accepts no responsibility for unsolicited materials sent to its office, nor is it liable for loss or damage to such materials.

X-RAY MAG observes a strict privacy policy. No personal or private information will be shared with a third party without the written permission of the owner.

NAUI WORLDWIDE
DIVE SAFETY THROUGH EDUCATION

News from NAUI in X-RAY MAG:

This issue of X-RAY MAG includes news and press releases from NAUI in sections designated by the NAUI logo. While the page design is done by X-RAY MAG as an integrated part of the magazine, these news stories are brought to you by NAUI at NAUI's discretion.

X-ray mag

News edited by Catherine GS Lim and Peter Symes

way down deep NEWS

STERLING ZUMBRUNN

Nudibranch, *Chromodoris elisabethina*

Healthy coral reef photographed on the CI Marine Rapid Assessment Program

Jean Haharavo of the National Center for Environmental Research of Madagascar, records notes about coral coverage

Island group off Northeast Madagascar

Two species of sweetlips, (*Plectorincus picus*) and (*Diagrama punctatum*), wait to be cleaned under a table cora

Conservation International reports

Healthy Coral Reefs Off Madagascar Found to Resist Damage From Climate Change

All photos: Conservation International

Healthy coral reefs of Madagascar's northeast coast have so far resisted the damaging effects of warmer ocean temperatures attributed to global climate change

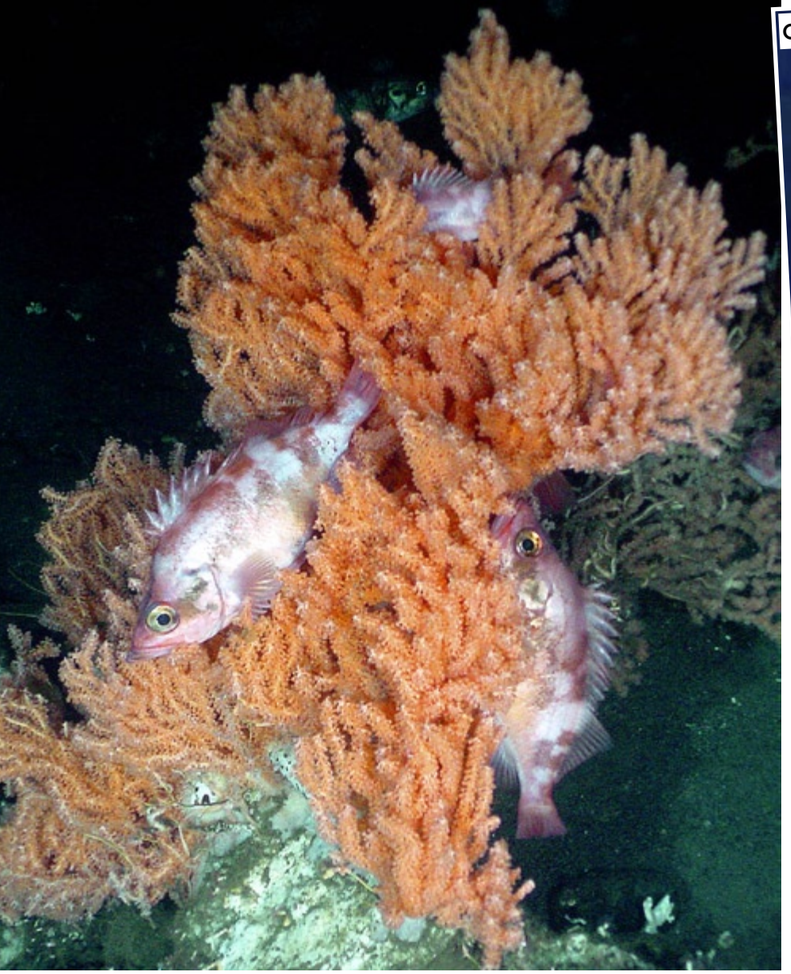
In March, scientists from Conservation International and its partners surveyed a previously unexplored region between Cape d' Ambre and Baie du Loky where they documented a much greater variety of life than expected. They found healthy coral reefs that have avoided bleaching attributed to climate change found in other Indian Ocean reefs. The researchers believe cool water currents from adjacent deep ocean areas offset the warming effects of climate change. One fish species believed new to science was observed and 17 others noted for the first time in the waters off Madagascar. These findings increased the total number of fish species in Malagasy waters to 82 .

Highest coral diversity

The two Rapid Assessment Program expeditions also recorded the highest coral diversity of the western Indian Ocean and the Red Sea, making the region one of the richest in Indian Ocean marine biodiversity. "In the end, these expeditions have doubled the number of marine species known to the region," said Sheila McKenna, director of marine biodiversity for CI's Center for Applied Biodiversity Science. "That demonstrates the need to protect these areas."

Jean Maharavo of Madagascar's National Center for Environmental Research, who took part in both expeditions, noted that much of the island nation's marine biodiversity has yet to be studied. "During each of these two expeditions, we discovered new fish and coral species," Maharavo said. "That shows the need to protect what's out there before we lose biodiversity that we never even knew existed." ■

SOURCE: CONSERVATION INTERNATIONAL



Dark blotched rockfish nestled in the branches of a gorgonian

Extended Reefs Discovered Off US West Coast

NOAA scientists have discovered areas of deep-sea corals in the Olympic Coast National Marine Sanctuary off the Washington state's Olympic Peninsula

Results from the 12-day scientific mission were dramatic. Scientists used a Remotely Operated Vehicle in depths down to 600m to photograph and video tape the coral and sponge assemblages. At least six species of soft coral and one species of stony coral were observed. In some areas scientists encountered fields of gorgonians with individual colonies standing as high as one meter. Researchers observed coral species supporting thriving populations of invertebrates as diverse as tube worms, shrimp, brittle stars, sea slugs, crab, colonial and solitary sea anemones and feather stars. Some of the coral assemblages appeared to form aggregation sites for rockfishes and pregnant females of at least three species of rockfish were observed nestled among the coral and sponge structure. Researchers also saw egg cases of sharks attached to the coral colonies. Corals observed included giant cup corals, branching soft corals such as "bubblegum coral" and the stony reef-building coral *Lophelia*.

"*We know that deep water corals are an important part of the ocean ecosystem, but we know very little about them*," said Timothy R. Keeney, co-chair of the United States Coral Reef Task Force. "*Further study of this area shows promise in expanding our understanding of the ecological role of deep coral habitats, and perhaps even providing insights into the future impacts of climate change and ocean acidification on such important ecosystems.*" ■

Red gorgonian coral branch supporting attachments of a whitish basket star, crinoids and several shark egg cases

Results from the surveys were dramatic

Rosethorn and red-banded rockfish adjacent to the reef-building coral *Lophelia pertusa* and a giant cup coral

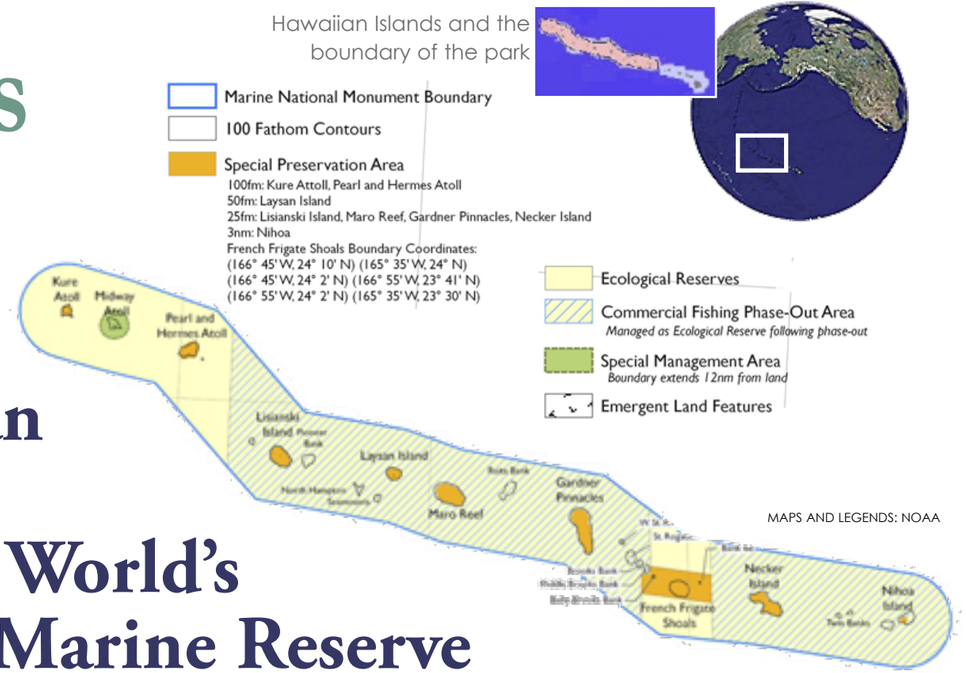
Gorgonian soft coral tentatively identified as an Umbellula species

Gorgonian soft coral tentatively identified as a Paragorgia species

Rosethorn Rockfish

news

Edited by
Peter Symes



MAPS AND LEGENDS: NOAA

Hawaiian Islands Become World's Biggest Marine Reserve

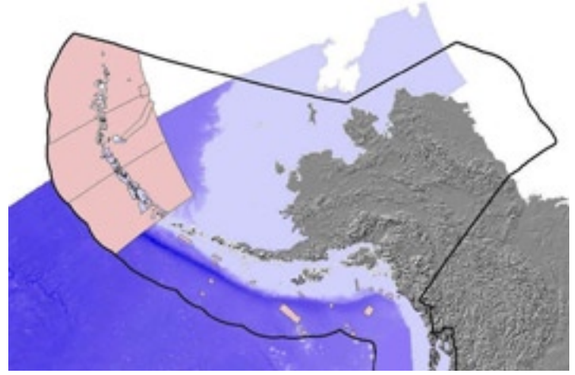
On June 15, US President Bush announced the establishment of the Northwestern Hawaiian Islands Marine National Monument.

With his signature, an area that stretches across 2,250 kms, covering nearly 362,600km^2 around the Northwestern Hawaiian Islands came under US environmental protection, making it the world's largest protected marine reserve.

"We will protect a precious natural resource," Mr Bush said at a White House ceremony where he declared a string of Pacific islands and submerged volcanoes a national monument.

The protected area starts about 260 kilometres west of the inhabited Hawaiian island of Kauai and stretches nearly 1,900 kilometres from Nihoa Island in the east to Kure Atoll in the west.

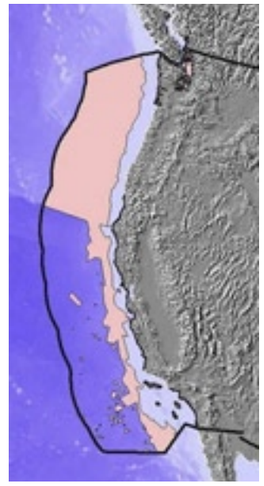
The area includes the world's most remote and relatively undisturbed coral reef ecosystem and supports more than 7,000 species, including more than 100 species unique to those islands. ■



Protected zones around the Aleutians

No More Bottom Trawl Off Aleutian Islands

On June 27, in what have been called a watershed event for ocean conservation, NOAA Fisheries protected more than 960,000 square kilometers of seafloor in the Aleutian Islands of Alaska from destructive bottom trawling. This closure establishes the largest protected area in United States waters, and the third largest such area in the world (after closures in the Mediterranean Sea and Azores and Canary Islands). The Aleutian closure signals a changing tide in U.S. fishery management practices to look at the health of the entire ecosystem instead of productivity of single species money fish. ■



Protected zones off the US west coast

WWF-CANON / ALAIN COMPOST

Irrawaddy Dolphin

Burma Establishes Reserve for Unique Human-Dolphin Partnership

The government of Burma has established a protected area for a partnership between fishermen and Irrawaddy dolphins—a species that is threatened throughout much of its coastal and freshwater range.

The fascinating partnership involves fishermen summoning the river-dwelling dolphins to voluntarily herd schools of fish toward the boats and awaiting nets. Thereby the fishermen can increase the size of their catches by threefold, and the dolphins appear to benefit by more easily preying on the cornered fish in both nets and on the muddy banks of the river. Specifically, some 70 kilometers of the Ayeyarwady River have been protected to safeguard the cooperative fishery. ■

Massive Marine Reserve Planned in Indonesia

Indonesia has announced plans to create a marine protected area over 12.000km2 off the eastern coast of the Derawan Archipelago in the Sulawesi Sea.

The archipelago is an integral part of WWF's Sulu-Sulawesi Marine Ecoregion, which contains some 450 species of coral and support one of the world's largest varieties of reef fish, as well as commercial and community fisheries. In recent years, however, overfishing and destructive fishing methods, including the use of cyanide and dynamite, have destroyed large sections of coral and depleted fish populations. "We are pleased to see the local government recognize the need to protect and manage the region's marine resources of the region," said Dr Lida Pet Soede, director of WWF-Indonesia's marine programme.

Sulu Sulawesi Marine Ecoregion

WWF and The Nature Conservancy are currently working with the Berau District and local communities in developing a zoning plan that will include no-take zones, as well as traditional-use zones where only small-scale traditional fishing will be allowed. Other zones will be set up for tourism, fishing and other recreational activities.

Community members of more than 25 coastal villages initiated the call to protect their marine areas, following reports from local fishermen that fish catches were decreasing and revenues were being lost due to increased non-resident fishing operations. ■

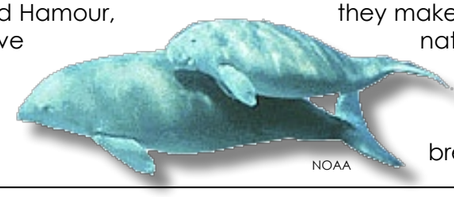
New Marine Protected Area in Abu Dhabi

In Abu Dhabi, the Al Yasat group of islands off the Western Region and the surrounding waters has been declared a Marine Protected Area where catching or removal of organisms are prohibited.

The group of islands, covering a total area of 482km^2 are surrounded by coral reefs, which act as important marine sanctuaries to many species, including the already over-exploited Hamour, Sherri and Farsh. The reefs have good coral growth and high coral cover with around eight coral species present.

The islands have irregular coastlines with both rocky and sandy shorelines, providing a variety of habitats. The MPA has suitable foraging habitats for the critically endangered Hawksbill turtles.

It also has significant populations of marine fauna including the endangered Green turtle and the Dugong. Desert hares are present on the islands, where they make use of the natural landscape and vegetation for shelter, food and breeding. ■



NOAA

news

Edited by
Peter Symes

World Record: 270m Unaided Dive at Dahab

(FROM UNDERWATERTIMES.COM NEWS SERVICE)

On July 8, Hungarian diver Gusztav Riczler set a new world record for the deepest unaided scuba dive. The 37-year-old man set the new mark by diving to a depth of 270 meters near the resort of Dahab on coast of the Red Sea.

Riczler descended to the maximum depth in 14 minutes, and then started the eight hours long ascent back to the surface, which required several decompression stops. Riczler carried eight tanks with different gasmixes for different depths. The dive took place at the Blue Hole, located a few kilometers north of Dahab, and known as one of the most dangerous diving spots in the world. Due to a series of tragedies that occurred there, it is often reffered to as "a divers' cemetery". ■

FABIENCOUSTEAU.COM

Blind Diver Sets Depth Record

British diver Mark Threadgold set a new world record for the deepest dive by a blind person after reaching 103m in the Red Sea. The dive took two hours to complete using a closed circuit rebreather with trimix. Threadgold was aided by four sighted divers controlling his equipment. The 38-year-old former sergeant was already a diver when an accident blinded him. However, he was determined to carry on diving after he lost his sight. To Dive magazine Threadgold stated he hoped the record would raise the profile of St Dunstan's, a charity which helps rehabilitate blind ex-servicemen and women. ■

Close Call for Fabien Cousteau as His Shark Sub Suddenly Sinks

Fabien Cousteau, grandson of the legendary Jacques Cousteau, nearly lost his life in a submersible built to look and move like a Great White shark, while on location off Mexico. To his horror, the submarine he was piloting stopped responding to the controls and plunged to the sea floor. Upon crashing, Fabien was pinned between the sub and the ocean floor precariously close to a deep drop off. With communications lost and no way to communicate with the surface or escape, his sister Celine feared the worst. Eventually, a team of divers including Celine managed to free Fabien from certain death. The shark was being used in support of the filming of the documentary "Shark Mind of a Demon" when it sank off Isla Guadalupe. ■

FABIENCOUSTEAU.COM

Filephoto from Fabien Cousteau's website of the shark sub that sank

Scientists Give Gore's Movie on Global Warming a Thumbs Up

Former United States Vice President Al Gore

Leading climate scientists are giving ''An Inconvenient Truth,'' former US vice president Al Gore's documentary on global warming top marks

The Associated Press contacted more than 100 top climate researchers by email or phone for their opinion. Of those researchers who responded that they had seen the movie or read the book, all stated Gore conveyed the science correctly. The world is getting hotter and a man-made catastrophe is in the making caused by the burning of fossil fuels.

William Schlesinger, dean of the Nicholas School of Environment and Earth Sciences at Duke University was quoted as saying that it was excellent. "He got all the important material and got it right." Robert Corell, chairman of the worldwide Arctic Climate Impact Assessment group of scientists, wrote "I sat there and I was amazed at how thorough and accurate it was. I'm absolutely blown away. There's a lot of details you could get wrong. I could find no error."

In an interview with the Associated Press Al Gore said he wasn't surprised ''because I took a lot of care to try to make sure the science was right." ■

Jill Heinert to Map Out Bermuda Caves

A project to map out Bermuda's extensive underwater cave systems is due to start within the next 12 months, and it is likely cave divers will explore regions of the Island never before seen.

The caves harbour some unique species and 22 of the 80 cave-adapted animal species so far discovered there are critically endangered. Some are so rare they exist only in a single cave "room". Finding more of these rare and unique creatures is a distinct possibility, so the various stages of the exploration will be filmed as a documentary to be entitled "Bermuda High". The film will be shown on TV stations around the world, and there will also be a web-based documentation resource site.

The project is being driven by the Bermuda Aquarium Museum & Zoo, former natural history curator Wolfgang Sterrer and cave expert Tom Iliffe who brought onboard award-winning film-maker and one of the world's top cave divers, Jill Heinerth of US-based Karst Productions.

Bermuda's limestone caves are thought to date back to between one and two million years, however, some of the life forms that have found sanctuary in the undisturbed underworld stretch back even further into the mists of time and have somehow made their way to Bermuda. The well-known Crystal Caves in Hamilton Parish were only found in 1905, but opened a fascinating chapter in the knowledge of Bermuda's natural wonders. ■

NAUI EUROPE Workshops

To create a bigger and stronger NAUI in Europe and to assist the members better in the local language, NAUI Europe works with NAUI REPs to promote NAUI and to assist with quality control.

A NAUI REP is an active status Course Director designated to teach course director workshops. Before some one can call himself a NAUI REP, he or she first goes through a REP workshop with the NAUI Europe training department. In this workshop, the candidates are prepared to do their job in their area.

The workshop handles the following topics:
- ► Standards and policies leadership courses
- ► Quality control
- ► Marketing and sales of the NAUI educational system
- ► Why NAUI
- ► Translations
- ► Administrative requirements
- ► Certifying instructors/instructor trainers and course directors
- ► Evaluations of class room sessions
- ► Micro teaching demonstration
- ► Stock keeping
- ► Cap program
- ► Prospecting and recruiting new members

The final exam is a combination of an instructor/instructor-trainer and course director exam. These workshops are held on regular basis in the NAUI Europe office.

The schedule is available on the NAUI Europe website. **www.naui-europe.com** ■

Celebrating 10 Years with Walt Disney World Resorts

In celebration of the 10-year anniversary of their association with Walt Disney World Resorts, NAUI will be hosting dive guests at Disney World's "The Living Seas" attraction.

Due to this long association, NAUI has exclusively acquired all the dives at "The Living Seas" attraction at Epcot during the week of the industry's tradeshow in Orlando, November 5-11, 2006.

For the past 10 years, NAUI has been the official dive training agency for Walt Disney World Resorts. This relationship has meant that the divers who work at America's best known theme park have received the best dive training in the world.

Disney World's "The Living Seas" attraction is one of the largest man-made ocean environments in the world.

"We are very excited about providing our dive partners and guests with a world-class experience that can only come from Disney World," stated James Bram, President of NAUI. "We have thoroughly enjoyed our working relationship with Disney, and we're quite proud of our many years of service to them."

Mr. Bram says that NAUI will use the tickets as a way to thank top performing NAUI dive center owners and operators as well as to welcome international NAUI operators to DEMA. Quite a few tickets will also be available through contests held at the NAUI booth during the show and some will be given away as prizes during the annual Dive Industry Bash. ■

Disney Dive
Sunday, November 5

Dive at Epcot's "The Living Seas" Exhibit at Walt Disney World® in Orlando! Sunday, November 5, 4:30-5:30, 5:30-6:30 and 6:30 to 7:30.

Price of $140 includes admission to Epcot following your dive. Sorry, no coupons apply to these dives. Limited space is available on a first-come, first-serve basis, and is exclusively available only through NAUI. Don't miss your chance to create magical memories for a lifetime... reserve your spot before they're all gone!

https://store.nauiservicesgroup.com

Did You Know?

1. NAUI is the fastest growing scuba agency in Europe and the Middle East due to its award-winning educational materials and the special sponsored program for dive professionals becoming a NAUI CD (course-director and examiner) and a NAUI REP (representative).

2. NAUI has educational materials in the following languages; English, German, Dutch, Italian, Swedish, Spanish, Chinese (traditional), Chinese (simplified), Korean, and expects to add the following; Hungarian, French, Thai, Greek Arabic. NAUI is also working on Romanian, Czech, Polish and many more languages.

3. All NASA astronauts are NAUI certified and qualified divers. We are sure that you know how important *they* find their level of training.

4. NAUI is involved in many great adventures and is also this year part of an expedition to scuba dive under the Arctic ice of the North Pole (north of Spitsbergen/Svalbard).

5. NAUI training up to the NAUI instructor level is offered at many sports universities due to the fact that the NAUI system provides the best dive education and allows a good deal of academic freedom to teach at the highest levels.

6. NAUI services all members directly through their offices in USA (HQ, Tampa, USA, for the Americas and Pacific), Asia (Kuala Lumpur, Malaysia for Asia and Australia) and Europe (Nijverdal, The Netherlands, for Europe and the Middle East).

7. Cross-over courses (ICC) and courses up to course director and examiner (CD) and also NAUI REP are done at the NAUI EUROPE office and training centre, which is one of the most modern and best utilised centres for this purpose.

8. NAUI also has the NAUI TEC program for all TEC training from "intro-to-tec" up to TRI-MIX-II, etc.

9. You are also invited to become part of the NAUI family.

10. NAUI offers for those who want the become a NAUI CD (and examiner) and also those who wants to become a NAUI REP a special sponsored program ■

NAUI WORLDWIDE
DIVE SAFETY THROUGH EDUCATION

New Rep in Austria

Earlier this year, Austrian Gerhard Haas did a crossover program with the German NAUI rep Jórg Graul to become an Instructor Trainer. He then went on to organise his first NAUI ITC in Austria during which Jörg came over for the Instructor Qualifying Phase (IQP) and Gerhard did his CDW (course director workshop). Acting as a NAUI CD, Gerhard Hass visited NAUI EUROPE's offices to do his REP workshop, which qualified him to become NAUI's new representative in Austria. He will now update his website to assist NAUI members in Austria and to supply the members with all the most requested NAUI materials. He can train students up to NAUI CD (and examiner) level and requalify those who lost their active status. ■

Training

Edited by
Peter Symes

Tom and Patty Mount Regain Control of IANTD

Effective June 25, 2006, Tom and Patti Mount have reached an agreement with Rudi Asseer in which full financial and operational control of IANTD has been returned back to the Mounts. In doing so, all parties have agreed that all ownership, interest in and management control of IANTD has been returned to the direction of IANTD's shareholders: Tom and Patti Mount, David Mount and Joseph Dituri. As part of the parties' agreement, Mr. Asseer has also agreed to return all IANTD, equipment, merchandise and products to the Mounts.

IANTD strives to be on the cutting edge of advancements in diving technologies and remains dedicated to continuing that pursuit. New and more stream-lined support for registration and ordering merchandise have been introduced, and IANTD plans to unveil other new and inventive offerings that should assure that IANTD remains ahead of the "pack". ■

PADI International: Getting People Diving

Various linked promotions are underway at PADI International Ltd, all with the aim of enticing people further into the world of scuba diving with PADI. Each of these promotions cover the entire PADI International Ltd territory.

The Specialty of the Month promotion is a year long campaign with the aim of generating interest in PADI Specialty courses. These courses give divers a further knowledge and experience in a chosen subject area. Each month, PADI promotes the following Specialty of the month based on the calendar below:

January:	Dry Suit Diver
February:	Underwater Navigator
March:	Search and Recovery
April:	Project AWARE
May:	Digital Photographer
June:	Enriched Air Diver
July:	Deep Diver
August:	Wreck Diver
September:	National Geographic Diver
October:	Night Diver
November:	Equipment Specialist
December:	Wild Card! PADI will advise..... ■

BSAC United Kingdom Go! Dive

This summer, BSAC in the UK is inviting all divers to come and give it a go the BSAC way. Have you just leared to dive abroad and would love to find out about diving in the UK but don't know how to go about it? BSAC has hundreds of clubs up and down the country. Get BSAC free on 0500 947 202, and they will locate your nearest branch who can take you diving.

It doesn't matter where you trained or who you trained with. And it doesn't matter whether you haven't dived for a few seasons or are just itching to get back in the water after a break from diving due to family or work. **bsac.com** ■


PETER SYMES

SSI Goes Technical

Momentum for an SSI technical diving program has been building for several years and the move is based on the conviction that the SSI Education System could be extended seamlessly and that the SSI organization had the expertise necessary. The development team led by Project and Training Manager Steve Newman has has been gathering requirements and assessing needs. They are now creating detailed development, training and marketing plans and are developing courses, training standards, exercises and products. The first products are anticipated to be released by the end of 2006.

"There are many quality technical diving programs on the market and we respect them all," said Gary Clark, president of Scuba Schools International. "But there's still room for a program that combines quality education and business support, the SSI way. Plus our dealers prefer to work with one company, and our instructors would appreciate paying dues to one company. We've been evaluating the market for a while and feel the time is right."

No further information about the SSI technical diving program will be made public at this time. **www.divessi.com** ■


PETER SYMES

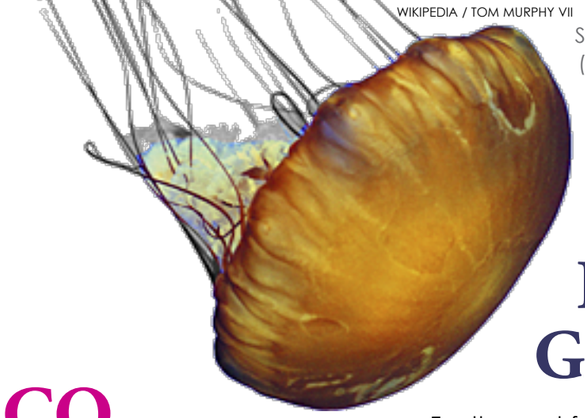
SDI Receives Certification From the European Underwater Federation

Effective immediately, all of the Scuba Diving International (SDI) Regional Offices within Europe have received the stamp of approval from the European Underwater Federation Certification Body (EUF) for their compliance with CEN standards.

SDI has received the certificate of approval for the following countries/regions: Cyprus, Greece, Benelux, Czech Republic, Austria, Slovakia, France, Monaco, Germany, Italy, Malta, Poland, Portugal, Scandinavia, Spain, UK and Ireland. For more information about SDI, visit **www.tdisdi.com** ■

Jelly News

Edited by
Peter Symes



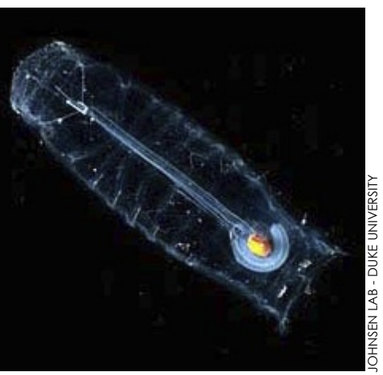
WIKIPEDIA / TOM MURPHY VII

Sea Nettle
(*Chrysaora quinquecirrha*)

Jellyfish and CO_2

Salps, jellyfish-like creatures, may play major role in fate of Carbon Dioxide in the ocean, report biologists from Woods Hole Oceanographic Institution in *Deep Sea Research*.

The salps, about the size of a human thumb and considered by many just another low member in the ocean food chain, may be more important to the fate of the greenhouse gas carbon dioxide in the oceans than previously thought. The oceans absorb carbon dioxide from the atmosphere, including some from the burning of fossil fuels. In sunlit surface waters, phytoplankton use the carbon dioxide, CO_2, to grow. Animals then consume the phytoplankton and incorporate the carbon, but most of it dissolves back into the oceans when the animals defecate or die. The carbon can be used again by bacteria and plants, or can return to the atmosphere as heat-trapping carbon dioxide when it is consumed and respired by animals.



JOHNSEN LAB - DUKE UNIVERSITY

The salp *Salpa maxima*. Salps are pelagic tunicates often found in huge abundance.

Swarming by the billions in "hot spots", salps may aid in transporting many tons of carbon per day from the ocean surface to the deep sea thus keeping it from re-entering the atmosphere.

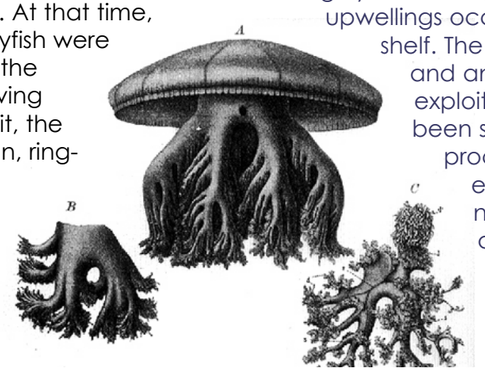
One swarm covered 100,000 square kilometers (38,600 square miles) of the sea surface. The scientists estimated that the swarm consumed up to 74 percent of microscopic carbon-containing plants from the surface water per day, and their sinking fecal pellets transported up to 4,000 tons of carbon a day to deep water. ■

Japan Fights Invasion of Giant Jellyfish

For the past few years, massive schools of giant Echizen jellyfish have been reported at a number of coastal areas. The plague that occurred in the summer of 2005 was particularly serious. At that time, 300 million to 500 million Echizen jellyfish were flowing into the Sea of Japan from the Tsushima Strait every day. After moving northward through the Tsugaru Strait, the jellyfish swam into the Pacific Ocean, ringing the coast of the nation.

During their sea-going voyage, the jellyfish grow up to 1.5 meters in diameter and 200 kilograms in weight.

The plagues of jellyfish have wreaked havoc on the fishing industry. Fixed fishing nets are torn apart and fouled with the jellyfish, which decimate fish hauls. Fishing crews are exhausted from constantly having to remove the behemoths from their nets. According to the Fisheries Agency, there were about 109,000 incidents of jellyfish causing damage to the fishing industry and the total damage nationwide is estimated at tens of billions of yen. ■



Jellyfish Slow Japanese Nuke Plant

On Thursday, July 20, 2006 Reuters and CNN reported that jellyfish had forced a Japanese nuclear power plant to slow down production after the slimy creatures blocked up the plant's seawater cooling system. ■

Namibia Now Has More Jellyfish Than Fish

The population of the jellyfish sea nettle have exploded near Namibia and have actually overtaken fish in terms of the biomass they contribute to the ocean region possibly as a consequence of over-fishing. Climactic changes could also contribute to jellyfish population shifts. Jellyfish are now so abundant that they significantly interfere with fishing operations and industrial water-uptake systems. In the past, this region has offered abundant fish stocks, thanks largely to its being served by cool, nutrient-rich upwellings occuring along the continental shelf. The fish stocks, including sardines and anchovies, have been heavily exploited since the 1970s and have been significantly depleted in the process. Because fish and jellyfish essentially compete for similar nutrient resources, a dramatic decline in fish populations could theoretically contribute to a substantial shift in the abundance of jellyfish. ■

COLIN TEO

(PREVIOUSLY POSTED ON XRAY-MAG .COM)

Unknown Ecosystem Found in Cave

A unique ecosystem that was isolated for millions of years has been discovered in a cave in Israel. At least eight previously unknown ancient animal species were found—four seawater and freshwater crustaceans and four terrestrial species.

Scientists believe that the cave, which has been dubbed the Ayalon Cave, was sealed off five million years ago, when the Mediterranean covered parts of Israel. The cave, which Hebrew University Professor Amos Frumkin said is "unique in the world", had been sealed off from the outside world since its surface was situated under a layer of chalk that was impenetrable to water. Miners found the ecosystem while drilling rock at a quarry near Ramle when a small opening was found leading to a cave extending to a depth of 100 metres beneath the surface. ■

Plankton and N_2

Scientists towing an underwater digital microscope across the Atlantic have found possible missing links to the global Nitrogen cycle.

Trichodesmium is one of many tiny photosynthetic organisms that use the sun's energy. Production of biomass in surface waters is typically limited by nitrogen, but Trichodesmium is able to escape that constraint by virtue of its ability to utilize nitrogen gas, which is plentiful in the atmosphere and upper ocean.

Now researchers from Woods Hole Oceanographic Institution believe that this multi-celled, filamentous organism plays a quite significant role in the input of nitrogen to the upper layers of the tropical and subtropical ocean, which make up nearly half of the Earth's surface.

In their report in the journal Science, the researchers suggest that nitrogen fixation rates for Trichodesmium may be up to 5 times higher than previously estimated from traditional sampling.

Trichodesmium abundance has been difficult to measure using traditional net sampling because the colonies are easily damaged or destroyed during collection. By contrast a digital video-microscope on tow, the Video Plankton Recorder (VPR), is a non-invasive instrument that automatically samples and sorts images of Trichodesmium at a rate of 30 frames per second. ■

Click on map to download a higher resolution map (as a 950Kb pdf) directly from WWF

"The project has shown that most Gulf coral reefs are in good health"

WWF Maps Coral Reefs in Arabian Gulf

WWF UAE has helped prepare the first map of coral habitats in the southeastern Arabian Gulf, highlighting some of the most extensive and biologically important coral reefs around the offshore islands and banks of the United Arab Emirate of Abu Dhabi and Qatar's harbour. This large scale habitat map, which has been prepared using Landsat satellite imagery and is an outcome of the Coral Reef Investigations in Abu Dhabi and Eastern Qatar project, will allow resource managers to assess the quantity and quality of marine resources under their jurisdiction.

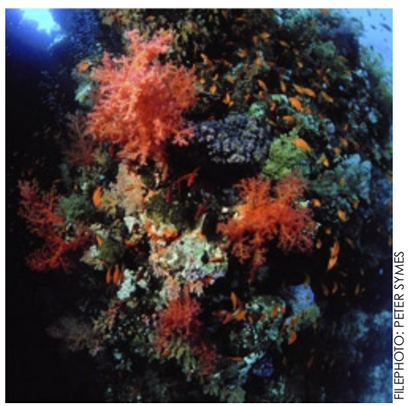
Since January 2005, threatened coral habitats of the Arabian Gulf have been studied and mapped with a view to developing a comprehensive conservation and management plan for these valuable ecosystems. Although ground-truthing was done at over 1,000 points for accuracy control, it is still a preliminary map that requires fine tuning and approval from government agencies implementing the project in the UAE and Qatar. This will be taken up in the months ahead, when higher resolution imagery will be used to map areas of special interest in greater detail.

"The project has shown that most Gulf coral reefs are in good health," commented Majid Al Mansouri, Board Member of the Emirates Wildlife Society, an associate organization of WWF in the United Arab Emirates. ■

Research on Farasan Islands Reefs

A team of coral reef researchers from the US, UK, Canada, Austria, France and Saudi Arabia have surveyed the Farasan Islands Marine Protected Area.

The Farasan Islands, located in the southern Red Sea, 40 km off the Saudi Arabian port of Gizan, are widely recognized for their diverse marine and coastal habitats, important for commercial fish stocks, turtles, cetaceans, dugongs and migratory birds. Protected areas have also been established on the islands for unique terrestrial fauna and the extensive stands of Avicennia and Rhizophora mangroves. The recent comprehensive survey of marine resources and the impact of human utilization of the Farasan Islands Protected Area provides a platform for developing and integrating other studies to monitor key wildlife species, and the marine environment as a whole. ■



FILEPHOTO: PETER SYMES

Underwater Ant Discovered in Australia

The intertidal ant species was discovered by Ph.D student Jeff Wright. Click on image to see larger picture

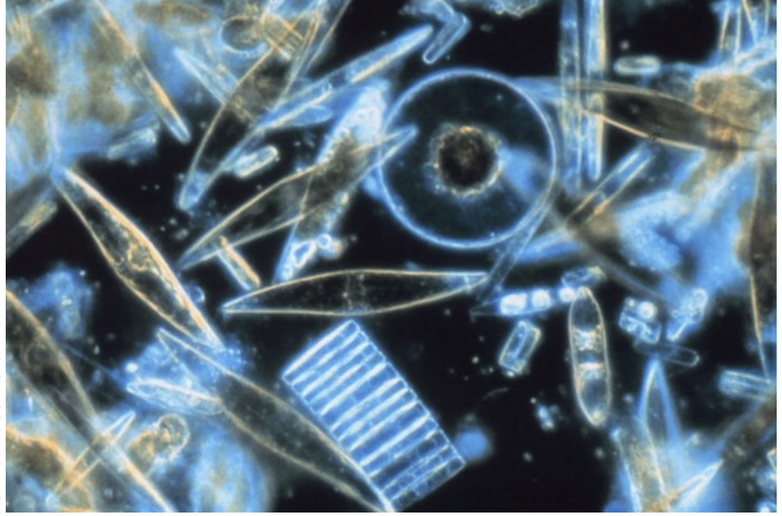
Australian scientists have discovered what they think is the only species of ant that can live under water.

Researchers at Townsville's James Cook University said that recently discovered *Polyrhachis sokolova* nest in submerged mangroves and hide from predators in air pockets. Dr Simon Robson says it was an accidental discovery. ■

NOAA

Underwater Insect Uses Oxygen From Hemoglobin for Buoyancy

Insects called Backswimmers (*Anisops deanei*) carry a bubble of oxygen on their abdomens that serves as their buoyancy vest which they use to regulate their depth. At the start of the dive, the bubble is so big that the insect floats. As oxygen is taken up by respiration, the bubble shrinks and the bug sinks as deep as a metre. When it eventually reaches neutral buoyancy, it hovers. To maintain depth, the insect slowly releases oxygen stored in haemoglobin into the bubble. There are no other insects that control their buoyancy in this manner. (NATURE, VOL 441, P171) ■



NOAA CORPS COLLECTION

Marine diatoms as seen through a microscope. These tiny phytoplankton are encased within a silicate cell wall

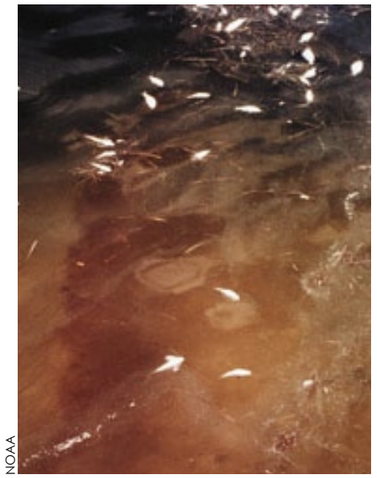
Can Plankton Provide Clean Power?

A Spanish company claims to have developed a method of breeding plankton and turning the marine plants into oil, providing a potentially inexhaustible source of clean fuel, Reuters reported in July.

The company, Bio Fuel Systems, has not yet tried refining the dark green coloured crude oil phytoplankton into biopetroleum, which can be used as fuel for vehicles, but a spokesman says that it has drawn up plans to start continuous industrial production in 14 to 18 months.

"Our system of bioconversion is about 400 times more productive than any other plant-based system producing oil or ethanol," it said, referring to currently available biofuels made from plants like maize or oilseeds.

Phytoplankton, like other plants, also absorb carbon dioxide as they grow. Scientists have examined the possibility of stimulating growth of the single cell plants as a means of reducing the amount of CO_2 in the atmosphere. CO_2, liberated by burning fossil fuels like coal, oil and gas, is widely held responsible for global warming. Bio Fuel Systems said its new fuel would reduce CO_2, is free of other contaminants like sulphur dioxide and would be cheaper than fossil oil is now. SOURCE: REUTERS ■



NOAA

Red tide—an algal bloom produces toxins that threaten human health and marine mammals, contaminate local fish and shellfish and depress coastal tourist and recreational industries

Ride Tides Linked to Hurricanes

Hurricanes may have helped fuel the Red Tide that plagued Florida's west coast last year, according to researchers at the University of South Florida and the United States Geological Survey.

Red Tide is a naturally occurring algae bloom that periodically affects the Gulf Coast, kills fish and other marine life and can cause itchy throats, watery eyes and respiratory problems in humans. Red Tide thrives on nitrogen and phosphorus, but exactly what triggers Red Tide outbreaks remains a mystery.

Rivers, the researchers found, provided barely enough phosphorus and far too little nitrogen to sustain the 2005 Red Tide bloom.

Frank Muller-Karger, an oceanography professor at USF's College of Marine Sciences thinks the nutrients pumping out of the underwater springs play a main role as they pump millions of gallons of groundwater directly into the ocean. The record rainfall from the four hurricanes that raked Florida in 2004 swelled the aquifer, potentially sending high amounts of nutrients into coastal waters through underground springs. When rain falls, some of it seeps through Florida's porous and phosphorus-rich ground and into the aquifer. As it filters through, it picks up the natural phosphorus and nitrogen in higher concentrations than runoff into rivers. SOURCE: GEOPHYSICAL RESEARCH LETTERS ■

First Evidence of Human-Like Behaviour in Fish

Dr Lexa Grutter, University of Queensland, have shown client fish eaves drop to determine the trustworthiness of cleaner fish. And that cleaner fish in turn behave altruistically to be considered more trustworthy.

Cleaner fish are fish sought out by client fish who queue up to have their parasites removed. Cleaners may cooperate and remove parasites from client fish, however they may also cheat by feeding on client mucus, which they prefer. As such there is a temptation for cleaners to cheat.

FAO

Given a choice, clients preferred to spend more time with a cleaner that behaved cooperatively than with a cleaner whose cooperative level was unknown. Experiments suggest image scoring—where bystanders notice the altruistic act and are then more likely to interact with the altruists in the future—is one of several alternative mechanisms used by clients to avoid exploitation by cheating cleaners.

"Our research shows complicated behaviours in cleaner fish where the benefit of cooperation was not reciprocated directly but instead gave them a better reputation," Dr Grutter said.

"This may be the important intermediate step to the more complex form of indirect reciprocity that humans are able to play, where each act is altruistic.

SOURCE: NATURE ■

news

Travel News

Reporting by Catherine GS Lim

Emperor Divers' New Website Launches Family Diving

To celebrate the launch of a new website, Emperor Divers has also introduced its brand new Family Diving programme. Having listened to its guests, Emperor has responded to the general consensus that says not enough is being done for family diving and has introduced a range of activities and services at its Sharm El Sheikh dive centre, starting in October 2006. Divers will also be able to choose to do two dives in the morning or two in the afternoon, leaving plenty of time to lie around the pool or spend time with the children. **www.emperordivers.com** ■

New *blue o two* Liveaboard Enters Service

Commencing Aug. 4, 2006, the new 41m luxury live-aboard *M/V Blue Horizon* will enter service out of Hurghada. Check out **www.blueotwo.com** for schedule and prices. ■

Red Sea College Makes Photographers-Only Trips

For the first time in Sharm, you can be part of a dedicated dive group where a camera is compulsory kit. Catering only for photographers, the dives are conducted at a slow and relaxed pace, ensuring you have all the time required to get those much sought after pictures to treasure. Up to four dives a day. **www.redseacollege.com** ■

Lost Your Bags? Up To Seven Per Flight Do

Waiting in vain for your bag to show up on the luggage carousel at the airport this summer is becoming all too common. Officials estimate that the number of passengers with misplaced bags is increasing up to an average of seven per flight on typical Lufthansa or Iberia flights, six on Luxair and Austrian Airlines, and five on British Airways and Air France. Low-cost airlines did not volunteer for the study, which included 25 major airlines.

Overcrowding, increased congestion and complicated connections at airports are blamed for the increasing numbers of lost baggage. Critics say that airlines are not investing enough time and money into improving the situation. Authorities say that the 30 million lost bags per year cost the industry £1.4 billion. In the US, 10,000 bags were lost per day last year.

Some companies are now offering alternative baggage-tracking systems to alleviate the problem. New technologies are being tested by airlines including Radio Frequency Identification, which is already being tested at Hong Kong and Las Vegas airports, but critics say the system is cumbersome and requires massive infrastructure to work. ■

Eritrea To Promote Sound Ecology

Divers praise the natural beauty and diversity of the waters around the 350 or so islands and rocky outcroppings that dot the Red Sea off the port of Massawa, Eritrea, in Africa. Dolphins, dugongs, five species of sea turtles and some whales are found in rich Eritrean waters according to a United Nations-sponsored survey last year. While border tensions remain high between Eritrea and Ethiopia, administrators want to develop tourism to the area as well as protect the natural habitat by implementing international environmental directives to curb the rise of desertification in the region. ■

Next Hot Dive Destination: Libya?

With 1200 miles of pristine coastline, Libya might just be the next hip place to dive. According to officials the government has secured roughly $3 billion in investments to build up infrastructure on the beaches. Following in the footsteps of Saudi Arabia, Libya is hoping tourists will flock to their southern edge of the Mediterranian after diving North African waters in Egypt and Crete. Recently removed from the US list of country's with state sponsored terror, Libya's warm waters, plentiful Roman and Greek ruins and relatively unexplored coastline is bound to attract the interest of quite a few adventurous divers and tourists despite underdeveloped service and hospitalisty industries and few dive centers dotting the coast. ■

Underwater Hotels

Tanzania

The first Tanzanian underwater hotel resort will be completed next year. It is the second in the world after the underwater hotel built in Sweden. In fact, it is a Swedish investor who is behind the project, Micael Edler, who is also working to build up tourist traffic from Northern Europe to Tanzania. It is hoped that the new underwater hotel resort will attract tourists to the area from the US and Western Europe. ■

China

The first Chinese underwater hotel resort will be completed in Qingdao by the start of 2008 in time for the Beijing summer Olympic Games. The new resort is the brainchild of Hydropolis Resorts which received land allocation and sea rights from the People's Government of Laoshan District in China. The project is expected to cost around €400 million. ■

Do We Really Need A Dive Shop On Sipadan?

The Malaysian government stopped construction work on a restaurant and dive shop on Sipadan Island after a barge destroyed a patch of coral as big as two tennis courts in May. Officials of state tourism say that existing structures are sufficient enough to provide for divers visiting the area. Plus, nearby Palau Mabul has these facilties just 15 minutes away. Officials from Tourism Malaysia said that the damage to Sipadan's coral reef would not have a great affect on tourism to the area because remedial actions were taken. ■

New: Cayman Brac Deco Chamber

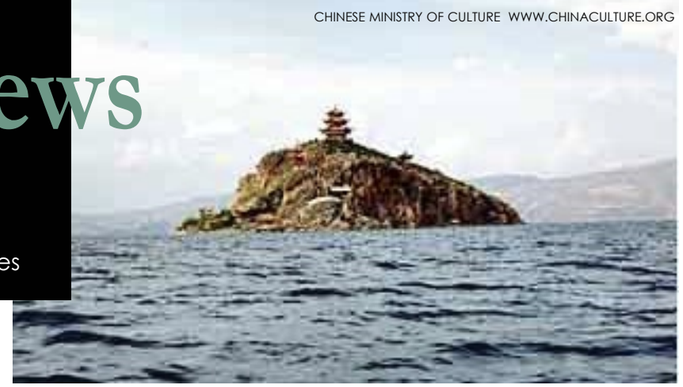
A new hyperbaric chamber will be installed at Faith Hospital on Cayman Brac by the end of the year. It is an expansion of the Grand Cayman Cayman Hyperbaric Services in George Town, which has been owned and managed by BSAC members John and Ann Elliott for the last ten years and upgraded with state-of-the-art renovations over the past 30 years. ■

Galapagos: Tourist Submarine Detained

Nine seamen and their British-owned tourist submarine were detained by Ecuador said officials of the country's environmental reserve. The crew piloted the sub into protected waters of the Galapagos Islands where use of submarines is forbidden. Authorities said the crew and sub were hired by a group of Russian tourists who paid $120,000 for a 4-hour trip through the Pacific Ocean archipelago. The tourists left Ecuadorean waters by yacht, but the crew remained for the investigation. ■

news

Edited by
Peter Symes



CHINESE MINISTRY OF CULTURE WWW.CHINACULTURE.ORG

The Fuxian Lake lies about 60 kilometers to Kunming City and covers an area of 212 square kilometers. With a depth of up to 155 metres, it is also the second deepest freshwater lake in China after the Tianchi Lake, a volcanic-vent lake lying in Changbai Mountain in Northeast China

Fuxian Lake —The Chinese Atlantis?

A tale persists that an ancient city is buried deep in a lake in Yunnan, a border province in Southwest China. But unlike the mythical tale of Atlantis, the submerged secret in Fuxian Lake near the city of Kunming, may be a reality.

Eight years ago, a local diver named Geng Wei saw a slew of large flat rocks scattered underwater off the eastern bank of Fuxian Lake. In June, archaeologists then discovered remains of a group of huge ancient buildings at the bottom of the lake. The team also found numerous regularly placed stones featuring mysterious carvings. Sonar surveys have shown that the complex of architecture at the bottom of Fuxian Lake covers approximately 2.4 square kilometers, larger than the capital of the Han Dynasty.

People cannot help but wonder why such a large city left no trace in historical records. According to a Chinese newspaper, it was recorded in historical documents that a city named Yuyuan was established in the Fuxian Lake area by the Western Han Dynasty (206BC-24AD), but that there are no further historical records of the city after the Sui and Tang Dynasty (589-907AD). Local legend has it that Yuyuan City and its people sank to the bottom of Fuxian Lake.

One of the structures resembles a pyramid of stones ornamented with various designs and symbols. Amongst the many engraved stones, one stone has attracted particular attention. On the top right of the stone is carved a small circle surrounded by seven radial lines, resembling the Sun. On the left side of the stone is carved a similar circle, but with only four radial lines.

According to experts, a Sun-shaped intaglio [type of carving] on a stone is very rare and believed to be more than 1,800 years old.

The investigation team also found on the stones some carvings resembling masks. Other marks found at the site include "0" and "1" signs and seven holes carved in a neat design in the stones. Some simple line drawings were also found, one of which resembles a human face. On some other stones were carved signs looking like Roman numeral "1" and the English letter "y" arranged in a row.

Experts admitted it is not yet possible to decipher these symbols. If the underwater relics are indeed far older than 1,800 years old, the scientists will have to explain what tools could have been used for such carvings at that time. ■

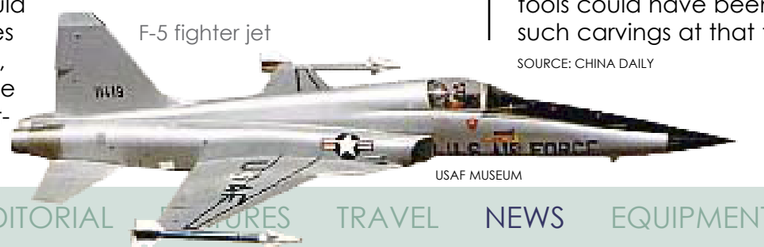
SOURCE: CHINA DAILY

Mammoth lake —an *upcoming* Texan Atlantis?

The owner of the 50-acre sand pit has plans to flood the hole, fill it with a variety of objects ranging from an antique fire truck to an old F-5 Navy fighter jet. Some also want to throw in a bus and a space shuttle look-alike that once thrilled visitors at a now-defunct amusement park in Houston. The concept is to create Mammoth Lake Scuba Park near Clute in southern Texas, USA. It would be one of the nation's biggest lakes ever created specifically for diving, and one of the few started from the ground up, instead of from an existing body of water.

In 2003, tusks were unearthed in the pit. A skull and other bones also were found. Scientists determined the skull was about 38,000 years old and came from a warm-climate relative of the woolly mammoth.

The guys behind the project are Kenny Vernor and his cousin Tim Sweeten, both 46-year-old diving enthusiasts. ■



F-5 fighter jet

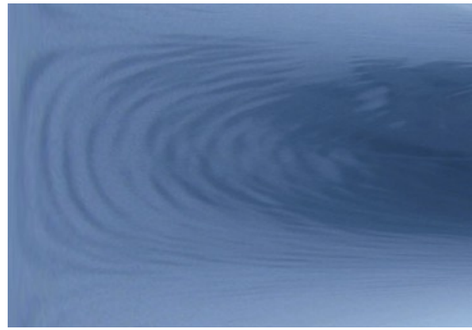
USAF MUSEUM

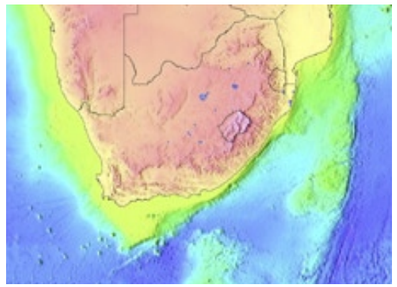
Ocean Vortex 'Death Trap' Discovered

A massive ocean vortex discovered off the West Australian coast is acting as a "death trap" by sucking in huge amounts of fish larvae and could affect the surrounding climate, an international team of scientists have discovered.

Led by Dr Anya Waite, a biological oceanographer from the University of Western Australia and Murdoch University, the 10-member team found the vortex just west of Rottnest Island. It is 200km in diameter, 1000m deep and spinning at speeds up to 5kph acting as a "death trap" by sucking in fish larvae from closer to the shore. "It's actually acting as a predator, by taking the fish larvae, which need to stick around their natural habitat on the coast, and dragging them off to sea," Dr Waite said.

Visible from space, the vortex resembles a giant child's spinning top and was created by current movement down the coast. The climate above the vortex was noticeably different. ■





South Africa Claims Vast Tracts Of Sea Floor

South Africa is about to include an unclaimed million square kilometres of ocean floor within its borders.

Under the terms of the United Nations Law of the Sea Convention, South Africa is in the process of claiming up to1.4 million square kilometres of underwater territory off the country's mainland and around the Prince Edward and Marion group of Antarctic islands.

South Africa's fishing, natural gas, diamond-mining and pharmaceutical industries are likely to be the first to benefit from the initiative. ■

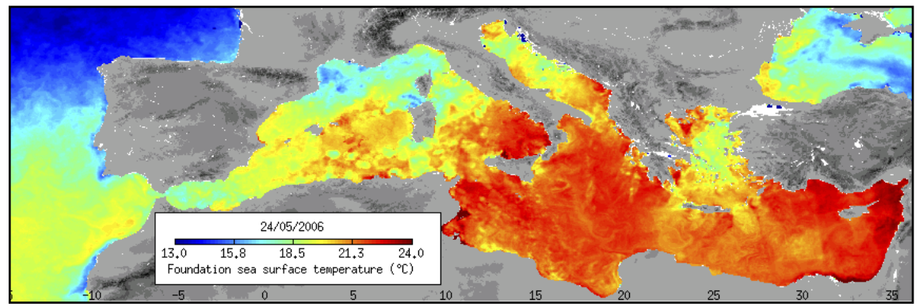
Underwater Volcano Found by Italy

Italian scientists have identified a huge underwater volcano 40km off the southern coast of Sicily. The volcano is named after the Greek philosopher Empedocles. The structure, which incorporates peaks previously thought to be separate volcanoes, has a base that measures 750 square km—an area larger than Rome—and stands 400m high. One peak is just seven metres below the sea's surface. Empedocles is dormant and shows no sign of imminent eruption. ■

Choose Your Beach in the Mediterranean with Medspiration

Summer in Europe means time for the beach. But rather than just going for it hoping for the best, the warm water can now be located before you leave home thanks to ESA's satellite generated Mediterranean heat map. Each day, a flotilla of satellites map the surface temperature of all 2,965,500 square kilometres of the Mediterranean. ESA's Medspiration project has an unprecedented spatial resolution of two square kilometres, high enough to detect detailed features like eddies, fronts and plumes within the surface temperature distribution. A new heat map is made available daily.

Medspiration uses data from six different sensors—two European, two American and two Japanese. ■

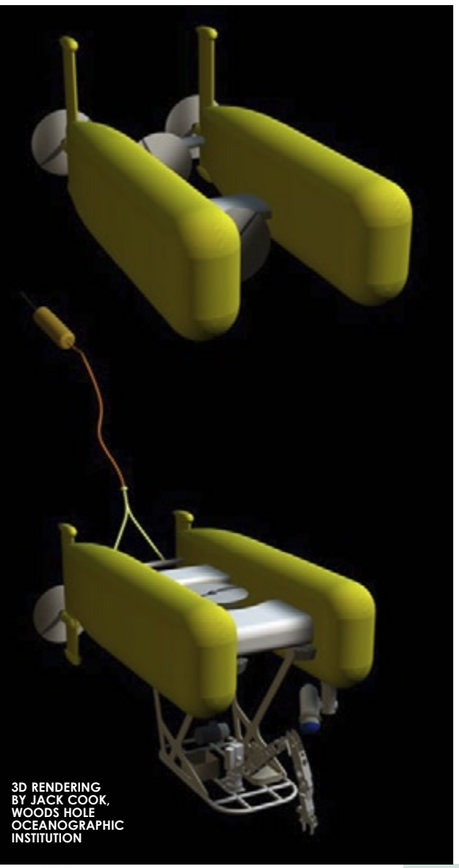


news

Edited by
Peter Symes

Coral Death Results from Bacteria Fed by Algae

Reporting in the June 5 online version of the scientific journal Ecology Letters, scientists described laboratory experiments demonstrated how bacteria kill coral with the help of algae. "Our study shows that bacteria are the front line that kill corals," First author Jennifer Smith explained. However, with the addition of an antibiotic, coral death even in the presence of algae was prevented, showing that bacteria fed by the algae are the agents of coral death. "We are the first to link these processes together," said Smith. "Algae release sugar fueling bacterial growth on the corals. These bacteria suffocate the coral by cutting off the supply of oxygen. Once the corals die, this frees more space for more algae to grow. We think this process sets up a positive feedback loop that accelerates the rate of decline in already damaged reef ecosystems." ■



3D RENDERING BY JACK COOK, WOODS HOLE OCEANOGRAPHIC INSTITUTION

New Hybrid Deep-Sea Vehicle is Christened *Nereus*

Nereus—a mythical god with a fish tail and a man's torso—was chosen in a nationwide contest as the name of a first-of-its-kind, deep-sea vehicle under construction at the Woods Hole Oceanographic Institution.

The vehicle, a Hybrid Remotely Operated Vehicle, or HROV, will be able to work in the deepest parts of the ocean, from 6,500 meters to 11,000 meters , a depth currently unreachable for routine ocean research. Scientists also plan to use it to explore remote, difficult-to-reach areas, including under the Arctic ice cap. ■

Nereus has two modes: a free-swimming mode for wide-area ocean surveys and tethered to a surface ship mode for sampling of the seabed

'CSI: Coral Reef'?

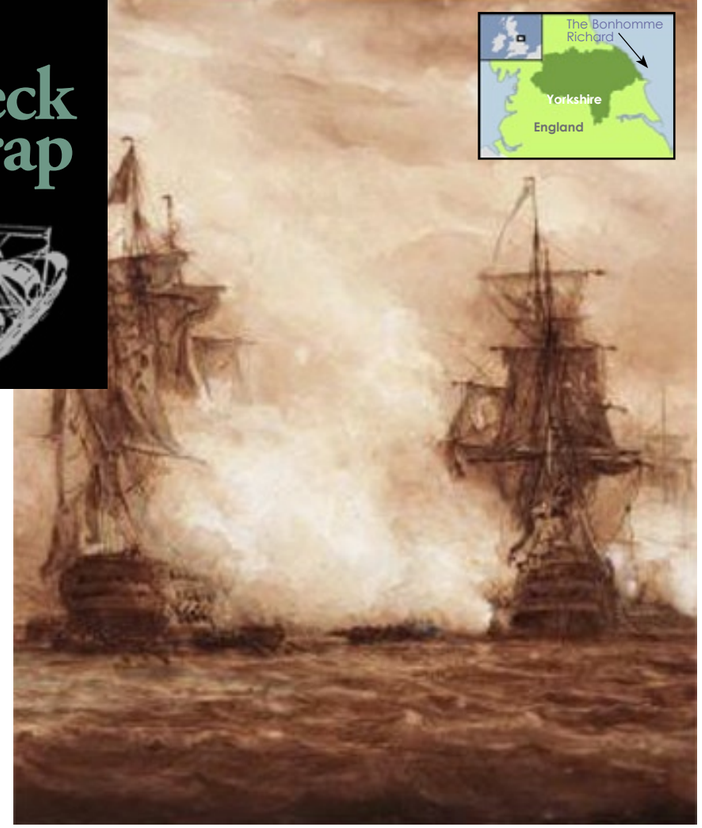
Biologists and criminalists are now joining forces in an unprecedented cross-discipline collaboration in order to develop specific crime scene investigation techniques that work underwater where almost nothing that is standard procedure on land works, writes Associated Press, which stated when an ecological disaster strikes, marine biologists already know what to look for. Now, they will also learn how to report and preserve their findings so they will hold up in court.

"The coral reef is the body," said Ken Goddard, director of the U.S. Fish and Wildlife Service Forensics Laboratory, who is supplying the criminal investigation expertise. "Except, I can't take it in for an autopsy."

The idea was born last October in Australia among marine biologists attending an international conference on coral reefs, said David Gulko, a coral reef ecologist for the Hawaii Department of Land and Natural Resources. "We started doodling on a cocktail napkin with various ideas and what came out of that was, `Gee, we need the equivalent of CSI for coral reefs,'" he said, using the term popularized by the CBS television series "CSI: Crime Scene Investigation."

For more information, see the U.S. Fish and Wildlife Service Forensics Laboratory at: **www.lab.fws.gov** ■

wreck rap



Bonhomme Richard locked in battle with the *Serapis*. Drawing by Christian Schetky (1778-1874)

New Search for *Bonhomme Richard*

The quest goes on to locate the wreck of the *Bonhomme Richard*, the flagship of US Revolutionary War hero John Paul Jones, which sank in the North Sea 227 years ago. On September 25th 1779 after the epic sea battle with the British frigate *HMS Serapis* off Flamborough Head, Paul Jones sadly watched from the *Serapis'* quarterdeck as *Bonhomme Richard* sank slowly beneath the wind-swept sea, her colours still flying from her main mast. Jones and his crew captured the British frigate, but the *Bonhomme Richard* was so badly damaged that Jones and his crew had to move to the captured ship.

Where best-selling author Clive Cussler of Wreck Dectectives fame failed on at least five occasions, a soft-spoken underwater archaeologist from the Annapolis area is optimistic about success. New software will be used with remote-sensing equipment aboard the *Lia*, a survey vessel that will lead the latest search for Jones' ship. The expedition began on July 17 and is organized by the nonprofit Ocean Technology Foundation (OTF) in Connecticut and the Naval Historical Center (NHC). ■

NAVY PHOTOGRAPHIC UNIT

New Search for the Missing *HMAS Sydney* Planned

HMAS Sydney Search P/L, is a not-for-profit company behind a new search for the remains of the cruiser *HMAS Sydney*. Despite many searches no trace of the *HMAS Sydney* has ever been found since its skirmish with the German raider *HSK Kormoran* off Western Australia on 19 November 1941. All *Sydney's* 645 crew were lost while 341 of *Kormoran's* 390 personnel were rescued.

HMAS Sydney Search is still raising funds to refine its search area west of Shark Bay, describe its underwater search equipment and outline other aspects of the search timed for this summer. ■

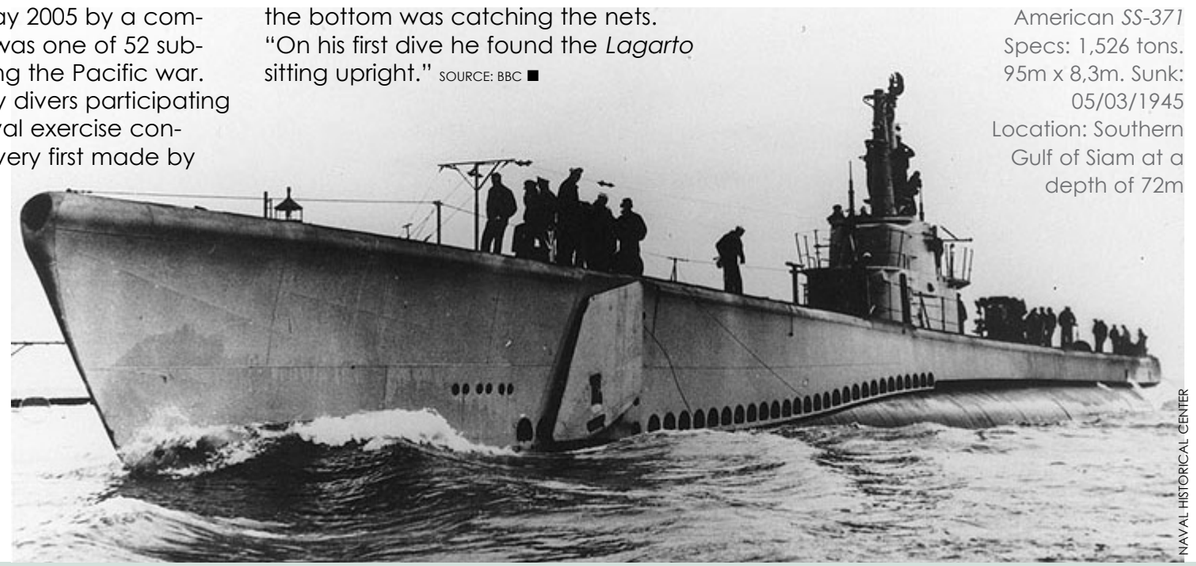
US Navy Confirms

WWII Sub *USS Legarto* Finally Found

US Navy divers have examined the wreck of a sunken World War II submarine in Thailand is the wreck of the *USS Lagarto*. It was one of the Navy's newest submarines, launched in the last year of World War II and sent to the Pacific. The submarine was preparing to attack a Japanese convoy when it was last heard from on May 3, 1945, with 86 sailors onboard. It is believed to have been sunk by a Japanese mine layer.

Now the lost sailors are on "eternal patrol"—the phrase sailors often use for submariners that bravely went to sea and never returned. Lt. Cmdr. Jeff Davis, spokesman of the Pacific Fleet Submarine Force at Pearl Harbor, said *USS Lagarto* was first discovered in May 2005 by a commercial diver. It was one of 52 submarines lost during the Pacific war. Last month, Navy divers participating in an annual naval exercise confirmed the discovery first made by British wreck diver Jamie McLeod.

McLeod used records from "fishermen in the area where they lost a lot of nets," Davis said. "He assumed that something on the bottom was catching the nets. "On his first dive he found the *Lagarto* sitting upright." SOURCE: BBC ■



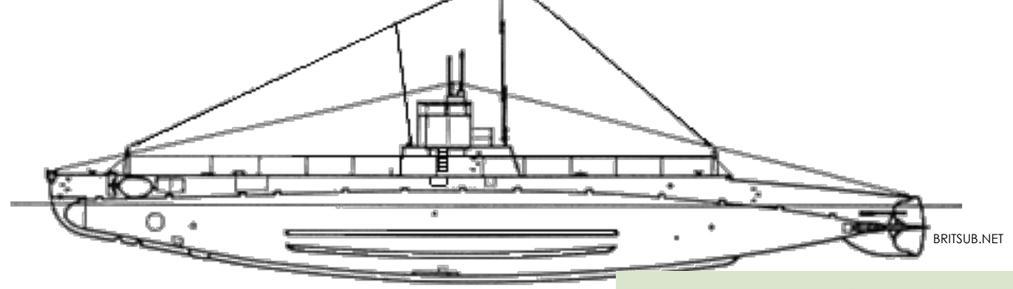
NAVAL HISTORICAL CENTER

American *SS-371*
Specs: 1,526 tons. 95m x 8,3m. Sunk: 05/03/1945
Location: Southern Gulf of Siam at a depth of 72m

Civil War Iron Clad to be Mapped

THE WRECK OF THE IRON-CLAD "MONITOR."

A group of researchers has set out to map the wreck of the *USS Monitor*, the famed Civil War gunboat that sank in a storm during the Civil War in the waters off Cape Hatteras, North Carolina. Best known for its battle with the Confederate ship *Virginia* in March 1862, it sank in about 70 meters of water on Dec. 31, 1862, while heading south for further Civil War operations. Sixteen of its 62 crewmen died. The rest were rescued by the *USS Rhode Island*, which had been towing the *Monitor* and helping evacuate the crew as the *Monitor* took on water. At a time when many ships were still being made of wood, the iron clad *USS Monitor* was the most advanced naval vessel of its time, featuring innovations such as a rotating gun turret and armor plating. ■



H1 class coastal defence submarine of Group I. Builders: Fore River Shipbuilding Co., Quincy, Mass., USA in 1915. Ordered for 1914 Emergency War Programme

BRITSUB.NET

Intact World War One Sub Found Off Scottish Coast—But Which One?

A virtually unscathed First World War submarine has been discovered in deep waters off Eyemouth in Scotland by divers from Edinburgh and South Queensferry, the Scottish daily, The Scotsman, reported on July 19 .

It is thought to be a British submarine known as the *H11*, which was lost in 1920 while under tow, and it seems to be in very fine condition despite lying on the bottom of the North Sea for more than 85 years.

The submarine is around five metres tall and 45 metres long and is lying at a depth of 60 meters on her port side with the bows clear of the sea bed.

According to members of South Queensferry Sub Aqua Club (SQSAC), there seems to be little damage to the submarine with the conning tower, periscopes and hatches in good condition.

Members of the club are now awaiting confirmation from the Royal Navy that the submarine was not manned before they carry out further investigations of the torpedo-carrying vessel. ■

New Artificial Reefs

Thailand is to use decommissioned garbage trucks for their next artificial reefs projects. Up to 189 decommissioned city garbage trucks are to be thoroughly cleaned and dumped at sea about two kilometres off Pattani and Narathiwat provinces. ■

North Carolina began building artificial reefs in 1987 starting with the sinking of a 115-foot landing craft —the type used to carry soldiers and equipment to the beaches of Normandy, France, in World War II. Last year, the Coast Guard donated its first Falcon jet and this year added another. ■

Cozumel has sunken two new wrecks for divers. The two former Mexican Navy patrol ships, 26-metre-long P-47 Laguna *Mandinga* and 13-metre-long *Patzcuaro,* have become the latest artificial reefs in Cozumel, Mexico. They are now resting about 350 metres from shore at a depth of 12 metres. The sinking of the P-47 served as the launch of a long-term program, which over the coming year will consist of several ship sinkings organized by local government officials. ■

Search for *HMS Nymph* Turns Up Two Other Wrecks

In 2005, two well-preserved 18th Century shipwrecks where discovered in the Caribbean by a team of archaeologists from the Bristol University who were trying to locate *HMS Nymph*, a warship which sank in the British Virgin Islands in 1783.

Now researchers hope that these finds could shed new light on life in the 1700s.

Marine archaeologists are to investigate the two sites again and try once more to also locate the *HMS Nymph,* which was initially discovered in 1969, but its location has since been lost.

Initial investigations indicate that the first site is probably a vessel of 80-100 tons, built for trade, and originating in Bermuda or the Caribbean region. The other ship appears to be a 250-ton vessel, also built for trade, and constructed along the eastern North American seaboard. They will use a robot to collect video data, which will then be catalogued.

SOURCES: BBC AND BRISTOL UNIVERSITY WEBSITE ■

HMS Nymph engaged in battle

HMS Resolution Protected

The remarkable wreck of a big English warship has now been given protected status under the Protection of Wrecks Act of 1973. It was found last year by local divers in Pevensey Bay off East Sussex (UK) and is believed to be that of the 70-gun *Resolution,* which is thought to have sunk in the Great Storm of 1703. The *Resolution* was the flagship of an expedition against the Barbary Corsairs in 1669 and took part in the unsuccessful attack on the Dutch Smyrna convoy, which resulted in the Third Dutch War. The law means the government can prevent uncontrolled interference in sites identified as being likely to contain the remains of a vessel, or its contents, which are of historical, artistic or archaeological importance. SOURCE: BBC ■

Resolution in a gale by Willem van de Velde, the younger, depicts the second *Resolution* c. 1678. Twelve ships of the Royal Navy have borne the name *HMS Resolution*

Look Ma, No Legs!

One of the best examples of evolutionary change over millions of years is how whales lost their legs. Now, US researchers have found a genetic basis behind the disappearance of legs in ancient whales who used to look like large modern dogs with four limbs.

According to scientists, slowly accumulated genetic changes over 15 million years produce the gradual shrinkage of the whales' hind limbs. These changes occurred during embryonic development and led to the steamlining of the graceful swimmers that whales are today.

Researchers from Northeast Ohio University found that for a brief time during embryonic development the whale fetus does sprout hind limbs, which quickly disapprea again as they reach the second month of their 12-month gestation period. The responsible gene is call the Sonic Hedgehog gene, say experts.

While the Sonic Hedgehog gene drops out early in the evolution of dolphins, whales hind limbs did not change in their basic arrangement, which proves that the gene was still functioning 41-50 million years ago and lost its power later. ■

Close-encounter by Judith Gebhard Smith. Pencil and encaustic on paper, 8 x 14 inches.
www.nightwingstudio.com

Whaling Win May Lead to Whaling Woes

The battle between pro-whaling and anti-whaling nations continued at this year's annual meeting of the International Whaling Commission in Italy, a body set up in the 1980s to conserve whales and develop the commercial whaling industry.

Officials say that while pro-whaling nations like Japan, Norway and Iceland have won a bid to an eventual lifting of the moratorium on commercial whaling that has been in effect since 1986, it will not be voted upon this year and talk of compromise ended the meeting with environmental groups dead set against the lift of the ban. Yet, some anti-whaling nations showed signs of willingness to work toward compromise seeking some sort of middle ground and ways to make commercial whaling sustainable at the same time as maintaining protection for endangered species of whales.

Pro-whaling nations like Japan say that some whale species have increased numbers and can be hunted without endangering the species. But anti-whaling nations like the US want monitoring measures put in place so when the ban is eventually lifted, whale species will not suffer from commercial hunting. In the past two years, those nations that continue to hunt whales have increased the number of whales they take from the sea.

Environmental groups like GreenPeace say they will step up protests against commercial whaling. The cruelty of the current method of killing whales, which allows the whale to suffer up to two hours while it dies, is considered enough of a reason to maintain the ban on whaling.

By next year's meeting, it is expected that several more nations will join the cry to Save the Whales, as protests gain new momentum.

SOURCE: BBC NEWS ■

Proposed: Boat Speed Limit to Save Whales

A US government agency set a proposal on the table to set a speed limit for boats along the East Coast to help decrease the number of whales killed in deadly collisions.

The National Marine Fisheries Service called for a less likely lethal speed limit of 10 knots, or 11.5 mph, for 65-foot vessels and up. The speed limit would be regulated in areas where there are North Atlantic right whales.

The move was originally recommended in 2001 by Cmdr. Bill Russell, a retired Coast Guard official, who told Forbes he was glad to hear that the agency is finally doing something to help protect the whales as ship strikes are the most comon human-caused deaths among whales.

It is estimated that 300 right whales make their home in the Northern Hemisphere and have been on the endangered species list since 1970. The proposed speed limit would be mandatory between the months of November and April along the whales mid-Atlantic migratory route from the north of the state of Georgia to Rhode Island.

Other restricted areas would include the whales' feeding grounds in Cape Cod Bay of Massachusetts from January to mid-May, off northern Cape Cod's Race Point from March to April and the Great South Channel from April to July. Yet, federal vessels would be excluded from the regulations. SOURCE: FORBES ■

Farmers Try to Wriggle Out of Protecting Orcas

In Washington state, USA, farming and industry groups sued the government to remove the 89 Puget Sound orcas from the endangered species list, claiming that the protective regulations force unnecessary land use and water restrictions.

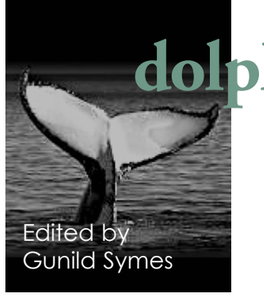
The plaintiffs complained that the listing issued by the National Marine Fisheries Service in November will place undue burdens on the state's farms, specifically those located near salmon-filled rivers. Salmon are the killer whales' main source of food.

They fear that those who execute basic farm practices and disturb the salmon could face fines and even imprisonment, according to the lawsuit.

Environmentalists say this scenario is a bit far-fetched, even though it is true that deliberate harassment of protected species carries a punishment of a year in jail.

The plaintiffs say that the Northern Pacific resident orcas are a subspecies and are therefore not protected under the wording of the law since they are not a distinct population of the species. Representatives of the group say that they just want the fisheries service to follow the letter of the law.

Environmentalists find the arguement preposterous and tell CNN that the the Endangered species Act Defines "species as "any subspecies of fish or wildlife or plants." SOURCE: CNN ■



Last Bid to Save Chinese Lake Dolphin From Extinction

The Baiji is one of the world's most critically endangered mammals. With only 17 living individuals left, the dolphin species is facing imminent extinction according to researchers. An international group of zoologists have developed a plan to save the dolphin, which finds its home in the Yangtze River of China.

By moving some of the dolphins to a nearby lake, the scientists hope to protect them from fishermen.

Experts say that the species is threatened by industrialisation, boat collisions, capture in fishing nets and overfishing, which depletes the animals' food source.

Baiji on a stamp

The baiji, *Lipotes vexillifer*, is listed as the most endangered cetacean in the world on the international recognized Red List of Threatened Species.

The rescue plan of the Baiji involves a close monitoring of the species under semi-natural breeding conditions in a reserve in a lake, which was once part of the Yangtze River, according to the published report from the Institute of Zoology and Zooloagical Society of London.

Tian-e-Zhou lake is already home to another freshwater cetacean called the Yangtze finless porpoise. The lake has fish and conditions that are most likely suitable for the baiji according to officials. Costs of the operation could exceed £200,000 or $365,000 in the first year. According to officials, the rescue will use boats and helicopters as well as holding pens, veterinary staff and fish stocks. The long term goal is to reintroduce the baiji to the Yangtze River when they recover and only if they can thrive there. SOURCE: BBC NEWS ■

Lieutenant Fipper?

Dolphins and sea lions are now working for the US military according to reports from the Navy's Marine Mammal Program. They are flown in from San Diego for large scale military exercises and participate in simulated mine recovery and mine detection.

According to naval spokesmen, the dolphins are still better than unmanned vehicles at finding mines and dealing with them.

The war games involve more than 40 ships, 160 aircraft, six submarines and almost 19,000 military personal from the US, UK, Australia, Canada, Chile, Peru, Japan and the Republic of Korea.

The Navy has employed marine mammals in operations since the early 1960s, saving the military about $1 million per year according to officials.

Animal rights activists oppose the use of animals in warfare. They believe it results in abuse of the marine mammals. SOURCE: AP NEWS ■

Dolphins Teach Their Young to Use Tools?

In Australia, dolphins have been observed using tools and their young learn how to use them as well. It is the first time that scientists have found confirmation of cultural transmission according to researchers.

In Shark Bay, Western Australia, some dolphins have devised a way to break off pieces of marine sponges to wear over their snouts while foraging. It is believed that they use these sponges like a sort of snout-glove to protect their delicate rostrums as they dig through the sand to find prey.

The animals actually choose conical shaped sponges over the more common flat shaped sponges since the conical shape do not fall off the dolphins snout. Most of the sponge-using dolphins are female according to experts.

It is not clear yet whether the passing on of the use of sponges is genetic or learned, but it is clear that those using sponges are maternally related through investigations of mitochondrial DNA, which is only passed on through the mother. Based on finding, scientists presume that the trait is culturally transmitted even through the actual act of dolphins teaching their young to use sponges has not yet been observed.

SOURCE: NEWSCIENTIST ■


Dolphins by Italien figure painter, Sergio Zampieri. Oil on canvas, 40 x 20 inches. **www.sezart.net**

UK: Dolphin and Whale Survey in the English Channel Launched

Dolphin and whale monitoring in the English Channel has been extended with the collaboration of a marine conservation research charity, Marinelife, and Brittany Ferries.

Research trips from Brittany Ferries will take place on a monthly basis on the Plymouth, UK, to Roscoff, France, route during which types of dolphins, whales and other marine life and birds will be studied for their distribution and abundance in the UK waters.

The data acquired will be used to identify dolphin and whale hotspots as well as annual and seasonal movements and threats to marine life by fishing practices. By-catch is a major reason for the large amount of dead Common Dolphin washing up annually on the coast of West Country mainly during the winter months.

Over the last 12 years, Marinelife has monitored the dolphins and whales of the English Channel continuously according to the group's spokesperson. In the surveys, scientists have found a return of the Minke Whale in recent years and the presence of other protected or endangered species such as the Bottlenose Dolphin and the Harbour Porpoise despite the heavy shipping traffic of the Channel.

The extention of research operations would not have been possible without the aid of Brittany Ferries according to the research director of Marinelife, Dr Tom Brereton.

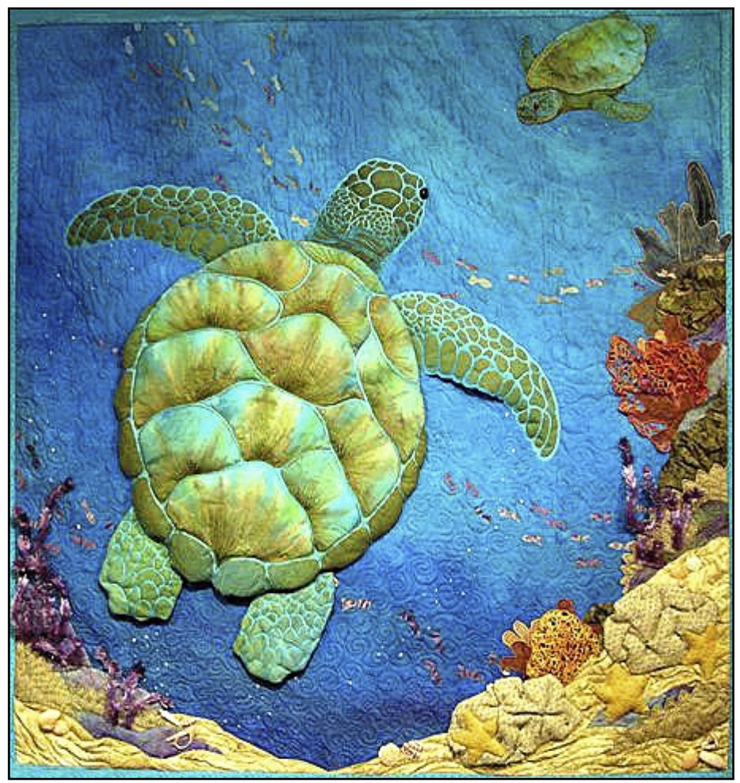
SOURCE: BBC NEWS ■

Edited by
Gunild Symes

TURTLES

Adopt a Turtle Nest!

Help a bunch of sea turtles live to greet the sea! Support the nest relocation program at Cape Romain Wildlife Refuge on Cape Island, South Carolina, USA. For more information, visit: **www.fws.gov/caperomain**



Green Turtle's Sea, by C. Susan Ferraro. Fiber art of hand-dyed and appliquéd fabrics, 38 x 40 inches. **www.artisancsf.com**

Saving the Giants

Ghana will soon have six sanctuaries for the endangered giant sea turtle along its Atlantic coast. Environmentalists from the Ghana Wildlife Society have raised nearly $20,000 for the protection of the giant sea turtles' nesting grounds where several hundred of the animals come to lay millions of eggs each year from August to March.

It is reported by local wildlife activists that up to two-thirds of the giant sea turtles in Ghana are killed by local fisherman for food, the turtles shells used as decorative ornaments or vessels in homes.

Experts say that many of the turtles come from as far away as South America only to meet their doom on the beaches of Ghana. In addition to being hunted by humans, domestic animals such as dogs and pigs dig up, eat or destroy more than one million sea turtle eggs each year. The species is facing extinction according to environmentalists.

But local fisherman do not see turtle-driven eco-tourism as a feasible way to replace the obtainable income from catching sea turtles. Their main concern is how to feed their families and care for sick children.

The wildlife society is putting up billboards on local routes to the area to raise awareness about the plight of the giant sea turtles. SOURCE: BBC NEWS ■

Silver Sea Turtle pendant
by Roland St. John
www.bigbluedive.com

Ridley Release Rocks the Charts

The largest single-day turtle release by U.S. and Mexican scientists took place on the shores of the Gulf of Mexico on June 28th to mark the recovery of the Kemp's Ridley sea turtle. Close to 240,000 hatchlings wriggled their way across the sandy beach near the town of Tepehaujes, Mexico, to meet the sea for the first time.

According to experts, the Ridley is the world's most endangered sea turtle. While the sea turtles' nestings on Mexico and Texas beaches have risen to record highs this year, researchers warn that current levels of funding and activities must continue if the Ridley is to make a full comeback.

With the number of Ridley sea turtles coming to nest on Texas beaches reaching close to 100, which is twice the number last year, US scientists' activities to establish another nesting location for the turtles aside from their primary home in Mexico have been vindicated. SOURCE: TEXAS PARKS AND WILDLIFE ■

2006: Year of the Sea Turtle

In order to raise awareness around the world to the risk of extinction facing six of the seven species of sea turtles, the United Nations has designated 2006 as the Year of the Sea Turtle. Coordinated by The Indian Ocean - South-East Asia (IOSEA) Marine Turtle MoU Secretariat in Bangkok, the Year of the Turtle has several core themes including taking measures to ensure the long-term survival of sea turtles, conserving their habitats, encouraging applied research and reducing accidental capture in fishing operations. Activities focusing on these themes will include training workshops in Viet Nam for the fishing industry, clean-up days for turtle beaches in Pakistan, publishing new research findings in Thailand and launching limited edition postal stamps in Kenya.

The Convention on International Trade in Endangered Species Wild Fauna and Flora (CITES) states that sea turtles, including hawksbill, olive ridley, Kemp's ridley, leatherback, loggerhead and green, are endangered due to international trade. According to experts, if commercial trade continues, these species will soon become extinct. To find out how you can help, visit the website: **www.ioseaturtles.org** ■

Rising Water Temps Drive Leatherbacks North to the UK

More Leatherback sea turtles are heading north to the warming waters around the United Kingdom predict marine researchers. Britain's oldest species is driven further north due to rising water temperatures.

While it was thought that the food source, plankton, was what drove turtles to a region, scientists are now recognizing the role of temperature in the animals' migration.

The use of satellite tages are enabling researchers to track the Leatherbacks' movements and behaviors. Data collected suggest that the numbers of turtles travelling northward has already increased.

According to experts, the Leatherback turtles have travelled the seas for over 65 million years. They are most often spotted in August and September. SOURCE: BBC NEWS ■

THE CANADIAN

High Arctic

Diving in a World of Ice

Text and photos by Louise Murray

The sea ice is about two metres thick above frigid Arctic waters over 300 metres deep—and we are camping on it! It's a strange sensation, knowing that there is nothing but frozen water between you, and water so cold it kills in less than four minutes. This clearly had an effect on Martin, a Swedish photographer, who had a nightmare on his first night out on the ice. "I dreamed that my body heat was melting the ice underneath me and my sleeping bag was about to sink into the depths," he said, "I'm glad I woke up."

adventure

Diver descends through a crack in meter thick sea ice

The expedition team brings everything they need with them by sled to the remote dive site

We are camping in the Arctic wilderness, having joined an expedition to Canada run by Arctic Kingdom, specialising in Arctic dive trips. It's a fantastic opportunity to experience the beauty of the Arctic and to see polar bears, beluga, narwhals and Greenland sharks.

Leaving Ottawa in the throes of a sultry 28 degree heat wave, our next landing is at Iqualuit, some four hours later, where a quick foray outside into freezing temperatures for a cigarette, confirms our arrival in the high arctic. A couple of other stops in Nunavut, a Canadian Territory, home to the Inuit people and six hours after leaving Ottawa, we land near the village of Arctic Bay where the temperature hovers around zero in the weak spring sunshine amid flurries of snow.

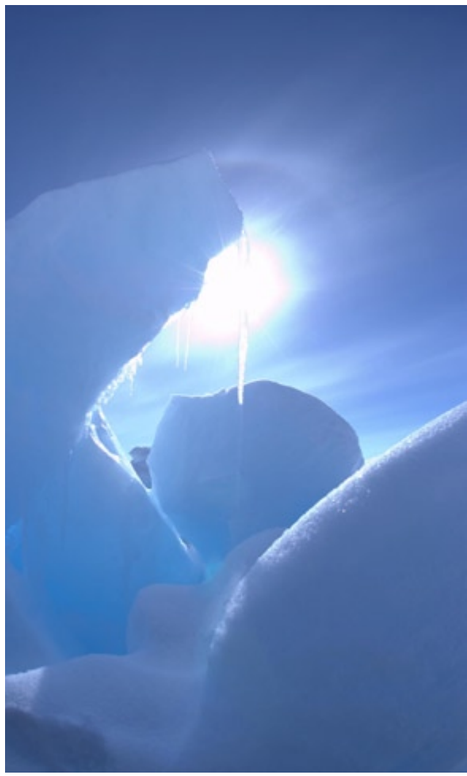
Everything that we will need for the next two weeks from shelter, food and bedding to compressors, fuel and generators has to be taken with us. The logistics are formidable, as we are venturing 100 miles out on to the sea ice. Our destination is Lancaster Sound, near the spot where Sir John Franklin perished in 1847 with all his men in the search for the North West Passage.

Ice Diving

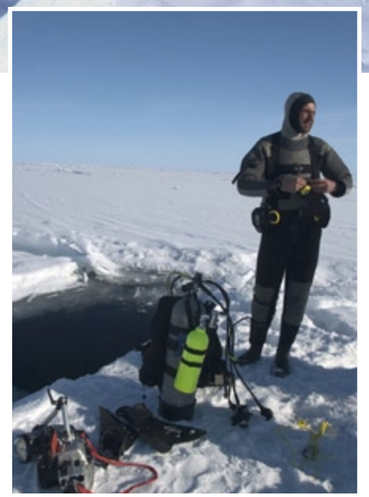
Our first crack at a dive site starts with the largest Stihl chainsaw in the world, a 1.2 metre monster, Graham Dickson, expedition leader fires it up, a mad grin spreading across his face, as he does love his boy's toys. Unfortunately, the easiest ice diving option was not to be, as after cutting three different holes near to an ice fracture beside camp, it is clear that the chainsaw is just not man enough to cut through the two-metre thick ice.

We load all the gear—cameras, tanks, ropes—on to the komoteks, or sleds, and head off to our next dive site option, a lead 10 km away. A lead is a crack in the sea ice that has opened and frozen shut leaving an area where the ice is much thinner, such that we can break our own entry hole to the water.

This is a serious overhead environment, and safety and redundancy in our diving is critical. "Everyone will be roped and dive in pairs initially. The second diver is responsible for signals to the rope tender on the surface," says Graham to groans from the photographers who hate both ropes and diving with a buddy, "and if all goes well



TOP: Polar bear
BOTTOM: Sun and ice
PREVIOUS PAGE: The austere high Arctic landscape



THIS PAGE: Scenes from camp; Divers prepare for a trip down under the ice

FOLLOWING PAGE: Diver laden with Sea-Doo and photographic equipment descends to find life under the ice

Iceberg

we'll see about solo diving on the ropes. Compasses are unreliable this far north, so don't use them."

The water is a cool minus 1.8 degrees C, as cold as sea water can get before freezing. "I've never found the cold much of a problem," says Australian Kelvin Aitken, "but then, I do have a lot of natural insulation there," pointing to his belly and laughing, "anyway, your face goes numb as soon as you hit the water."

All goes well on our first under ice exploration. The underside of the crack is intricately scalloped and corrugated by water and pockets are home to brown algae, sometimes dislodged in clouds by our bubbles. The lifeblood of the whole ecosystem, the pinkish krill, are easily recognizable, whizzing about like prawns on adrenaline.

Diver emerges with full face mask from the frigid waters

There are also many beautiful invertebrates, jellyfish pulsing slowly, and weird pteropods, a kind of snail, swimming by with two gracefully flapping 'wings'.

Later, when diving the lead close to shore, we have a chance to investigate the bottom. It is teeming with life, brittle stars wave their arms at more than fifty to the square metre, and tube worms, nudibranchs and filter feeders of all sorts carry on their business next to red and green seaweeds. Far from mirroring the relative scarcity of species in the Arctic desert up top, this is an ecosystem that is exploding with life. I regret not taking a macro port for the camera. Next time perhaps.

TOP LEFT: Floe edge; ABOVE: Sculptural forms of Arctic iice

Greenland Sharks

Each day we check the line to see if a shark has been attracted to the bait set over half a kilometer down in the icy depths. Probably less than thirty people have ever dived with these rarely seen deep water denizens, so imagine the excitement when Graham shouts, "Yes, we've got one, kit up fast. I want to get the animal back to the deep as quickly as possible."

Little is known of the shark's behaviour other than it has a reputation for being a sluggish and a non-aggressive carrion feeder, with the largest recorded clocking in at over 7 metres. Slow moving does not fit the evidence though, as scientists have been unable to explain how the sharks have been found with fast moving prey in their bellies like salmon and seals.

Slipping into the water, 30 + metre visibility reveals our shark swimming lazily, its dark mottled body stark against the blue ice, I approach the business end cautiously, keen to photograph the parasitic copepod that is found on each shark's eye. Sure enough there it is. It is believed that the parasite actually blinds the shark over time, but the huge nostrils, largest of any shark's, belie its main feeding sense in the dark cold water.

Kelvin is over the moon having shot his first Greenland shark, but the rest of us have really come to this remote spot for the beluga and narwhal.

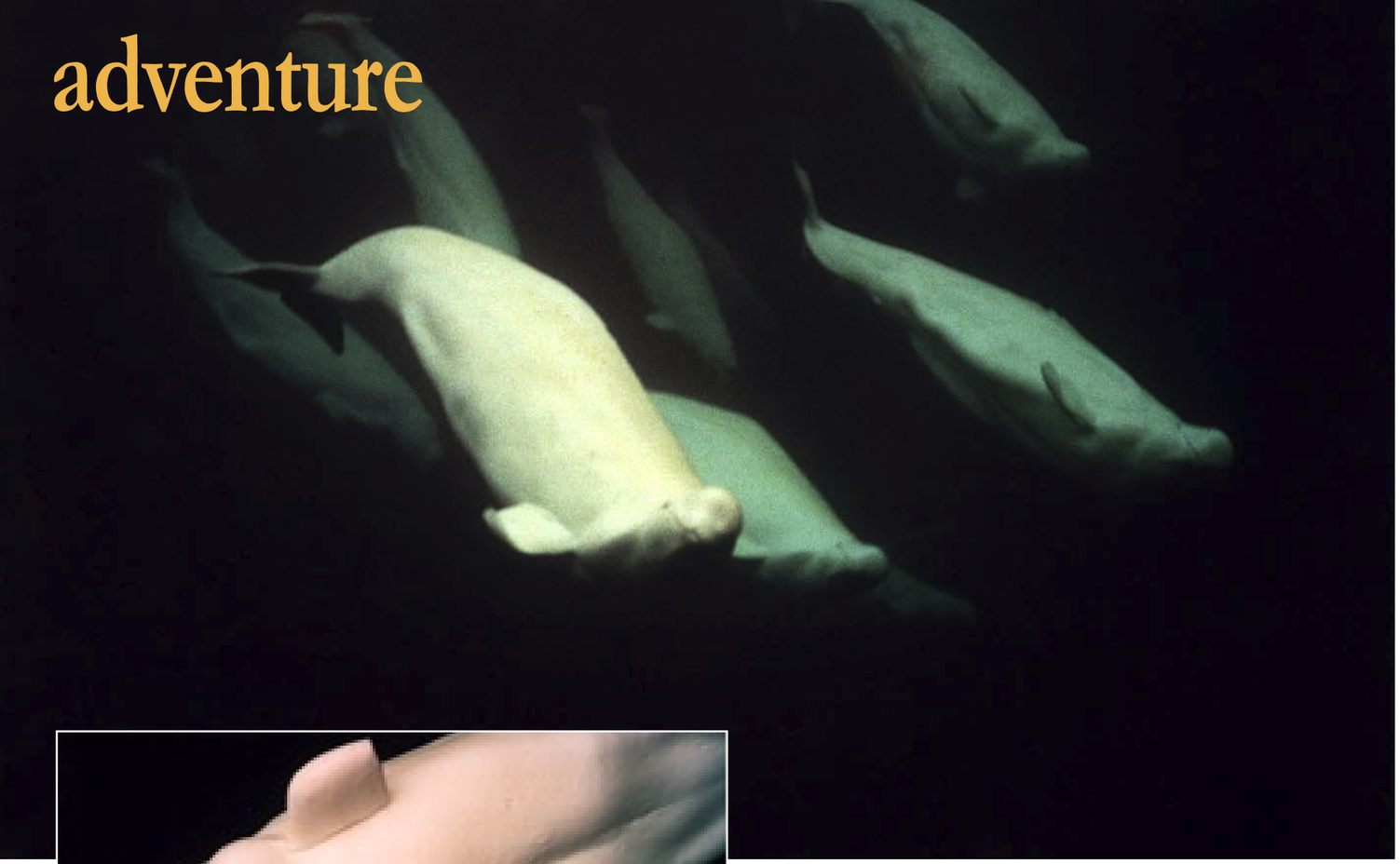
Whales

Our visit in May is timed to coincide with the advent of the Arctic spring when the sea ice begins to fracture as it thins and reacts to the stress of tidal movement and warming temperatures. When large sheets of ice break off, a floe edge is created, forming the boundary between ice and sea. Suddenly light can penetrate the frig-

Greenland shark; INSET: Close-up of a parasite inflicting the eye of the shark

GRAHAM DICKSON

TOP TO BOTTOM: Arctic landscape; A polar bear snifs the air to track prey; First look, beluga whale and human being share a moment



THIS PAGE: Underwater scenes from a tour with the belugas

High Arctic

whales.

First come the narwhal, mottled grey and white. I am only about 20 metres out from the ice edge, snorkelling, when a family group of six passes directly below me singing to each other as they go, the males with their distinctive tusks spiralling out in front of their heads. The sight took my breath away. The narwhal are clearly aware of the few strange neoprened objects at the surface but aren't stopping to investigate.

At last, a group of inquisitive beluga approach, blowing bubbles at us, and following us back to the ice edge each time we leave to warm up with some hot chocolate. Beluga have unfused cervical vertebrae and so can turn their heads to follow our every move, as they swim along on their backs below, shadowing our every twist and turn.

Paul Jackson has brought along his hydrophones to capture their sounds and sits on the floe edge in a folding chair smiling to himself as he makes his recording. Most of the rest of us are floating, snorkelling on the surface, or free diving down, cameras in hand. Known as sea canaries to early sailors, the whale song reverberates through your body, you can both hear and feel the song.

The floe edge works as a whale highway as the animals use them on their northward spring migration, sending out regular patrols to search out safe new leads for the pod to follow. On a good day, hundreds of whales cruise by, groups of up to twenty tusked narwhals and pods of curious white beluga.

id waters triggering a plankton bloom that fuels the return of the whales feeding on fish attracted by the plankton.

We've waited over ten days for a floe edge to form, so when Tommy powers back into camp after a reccy on his snowmobile, we all want to know what he has to report, "It's there. The ice has broken off," the 66 year old Inuit wildlife officer shouts with a toothy grin. This is the moment that we have all been waiting for, to swim with Arctic

Arctic armor

After many Arctic diving trips, I have two secret weapons under my SEAC drysuit. A Fourth Element Arctic two piece undersuit keeps me pretty toasty, and I have to confess that I rarely took it off for two weeks, but what the hell, no one else could wash either, so there were no complaints.

Inuit wildlife officer

Polar bear tracks

Between that and my drysuit, I use a Typhoon Icebreaker—a battery operated neoprene hot vest developed for the military to extend my dive times as much as possible. Keeping your body core at 42 degrees, it stops the body withdrawing blood from the extremities and means that you can stay in the water at least 50% longer than without it.

The Arctic is not the most obvious of dive destinations. Simply being there offers an incredible experience. Having a chance to meet experienced Inuit guides and benefit from their knowledge is a real plus, but being able to venture below the ice is the ultimate adventure, to feel and be part of an ocean teeming with life. But to see Arctic whales, hear their sounds in the water, through the ice and through your body, and to connect in a way impossible to describe is a real privilege. I'll be back as soon as I can.

Full details of Graham Dickson's Arctic marine expeditions for walrus, bowhead whales, polar bears, beluga, narwhal and Greenland sharks can be found on his website at ***www.arctickingdom.com***

Louise leads diving and snorkelling trips to the high north for Arctic Kingdom. A self confessed polar nut, she takes every opportunity to visit and explore the Arctic regions to photograph the animals and people of the north. A photojournalist by trade, she writes for The Times and Guardian newspapers in London and in magazines around the world. As we publish, she will be on her third trip to the high Arctic this year, to Hudson's Bay to photograph polar bears and beluga whales. For more information or to order images, visit Louise Murray's website at the link below: ***www.louisemurray.com*** ■

ABOVE: Louise Murray
LEFT & BELOW: Arctic landscape and ice forms

CLIMATE CHANGE AND THE ARCTIC

In as little as fifteen years much of the Arctic Ocean could be ice free in summer. The last time that happened was a million years ago. For the Arctic peoples and the animals who share their home, the prognosis is not good. Dr Terry Prowse, Canadian geographer and member of the international Arctic Climate Impact Assessments group says, "The Arctic is the canary in the global coal mine, and its already sick."

Sea ice cover in the Arctic summer reached a record low last year due to warmer summer temperatures, and ice thickness has decreased by 40% over the last 30 years. Scientists have been monitoring the thickness and extent of the Arctic ice via NASA satellites from space. The results are alarming. In a vicious circle more white, heat-reflecting ice is melting and being replaced by darker, open ocean, which absorbs more heat from the sun, accelerating the warming. The Kyoto protocol on greenhouse gas emissions came into effect in February 2005 and is projected 2012 to reduce greenhouse gases by about 5% from 1990 levels. Even if all governments are successful in meeting the targets set in the protocol, which looks increasingly unlikely, the planet is expected to warm by 3 degrees by the end of the century. In the polar regions, the warming will be twice that.

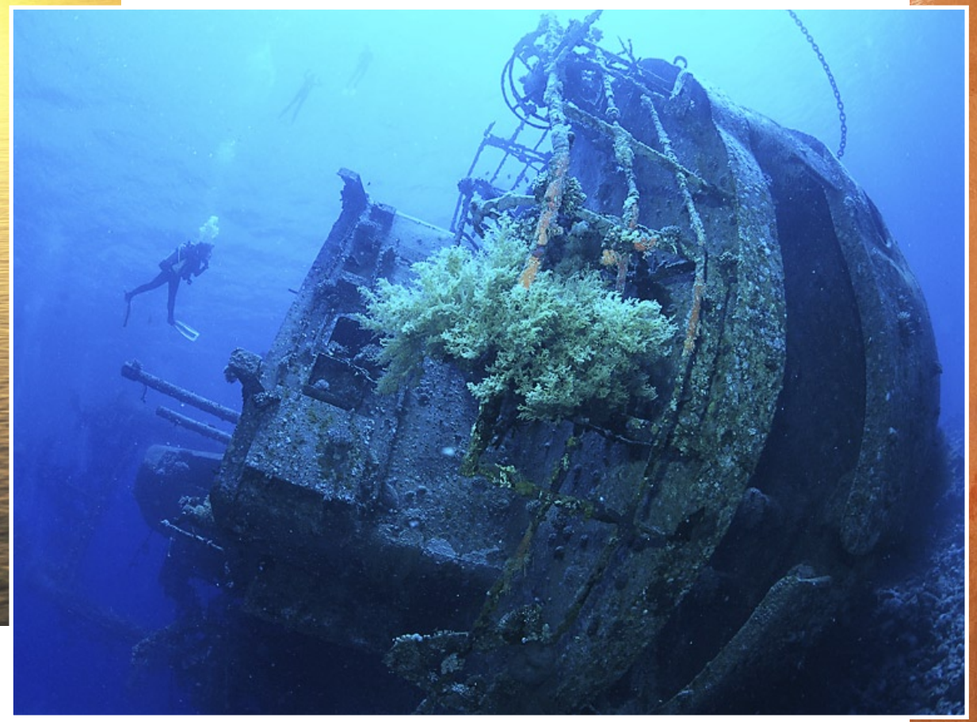
Ruth Curry at the US Woods Hole Oceanographic Institute came up with an apocalyptic vision of the future based on events already in progress. She found that between 1965 and 1995, 20 billion tonnes of freshwater melted from the Arctic into the north Atlantic, more freshwater than in the all of the Great Lakes combined. If this continues, "The great ocean conveyor belt that drives the planetary water cycle and causes the Gulf stream to modify our north west European climate could shut down altogether, triggering an abrupt change in climate only decades from now." This 'Day after Tomorrow' scenario could see much of the northern hemisphere plunged into a mini ice age.

Greenland's ice cap, which contains enough ice to raise sea levels globally by 7 metres, is starting to melt and could collapse suddenly, Curry said. Most scientists believe that it would take hundreds of years of warm weather to melt it all, but already freshwater is percolating down, lubricating the base and making it more unstable. Eric Rignot of NASA's jet propulsion lab has been measuring the rate of loss of ice from the ice cap via satellites. Over nearly a decade the rate of annual loss has almost doubled from 90 cubic kilometers in 1996 to 150 cubic kilometers in 2005. ■

Text by Peter Symes
Photos by Peter Symes
and Yann Saint-Yves

Feeling *relaxed* in Jordan

EASY diving, relaxed atmosphere enlightened & friendly people



ABOVE: Bouyant swimmer relaxes in the sunset at the Dead Sea; CENTER: Diver explores the *Cedar Pride*

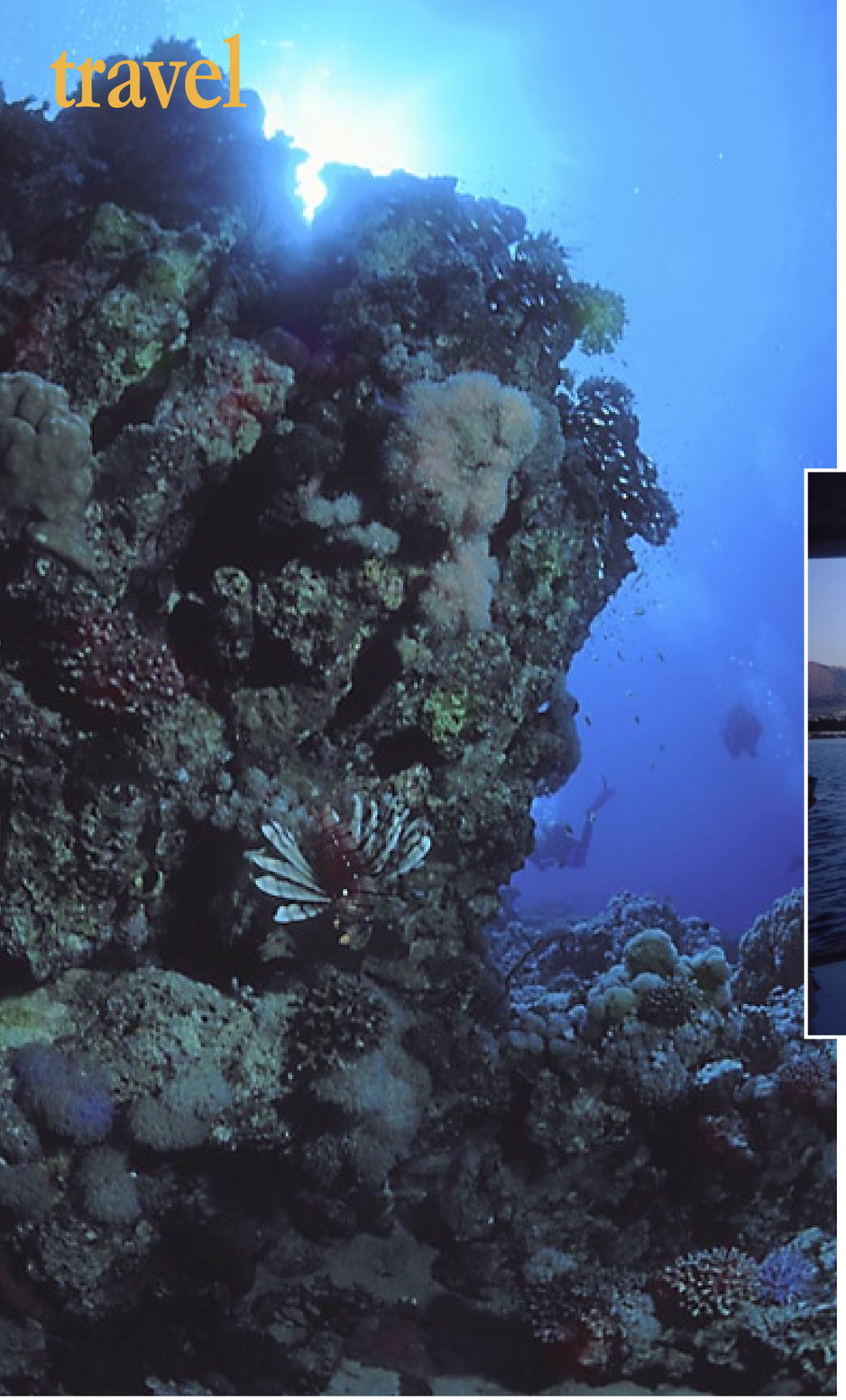
Strong tea with fresh mint leaves. It is very refreshing, almost habituating, but it takes a lot of sugar

The Hashemite Kingdom of Jordan is just soaked in this special ambience that dreams and adventures are made of—the air scented with traces of spices, desert flowers, charcoal and tobacco smoke from the water pipes and where the past and the present seamlessly weave together. It's a mystic place that seems to exist in a time and dimension of its own. Relaxed, exciting and always intrguing, Jordan is a true get-away, yet also a place that plays with all six senses.

A profound experience, that always stood out in stark contrast to the stereotyped images of the Middle East as a region dominated by strife and unrest, was the sense of always feeling safe and well treated and of peacefulness wherever we went. This first impression has stayed with us ever

Guard posing at Petra, the ancient Rose city

Jordan



Typical reef structure off the Jordanian coastline. Below the fringe reef a lot of coral boulders and pinnacles are found. Note the Lion fish, which are found in abundance here

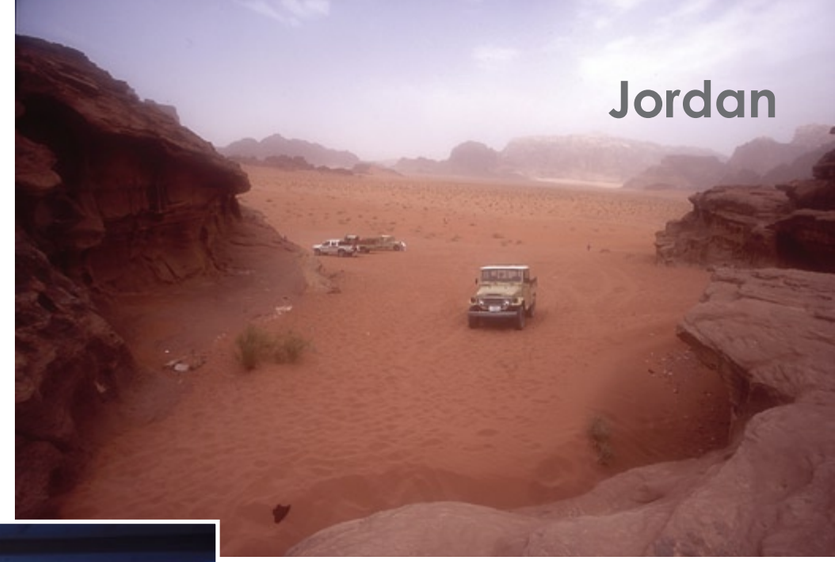
since. With great topside adventures and sights to balance easy and wonderful diving, Jordan is clearly one of the most under-appreciated dive destinations around.

Ancient land

Jordan's history as modern state may be relatively short, but this land is ancient. It is also a biblical land revered by Muslims, Christians and Jews, and the country seems to be peppered with pitstops with some reference to the holy books, which always calls for a pensive moment even for the non-believer. It is said that half of humanity views this land and the river of Jordan as the geographic and spiritual heartland of their faith. Here, the prophet Abraham arrived in the Holy Land; Moses saw the promised land, which he would never enter; John the Baptist preached, baptized Jesus and was killed by King Herod; Jesus received the Holy Spirit and resisted the temptations of Satan; and the Prophet Muhammad made his night time journey from Mecca to Jerusalem.

Here, you can experience the magnificence of Wadi Rum where the legendary Lawrence of Arabia during the first world war led the Arabs in a revolt against the Ottomans (Turks) and their 400 years of occupatio, and of course, Petra, the mystic rose city, which lay hidden for centuries deep in the forbidding mountain range between the Jordan river valley and the eastern desert expanses. Also we find here the Dead sea, the lowest point of the Earth and saltiest sea in the world with it's eye-stinging 30% salt content. Here, the tales of a thousand and one nights co-exists with mobile phones and the Internet.

Aqaba seen from the bay, direction East

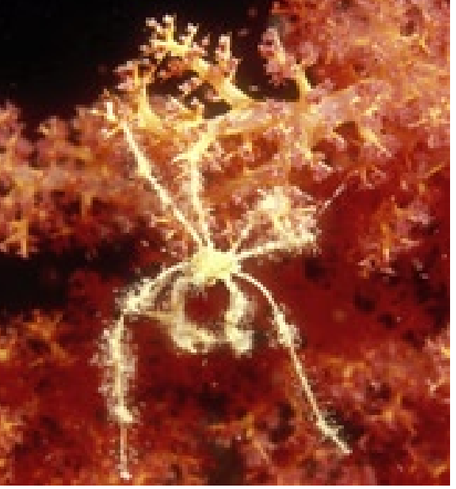


Wadi Rum, the fascinating red desert

Much more than diving

Calling Jordan a dive destination might thus be somewhat a misnomer though we, obviously, also went there to dive. Surely, you can enjoy some good diving there, and the country makes no small marketing effort in making this statement too. But let me get back to the diving in a minute... It is all the other stuff that truly sets Jordan apart and makes it not only worthwhile but also a must-see-at-least-once-in-a-lifetime destination. As for the diving, viewed out of the overall context, it is absolutely decent, though clearly not in the same class as the southern Red Sea, or the unique remote locations in Southeast Asia. But let's not compare apples to oranges here. With only 25 kms of coastline tucked away in

At the Royal Diving Center. From here three dive sites are accessible from the end of the pier



Spider Crab, presumably
Macropodia rostrata on soft coral

► Get Google Earth Bookmark ◄

Jordan

The Jordan dive sites are, for the vast majority, located within the Coral Reserve. The vertical scale of the image is about 25km (15.5 miles). Whereever one is accommodated, any dive site is only a short drive away

the upper far corner of the Bay of Aqaba, the numbers of dive sites are somewhat limited by the competition for space from the port, ferry terminals and industrial complexes. Yet, it offers a couple of world famous dive sites and plenty of rich pickings to last you a very long diving holiday there.

Jordan's stretch of coastline towards the Red sea is squeezed in between Israel and Saudi Arabia and faces the Sinai Peninsula and Egypt across the Bay of Aqaba. At the apeks of the bay, the city of Aqaba lies adjacent to the Israeli resort town Eilat located just across the border. The borders in this area have, as one might expect, been drawn artificially, the concept of states and borders being mainly an European invention imposed on the region more than a century ago as a part of the struggle between the old colonial powers.

At first, Jordan did not have much of a coastline. The border between Jordan and Saudi Arabia was first formally defined in the Hadda Agreement of 1925. In 1965, Jordan and Saudi Arabia concluded a bilateral agreement that resulted in some exchange of territory and re-aligned the boundary extending Jordan's coastline on the Gulf of Aqaba by about 18 kilometers. The new boundary enabled Jordan to expand its port facilities and establish a zone in which the two parties agreed to share petroleum revenues equally if oil was discovered. This swap also brought a number of new dive sites within the Jordanian border. It is in this zone we now find most of the dive sites.

In return, Saudi Arabia got a large area of seemingly barren desert. Of course, shortly afterwards, the Saudis struck oil on their new piece of land!

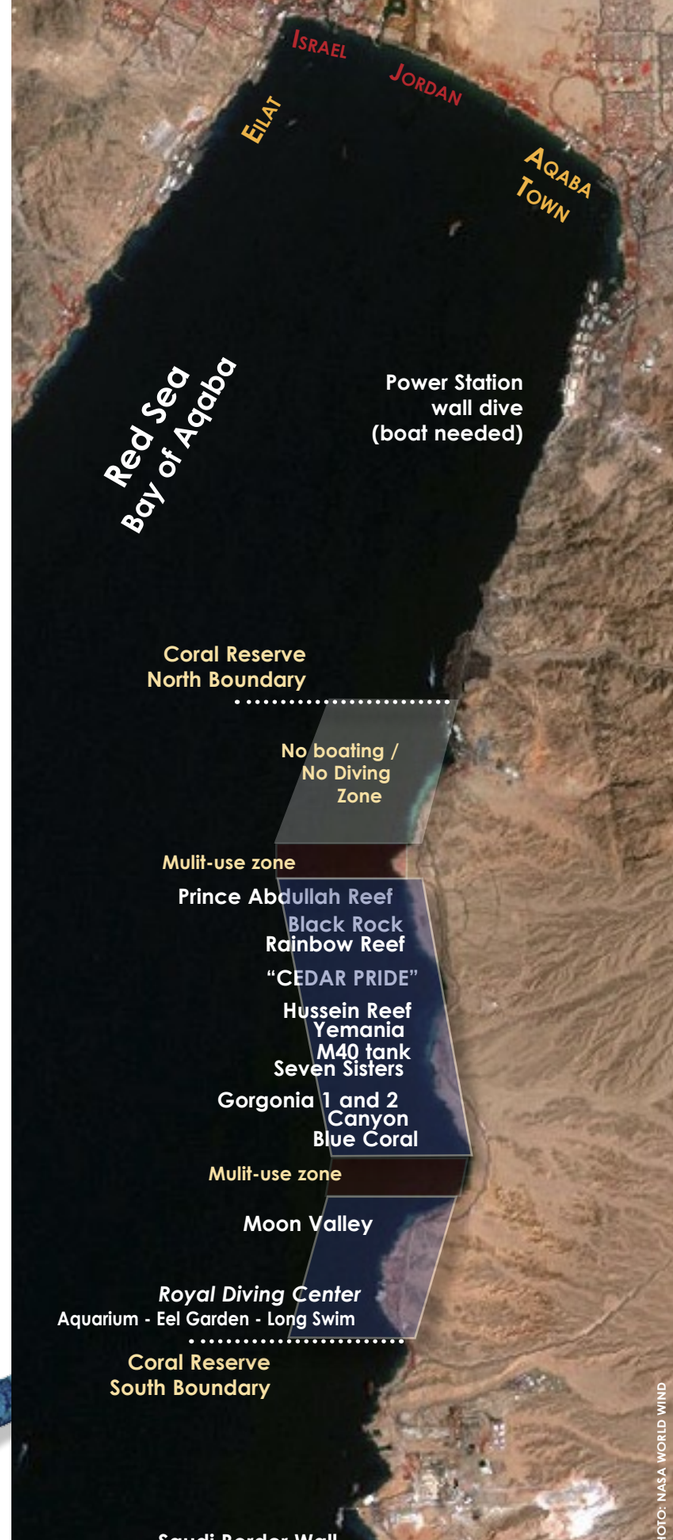
Water sports in Jordan - the easy approach

So, what's on offer?

Surrounded by the rose-coloured mountains, whose hues appear to change as the sun moves across the clear blue sky, Aqaba is an ideal base for travellers who want to sit back and relax the easy life on a sandy beach, go diving or explore the many sites from a history that stretches back thousands of years.

Here, it is also possible to avoid the big crowds now seen at the more popular Egyptian Red Sea resorts and still enjoy extravagant and pristine coral formations and a spectacular wreck. Having previously been to Eilat, which is just a few kilometres away and from where I returned home quite disappointed as the diving appeared very barren to me, my expectations for diving in Jordan weren't exactly sky-high when I arrived. But I was positively surprised, and I later learnt that more than 140 different species of coral have been identified here, many of which are endemic to the gulf.

The diving along this coastline is very good relative to other diving sites in the Northern Red Sea due to its sheltered location. The sea in the Gulf of Aqaba is almost invariably calm with temperatures varying between 20° C in winter months to 26° C in summer. All diving is shore based as Jordan offers fringing reef, which



Small boxes of silver and embedded gemstones at a local bazaar

Jordan

commences at the shore line, and there are no off-shore reefs to warrant boat diving. Both boat and shore diving access the same sites. It is just a matter of which mode of transport is preferred.

Ok, let's start from the top—not very original, but at least it has some order to it.

The Power Station

The first dive site we find in the shadow of an old power station, about 5km south of downtown Aqaba. Here, the reef drops from the surface to 5m then slopes to 12m before dropping vertically to 200m in a sheer wall making it no place for divers lacking buoyancy control. There are overhangs at 25m where excellent fan corals and soft corals abound as nutrient rich waters gently flow along the wall also bringing cooler water up from the abyss. Here, even so close to the town and human infrastructure, big pelagics can be seen out in the deep blue. But it is mainly the structures and corals with fish and critters hiding in them that is the point of attraction here.

There are lots of glass fish here darting in and out of crevices in which various species of morays also like to tuck into. So do lionfish, which enjoy hanging upside down so they can look up too. Watch out for the various other members of the Scorpinidia family. If you look closely you may be able to spot several frogfish and the green-blue Devil Scorpion Fish—and perhaps an octopus. A safety stop at 5m will give you lots to see at the edge of the fringing reef.

Characteristic hues and colours in the signage and store fronts in Aqaba

The Zones

As indicated on the map of dive sites on the previous page, the lower part of Jordan's coastline is mostly taken up by a coral reserve. This is subdivided into some zones. In the northern end, a part of the reserve is a no-go area for boats

ABOVE: Wild camels roaming the Wadi Rum desert
LEFT: Diving close to the Saudi Border. The dense beds of corals were typical for many sites in Jordan .We allways enjoyed great visibility

Jordan

The are many shoals of fish darting in and out between the coral structures. Right: Fusiliers close up

and divers. This is the part where the coral reefs are left entirely in peace.

A big section in the middle and two smaller ones at each end are set aside for diving, interspersed by two smaller areas. They are nothing much other than wide channels really, which are set aside for 'multiple purposes', which I guess means that boats are allowed to get to and from the shore.

In any case, most of the dive sites, except for the "Power Station" and the "Saudi Border" are located in these reserved zones.

First Bay Area

The first section of the Coral Reserve is, unsurprisingly, called First Bay. It lies about 10km south of Aqaba town, and the reserve starts just past the Aquarium and Marine Center.

There are three primary dive sites in this section: "First Bay", "Cazar Reef" and "Eel Garden". Here, we are told we will find a shallow fringing reef with very prolific coral and fish life with the reef starting at 2m and extending down to 30-40m and beyond.

The entry point for First Bay is just about 200 meters north of the Club Murjan. We rig up on the beach, then start wading out into the lagoon and continue finning on snorkel once the water got up to our waist. Just before getting to the reef, we go on scuba and drop down and through a gulley at around 3m.

The area is a "mixed pasture" of coral patches and eel grass. At a first glance, it's not really impressive—nothing dramatic seems to be going on here—but it's got it's own ambience and, as always, the devil is in the details—or rather, the small critters hide in the eel grass or small coral outcrops.

Since my friend John came out of the water being all bubbly and excited about all the seahorses he photographed, I was not able to help myself dive in and adopt a surely strangelooking swimming style where I, in a slightly downward tilted position, sweep across the eel grass patches with my face very close to the seabed. I can swim like this by being slightly buoyant while finning forwards and slightly downward. I must have looked like a dog sniffing out a patch of grass but it enabled me to pick out small decorator crabs and small shrimps camouflaged so well that I would not by any chance have spotted them otherwise.

Alas, I didn't see the seahorses I really wanted to. Perhaps John had just been pulling my leg—wouldn't be the first time. He likes teasing me.

Anyway, my sweeping across the seabed soon saw me out to about 12-15m where the coral outcrops and patches of sand were completely replaced by the eel grass.

Out here, it was said, I should've been able to spot Lunar Tail Grouper and large slipper lobsters. I have never seen one, so I was keen to spot one. But I seemed to

Conservation *"Don't even get close!"*

While most dive destinations impress on their visitors not to touch the corals, Jordan has taken it a bit further. By Royal Decree, King Abdullah and his father the late King Hussein both being keen divers and eager to protect their nation's underwater treasures it is not permitted to go any closer than a meter to the reef. And it is enforced quite diligently, resulting in maintaining reefs in Jordan in pristine condition. Occasionally, if you're taking photographs and have your buoyancy under control, your dive guide might turn a blind eye to you inching yourself a bit closer, but make no mistakes here - woe betide the sorry soul who actually touches the coral! It should be noted that the decree even extends to the permanent shotlines which mark every dive site, many of them now colonised by numbers of soft corals themselves. Divers from Northern Europe who dive from boats and in currents regularly habitually use down lines for ascent and descent but here the line should be used for visual references only.

King Abdullah II's portrait seems to hang everywhere in Jordan

have been out of luck on this day. So, I returned topside with a pleasant dive behind me but with little of interest on film. Can't win them all I guess. Yet, when the sun settled that day behind the Sinai mountains across the bay, it had been a very giving and relaxing day. As I packed up my gear in the last sunrays my stomach started to rumble. Time for a quick shower and some fabulous shish kebabs under the starry night sky. One thing I can't help liking about Arabia is the scented smell of their charcoal grills.

I didn't visit "Cazar Reef" or "Eel garden", also the location of "Club Murjan", but at the first, there was a small area of upwelling, which attracts shoaling fish. Sea bass, lots of Cornet fish, shoals of Fusiliers, schools of Squid and Octopus are common making this an excellent site for photographers with several cleaning stations around. This is considered a more advanced dive site.

At "Eel Garden", there is a pinnacle at 19m covered in soft corals and Christmas Tree worms of al colours surrounded by a dense growth of Black corals. The conspicuously looking Harlequin shrimp and Ghost Pipe Fish can also be spotted here regularly.

Abdullah Reef

Abdullah reef is off an area known as the Tourist Camp and known for stunning displays of fire coral. Again there is a slope between 5 and 12m leading from beds of eel grass down to a level of coral boulders and pinnacles. In the middle of the area there is a large circular reef with a Gorgonia Fan coral in the centre.

Jordan

Following the reef south, there will be a large anemone city habituated, as usual, by clownfish and occasionally a Ghost Pipe fish hanging around too. Scorpion Fish will often try to disguise themselves on cabbage or acropore corals.

Adjancent to the Tourist Camp area, on the northern side of Wreck Bay, we find a dive site called the "Black Rock", which is charactised by slopes of coral expanses and large bushes of black coral. Turtles are known to be frequent visitors to this reef and the easy access to this site and prolific life makes it ideal for snorkellers or less experienced divers. The corals start already just below the surface in the shallows before dropping away steeply about 30m from shore.

The *Cedar Pride*

This great wreck is arguably the most famous dive site in Jordan. The *Cedar Pride* was an 80m long Lebanese freighter sunk in 1986 by the late King Hussein at the wishes of Prince Abdullah, now King Abdullah, as an attraction for divers, both of them being avid divers themselves.

Cedar Pride was lying in ballast in Aqaba when a fierce fire broke out in the engine room.

At a first glance the corals don't seem quite as impressive as the Southern Red Sea but there is a lot of macrolife

CURRENT AFFAIRS

Israel and Jordan discuss plans to build joint airport at Aqaba

Jordan's King Abdullah, Israeli prime minister Olmert and Palestinian President Abbas met at the Nobel Prize Laureates conference in Petra on June 2006. It was here that Israel and Jordan agreed on a number of joint projects including the construction of a joint international airport in the Gulf of Aqaba to be used by both countries. They also agreed on plans for the "Dead Sea-Red Sea" project, which involves the construction of 250km canal to channel water from the Red Sea to halt the present dramatic drop in sea level of the Dead Sea.

Israel's Vice Prime Minister Shimon Peres informed the press that the new joint airport will serve international carriers with two terminals, one Jordanian and another Israeli. As a consequence, the existing airport in Eilat, just across the border, will most likely be closed.

King Abdullah and Shimon Peres also discussed joint Israeli-Jordanian-Palestinian economic projects including the establishment of free trade zones. Israel views Jordan as a bridge to the rest of the Arab countries and sees the prospect of close economic and trade ties with an important Arab state as Jordan as an important step towards easing its regional isolation among its Arab neighbours. Jordan and Egypt remain the only Arab states that have signed peace treaties with Israel.

According to the BBC the informal breakfast in Petra was the first occasion in a year in which the Israeli Prime Minister and Palestinian President Mahmoud Abbas met. The Petra meeting comes at a time of deep divisions between rival Palestinian factions, with senior Hamas and Fatah officials locked in talks to resolve their differences, mainly over a plan proposed by President Abbas that implicitly recognizes Israel. ■

LEFT: Keeping properly hydrated under the Arabian requires constant liquid
BELOW: A 4x4 cools off during a break during a visit to the Wadi Rum desert

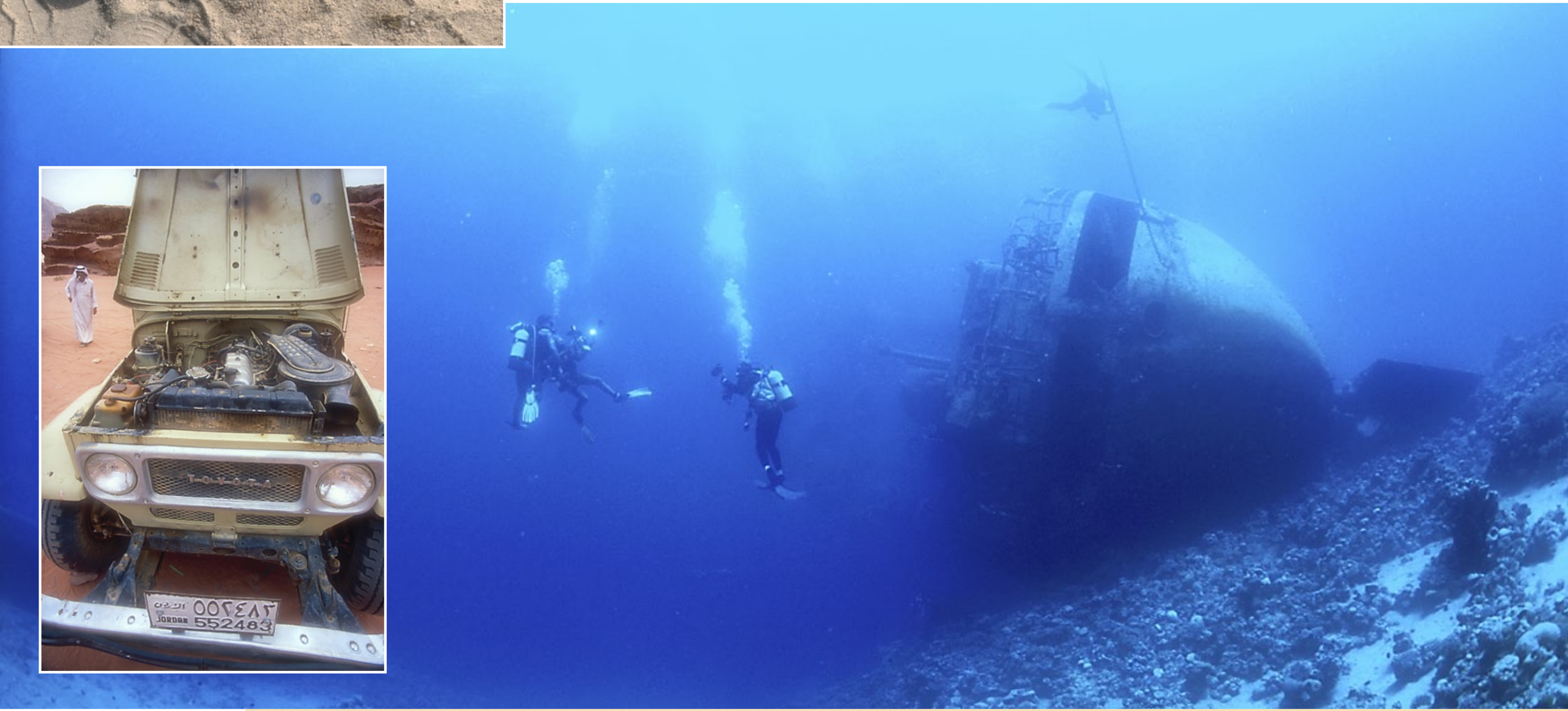
The fire raged for several days and two crew members perished. The accident left the 1,161 tonne freighter so heavily damaged that she was declared a total loss and abandoned in port for three years before it was decided to sink her as an artificial reef.

King Hussein, a keen diver himself, was patron of the project, so a location was promptly selected, the ship stripped down and cleared of dangerous chemicals, hazards to divers were removed and she was towed down the coast outside Aqaba and sunk.

She now lies only 150m from shore on her port side across two reefs at a depth of 12-27m in an undisturbed location where the visibility seldom reaches below 30 metres making this wreck one of the best shore dives to be found anywhere. *Cedar Pride* is mainly intact, even if the hull is starting to deteriorate, and home to many corals. It is often also possible to see sea horses at the wreck.

Above water, there is not much to be seen at the site. It is basically only a little sandy cove with a featureless beach along the coastal road between Aqaba and the Saudi border. Only the two big permanent buoys that mark the ends of the wreck gives away where it is, though you can just pick out a shadow in the water when the light is right.

There is a little jetty there enabling you to walk half the distance out to the wreck before having to take a giant stride off the platform. From here on, one just follows the



Cedar Pride rests on her port side only 150m from the beach

Jordan

Feeling welcomed was such a common sentiment during our visit

The superstructure on the *Cedar Pride*, has plenty to see

slope down, if you can't see the wreck already. In any case, one has to be grossly navigationally challenged to avoid this huge wreck, which lies across your path just in front of you.

Most of the time the full 80 metres of the wreck will be visible. As the wreck has come to rest on two reefs, there is an arch under the midsection of the hull with plenty of room to swim through and come out on the outer side of the wreck where the superstructure is.

Along the searails and, in particular, on the booms and crow's nest, which is now jutting horizontally out in the water, there are some spectacular soft corals and gorgonians. It is easy just to fin around the perimeter at any depth and from below the silhouette of the superstructure and the crow's nest against the deep blue beyond, there can be a striking view. As with wrecks everywhere else in the world this one is also home to many species of fish which like to take shelter in or around the wreck.

There were huge shoals of blue fusiliers constantly circling as well as Sergeant Majors and damselfish around us almost everywhere. We even spotted a couple of octopuses which folded and tucked themselves in the most incredible ways into the tiniest spaces. With no bones in their bodies they can contort themselves through any opening they can get their beak, their only hard part, through.

What really made this a most enjoyable dive site is the fact that it was a beach dive and you could just go up and down as many times as you pleased and had extra tanks available—your nitrogen load permitting of course.

As you can picnic right there on the beach too, it is perfect for a full day's outing provided that you bring plenty to drink and a parasol or some other means of shelter.

The Japanese Garden

With the main reef starting already at 5 meters and with winding, sandy pathways leading the diver through gulleys alternating with eel grass beds the name of the reef is actually very fitting. Diving here is not unlike a stroll in a botanical garden where you want to leisurely look at all the displays of hard and soft corals and the myriads of colourful life darting in and out between the branches before heading round the next corner and into the next section.

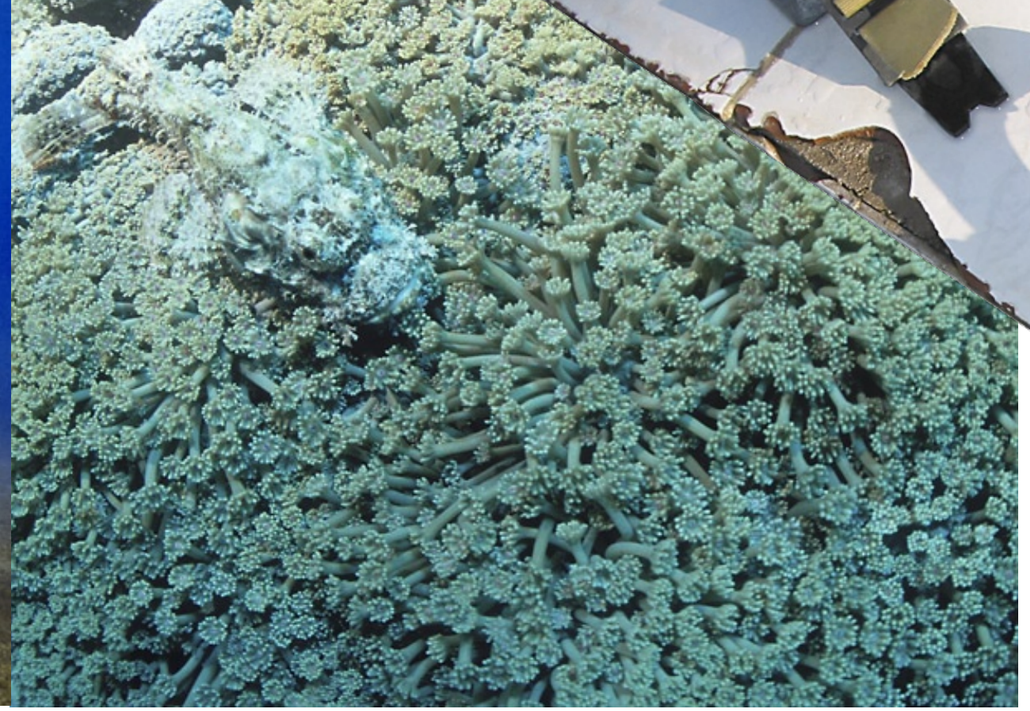
Big cabbage and Brain corals can been seen here—bushes of black coral and some large gorgonians too. It's a good site for macro. Typical fish here are the Guineahen Wrasse, Parrotfish, Blue Spotted

PHOTO: STEIN JOHNSEN

The decommissioned M40 standing guard is both a popular and easy dive

On an outing to the desert, we were treated to lunch and traditional entertainment

Jordan



The fringe reefs along Jordan's coastline boast a quite healthy population of Scorpionfish. Good models they are —they keep still

Grouper, Trumpetfish and shoals of Orange Basselets and Sergeant Majors.

In the eel grass bed, you may find Snowflake Morays, resting turtles and if you swoop by closely enough scrutinizing the bottom, you may pick out a seahorse or two. Meanwhile, on the other end of the scale, if you lift your gaze towards the blue haze of open water in the distance, you may be able to pick out the outlines of patrolling white tip reefsharks.

Seven Sisters Pinnacles

This is a large, flat reef with seven pinnacles of coral, which makes for another dive that is easy, relaxed and full of stuff to watch. The area is full of marine life, and with a depth of only 8-9m, which also allows a practically endless bottom time, this site is excellent for photography.

Each pinnacle is covered in coral and absolutely teeming with life, which one can spend endless moments just watching until suddenly spotting something new that moves that apparently wasn't a branch after all.

Big Eye Emperor and shoals of Fusiliers live around these pinnacles and circle them from above while porcupine fish hide underneath small outcroppings, peeking out warily at the passing divers with their droopy expressions.

M40 Tank

From the "Seven Sisters" you can reach the tank—yes, an armoured vehicle. But going directly out to this other quite unique dive site, you swim over some beds of eel grass in which there is a good chance of spotting seahorses before getting to an area made of mixed patches of sand, coral structures and eel grass.

"Make reefs, not war"

Suddenly, at about the 6 metre level, you will spot an armoured vehicle very much out of its intended habitat. An old M40 anti-aircraft tracking vehicle, aka "The Tank", was put in place here in September 1999 to create an artificial reef. With its twin gun barrels pointing out into the empty blue of the Gulf of Aqaba, it still seems poised to defend the coastline from an imaginary attack from the sea.

With its hatches open, and engine clearly visible, the tank was completely intact. As dive sites go, the novelty this on e quickly wears out—one visit is really cool, but suffices as the tank is a relatively small object. But the first encounter is fun, indeed, and I can clearly remember how my initial reaction went: "*This is neat. Make reefs, not war.*"

It is always fun to hover around an identifiable object, as if you could fly, and observe it from strange angles. As a photo subject, it is also something different from the run-of-the-mill house wreck, and you can make some good stills for your own photo album. As corals are just about to colonise the vehicle, please do try to avoid touching it however tempting it might seem.

While we were there, a pair of courting Trumpet Fish seemed oblivious to us as they carried on with their romantic liaison.

Gorgonia 1 and 2

Yes, this is actually two dive sites about 500 meters apart. The sites are named after a truly massive

The Ecologigal Importance Of the Seagrass Beds


WIKIPEDIA

The lush bed of seagrass in the shallows was a quite prominent feature at the Jordanian dive sites.
There is some unusual features and tidbits about seagrass worthwhile mentioning in this context. Seagrass are flowering plants that grows in marine saline environment (of which there are very few species)

They are not kelp ("seaweed") which are algae. The perhaps most visible of the many profound differences between them is that flowering plants have roots, stems and leaves with a circulatory system, veins, that transports nutrients - algae do not, and the "roots" of kelp only serve to anchor the plant to the substrate.

Seagrasses can form extensive beds or meadows. Zostera is a small genus of widely distributed seagrass, commonly known as eelgrass. It contains twelve species. Seagrass beds are highly diverse and productive ecosystems, and can harbour hundreds of associated species from all phyla, for example juvenile and adult fish, epiphytic and free-living macroalgae and microalgae, shellfish, bristle worms, and nematodes. Few species were originally considered to feed directly on seagrass leaves (partly because of their low nutritional content), but scientific reviews and improved working methods have shown that seagrass herbivory is a highly important link in the food chain, with hundreds of species feeding on seagrasses worldwide, including manatees, fish, birds, sea urchins and crabs.

ECOSYSTEM ENGINEERS

Seagrasses are sometimes labelled ecosystem engineers, because they partly create their own habitat: Their leaves slow down currents increasing sedimentation, while their roots and rhizomes then stabilize the seabed. Their importance for associated species is mainly due to provision of shelter, as they make up for a three-dimensional structure in the water column, and for their extraordinary high rate of photosynthesis. As a result, seagrasses provide coastal zones with a number of ecological goods and ecological services, for instance fishing grounds, wave protection, oxygen production and protection against coastal erosion. ■

The explanations gotta be that Arab is read right to left. Anyways, the case in point was that you can easily take a bus to the dive sites

Gorgonia fan coral at 16m at "Gorgonia 1". Nonetheless, this site is mainly relatively shallow and an easy dive mostly located at the 10 meter level where it comes up with a splendid display of massive coral formations, including a 'lettuce coral' the size of a minibus just as you exit the gulley taking you through the fringe of the reef. This site is also known for its three pinnacles teeming with fish life predominantly Lionfish and Anthias, but occasionally also Cornet fish and Jacks.

Throughout most of the year one of these pinnacles is covered in Lion fish which gather in huge numbers to hunt for fry, which makes for an extraordinary photo opportunity. There is also a resident turtle.

Another of the pinnacles is full of Glass fish, Coral Groupers and Stone fish and a big contingent of cleaner shrimps keeps a well-visited cleaning station busy at all times.

Approximately 500m to the south, "Gorgonia 2" bids welcome to divers with an easy entry onto a shallow grassy area, where the reef starts about 30 metres from the shore at 2m - 3m depth. The base of the reef is a good location to spot Scorpion Fish, Stone Fish and Crocodile Fish. We also find two large pinnacles at six meters and a reef with Broccoli and Rose coral, which drops down to 20m, and a large Gorgonia Fan coral. Lots of Lion Fish and eels.

Blue Coral

This site is characterised by fingers of corals extending from the coast like lava flows reaching for the depth. The flat stones at the entrance can be slippery, and with sea urchins present, caution is needed on entry. The reef starts at around 12m and is fringed with beautiful blue acropora coral and some rare sea anemones. This site is also known to have many unusual nudibranchs, so do kit up with your macro configuration here. Pipefish often hide in the sea grass too.

Saudi Border Drop-Off

The name of this site is to be taken quite literally. As we got of the bus taking us to the site, we were looking right at the gates to the Saudi Arabian border a couple of hundred metres further down the road. I guess that you could re-emerge on the other side if you wanted. The very little there is to see here top-side belies what is to seen underwater. This dive site, which was my favourite offers something for all levels of experience. There is an easy sheltered part dotted with interesting pinnacles and a plateau that gradually slopes into a wall of vivid coral that drops down to 50m and beyond. Here, large Plate corals abound and small caverns at 30m. At around 40m, large Groupers can be seen peeking out from behind the rock pinnacles. Here the abyss really beckons you down and I soon enough found me too close to 40m for comfort being on a single tank and a rental regulator with a disturbing tendency to free flow. Needless to say I asked my buddy to stay close while I took some pictures of the massive formations of Cabbage and Broccolli corals here before turning back. On the way up we passed a spectacular double pinnacle on the edge of the wall at 18m where we came across a pair of playful turtles.

At the Saudi border. Not much to see top-side but down under we find one of the best and mots exciting dive sites in the country

Big bush of Brocolli Coral *Lithophyton arboreum*, at the Saudi Border dive site

The Rose City
Petra

The ruins of Petra, the ancient capital of the Nabatea empire is one those marvels that captivates even the most seasoned traveller. Hidden and forgotten for centuries in a hollow among the rose sandstone and limestone hills, lies one of the most extraordinary and fascinating monumental complexes of the ancient world.

Walking down a gulley from the hotels in the nearby village of Wadi Mousa, nothing gives away that in the middle of this seemingly barren and hostile area, a splendid metropolis of an ancient culture is located. Yet, it was this invisibility and the natural defenses that guaranteed the safety and prosperity of the rose red city.

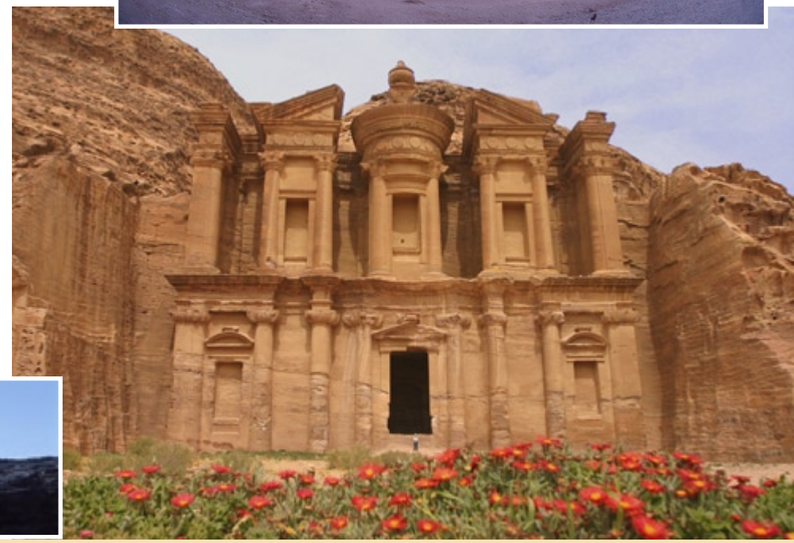
As we walk down the stony old path along the river bed and through a very narrow gorge, there stands (you don't see it before it is there smack right in your face) the famous al Khazneh temple. Ornate, carved right out of the rose rock, it is an astonishing sight, the majestic structure rising all the way up along the cliff.

Here, centuries of history stares right back at you. The Petra valley has been inhabited since 1500 BC—and there's no wonder why it has. Looking at a map over the Middle East, Petra sits right where the roads running north-south and east-west met linking Gaza at the Mediterranean and Cairo in the West with Charax in the Persian Gulf and Medina in Arabia in the East with connecting routes coming down from Palmyra, Damascus and Amman towards Aqaba and the Red Sea. The complex is so much bigger than I thought.

al Khazneh Temple
Photo by Yann Saint-Yves

Past the al Khazneh, it's a whole city, which we spend the whole day exploring. Here, are temples, old arenas, houses, workshops... It's impossible to do it justice in a just few pages.

We rounded off the day striding the one-hour climb to the magnifient Deir temple where we could also enjoy a breathtaking view over the whole forbidding range, with the Jordan valley in the West.



The Deir is perhaps the Nabatean architects' most astounding creation. It stands in an isolated position on the top of the mountain spur, quite a climb's distance away. From the top of the plateau there is a magnificent view and the Jordan valley can be seen in the West.
Photo by Yann Saint-Yves

Jordan

View over part of central Amman that lies sprawled across seven hills

FAR LEFT:
Bust of Alexander the Great on display at Amman's Archaelogical Museum

Other sights

In Amman, the Archaeological Museum now located at an ancient temple on one of the central hills is definitively worth a visit for the culturally inclined. Amman itself doesn't seem to have much of a nucleus. Save from the big amphitheatre, the city was more like a homogenously sprawled across seven hills.

The Jordanians come across as a relaxed, peaceful people with a friendly disposition. We were told that unlike so many other Arab nations, Jordan has no significant natural resources and, therefore, has to rely on education and export of intellectual virtues for which reason a significant part of Jordan's workforce is employed in high-level positions in other Arab countries and sending back money. The Jordanians appear very well-educated and well-informed, and if any sort of lasting peace can be achieved in the Middle East, Jordan could surely become a much sought after destination for dive travellers. So get there soon, before the crowds start moving in.

►Get Google Earth Bookmark ◄

A panoramic point outside Nebo where Moses allegedly died before he reached the promised land in the distance. Here, a sign (cut out and superimposed) points out how close the biblical towns lie, i.e. across the valley, Jerusalem is only 40km away, yet in a completely different reality from the tranquility on the Jordanese side of the border

Mt Nebo

Going south out of Amman, we passed Mt. Nebo. This is the mountain from which Moses saw the Promised Land and where he subsequently died. There's a church here with nice mosaics, but the location is mainly interesting for the panoramic views. Mt. Nebo is traditionally believed to be the burial place of Moses.

Madaba

Our next stop was St. George's Church in Madaba. It's famous for a large 6th century mosaic floor, which depicts a map of the Middle East. It's the first known map of the region and the oldest preserved map of the Holy Lands.

Wadi Rum is a vast silent place, timeless and starkly beautiful. It lies 70 kilometres northeast of Aqaba. A 4x4 adventure or a night spent under the stars surrounded by the majestic rugged mountains and desert is an unforgettable experience with a scent of history. It was through this forbidding desert that Lawrence of Arabia, during the First World War, rode in to ambush Aqaba and take it from the Ottomans. ■

The mosaic floor in St. Georges church in Madaba is the oldest map of the holy lands

The real Lawrence of Arabia and a DVD with the Academy Award winning movie from 1962

Lawrence of Arabia

Lieutenant-Colonel Thomas Edward Lawrence, CB, DSO, Legion of Honour (1888 –1935) gained international fame for his role as a British liaison officer during the Arab Revolt of 1916-18.

Lawrence first journeyed to the Middle East in 1910 where he studied Arabic in preparation for joining a British Museum excavation in Syria. In 1914, under the guise of a field trip, he participated in a British military survey and mapping project on the Turkish-controlled Sinai Peninsula. When Turkey entered the war on Germany's side, British Military Intelligence sent him to Cairo.

Meanwhile, the Arabs viewed the involvement of the Ottoman Empire in the war as an opportunity to revolt and drive the Turks from their land. Seeing in this a chance to harass the Turks, the British lent support to the Arabs through shipments of arms and money. The revolt sputtered, however, and was by 1916 in danger of collapsing. Lawrence was sent to bring order and direction to the Arab cause.

The experience transformed the introverted Lawrence into one of the most colorful military figures of the war. For two years, Lawrence and his band of Arab irregulars attacked Turkish strongholds, severed communications, destroyed railways and blew up hundreds of railways bridges. They ambushed and conquered Aqaba from the Turks and supported the British regular army in the drive north to Damascus. His leadership brought success and he entered Damascus with the Arab tribesmen to prepare the way for King Faisal. He then attended the Peace Conference at Versailles with the Arab delegation. ■

The Dead Sea

Text and photos by Yann Saint-Yves

More and more people are coming here just to heal their skin problems such as psoriasis. And tour operators are targeting this potential market more and more. It's turning Jordan into a family destination where the Mister can cure his skin, and the Madame can visit historical places such as the Baptism Site of Christ, Madaba mosaic's factory and Jerash's antique city. And as Jordan is mostly safe, she can drive by herself in a rented car, as all road signs and directions are written both in Arabic and English.

With the very broad array of treatments offered at the spa, you can just get lost with the choices: hot stone massages, algae wraps, Dead Sea mud body treatments and facials, Dead Sea salt peels, hydrotherapy, aromatherapy... Well, if you want to test everything, it will probably take two weeks and quite a lot of money—but it's worth it, for sure. Even If you're not a Spa-aholic, you must test a few of them!

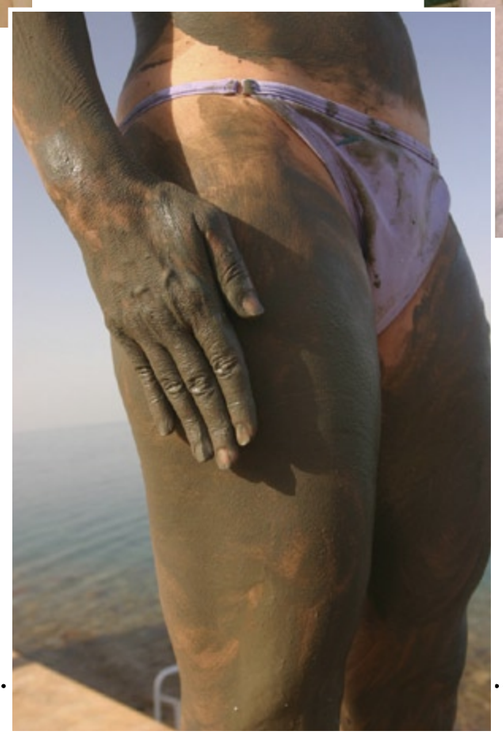
As the sun goes down on the Israeli side of the Dead Sea, the spa turns silent and welcomed fresh fragrances waft out of the magnificent gardens. Then, you can join some friends at the Chicha Bar to enjoy genuine mint tea, or taste the apple-flavored *narghileh*. As Mövenpick concentrates many activities in the hotel, you can spend your whole week there. It is a guaranteed soft moment for the whole family. ■

The Dead Sea is both the lowest point on Earth at 418 meters below sea level and falling, and the deepest hypersaline lake in the world at 330 meters deep. It is also one of the saltiest bodies of water on Earth with a salinity of about 300 ppt, This is about 8.6 times greater than the average ocean salinity. It is 67 kilometers long and up to 18 kilometers wide, and is located on the border between the West Bank, Israel, and Jordan, and lies in the Jordan Rift Valley. The main tributary is the Jordan River.

"Here's a perfect moment in a perfect world"

You're in "History Land", a place where almost every human has a link, a bond, a root. Welcome to Jordan. A few miles away is Mount Nebo surrounded by olive trees. From this point, you can stare at the Dead Sea and the Promised Land... In this place, you can feel history in the ground, in the stones, in the air...

On the seaside, in the Mövenpick resort, 6000 square meters of luxury and softness are dedicated to body and skin care: Zara Spa is the place. You can enjoy several water pools with different salinities, from neutral to the Dead Sea flotation pool. Discrete perfumes and fountains keep you in a very "zen" frame of mind.



fact file

Jordan

Coat of Arms of the Hashemite Kingdom of Jordan

History The country of Jordan is located in the Middle East, northwest of Saudi Arabia in strategic location at the head of the Gulf of Aqaba. It is the Arab country that shares the longest border with Israel and the occupied West Bank. For most of Jordan's history since its independence from British administration in 1946, the nation has been ruled by King HUSSEIN (1953-99) who successfully dealt with competing pressures from the US, USSR, and UK, Israel, various Arab states and a large internal population of Palestinians, surviving several coup attempts and even war. King Hussein reinstituted parliamentary elections in 1989 as well as gradual political liberalization. In 1994, the King signed a peace treaty with Israel. Following his death in 1999, his son, King ABDALLAH II, assumed the throne. With an aggressive economic reform program, the new King has consolidated his power. In 2000, the nation acceded to the World Trade Organization, and in 2001, began participation in the European Free Trade Association. In 2003, parliamentary and municipal elections took place after a two-year delay. The new government's focus in 2005 is on political reforms, fighting corruption and improving conditions for the poor. Government: constitutional monarchy; Judicial system: based on Islamic law and French codes; Capital: Amman

Geography

Terrain: The country is mostly desert plateau in the east with highland areas in the west; The Great Rift Valley separates the East and West Banks of the Jordan River; Coastline: 26 km; Lowest point: Dead Sea -408 m; Highest point: Jabal Ram 1,734 m; Environmental issues: limited natural fresh water resources; deforestation; overgrazing; soil erosion; desertification; Agriculture: wheat, barley, citrus, tomatoes, melons, olives; sheep, goats, poultry

Climate is mostly arid desert; the rainy season in the west is November to April; Natural hazards include droughts and periodic earthquakes

Economy Jordan is a small Arab country with less than adequate supplies of water and other natural resources such as oil. Fundamental problems plaguing the nation are debt, poverty, and unemployment however fundamental measures to improve living standards are taking place. In the past three years, the nation's capital of'Amman has worked closely with the IMF, practicing careful monetary policy, and making substantial headway with privatization. Liberalization of the country's trade regime has helped secure Jordan's membership in the WTO (2000), an association agreement with the EU (2001) and a free trade accord with the US (2001) leading to improved productivity and foreign investment. Before the US-led war in Iraq, Jordan imported most of its oil from Iraq. Now, Jordan is more dependent on oil from other Gulf nations, which has forced a rise in retail petroleum product prices and the sales tax base. Current challenges include reducing the budget deficit, reducing dependence on foreign grants and creating investment incentives to promote job creation. Natural resources: phosphates, potash, shale oil; Industries: textiles, phosphate mining, fertilizers, pharmaceuticals, petroleum refining, cement, potash, inorganic chemicals, light manufacturing, tourism

Currency Jordanian dinar (JOD); Exchange rates: 1 JOD = 1.11 EUR, 1.41 USD, .76 GBP, 1.88 AUD, 2.24 SGD

Population 5,906,760 (July 2006 est.); Ethnic groups: Arab 98%, Circassian 1%, Armenian 1%; Religions: Sunni Muslim 92%, Christian 6% (with a majority of Greek Orthodox and some Greek and Roman Catholics, Syrian Orthodox, Coptic Orthodox, Armenian Orthodox and Protestant denominations), other religions 2% including several small Shi'a Muslim and Druze populations (2001 est.)

Language Arabic (official), English is widely understood among middle and upper classes

Decompression Chamber

Princess Haya Hussein Hospital
Hyperbaric Department
Aquaba, Jordan, tel. (+962) 314111

Dive Operators

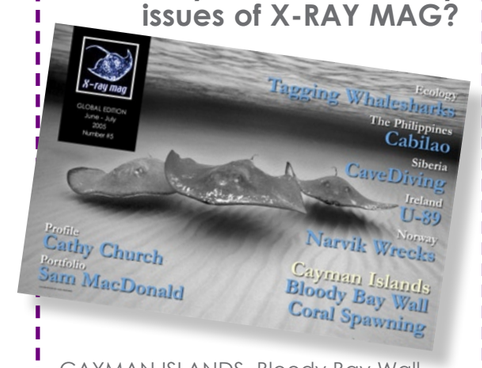
Dive Aqaba
www.diveaqaba.com
Aquatours Jordan
www.aquatours.com

Websites

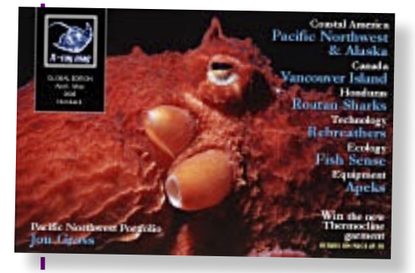
Jordan Tourism
www.visitjordan.com
Jordan Tourism North America
www.see-jordan.org
Jordan Ministry of Tourism and Antiquities
www.tourism.jo

FREE Back Issues

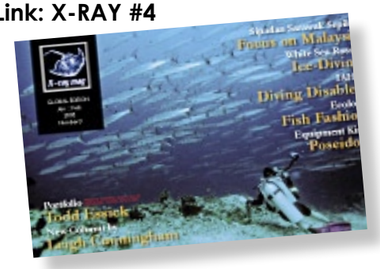
Have you seen the early issues of X-RAY MAG?



CAYMAN ISLANDS, Bloody Bay Wall, Freediving World Records, Innerspace, Coral Spawning, Wrecks of Narvik Norway, Siberian Cave Diving, Tagging Whalesharks, Cabilao **Link: X-RAY #5**

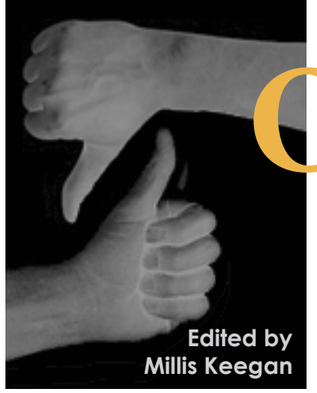


PACIFIC NORTH WEST AMERICA. Vancouver Island, Puget Sound, Neah Bay, Alaska, Honduras Sharks, Amous Nachoom, Jon Gross, Apeks, Fish Sense **Link: X-RAY #4**



MALAYSIA. Coral reefs after the Tsunami, Whale beachings, Tragedy in South Africa, Nemo's Nose: The Science of Fish Fashion, Ice Diving in Russia, Todd Essick **Link: X-RAY #3**

Featuring: Dolphins of Roatan, Himalaya Diving, Protecting the Reef, DEMA Show, Antibes Underwater Photo Festival, El Dorado **Link: X-RAY #2**



Letters & Opinions

All perspectives expressed in this section are those of the individual author and do not necessarily reflect the views of X-RAY MAG, DiveGuru.Net, or their associates

Edited by Millis Keegan

PETER SYMES

Do We Even Care Any More?

Rising ocean temperatures, urban and agriculture run-offs, evidence of Prozac, estrogen, the ever popular anti-bacterial soap and other chemicals have been detected in and around the oceans and around our reefs. The environmental stress makes it harder and harder for the reefs to recover. This year, entire colonies have died all over the Caribbean area, leaving ghostly white skeletons of once colorful reef behind. It's an unprecedented behind. It's an unprecedented die-off, never seen before.

Are we to blame? Do we even care any more? That was last month's question for the readers who we prompted for their opinions.

However, we received surprisingly few opinions on the matter. From this, I can figure one or two things out. One assumption could be that, okay, perhaps no one read the Letters and Opinions in the previous issue. But with the vast circulation of this magazine that is hardly the case. Which leaves me with the notion that we really do not care any more. But can that really be true? I refuse to believe that no one cares. So, I was left with no other alternative than to go ask around. Here are a few of the spontaneous replies:

Anita, a Swedish rescue diver, active diver for more than 10 years:
If I care? Yes, sure. But honestly, I feel like no one cares if I care. I do my part. I sort the waste products from our household. When I go to the market, I buy products marked as being better for the environment, like washing detergent, soap and so on. I don' have energy to think about fair trade as well. I have chosen to shop more environmental friendly instead. Anti-bacterial soap? That's not good for the environment? I had no idea. My mom says I should not buy leather either because the process is brutal. It is so tough. You need to be extremely alert to know everything in order to do the right thing. Come to think about it, I follow the direction the government informs me about. What they support, I support. Am I ignorant? Now, I am more confused than ever.

Joiner, Middletown, USA, who just bought yet another battery driven toy for his kid:
Are batteries bad for the environment? I don't give a .... I sort plastic and plastic bags, that's what I do, cause my wife tells me to.

Barry, Fort Lauderdale, Open Water Diver:
Do you mean to tell me that it is my fault that the reefs are dying? Get a life! I only dive to collect the lobsters.

Bella, Advance Open Water Diver, tourist from the Netherlands visiting West Palm Beach and Fort Lauderdale, Florida:
All the time! We try to be conscious consumers. It is not easy, and I learn new things all the time. Even things I thought to be true turns out not to be true. You have to be on the edge all the time, read and learn. But the only true change can come if the governments in the world give their people directions. As much as we want to save the world, if companies are not given rules to follow, they will dump their shit in the oceans. And on the public TV last week, they told the viewers to flush left over medicine down the toilet! Can you believe it? Where is the responsibility! Sorry, I get carried away. Sorry. Where were you from again? X-Ray Magazine? A dive magazine? I love diving.

Bob, Canada, non-diver:
Environment? If you ever tried that organic beer shit, you wouldn't care about saving the environment. It tastes like shit. I don't get it? You don't get it lady. Let Greenpeace or whatever take care of that shit.

Kevin, Deerfield Beach, Florida, Dive instructor:
Global warming and algae blooming? Don't get me started! The American government treats environmental issues in a very disrespectful way. For example, and this is no secret, you can look it up, they suppress scientists from giving their opinions if they don't approve of them. There is this climate expert at NASA who spoke up about the dangers. He got in trouble and now the government has to approve everything before it is released to the public. Yes, I am not kidding. The official government story is that there is no global warming and no relation beween temperatures and pollution and so on. Therefore, no one related to the government is allowed to say anything in conflict with that. Free speech does not exist in the real world. Don't take my word for it. I am sure you can find it on the Internet.

Granted, this is in no way a representative selection, merely a short interview session along Fort Lauderdale's Beach walk in Florida where I happened to be shortly before the deadline. The insightfulness of some answers showed real concern and knowledge. Some answers were ignorant, but all in all, the common thread breathes hopelessness. "Why bother? No one else does," seemed the be the underlying tone. This requires more attention, so the question for the next issue stands, and until then, we will dig a little deeper into what you can do and what you should not do to help better the environment.

About the DiveGurus

Millis Keegan, owner and founder of **www.diveguru.net**—the homepage that answers questions for divers, snorkelers, anyone with a love for our oceans really—is also a co-editor of X-Ray magazine. With the help of reputable experts www.diveguru.net will find the answer.

What do *you* think?

Get heard! Send us your opinion to **diveguru@xray-mag.com** by Sept 10 2006 and get a chance to win these exquisite *Silver Hammerhead Cufflinks* generously sponsored by **ReefJewellery**.

Let us find out. Tell us your thoughts:

Which Environmental Organisation Does the Best Job?

Where is the money best spent?

Who would you send €100/$128?

Let us know who you would nominate as the best, most efficient or worthy environmental organisation. Please email us with your choice briefly stating the reasons for your recommendation; 20-100 words will do. We need your input by Sept 16, 2006.

Email: **diveguru@xray-mag.com**

Edited by
Andrey Bizuykin
& Peter Symes

POINT & CLICK
ON BOLD LINKS

Gotta have it

Equipment

Titan CCR

CCR rebreathers are like supercars: Coveted, top-of the-range and often hand built in small series for the discerning customer. The Titan is made to fit any BCD or harness with no modifications and uses standard tanks and regulators. The scrubber canister uses Extendair cartridges, while more expensive in use than granules offers some practical advantages. The connectors for the diluent and oxygen tanks are industry standard quick connectors. The Titan comes with a Head-Up display controlled by an independent computer from that, which controls the solenoid. Comes with rechargable batteries that are user-changable.

www.bubbleseekers.com

Scubapro

We spotted this fancy watch on scuba-uwatecs Asia Pacific website—and only there. Specs list mentions exclusive Swiss precision, automatic quartz movement and machined titanium case. Rotating titanium bezel and cratch-resistant crystal glass. Bracelet is user-exchangable to sporty black diver's strap. Ultra-luminous dial and hour/minute hands. 200m rated.

www.scubaproasiapacific.com

Silent Hunter

This new long-bladed freediving fin from riffe is the longest tapered high strength plastic fin blade manufactured according to the manufacturer. The Silent Hunter offers better spring action and ease while swimming. The only plastic fin blade using flexible side rails, which helps channel water off the tip of the blade and prevent side wobble. These fins develop more forward thrust with less effort. Ankle weights are not necessary for quiet swimming. Foot pockets are made from two different rubbers; soft for comfort; hard for energy transfer to the blade.

www.speargun.com

Spanish brute

We don't see many Spanish products in the English-speaking press, so herewith a timely welcome to this 200m rated LED from Barbolight. The 210mm long body is made of a scratch resitant anodized aluminium alloy. Each of the three LEDs has a 215 lumen output and a colour temperature of 6300°K. The batteries are NiMh. 3.6v 4500mAh with a charging time of 5 hours. A full charge lasts 120 minutes.

www.barbolight.com

Mask Saver

We have all done it, I guess—lost a mask from wearing it on the forehead, dropping it in the water or sitting or stepping on it. Now, this nifty remedy from Aqualine Oceangoods could see the end of our woes. The Mask Saver is both a padded mask strap and, while out of the water, also a protective pouch. Out of the water you simply undo the buckle, which loosens the strap allowing the mask to dangle and not strangle below your chin, or you can unbuckle it all together and clip it on to an attachment clip on the BCD.

www.oceangoods.com

No floods

Aeris DVT (Dry Valve Technology) provides an "automatic extra layer of protection" from environmental contamination such as dirt, dust, sand, spray, dripping and pooled water, or even a "flash flood" in a rinse tank. How does it work? Open the tank valve and air is delivered through a downstream system without restriction. When your dive is finished, before the regulator is even removed from the tank valve, the DVT system is already closed, sealing out moisture and any other contamination.

www.diveaeris.com

Whites' Catalyst

"The next generation of dry suits. You have to see this revolutionary suit to believe it," writes renowned Canadian drysuit manufacturer Whites about their Catalyst. The anatomically correct CAD-designed pattern with pre-bent arms, legs and torso gives a perfect fit, a self entry zipper and molded air control knee pads with adjustable ankle straps to minimize air transfer to the boots. The suit comes with Multi-Laminate Shellsocks attached and Internal 3mm Neoprene Softsocks. If desired, rugged, neoprene insulated 7mm molded Rubber Boots with tough vulcanized sole covering and fin keeper are available instead. Inflate and exhaust vaves are from SI Tech.

www.whitesdiving.com

Vrroum!

Doesn't it look cool? Imagine taking your in-laws for a picnic in a couple of these. UboatWorx, the manufacturer, writes that this is the first affordable private 1 atmospheric submersible. Capable of diving to 50 meters depth for over two hours, there is no need to get wet or bother with decompression issues, staying dry and comfortable at all times. The specs sheet mentions six different safety systems and three redundant depth control systems. Lightweight materials makes it very easy to handle, and serial production, relatively cheap, though we didn't get the actual price tag.

www.uboatworx.com

(ALSO LOOKING FOR DEALERS WORLD WIDE)

Going someplace?

The #89 Backpackfrom Armorbags is the first backpack with wheels to stand upright writes the manufacturer. The large and rugged 100mm rubber-wheels are placed with a wide wheel base to maximise stability while meeting airline standards. The overall dimensions are listed as 28x18x11" (6800 cu in), corresponding to 71x46x28cm (92l). There is an exterior portfolio pocket for airline tickets and like stuff and the locking pullout handle makes is easy to trolley this bag down the concourses. For use on the dive boat, it comes with padded shoulder straps and rubber handles on each end. Fin pockets are inside as is a padded regulator pocket. For protection against the rugged handling and abrasion in both airports and onboard dive vessels, it is made out of 1682D ballistic material and has extra corner protection.

www.armorbags.com

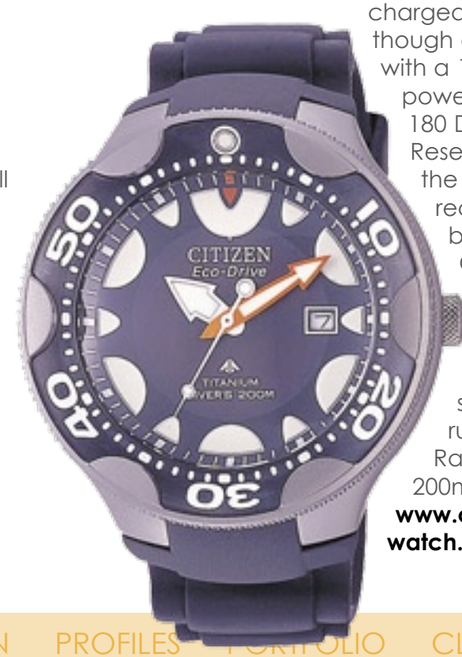
EZ Stretch

Action-Plus' EZ Stretch boasts a new concept. The first of the layers is a top layer of "Nano" neoprene where tiny capsules are applied over the surface of the closed cell neoprene. The second layer is SCS (Super Composite Skin), a hydrophobic layer. As it does not absorb water it dries quickly between dives, and is easy to get on and off. In addition, it prevents the growth of bacteria. The third layer is a super thin film of Titanium Metal, which reflects body heat back to your body. In combination, it increases heat retention by up to 55% in comparison to any standard neoprene. The fourth layer is neoprene—more stretchy and comfortable than regular neoprene. Overall, EZ Stretch should provide for a 4-way stretch of up to 70% over regular neoprene. **www.action-plus.com**

New Citizen watch

The Citizen Eco-Drive Quartz movement means never having to change batteries ever. It is charged by light, though comes with a 180-day power reserver, 180 Day Power Reserve, in the form of a rechargable battery. Case is made of Titanium, strap of rubber. Rated at 200m

www.citizen-watch.com



May the ForceFin be with you

Preview: The new SD-1 Flying Force will feature much of the same design as its predecessor but will include some new ones. Gone will be the fixed size foot pocket replaced with a redesigned adjustable pocket.

Forcefin.com

AV-2 Scooter

Built for serious underwater explorers, the AV-2 is depth rated to 70m (230ft) and can run up to 100 minutes, which is more than triple the average burn time of Apollo's first u/w scooter. Choose between the new increased voltage Lead Acid Battery (SLA) or for more extensive diving the Nickel Metal Hydrate (Ni-MH). With all that time to burn you can get distracted. The new battery life indicator is very useful tool. You can switch back and forth between battery types with the flick of a switch. Travel at up to 4kmh (2.5 miles per hour) with complete control of speed now at your finger tips. The new variable speed trigger works with the Hands Free Riding saddle (included) for smooth acceleration from full stop to top speed.

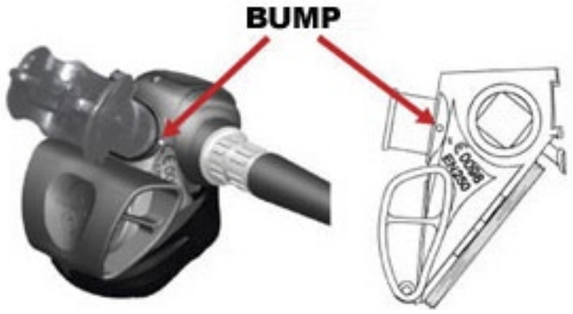
www.apollosportsusa.com

Euro Speargun

A completely new design, the new Riffe Euro Series spearguns were designed for all levels of divers. Manufactured by Riffe with the new MAG-TRACK, a magnetic track for ease of loading and free-shafting. The low-profile stocks are made with 5 vertical laminated teak strips and bolted front muzzle for added strength. Models E-90 & E-100 have a full radius barrel. Longer models, E-110 & E-120 have a corner rounded barrel for more beam strength. All models come standard with threaded stainless steel inserts for reel installation and low-Profile Trigger Mechanism with added silencer. Other common features of the series include side rotating spring loaded Safety and rear loading pad, giving full vision for aiming down spearshaft. **www.speargun.com**

Recalls & Updates

SCUBAPRO is conducting a voluntary recall of the X650 second stage regulator. A manufacturing error could cause the main housing of some regulators to change shape over time, and the cover and diaphragm to become dislodged. If this occurs, air flow will be interrupted and the regulator will no longer function. Only X650 second stage regulators purchased from authorized Scubapro dealers from November 2004 through May 2006, are affected by this recall. You can determine if you have one of these units by looking for a visible raised bump located on the right side of the regulator between the letter "C" and where the mouthpiece attaches to the regulator body.



At Scubapro, safety comes first and they ask that you stop using the X650 second stage regulator immediately. SCUBAPRO will replace your X650 regulator with a new one within thirty (30) days or sooner if your regulator is found to be one of those affected by this recall.

www.scubapro.com

Suunto has identified a software bug in the D9 and D6 diving instruments. The software bug may cause the D9 and D6 to incorrectly track dive time on rare occasions, potentially causing a risk to the diver. For further information, please read more on the link below.

Suunto is requesting that the D9 and D6 products with the following serial numbers be returned for a software update that eliminates this issue. Suunto will provide a free software update to fix the bug.

The products affected are:

D9 serial numbers 62102582 and below

D6 serial numbers 62103693 and below

Suunto strongly recommends that D9 or D6 should not be used for diving before the unit has been updated with the latest software. If the product is used before updating the software, backup instrumentation must also be used. Please bring your D9 and/or D6 to your nearest local authorized Suunto retailer for the software update as soon as possible. As a complimentary service, Suunto will at the same time replace your battery and perform a pressure test free of charge. Suunto apologizes for any inconvenience.

www.suuntoservice.com

Video iPod u/w

H2O Audio for iPod features a waterproof housing for Apple iPod 5G (with video) players, which are submersible up to 3m when paired with H2O Audio waterproof headphones. The Commander scroll wheel easily controls player functions even under water. Their iPod line is primarily for water sports that take the user no deeper than 3 metres, however their DV line of housings for mp3 players are designed for scuba use and are rated at 100m.

www.h2oaudio.com

Walea

Traditional 5mm wetsuit from Technisub combines the simple to use classic two-pieces suit with modern elegance and the latest materials. Arms and legs are pre-shaped on the body of the diver. Ankles and wrists have a special internal super-smooth neoprene seal to facilitate putting it on and taking it off and allows excellent thermal protection. Comes with a front zip and high necked long John pants for greater thermal protection. Specially designed kneepads guarantee resistance to wear and tear.

www.technisub.com

Squid Full Foot

The new Scubapro Squid Full Foot Fin is heralded as an advanced, fatigue reducing din for all levels of diving and snokelling. A three material technology incorporates a 'Hi-flex Blade Compound', which should create a channelling effect reducing effort and increasing power. Soft 'TPR' are used for the foot pocket, elastic bi-material version on side ribs and an Anti-skid element on the sole. Ultralight Technopolymer body for strength, power and thrust.

www.scubapro.co.uk

European Union:

CE markings for suits

CE marking has become a legal requirement under European law for drysuits and wetsuits manufactured in the European Union. Dive manufacturers have until 2007 to obtain the CE mark to sell wetsuits, drysuits and thermally regulated suits, as part of the new Personal Protective Equipment Directive in Europe

The new standard offers a clear way for the industry to improve safety for divers and surfers. The marking verifies that a suit's design parameters and materials have passed tests according to new European standard EN 14225:2005 (though, as consumers should be aware, it's not a verification of on-going production quality)

The standard was developed in September 2005 by experts and leading manufacturers aimed at standardising the production of wetsuits, drysuits and thermally regulated suits. Tests cover general material specifications and specific factors such as valve flow rates, seam strengths, zip integrity and resistance of seals to leakage and tearing as well as the reaction of suit materials to cleaning agents and storage. ■

Emergency beacon

If there is the slightest risk that you might surface out of sight from your dive boat, you might consider diving with one of these little saftety measures. The SOS Alerting unit from Sea Marshall is a Personal Locator Beacon that is depth rated to 100 meters. If needed, just press the buttom and the base unit on the dive boat receives an 'SOS' signal. Search and Rescue services can also home in on the signals from the personal locator beacon the on diver. **www.seamarshall.com**

Pelican case

Got delicate camera gear to ship? The 1640 Case from Pelican is watertight, crush- and dust-proof, and comes with an "Unconditional Lifetime Guarantee of Excellence". Open cell core with solid wall design is both strong and light weight, clasp protectors are made from stainless steel and the four strong polyurethane wheels have stainless steel bearings. Other features include pressure equalization valve, O-ring seal, fold down handles and retractable extension handle. Personalized name plate service available. Interior dimensions: 23.70" x 24.00" x 13.90" (60.2 x 60.9 x 35.3 cm)

www.pelican.com

Triple LEDs

SHOCKWAVE LED from Princeton Tec feature their proprietary optics and three Maxbright LEDs rated at three Watt each. This model comes with two modes of illumination, high for super bright and low for extended battery life. The light output is calibrated for both close range tasks and spotting at a distance. The Shockwave LED is engineered to be impact resistant and waterproof to 100 meters.

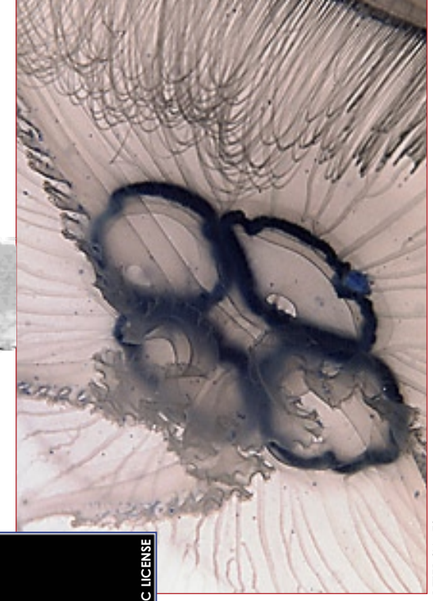
www.princetontec.com

ILLUSTRATIONS BY GUNILD AND PETER SYMES

Marine animals with missiles

Missile Attack

Text and u/w-photos by
Tyge Dahl Hermansen, Michael Arvedlund & Peter Symes



PETER SYMES

(graphic) Underside of a Moon jelly *Aurelia aurita*

WIKIPEDIA, IN PUBLIC LICENSE

Scanning electron microscope photo of discharged nematocyst

What? Animals in the sea armed with missiles? And thousands of them? Yes, you've read correctly. No, sea lions or dolphins have not been stealing Tomahawk missiles from any of the American navy bases. But did you know that jellyfishes, sea anemones and corals contain thousands of "miniature missiles" to kill prey and sting intruders? We will look at bit closer at this missile battery mechanism here.

PETER SYMES

Common sea anemone

Jellyfishes, sea anemones, and corals comprise approximately 9000 species worldwide. They all contain thousands of unique stinging cells called cnidae – that's latin for stinging cells! (It's not always that scientists baptise animals with extremely stupid scientific names). Therefore, all these animals belong to one group, scientifically called a phylum that has been given the name Cnidaria.

Cnidaria

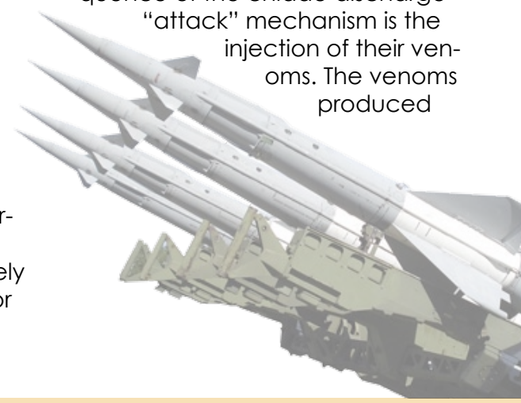
The stinging cells – the cnidae contain each an reversible hollow tube arranged in a spiral, with a harpoon like end (see b/w photo above and drawing next page). They are placed in the surface of the tentacles and the oral disk of the Cnidarians. Cnidae cells are fired into a prey, or something or someone who wants to hurt the cnidarian. In that process, the hollow tubes are unfolded extremely fast out of the stinging cell into the prey or enemy. The fastest ejections are equivalent to a missile's speed. The hollow tube contains toxins that are channelled through the tube, into the prey or enemy, which are either killed, or burned severely.

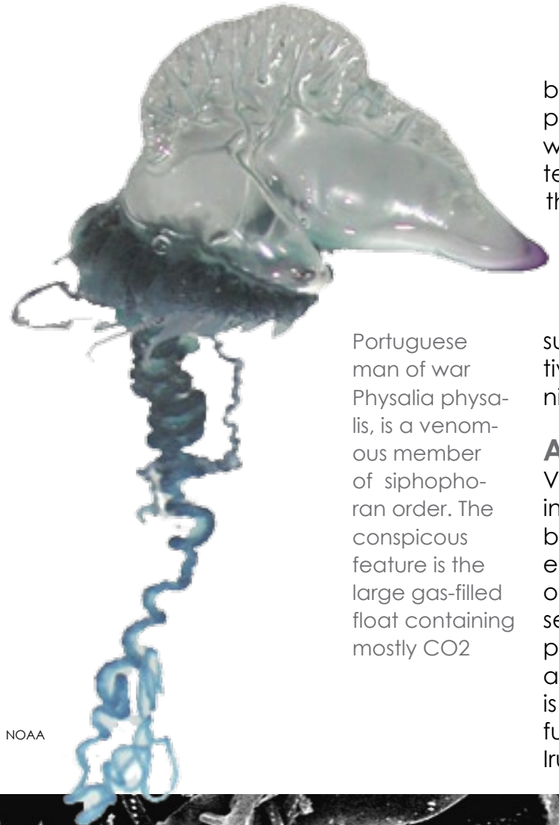
You were told not to touch

Think about what happens when you accidentally touch a fire coral (*Millepora* spp., see photo next page) when you are diving or snorkeling on the tropical coral reef. It won't kill you. But it burns so severely that you will feel uncomfortable for a few days, around the place on your body where you were stung.

Discharge

The mechanism behind discharge of cnidae and the sequence of steps that links the function of discharge is still poorly understood, though it has been investigated for decades. But generally, prey that touches a sense thread, which leads to a pressure in the cnidae capsule (a compartment in the cnidae), opens the lid, and the harpoon-like tip with the hollow tube in the end is fired. A clear consequence of the cnidae discharge "attack" mechanism is the injection of their venoms. The venoms produced





NOAA

Portuguese man of war Physalia physalis, is a venomous member of siphophoran order. The conspicous feature is the large gas-filled float containing mostly CO2

by these animals are used for capture of prey, and they have shown to interfere with key functions of physiological systems. Dependent on the mode of action these toxins can be divided into cytolysins and neurotoxins. Cytolysins act by puncturing the cells so the content is expelled, whereas neurotoxins interfere with neural activity. Because of this, such toxins can be used as an investigative tool to map physiological mechanisms.

Anemones and wasps

Venoms from sea anemones are in some instances capable of inflicting serious burns to people who touch them. However, stings from the Portuguese man-of-war (*Physalia physalis)*, the Australian sea wasp (*Chironex fleckeri*) some scyphozoans such as Stomolophus spp. may actually kill people. Irukandji syndrome is a seldom fatal, but nevertheless painful condition induced by the sting of the Irukandji jellyfish (*Carukia barnesi)*.

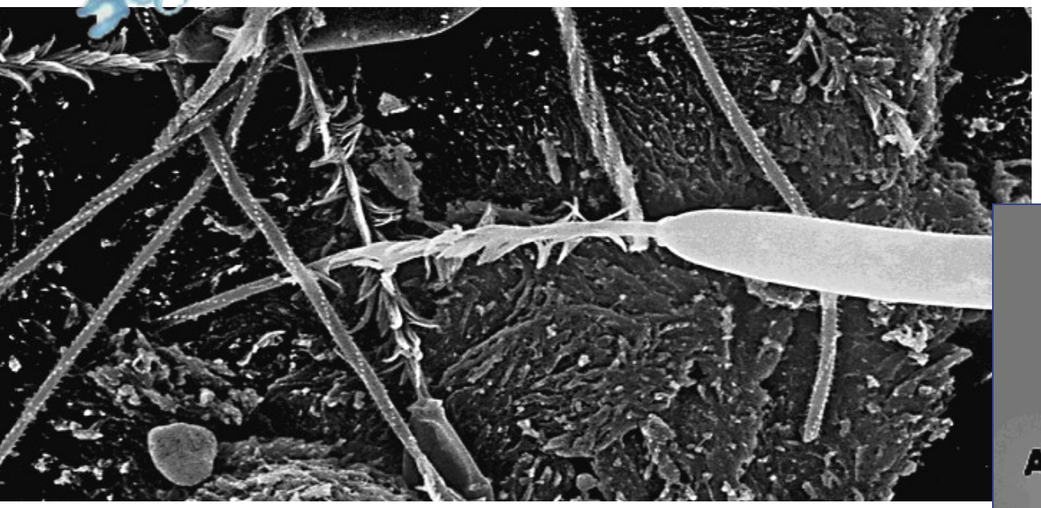
Millepora species are known as fire corals because the stinging cells (nematocysts) contained in the dactylozooids are powerful enough to cause a reaction in humans.

The Portuguese man-of-war have up to 9m long unfolded capturing arms each harbouring 700,000 toxic cnidae. If these arms are stretched they can gain a length of 50m. An adult Australian sea wasp has no less than 200 million toxic cnidae, together enough to kill approximately 250 people. Both of these stingers occur in schools, which makes them even more dangerous.

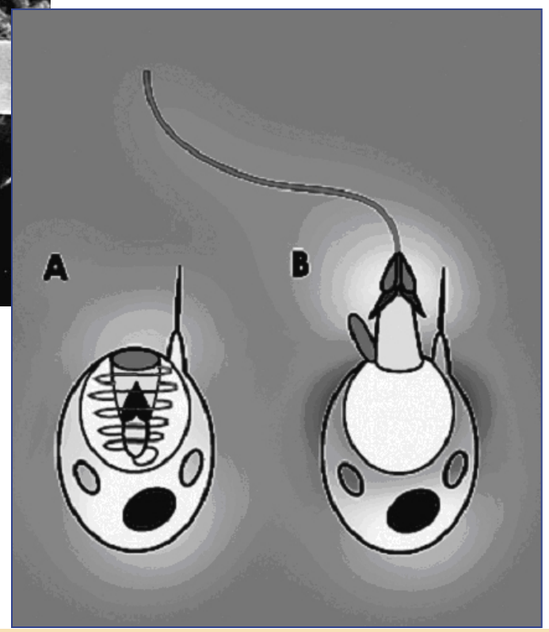
Jellyfish stings are a common summer hazard for sea bathers throughout the world. For example, it is estimated that in excess of 10,000 jellyfish stings occur alone in Australia each year.

One of the most common corals in the Northern Red Sea are the fire corals (*Millepora* spp.). The fire coral is the brown-yellow coral dominating the image. Touching a fire coral will produce a sting with a burning sensation that will last a couple of days. The fire coral is actually a Hydroid, contrary to most tropical corals that are Anthozoan. The fish on this image are the fairy basslet *Pseudoanthias squamipinnis*. The single anemonefish in the lower centre of the image is the endemic Red Sea two banded anemonefish *Amphiprion bicinctus*

MICHAEL ARVEDLUND



Aided by a high powered scanning electron microscope, we can glimpse how one of these very tiny stinging nettle cells, a cnidae, that has discharged its hollow tube into the skin of a fish. This nettle cell was attached to a clownfish host sea anemone. Clownfishes, or anemonefishes, do not provoke nettle cells to fire for reasons that are not yet known other than the fishes' protection lies in their mucus. The fish on this image was not an anemonefish but a sand goby. Scale: Horizontally the image is about .5 mm acros Image by Michael Arvedlund



Drawing of a nettle cell before and after firing. Drawing by Tyge Dahl Hermansen

Antivenoms

Moreover, in at least some parts of the Pacific, the incidence of envenomation from marine bites and stings appears to be rising due to increasing marine activities by both local and tourist populations.

In this context, new envenomation syndromes and new species of medically significant jellyfish are likely to be encountered according to Dr Kenneth D. Winkel at the Australian Venom Research Unit, University of Melbourne, who leads an international team team of Australian and American scientists conducting research into the development of new jellyfish antivenoms.

More research needed

Dr Winkel states in a recently published overview: "If snake antivenoms are considered orphan drugs, then jellyfish antivenoms are the poorest of the orphans. Despite the diversity, ubiquity and toxicity of the venomous cnidarians, only a single antivenom is available for jellyfish stings worldwide. That antivenom, an ovine whole IgG product, is directed against the Sea wasp (*Chironex fleckeri*). It also neutralises the venom of closely related cubozoans such as *Chiropsalmus quadrigatus*. The recognition of the life-threatening effects of various other jellyfish demonstrates the need for broadening the specificity of the existing product and/or developing additional specific jellyfish antivenoms."

IGG: Immune Globulin G, the type of antibody produced late in the immune response.

Only a single antivenom is available for jellyfish stings worldwide.

Jellyfish are a common summer hazard especially in Australia

NOAA / KEVIN RASKOFF.

Chrysaora jellyfish

Dr Winkel also mentions in his overview that the first reports of use of this antivenom to treat stings from sea wasps stems from a case in 1979 where it was noted that the antivenom had a dramatic effect against the necrotising local tissue reaction.

Cases of Irukandji syndrome have also been treated with this antivenom but with a generally uncertain outcome.

Its efficacy for Chirodropidae stings has also been established experimentally with no adverse reactions (apart from a single instance of mild generalised rash) reported following its use in over 100 cases. It also appears to be safe for use in pregnancy. Concerning the Portuguese man of war, no antiserum exist yet, but one of the pioneers into the research of cnidae and their venoms, Professor David Hessinger from Loma Linda University in California, USA, has made significant advances with the research concerning the composition of this venom, but no antiserum will be produced before the venom has been fully understood.

Ask the locals

It is always wise to check up with local divers or dive clubs, or the local police, if you are uncertain about the local situation with deadly stingers. Deadly stingers occur along the coast in Australia from November to May. However, if you are on a beach far offshore, then you should be in the clear.

In any case, and regardless of your destination, it is always an easy safety precaution to ask the locals and do what they do. ■

PETER SYMES

Hydriods, perhaps *Hydractiinia* spp, living on a snail shell inhabioted by a small hermit crab. This is a classical example of symbiosis. The crab gets a little extra protection while the hydriods gets transportation, exposure to more water and perhaps some scraps of the hermits meals

Edited by
Gunild Symes

All photos are courtesy of the individual artists and galleries

POINT & CLICK ON BOLD LINKS

Ocean Arts

Arts & crafts inspired by the sea...

Blacktip Shark with Flames
by Todd Michael Guevara, USA
Fiberglass and automotive custom paint, 76 inches
The artist, aka: The Fish Man, has taken aquatic art to a whole new level. Combining the hydrodynamics of sharks with his passion for the exceptional paint work found on hot rods and motorcycles, the result he says can best be described as "fire on water". **www.thefishman.net**

Kelp in Monterey Bay
by Donna Schaffer, USA
Oil on canvas, 30 x 30 inches
Schaffer creates original oil paintings of underwater marine life from Monterey and Carmel Bays and other Northern California dive sites. **www.underwaterpaintings.com**

As divers, we love the sea... so do many talented artists and skilled artisans, many of whom are also divers and like to surround themselves with images of the underwater realm while they must exist up on land. So, we scoured cyberspace to find some intriguing and well-crafted works in glass, wood, ceramics, metals, oils, fibers, silver, stoneware and even polyurethane that draw on the theme of the underwater world. Enjoy!

Lava Bowl
Joan Lederman, USA
Stoneware made with ocean sediment glazes
www.thesoftearth.com

Halibut Bowl
Laurence Scow
Native Arts, Canada
Wood, 28"w x 13"h
Just Art Gallery **www.justart.ca**

ocean arts

Jellyfish, Sea Shells & Whales

Humpback Whale
by Mike Gordon
New Zealand
Metal Sculpture
www.artbythesea.co.nz

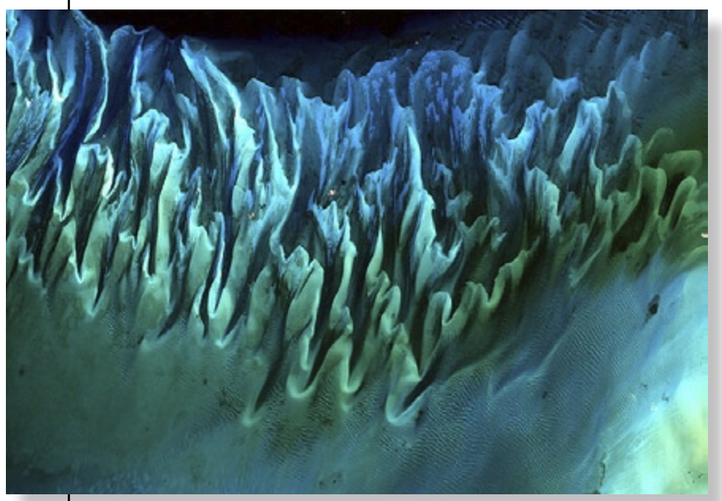
Jellyfish Series by Eric Ehlenberger of New Orleans, Louisiana, USA. Handblown glass, neon. Approximately 16" x 16" x 36" each. Survived Hurricane Katrina. Ships internationally. Venusian Gardens Art Gallery **www.neon-sculpture.com**

Moondance
by Susan Ferraro, USA
www.artisancsf.com

◄ Sterling silver and solid 18 karat gold ring with facet tourmalines, cut glass, sea glass and pearls by Gregory Pyra

Ammonite fossil ring
by Gregory Pyra, USA
www.artzonegallery.com

Seaglass necklace
by Gregory Pyra, USA
www.artzonegallery.com



Ocean Sand, Bahamas

The Earth as Art...

You might think this image is a magestic abstract oil painting hanging in some gallery, but it isn't. It is the earth as it appears from space. NASA's Landsat took this photograph of the reefs and seaweed gardens off the coast of the Bahamas. Taken by the Enhanced Thematic Mapper plus (ETM+) instrument aboard the Landsat 7 satellite, the images shows how tides and ocean currents in the Bahamas sculpted the sand and seaweed beds into fluted, multi-colored patterns in a similar manner to the way winds sculpt the magnificent sand dunes in the Sahara Desert. ■

IMAGE COURTESY SERGE ANDREFOUET, UNIVERSITY OF SOUTH FLORIDA

ocean arts

Art of the Octopus

Octopus
Ceramic tile
www.artontiles.co.uk

Octopus, Animal Trap Series (top)
Double Octopus Bowl (left)
by Iestyn Davies, UK
Blown Glass
www.blowzone.co.uk

Octopus Vessel
Ceramic Pottery
Carl Gray Whitkop, USA
www.absolutarts.com

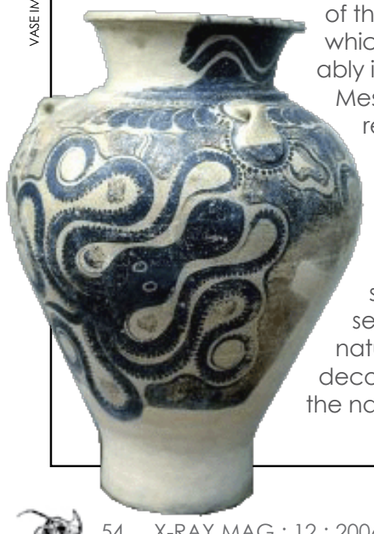
ABOVE: Stirrup octopus vase, Mycenaean 1200-1100 BCE

LEFT: The Dendra Vase, a Minoan vessel with Marine Style decoration, 1500 BC

LEFT: Late Minoan Octopus Vase, Earthenware, c.1500 BCE-1400 BCE, Crete, Greece

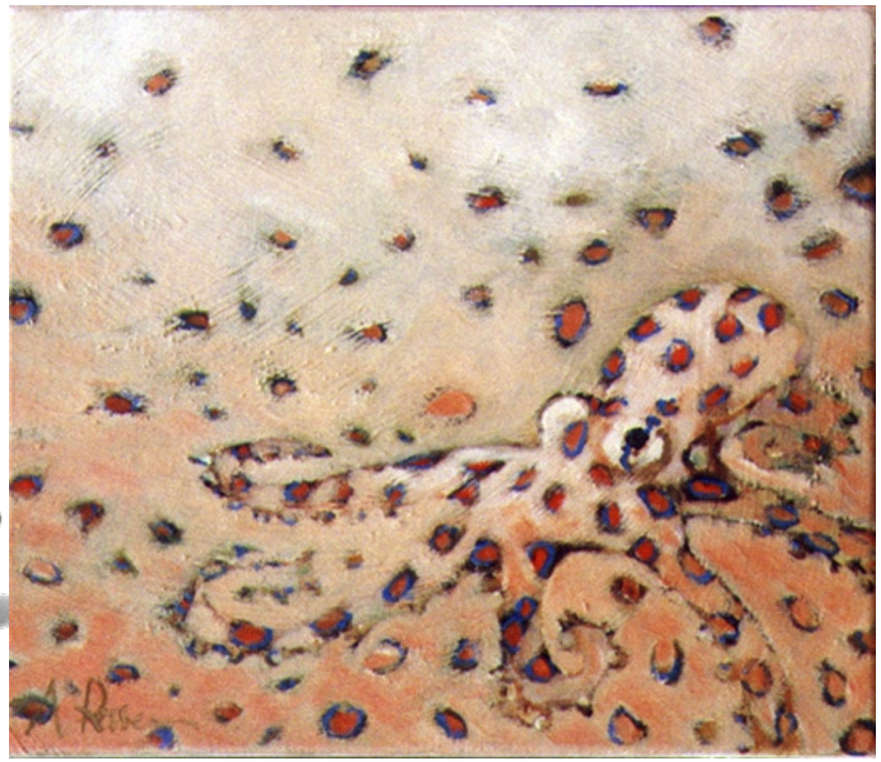
The Octopus in Ancient Art

Art historians tell of highly skilled Minoan (Crete) artisans in ancient times crafting ceramic vases with octopus painted in detail upon their surfaces. According to experts, a revolutionization of the manufacture of ceramic ware came with the introduction of the potter's wheel which was probably introduced from Mesopotamia. As a result, pots could be made faster, lighter and thinner, with more delicate forms. Researchers describe Minoan vessels as very organic naturalistic forms with decorations inspired by the natural world. Since the people lived on an island, they had a very close relationship with nature and the sea. Historians say that as the influence of the Minoan culture waned around 1400 BCE, the city of Mycenae in Greece became a center of power. According to experts, the Mycenaeans created fine pottery using the wheel and polychrome slip painting. Marine motifs reminiscent of those of the Minoan culture were used including the stylized octopus, but rather than painting designs to flow around the vessel, they contained designs within defined areas of pattern. ■



VASE IMAGES COURTESY OF WORLDART IMAGES CSU

Octopus Mug
Handmade and hand-painted ceramic 4 x 3 cm
www.centralcrafts.com



Blue-ringed Octopus
Oil on canvas
Angela Rossen
Western Australia
www.angelarossen.com

ocean arts

Under the waves

Seven Seas Bowl by Joan Lederman, who has used surplus core sediment for over a decade at her Woods Hole studio in Massechusettes, USA, "... samples from the Chukchi, Red, Dead, Black, South China and Mediterranean Seas, the Pacific, Atlantic and Indian Oceans and Earth crust slurry are all in my glazes. I add water and kiln heat, similar to the Earth's core, which melts the materials and releases their characters." **www.thesoftearth.com**

4 Fish Heads by Anneli Arms, USA
Polyurethane, wire, acryllics
40 x 36 x13 in.
www.anneliarms.com

Dolphin Mug
Handmade and hand-painted ceramic 4 x 3 cm
www.centralcrafts.com

▲ *Hammerhead* by Judith Gebhard Smith, USA. Etching. A diver for 20 years, Smith paints marine life with a combination of realism and abstraction. Using pastels and encaustic (pigment suspended in hot beeswax) helps her "convey the special connection that we as divers have the privilege to experience with the sea and its inhabitants." **nightwingstudio.com**

◄ *Snorkeling* by Angela Rossen Western Australia Acrylic on canvas 950 x 1000 mm. Her work expresses the joy she finds in nature, from the detail of a delicate box fish sheltering under a ledge to the brilliance of sunlight sparkling and reflecting in every movement of the water. **angelarossen.com**

▲ *Seahorse Bracelet* by Mark Prest
www.puretoas.com
▼ Tarpon Belt Buckle, Stainless Steel or Bronze by Capt. Pierre Pierce
www.pierreart.com

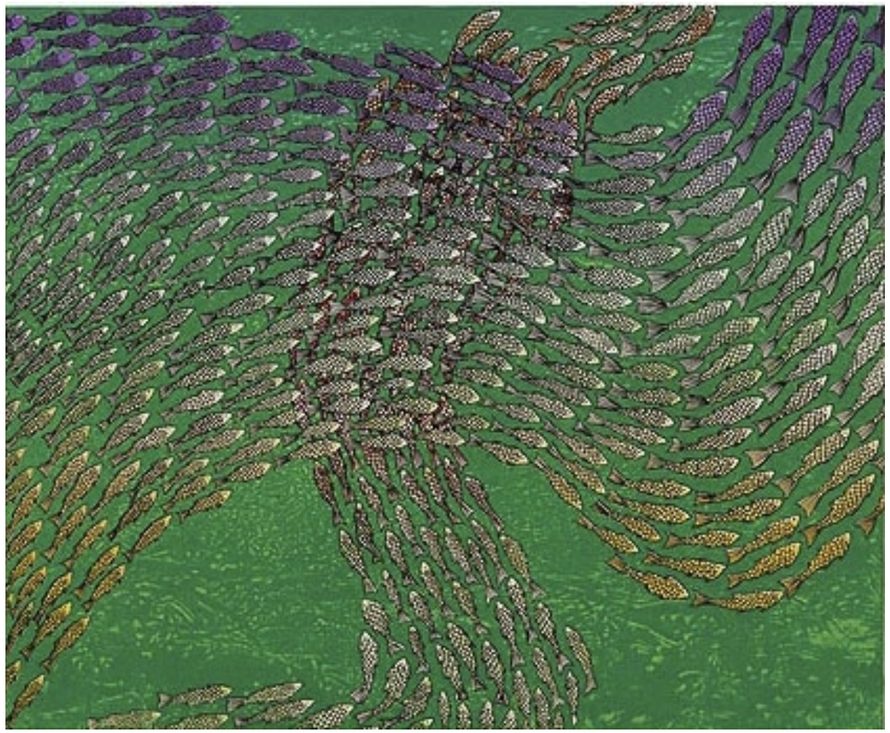
ocean arts

Under the waves

Beach glass bracelet
by Haden Starbuck, USA
Beach glass set in silver
www.mystikbeachstudio.com

Mandarine's Reef by Susan Ferraro, USA
Fiber art, 30 x 23 in. Susan Ferraro is a fiber artist who specializes in sea life and nature. Recently aired on HDTV's "Simply Quilts", her wall hangings and sculptures are dimensional and include a vast array of embellishments. **www.artisancsf.com**

Fish Bowl
by Zeke Wolf
New Zealand
Raku fired pottery
Art by the Sea Gallery
www.artbythesea.com



Cross Current Lithograph, 22 x 26 in., by Ningeokuk Teeveem, Canada
The image is reproduced with the permission of Dorset Fine Arts.
Courtesy of Galerie d'art Vincent, Ottawa **www.inuitfinearts.com**

Mangrove Entry Table
Loyd & Lee Jones, USA
16 x 24 x 30 in.
Copper reinforced with stainless steel preserved with clear acrylic. The leaves are petinaed. **www.mangroveart.com**

Shallow Seas
by Virginia Abrams, USA
Textile Art Quilt, 60 x 44 in. This work was inspired by the blues and aquas of the Mediterranean sea, and constructed of hand dyed cottons, machine sewn and quilted.
www.virginiaabrams.com

ocean arts

Sea dreams & visions

Blue Striped Grunts by Susan Duda, USA
Batik 40 x 50 cm **www.oceandudes.com**

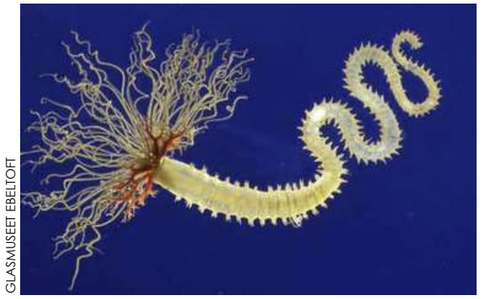
Coral Bleaching by Nalyne Lunati, USA
Oil on canvas, 137 x 158 cm. "*Coral Bleaching* depicts the topic of archipelago destruction, particularly from global warming. The idea was inspired by my visit to the Maldives. It is my favorite place for diving." **www.ArtTopix.com**

Taniwha, by Norman Clark New Zealand. Manaia taniwha bone carving's function is guardianship. Traditionally depicts balance between earth, sky and sea.
www.bonecarving.co.nz

Fisherman's Folly by Kavavaow Mannomee, Canada
Etching & Aquatint, 66 x 86 cm. The image is reproduced with the permission of Dorset Fine Arts. Courtesy of Galerie d'art Vincent, Ottawa
www.inuitfinearts.com

Taniwha
by Norman Clark
New Zealand
Fine engraved double-sided smoked bone carving, 70 x 50 mm
www.bonecarving.co.nz

Ocean Art History: Blaschka Glass



GLASMUSEET EBELTOFT

GLASMUSEET EBELTOFT

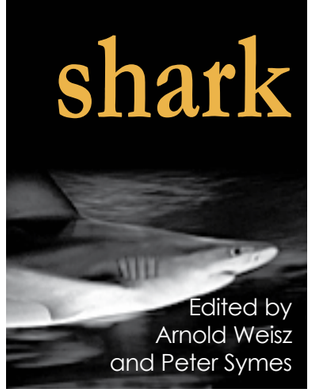
In the late 1800s, Leopold Blaschka (1822-1895) and his son Rudolf (1857-1929) produced glass models of exotic plants and bizarre sea creatures at their studio in Dresden, Germany. These beautifully detailed glass works were displayed at natural history museums and aquaria all over the world.

NATURAL HISTORY MUSEUM NOTTINGHAM

Source: The Design Museum

NATIONAL MUSEUM & GALLERY, CARDIFF

TOP TO BOTTOM: Jellyfish, Jellyfish, Soft Coral, *Argonauta Argo*



Bits & Bites

More Sharks Around Hawaii?

There have been more reports of shark sightings around Hawaii this year, but the experts say that just because there is an increase of sightings doesn't mean Hawaii's waters are getting more dangerous. At the state Division of Aquatic Resources, they say it's unclear whether the number of sharks is increasing. Nevertheless, shark attacks are rare. Since 1990, there have been 57 shark attacks on people or their gear. Out of these, 46 attacks resulted in injuries, and 5 of them caused deaths. ■

PETER SYMES

Record Hammerhead Had 55 Pups

The shark, caught in May off the Gulf Coast of Florida, USA, measured 14 feet long, weighed 1,280 pounds / 576 kilos, 4.4 metres long and had a hammer one meter across. Its size and weight was so great, Mote Marine Laboratory said, because it was pregnant with 55 shark pups—including 52 that were nearly full-term. And according to mote scientists, the shark would have given birth in a few days. The scientists had previously thought that hammerhead sharks gave birth to 20 to 40 pups at a time. This 40 to 50 year old hammehead shark was caught on rod and reel.

"Although we are thankful the fisherman gave this unique specimen to Mote, and we are learning a lot about this species from this large female shark, we were saddened to see so many unborn pups inside her so close to birth," said Dr Robert Hueter, director of Mote's Centre for Shark Research.

Mote Marine Laboratory ask fishermen to tag and release sharks. The laboratory itself has tagged more than 15,000 sharks and 16 different species since 1991. In 2005, Mote scientists tagged 700 sharks

"We ask fishermen not to kill sharks for sport and to remember that shark populations have been severely depleted by overfishing. Very large sharks like this hammerhead are often pregnant females that help maintain the status of the species' population into the future," Dr Robert Hueter explained. ■

Great hammerhead shark (filephoto)

ERIC CHENG

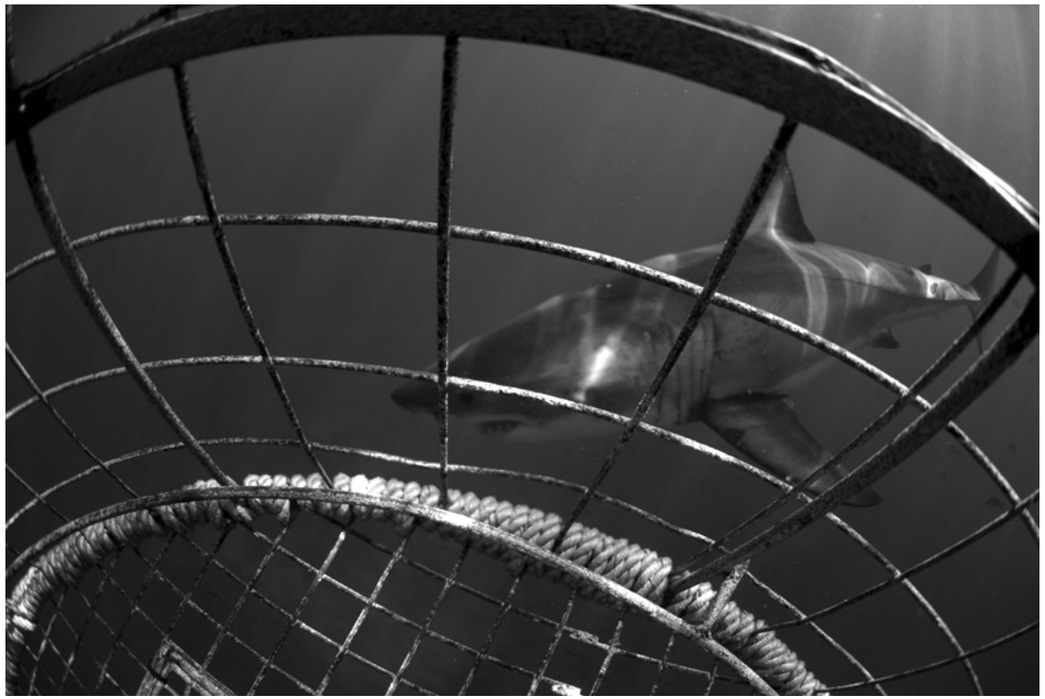
UPS Airfreight Whale Sharks

The only way to transport the largest fish in the ocean is by a Boeing 747. The Georgia Aquarium first had two female sharks flown in from Taiwan, and about a year later, they were accompanied by two male whale sharks. The whale sharks were flown more than 8,000 miles on a specially configured UPS B-747 freighter from Taipei, Taiwan, through Anchorage to Atlanta. The 747's interior was reconfigured to secure custom containers with highly advanced marine life support systems and accommodations were added for marine veterinarians travelling aboard. According to chattanoogan.com this is not the first time UPS has taken on the task of delivering aquatic animals to the Georgia Aquarium. Last year, four Beluga whales and more than 42 containers of smaller aquatic animals were flown in as well. ■

UPS

Whale Shark Quota Full

Taipei Times reports that the country's whale shark quota of 60 animals is already filled. The fishermen are banned from catching whale sharks until the end of the year. The whale shark quota for next year is set at 45 and falls to 30 sharks in 2008. If the ban is broken, the fishermen will face heavy fines. The ban is monitored by the Fisheries Administration under the Council of Agriculture of Taiwan. ■



DAN BEECHAM

Restrictions On Cage Diving

Cape Town wants to halt the expansion of the Great White shark cage diving industry. According to the Cape Times, the city officials are asking for scientific evidence that it does not increase the risk of shark attacks or harm the shark ecology. Since 2000, there have been nine shark attacks, of which three were fatal. This has raised concern among the public that shark attacks are triggered by baiting and chumming methods such as those used in the cage diving industry, which increase the danger of shark attacks. The city, therefore, called for a ban on the use of decoys and lures by operators and the expansion of shark cage diving areas. These restrictions should be enforced until a comprehensive shark conservation and recreational safety plan is developed. The city is working on such a plan together with the Department of Environmental Affairs and Tourism and several NGOs, organisations and marine scientists. ■

Basking Sharks Spotted Off Cornish Coast

This huge shark is completely harmless to humans, and was just attracted by the presence of plankton, its main source of food. The basking shark is officially the second largest fish in the world, behind the whale shark, which can grow to 65ft. These sharks are regularly seen in the costal waters of Cornwall, but also in the Irish Sea. There were two or three basking sharks swimming around for an hour or so that day, people on nearby beaches reported. SOURCE: DAILY MAIL ■

WIKIPEDIA / CHRIS GOTSCHALK

Reefs Decline Without Sharks

According to the Scripps Institution of Oceanography in San Diego, California and other scientists, the reduction of sharks on coral reefs may have contributed to the decline of reefs in the Caribbean. Fewer sharks allows lesser predators such as groupers to thrive, leading to a reduction in the number of algal feeders such as parrotfish. Sharks, which are on the top of the food chain, are very important for maintaining the stability of the system.

SOURCE: NEWSCIENTIST.COM ■

PETER SYMES

No sharks means less biodiversity

Three depth records on CCR

Just a 200m Dive

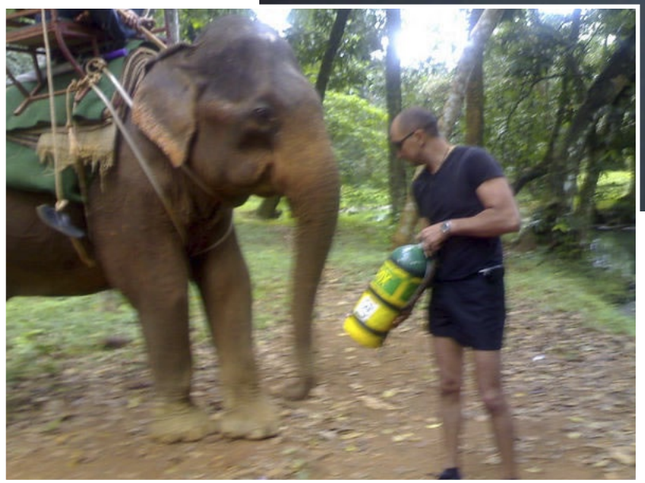
Text by Cedric Verdier. Photos by Mike Gadd and Lek Fukjeen

A long decompression hang with the Megalodon CCR

The very long exposures, even in warrm tropical water, is a concern. A dry suit is clearly a must, even if it means a difficult and very hot gear-up session in the tropics

May the 17th 2006. 6:30 PM.

The entrance of the Sra Keow cave, north of Krabi, Thailand, is dark and quiet. All the local kids who use the pond as a playground are now back home for dinner. The only three people still there, closely watching the motionless pond, trying to see any bubble or glow that could reach the surface now start to worry. The divers were supposed to complete their dive within four and a half hours...
Still nothing after six long hours.



A few minutes later, one of the divers finally surfaces. He lays there for some extra minutes, breathing pure oxygen and resting, giving to his body the time to adapt to the surrounding pressure. Almost exactly two hours later, the second diver appears in the complete darkness. They have a lot in common: they look exhausted and cold, they wear black equipment and mixed-gas rebreathers—and they just came back from the deepest cave dive in Asia.

Just a crazy idea

A few months earlier the same divers had come to this site to conduct a first exploration into what is supposedly the deepest cave system in Thailand. Two entrances are connected together as the gateway to a giant kingdom with crystal clear water, providing easy access.

Mike Gadd and Cedric Verdier, thanks once more to the precious support of Bruce Konefe in sorting out their logistics, then went deeper than any other diver in this cave: laying out a line in one of the passages going down to 150 m (490 feet). The main passage is huge, and it was impossible to see the bottom of the cave. This first expedition was such a success that they all decided to come back as soon as possible, which, however, due to the team member's other occupations would take another four months. Meanwhile, the abyss just had to wait.

Just a crazy plan

Cedric lives in Thailand and Mike in Singapore. Both wanting to going back to explore the cave down to the 200m level, they soon found themselves communicating almost daily on the matter, finding themselves face to face with a daunting technological and physiological challenge. As for the equipment side of matters, Mike dives with an Ouroboros and Cedric with a Megalodon CCR. Even if both units are extremely reliable and have a good reputation in the deep diving community, nobody has ever tested them to these depths. A few minor changes were necessary, mainly on the Megalodon, in order to carry out these dives with an acceptable level of safety. The handsets and the battery compartments were filled with mineral

oil to withstand the 21 ATA of ambient pressure and all air-filled pressure gauges were removed. Every single piece of equipment was thoroughly inspected and the divers meticulously read every user manual of all their gear (canister light, back-up lights, computers and depth gauge) to learn more about the crushing depth of each. Nevertheless, the notion of having some piece of gear imploding at depth never really left their minds.

Which dive plan?

Planning a dive to 200m (660ft) is clearly different than planning a "normal" trimix dive—if there is ever such a thing. The divers had long discussions about the right mix, the right setpoint and the right decompression procedures. To the bystander, the dive plans that both divers exchanged must have sounded like an elaborate code concocted by a secret agent on magic mushrooms. Eventually, Mike and Cedric finally agreed to use only one diluent all the way to the surface, to limit their setpoint on the bottom while slightly increasing it during the ascent. The deco obligation would be longer than when using multiple diluents, but the off-gassing process would be smoother. They also agreed on "trusting" the VPM-B/E algorithm implemented in V-Planner to safely bring them to the surface.

Making it back?

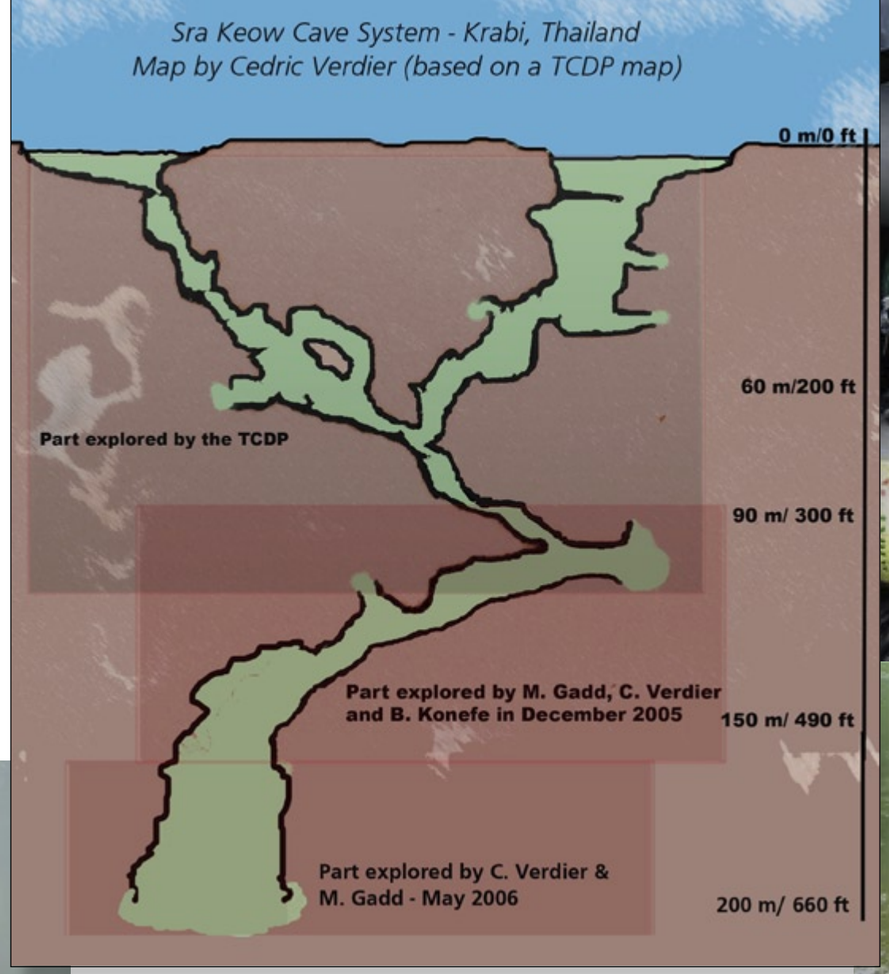
Diving deep is one thing. Also coming back alive is another. It is, therefore, of paramount importance that thorough contingency plans are made for every conceivable emergency or unexpected event.

Both divers spent an interesting evening in a pizzeria in Krabi, running over and planning for every "What if…" they could imagine. At the end of it, they opted for a comfortable safety margin by staging multiple tanks in the cave in the case one of them had to 'bail out' on open circuit. That, however, meant more tanks than a body builder could safely lift and a real challenge in keeping the whole set up fairly streamlined.

Dealing with heat loss

Extremely long exposures, even in quite warm waters (around 26°C at the surface), are also a concern. A dry suit is clearly a must, even if it means a difficult and very hot gear-up session in the tropics. A proper hydration schedule is also required (as is the P-valve).

It was decided to set up two very basic habitats, one for emergency at 12m (40ft) in case of convulsion (a.k.a throwing up!) and one at 6m (20ft) for comfort (to drink and eat some junk food). The divers couldn't help being concerned whether the local kids were able to free dive to the habitat and have a feast on the candy bars placed there for the returning divers.



Even with a rebreather, it's still necessary to stage a lot of tanks, in case of emergency bail-out on open circuit

One of the support divers retrieving all the staged tanks after the record-breaking dive

Just a crazy expedition

Diving in a pond surrounded by hysterical kids and impressive elephants is something that most divers will never experience. But gearing up with state-of-the-art rebreathers, full face mask and astronaut suits with a lot of sunburnt tourists and puzzled locals is not the best part of the dive. It is quite difficult to focus on a rebreather check-list when people come to ask you one of the most stupid questions imaginable - "You're going diving?"—as if you were considering going for a trek in the jungle with more than 80 kg of tanks on your back and a suit that makes you sweat your body weight every minute.

The equipment piled up all around the pond was very impressive, with the equipment for the bottom divers, all the stage tanks and the big twin sets of the support divers. The local people were also quite surprised to see both divers installing the two habitats (barely more than two blue buckets) which were simply named Ritz and Hilton.

"You're going diving?"

Everything would have been perfect if not for the rain. Unfortunately, the masses of water coming out of the clouds soon displaced water in the pond and the visibility quickly started to decrease until it was close to zero. This didn't make the dive any easier: the entrance of the cave is a restriction and following the guideline in a low viz would certainly slow down the descent. But in a very international team (American, British, German, Thai and French), there is always somebody to keep the spirits high.

Just a crazy dive

On the "big day", everyone is focused. Mike is going through his extensive – and quite long – Ouroboros check-list, Cedric listens to his MP3 player while checking his equipment, and the support divers are in the middle, trying to help them without disturbing them.

After a long process of gearing up and sweating at the surface—and

The habitats are also very convenient as a seat to gear up

The Terms

CCR:
Closed Circuit Rebreather. Top end type of rebreathers where breathing gasses are fully recirculated as opposed to semi-closed rebreathers, which constantly vent a fraction of the breathing gas.

Open Circuit:
Regulator / normal scuba

Ouroboro:
CCR made by Closed Circuit Research in the United Kingdom. (Photo from www.ccrb.co.uk)

Megalodon:
US-built CCR made by Innerspace Systems in Washington State. (Photo: www.custom-rebreathers.com)

Setpoint:
Most CCR rebreathers maintain a constant oxygen partial pressure—for example, a pO_2 of 1.3 bar typical at medium depth, in contrast to a constant oxygen fraction (percentage) in open circuit Nitrox tanks or semiclosed rebreathers. The setpoint is which pO_2 the rebreather is set (it is user-adjustable) to maintain. Different setpoints are used at different depths and can be changed in-water by a switch.

Need more explanations? Read more about rebreathers in X-Ray#4. Direct clickable link: www.xray-mag.com/article/95

Diluent:
Main breathing gas in an CCR (could be air) into which Oxygen in mixed to make Nitrox. Likewise, Trimix is also mixed on-board.

P-Valve:
A valve and hose on a drysuit enabling urination into the water.

Bail out
Switching to scuba, i.e. in case of problems with the CCR

a few minutes to relax at the surface—both divers finally submerge along the descent line that Bruce installed earlier. It will take 6 minutes to reach 60m (197ft). Then a long descent will follow to reach the end of the line at 150m (490ft). After a few seconds of hesitation and rest, a new line is laid and the divers continue the descent. The cave is massive and the water is very clear compared to the surface. Even with powerful lights, it is not possible to clearly see the opposite wall. The walls are vertical and as smooth as the shaved legs of a fashion model.

There seemed to be nowhere where the divers could wrap the line around a rock or formation. Mike finally finds a place to tie off the line, cut it and recover his expensive reel. Cedric is slightly below him, looking at the impressive environment. At 200m (660ft), he still can't see the bottom, which is at least a further 20m below.

At 200m

Both divers are relieved that none of the equipment has imploded and that both rebreathers have performed flawlessly. The work of breathing is still good, and there is no sign of hypercapnia, even with the standard axial canister in the Megalodon. After a few minutes exploring the cave, it's already time to start the ascent. The first stop is planned at 135m (443 ft)—just the beginning of a very long ascent.

Surprises

The funny thing about dive planning is that even if you plan for the worst case scenario, you can still be surprised. True to this principle, the ascent turned out to be everything but boring.

First, even after bringing plentiful amounts of gas for suit and wing inflation, both divers were heavy on the bottom and Cedric ran out of gas for his wing and had to switch tanks and reconnect his Low Pressure Inflator—something you don't like to do at 200m in mid-water, kicking hard to maintain your depth.

Secondly, all the computers used gave massive decompression obligations (especially the VR3 VPM) with long deep stops and overall hang time over six hours. Even if you plan your decompression very carefully, your common sense is always reluctant to "bend" your computer and fully trust your tables. Therefore, both divers were late compared to their decompression schedules, and the support divers were surprised and concerned not to find them around the expected depth.

200 m

◄ Two stage tanks of Trimix and Nitrox

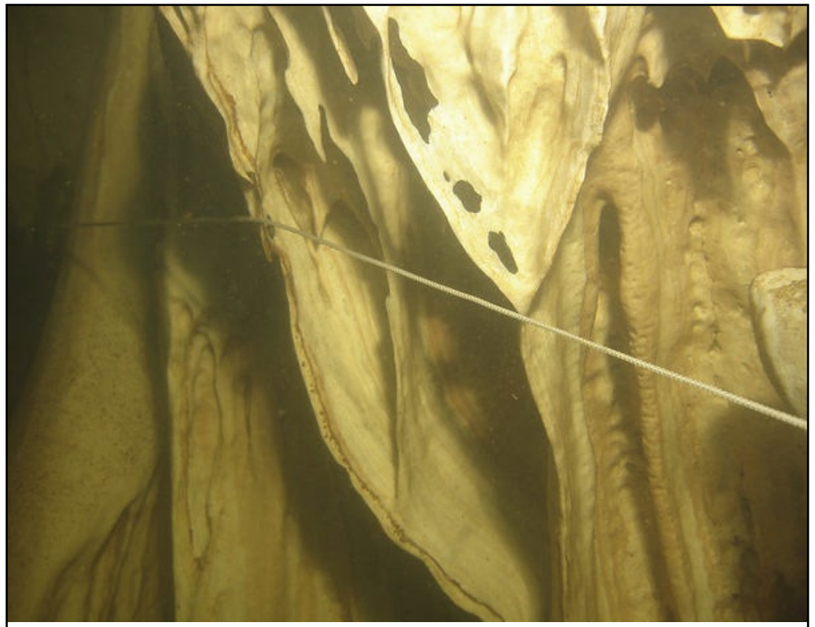
... and there is more

"Two men sat in a muddy lake, deep in the jungle in Thailand, clinging on to a big blue bucket named Hilton..."

Next, with such a low visibility, a line trap became the opportunity to understand the true meaning of streamlining one's equipment. Cedric and Mike both cursed (respectively in French and in English) when they couldn't find a way to follow the line with all their sling tanks and had to descend a little bit to find the proper passage.

Then the Ritz habitat decided to sink and become entangled in the main line. Cedric was quite surprised to bump his head into a plastic bag full of fruit juice.

Going on to the next unforeseen event, some annoying



Cave Diving in Thailand

With limestone and rainforest virtually covering the whole country, Thailand is the perfect place to find dissolution caves. Dry caves are quite popular and well documented, and many tourists prefer to visit them than simply burning on the beach.

Underwater caves are more often located in the south of the country, where the average elevation is quite low, like in Krabi. Nevertheless, some interesting cave systems were also explored along the Myanmar border from north of Phuket to Kanchanaburi, in the northwestern mountains. There, dams were built and valleys flooded. These former dry caves all feature some very scenic stalactites and stalagmites. ■

200 m

shrimps came to the decompression stops to find out whether the soft skin of mixed-gas divers could supplement their regular diet. Just so you know, it's extremely painful when these lovely creatures bite your face. Because of the extremely low visibility, reading the gauges was also very difficult. Some mistakes in the run time were made, and the ascent was even more delayed.

On a lighter note, the anti-dehydration plan was very effective and both divers exchanged their points of view. Cedric was happy to see his bladder still active at 200m and Mike enjoyed letting it go every 10 minutes.

Both divers spent a very long time at their shallowest stops, reading,

Long decompression stops are very boring. A little bit of reading helps to spend the time...

◄ The support divers, ready to help the bottom divers in case of emergency

sleeping or swimming around. Having drifted from the decompression station (a submerged tree trunk conveniently located at 6 and 4.5m), Mike was surprised to find a solid rock over his head when he started his final ascent to the surface. He had to look for the exit for quite a long time, while avoiding a descent (no diluent left).

8:30pm - and back!

Both divers are back at the surface. According to the support divers, Cedric is blue and Mike looks rather tired. They look at each other without really believe it.

—The deepest dive ever done with an Ouroboros (191m/ 626 ft).

—The deepest dive ever done with a Megalodon (201m/ 663 ft).

—The deepest cave dive in Asia.

Not for the faint of heart or the ones with sore backs. As with most techincal diving projects this too was quite equipment intensive

Technical data

Decompression schedule:
V-Planner VPM B/E
(Conservatism level 3)

Bottom diluent:
Trimix 5/75

pO_2 setpoint:
1.1bar at 200m (606ft), 1.3bar at 60m (197ft)

Gases:
16.000 liters of oxygen in 12 stage tanks, seven sling tanks and four on-board tanks. Twin sets and decompression for the support divers. Dry suits were inflated with air.

Decompression station:
Two habitats with ample food, drinks and reading.

"Give me a hand, will ya!" —the ordeal is finally over for the exhausted divers

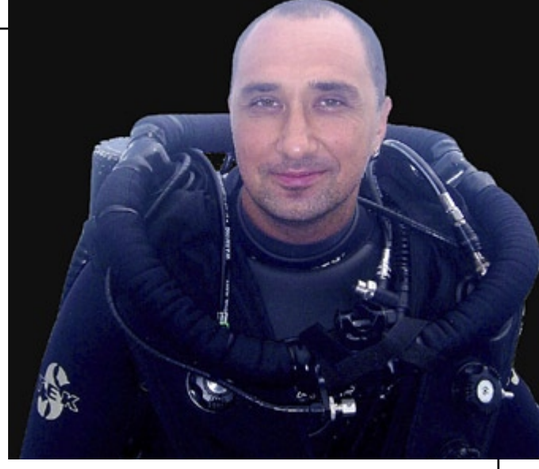
No mechanical problems, no CO_2 hit, no signs or symptoms of DCS. Quite an accomplishment.

They slowly pack their gear, helped by the support divers. Everything is dark and quiet and the lights from the car hardly help to gather all the equipment without losing anything. Anyway, tomorrow will be a clean-up dive. There are so many unused bail-out tanks to retrieve. Someone jokes about using them for a deeper dive during the next expedition. Someone else jokes about using Heliox instead of Trimix.

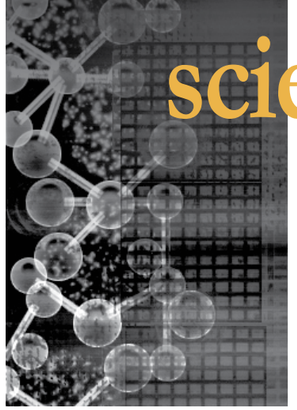
But jokes are all there is to it now. ■

Bio

Cedric Verdier is the founder of the TRIADE Project, established in 1999, discovering and exploring more than 20 virgin wrecks located in the south of France between 70 and 130m (230 ft) and 430 fsw. In 2002, he was the first diver to identify and dive the British cruiser *HMS Manchester* off Tunisia. Amongst other dive firsts, he pushed the limits of the Sra Keow cave in Thailand in May 2006, using his Megalodon Closed Circuit Rebreather, to an Asia-Pacific cave depth record of 201m (660 ft). He is currently planning the Yamishiro Project, an international expedition aiming to dive the Japanese battleship *HIJMS Yamashiro*

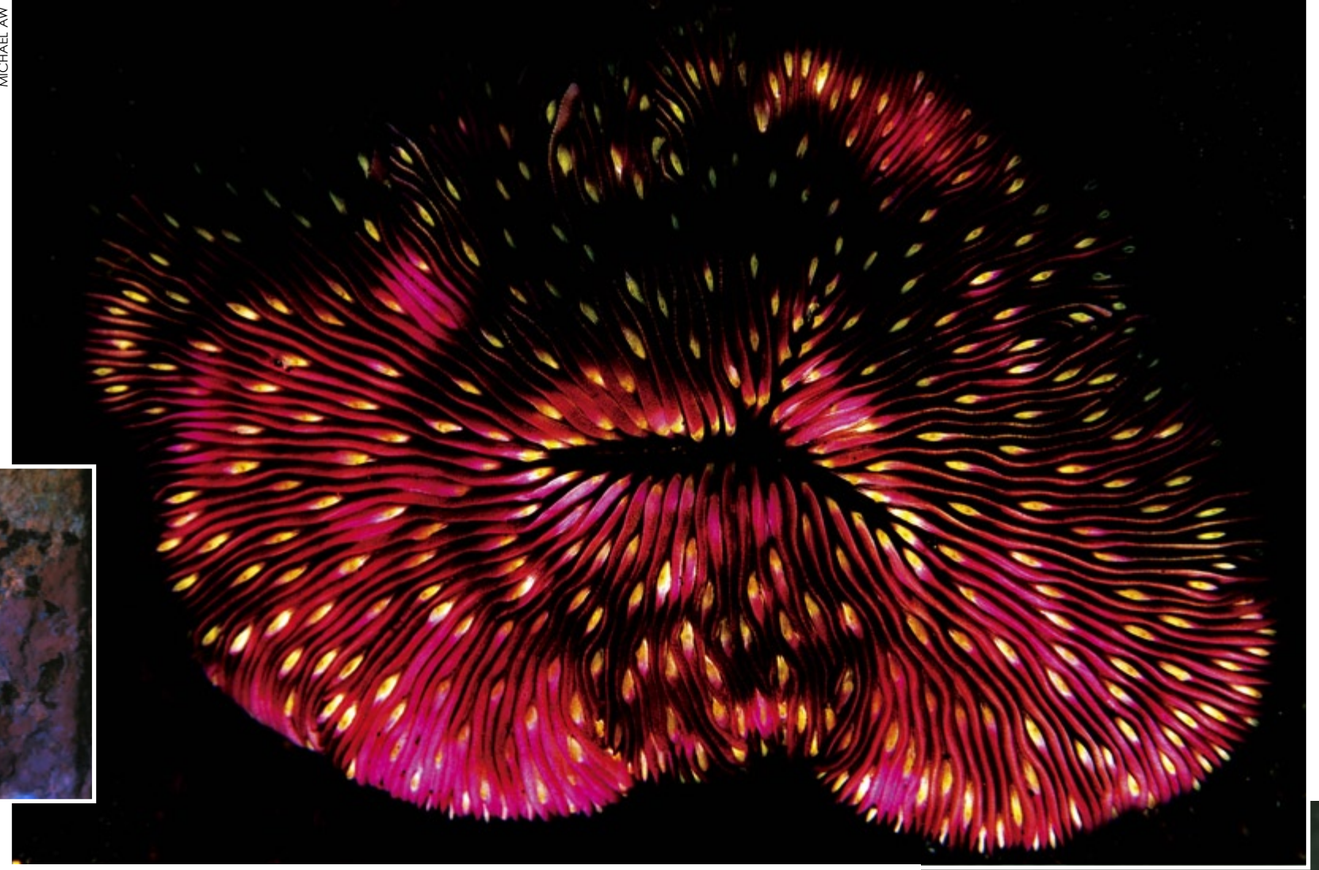


sunk in the Battle of Leyte in the Philippines in November 1944 and resting at a depth of 200m (660 ft). Cedric is a PADI Course Director and a Trimix Instructor Trainer for IANTD, PSAI, ANDI, DSAT and TDI. He spends most of his time teaching cave and mixed-gas rebreather courses at the diver and the instructor level. He is a past Regional Manager for PADI Europe and DAN and has written five books and more than 150 articles about diving. As he is always travelling all over the world, you can mainly contact him by email at:
info@cedricverdier.com



By Michael Symes
Photos by Charles Maze
and Michael Aw

The Attraction of Fluoresent Corals



MICHAEL AW

CHARLES MAZEL

A Chiton. Fluorescing isn't restricted to corals

How the corals get their algae

In the previous issue of X-ray Mag the problem of coral bleaching was discussed. Mechanisms were described which might provide resistance and protection to increased temperature and light intensities. It was stated that, due to rising sea-temperatures, the symbiotic algae that help supply nutrients to the polyps of the corals were dying off. These algae, known as Zooxanthellae, are thus vital for the existence of the coral polyps and as a consequence for the life of the reefs. But where do the algae come from, and how do the corals obtain them? Before answering this question, we must first look at what these algae are.

The Zooxanthellae

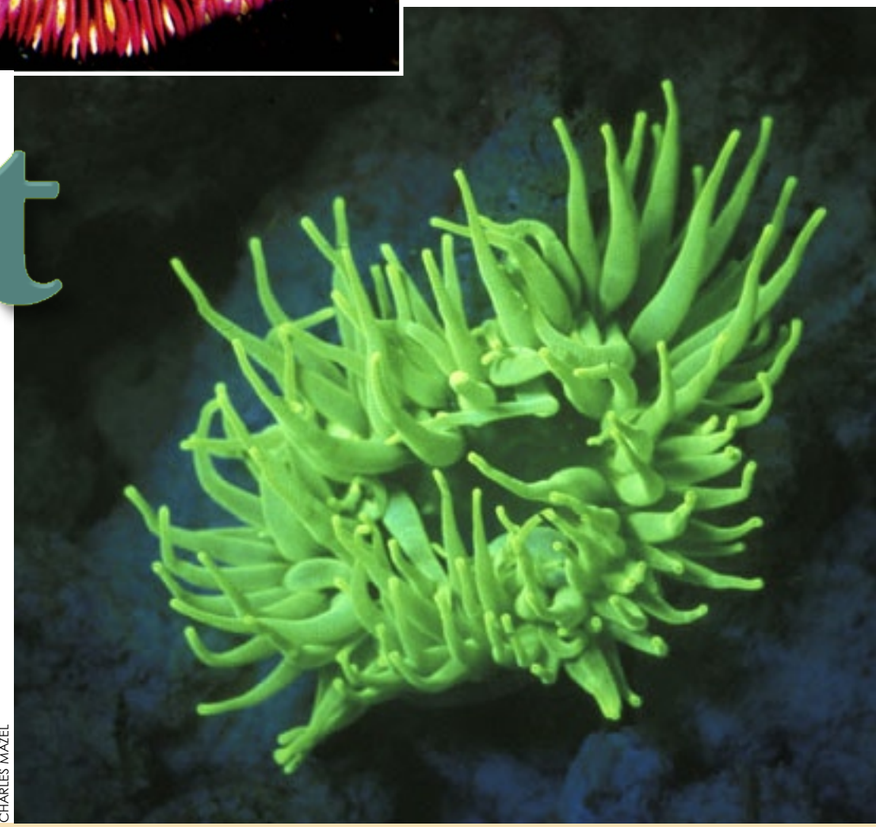
Zooxanthellae are best known for their role in the life of reef-forming corals. In tropical waters almost all coral animals contain a colony of zooxanthellae. Without these symbiotic plants, the coral animals would be unable to obtain enough nutrients to build their calcium carbonate skeletons, which accumulate to form the vast coral reefs of the tropics. Photosynthesis produces sugars essential for the plants to grow, however with the zooxanthellae enough sugar is produced to allow some to be shared with their hosts. In return, the host will assist the growth of the zooxanthellae by passing on some of its dissolved organic waste. The host animal cannot usually survive if the zooxanthellae are not present.

Acquisition of zooxanthellae

The host animals do not have any zooxanthellae in their larval forms and therefore must acquire them from the water column. Once a few zooxanthellae enter the body of their host animal they are able to quickly build up their population by splitting in half. This is their normal means of reproduction. The juvenile host filters the zooxanthellae from the seawater along with its food, and once in the stomach of the host, the zooxanthellae is passed into the surface flesh. Zooxanthellae multiply within the host due to simple cell division. Some nudibranch species get their zooxanthellae by eating cnidarians in which the zooxanthellae are already living, but how some obtain them is still a mystery.

Reaching the polyps

If they acquire them from the water column, then the algae must be present in the water close to the polyps. Now, although there are so many algae available, the sea is big; so what brings them close to the polyps in the coral reefs? Recent research makes the interesting suggestion that it is the corals themselves that signal their presence to the algae by attracting them by fluorescence.



CHARLES MAZEL

Coral animals and other related cnidarians (corals, soft-corals, sea anemones, gorgonians etc) are the most well-known animals containing symbiotic zooxanthellae, but they are also found in other invertebrates such as the Giant Clams (Tridacna) and many nudibranchs. Just as in their free-living relatives, zooxanthellae need to live in the sunlight, so they are usually found in those parts of animals, such as the skin, which are in the sunlight.

Zooxanthellae are thus any of various primitive, chiefly aquatic, one- or multi-celled, nonflowering plants that lack true stems, roots, and leaves, but usually contain chlorophyll. Algae convert carbon dioxide and inorganic nutrients, such as nitrogen and phosphorus, into organic matter through photosynthesis and form the basis of the marine food chain.

Zooxanthellae are thus single-celled plants that live in the tissues of animals, and are a group of microscopic plants which are usually found swimming and floating in the sea. They are dinoflagellates, which means that they have two long, thread-like arms, or flagella, used by many microscopic organisms for locomotion and feeding. Organisms which live like this are called plankton, and those that are plants are called phytoplankton. Like most plants, phytoplankton are able to convert the sun's energy into food through a process called photosythesis, so to survive they are only found in the upper layers of the sea and lakes where sunlight can penetrate.

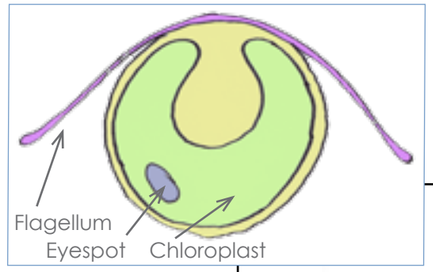
Many nudibranchs with symbiotic algae have greatly modified the shape of their bodies to provide as many sunlit regions as possible for their 'guest workers' to photosynthesise. ■

CHARLES MAZEL

Bristleworm under normal light (far left) and (above) flourescing under specially filtered light

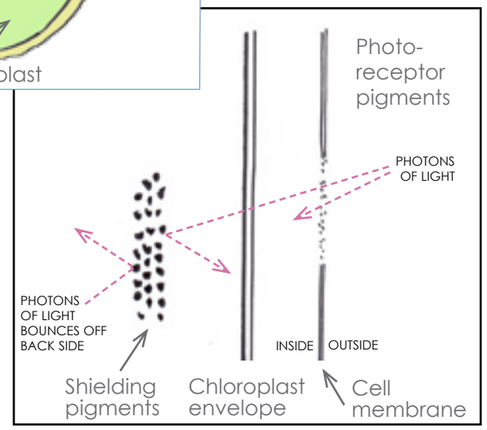
Fluorescent light

Fluorescence is the name for the absorption of light at one wavelength and its re-emission at another wavelength. The wavelength of maximum emission is generally longer than the wavelength of maximum absorbtion. This means for corals that fluoresce green light, which has wavelengths of about 550 nm, they must be absorbing light in the UV-blue region of the electromagnetic spectrum i.e. from about 350 nm to 450 nm. To produce this fluorescent light there are special pigments present in the polyps.



Schematic representation of a Chlamydomonas cell

Schematic representation of the eye spot



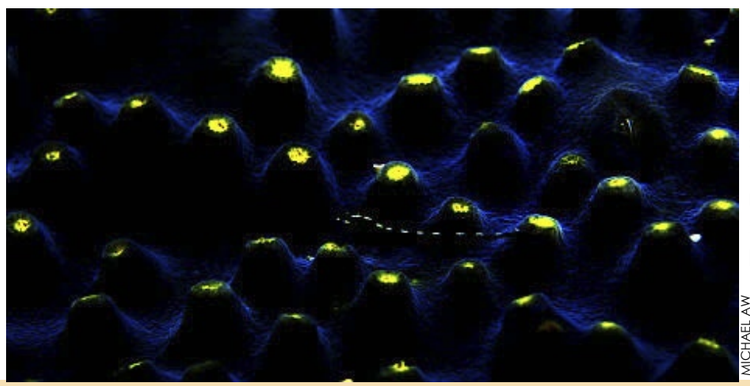
Green fluorescence

A short note in a recent issue of the scientific journal Coral Reefs proposes an interesting new idea for the function of green fluorescence in corals - that it may act in coral larvae as a beacon to attract symbionts. Evidence suggests that the microscopic algae that are symbiotic with corals are attracted to green light. The green fluorescence develops early in some coral larvae, and the note suggests that the green glow could help draw algae to the larvae to initiate the symbiotic relationship.

Now, the main questions here is, how are the algae stimulated to move towards this source of light? For we must remember, these are plants and not animals.

Attraction to light

The algae have an eyespot. This is a swelled area attached to a flagellum that contains pigment. The pigment proteins respond to the presence of light and signal the flagella to move toward it. This movement under the stimulus of light is called phototaxis.



MICHAEL AW

Phototaxis

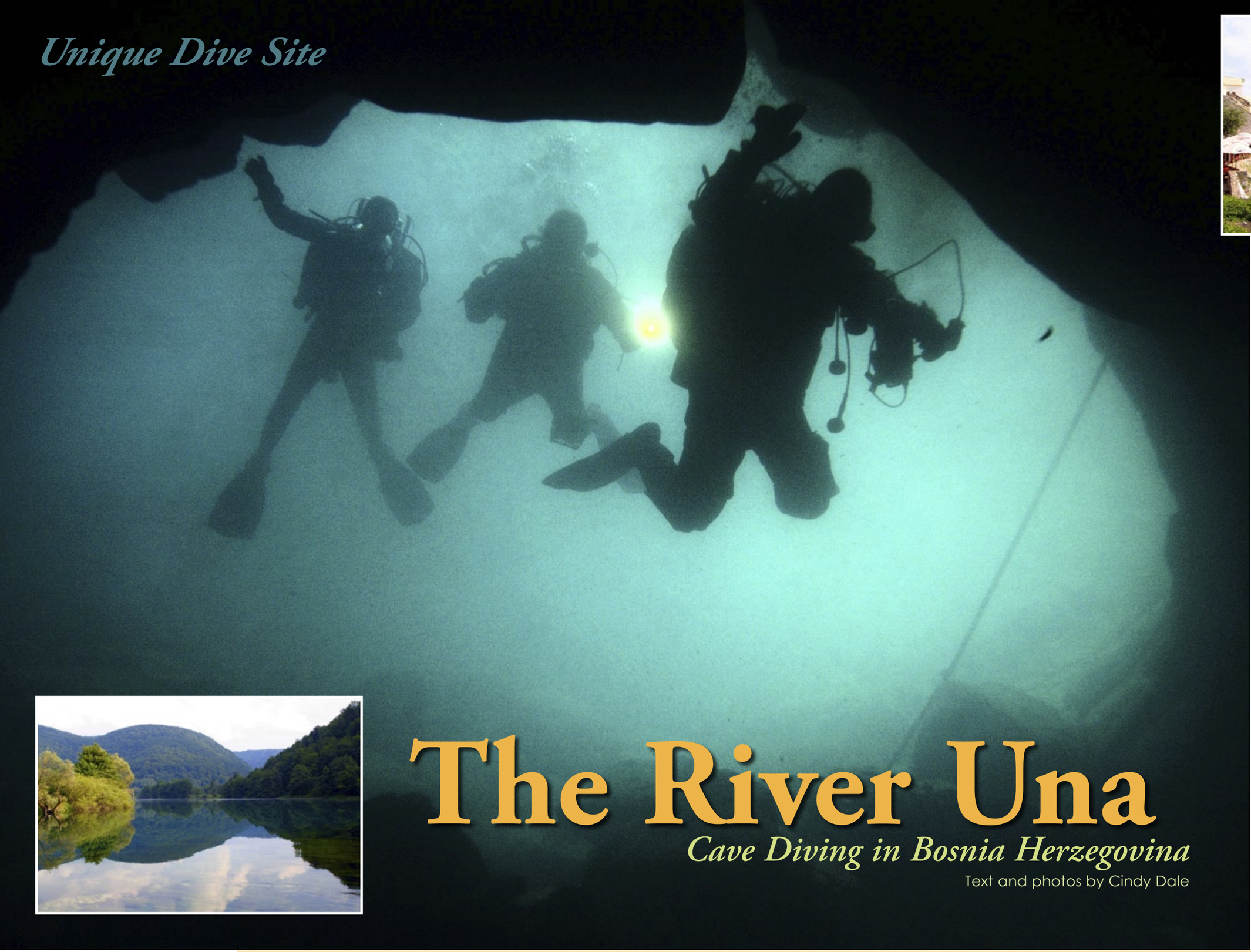
This is a very complex phenomenon which is still subject to much research. However, it can be simply described in a phenomenological way using the algae Chlamydomonas as an example. (See diagram.) The cell is about 10 mm in diameter, the eyespot is about 1 mm, and the flagella about 10 mm long. The photoreceptor pigment is localised in the cell's outer plasma membrane. When the photoreceptor pigment is stimulated, it sends an electrical signal to the transponder cells in the flagella. This stimulates the flagella to vibrate and make the algae to move or "swim" through the water. However, the dense pigment layer in the eyespot shields the photoreceptor pigment from light coming from one direction to the other. This causes the flagella to move differently, so that the swimming, rotating algae can continuously sample the spatial distribution of light. Thus, as the cell swims with its two flagella, it also rotates around the axis along which it is advancing. The algae swim towards the source of light. The energy required for this movement is supplied by photosynthesis.

For more information on filters and lights for photography, visit **www.Nightsea.com** ■

Litterature

O.A. Sineshchenkov and E.g.Govorunova, Lomonosov Moscow State University: "Rhodopsin Receptors of Phototaxis in Green Flagellate Algae"

Hollingsworth, L. L., R. A. Kinzie, T. D. Lewis, D. A. Krupp, and J. C. Leong, 2005. Phototaxis of motile zooxanthellae to green light may facilitate symbiont capture by coral larvae. Coral Reefs, 24:523.



The River Una

Cave Diving in Bosnia Herzegovina

Text and photos by Cindy Dale

The third dimension, a Bosnian experience

Cave divers are like rock-face climbers; their purpose is the same, only in the opposite direction, with one difference. Cave-diving is about as extreme as it gets.

It's a very Zen experience and the next thing to absolute oblivion. You are quite literally in a parallel universe, totally removed from reality. If its peace and quiet and isolation you're looking for, this is the place to be.

Cave diving is not about discovering what there is but determining what there isn't. In a cave you are surrounded by velvet darkness and an unnatural silence, leaving you with a distinct impression that the fish can hear your heartbeat.

To a virgin cave diver, it looks somewhat frightening as this is a completely different type of diving, with different equipment. It appears somewhat dangerous too as there are no shotline attachments.

"The reason for this is pretty straight forward," says Zeljko Mirkovic, of Una-Aquarius, a Speleologist, with numerous div-

LEFT: Divers enter a cave under the River Una (inset); ABOVE: Mostar bridge

unique dive

Diver explores the depths of a cave in the River Una where time stands still and one can hear one's own heart beat

ing and instructor qualifications.

"If a cave diver is hoisted to the surface in an emergency, it could cause a further crisis as the dangers of becoming entangled is great. And of course there are the caves themselves - seldom are they straight up."

"Also, being tied to a line limits a diver's movement and could have serious consequences if he is trying to sort out other problems."

For those who dream of travelling through time, the caves and the pits of the River Una are priceless, rich in unique aquatic flora and fauna.

"The River Una represents a primeval beauty only a few have seen," says Zeljko, "Sometimes she is shallow, other times bottomless, often wild with unpredictable raging rapids, then at once, tranquil and at peace with nature. But she is always beautiful and serene with cascading waterfalls and little pockets of quiet splendour. The Una is, I think, a little like a Latino woman - wild and reckless and full of surprises and at the same time desirable and evocative, only occasionally allowing you to think that you have conquered her."

Una's beauty can never be fully captured with a paintbrush; and a camera lens does her no justice, as her beauty extends beyond the visual.

"She needs her emerald waters to be stroked, she needs you to smell the nettles of the blacks pines and inhale the scent of virgin nature, watch her re-dress herself as the daylight begins to fade, and watch the sun dance on her coat of diamonds at sunset," says Zeljko.

"Sometimes one wonders where she derives her beauty from, whose soul she carries and what is beneath her surface."

Undeniably, the Una's outer beauty captures all who meet her. But her inner beauty is a world of silence and secrets. For millions of years, the Una hid her other dimension, the one where the river's dynamics have laboriously shaped, moulded and worn away the submerged landscape.

To understand her underwater splendour is to experience her currents and see them wash over the limestone rocks and sway the narrow fronds of underwater plants, playing with her riverbed sand, moving it here and there, like the desert winds move dunes. But this is only a small part of the Una.

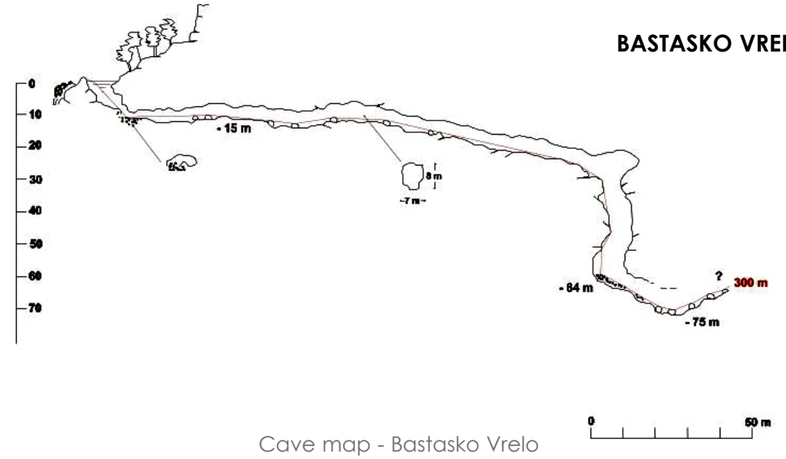
When gazing into her depths, you will periodically catch a glimpse of peculiar underwater figures and lustrous green stars glistening in the late afternoon sun—some call it a parallel universe where all her creatures live in harmony.

Some of Una's children are large, like her 10kg Trout and the Grayling, indigenous to Bosnia, and the 25kg Huchen, fresh-water crayfish, and small insects like the *Efemerela ignita*, the Human fish (*Proteus Anguinus*), and the large assortment of ornamental underwater plants, which all bear witnesses to Europe's cleanest river. But these are only some of the abundant life-forms found in the Una. Many remain undiscovered and unrecorded.

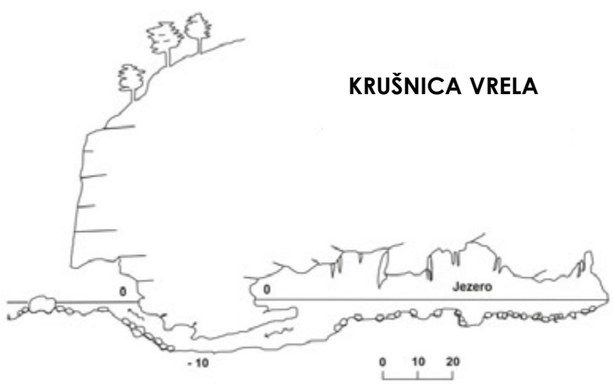
Una's underwater world has remained hidden from the world for centuries and the native experts are cautious about divulging her secrets.

"Perhaps the Una is ready for a fresh diversion, a new play-mate or two, in exchange for a glimpse at her most secret of places," says Zeljko, a man clearly passionate about nature.

For more information, contact: Una-Aquartius, Bosanska 22, 77000 Bihaœ, Unsko-sanski kanton, Bosnia Herzegovina or visit: ***www.una-aquarius.org*** ■



Cave map - Bastasko Vrelo

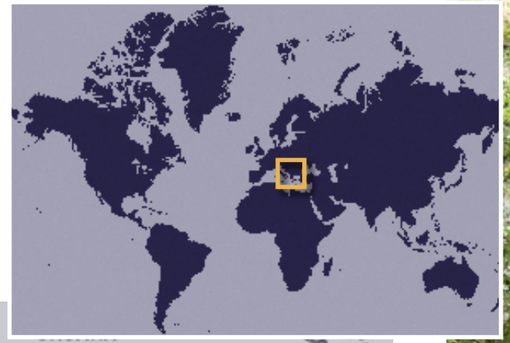


Cave map - Krusnica Vrela

Mouth of a cave dwarfs explorers standing in its gaping cavern and provides an entrance to a passage into the belly of the Earth

fact file

Bosnia Herzegovina



History In October 1991, Bosnia and Herzegovina's declaration of sovereignty was made. It was followed by a referendum on on 3 March 1992, which made a declaration of independence from the former Yugoslavia—a referendum boycotted by ethnic Serbs. Supported by neighboring Serbia and Montenegro, the Bosnian Serbs responded with armed resistance which aimed at dividing the republic along ethnic lines and forming a "Greater Serbia" by joining Serb-held areas. But by March 1994, Bosniaks and Croats had signed an agreement creating a joint Bosniak/Croat Federation of Bosnia and Herzegovina, which effectively reduced the number of warring factions from three to two. The three years of interethnic civil strife was halted on 21 November 1995, in Dayton, Ohio, when the warring parties initialed a peace agreement, which was finalized on 14 December 1995 in Paris. In the Dayton Peace Accords, Bosnia and Herzegovina's retained international boundaries and created a democratic multi-ethnic government which was responsible for conducting fiscal, diplomatic and foreign policy. A second tier of government was also recognized. It comprised of two entities approximately equivalent in size: the Bosniak/Croat Federation of Bosnia and Herzegovina and the Bosnian Serb-led Republika Srpska (RS). The Federation and RS governments were given the responsibiltiy of overseeing most government functions. NATO-led international peacekeeping forces were sent to Bosnia to implement and monitor the military aspects of the agreement, and later, to deter deter renewed hostilities. In December 2004, European Union peacekeeping troops replaced NATO forces to maintain peace and stability. Government: emerging federal democratic republic; Capital: Sarajevo

Geography Southeastern Europe, bordering the Adriatic Sea and Croatia. mountains and valleys.

Climate hot summers and cold winters; areas of high elevation have short, cool summers and long, severe winters; mild, rainy winters along coast

Environmental Issues The country is working to improve air quality and wastewater issues in industrial areas; limited sites for disposal of urban waste; water shortages and destruction of infrastructure due to civil strife from 1992-95; and deforestation.

Economy Next to Macedonia, Bosnia and Herzegovina ranked as the poorest republic in the old Yugoslav federation. While agriculture is mostly in private hands, farms are small and inefficient. Traditionally, the republic is a net importer of food. As a remnant of the socialist economic structure of Yugoslavia, industry remains greatly overstaffed. The country's two most serious economic problems are high unemployment and a sizeable current account deficit. Substantial amounts of reconstruction assistance and humanitarian aid come from the international community, yet the population will have to prepare themselves for an era of declining assistance. Agriculture: wheat, corn, fruits, vegetables; livestock. Industry: steel, coal, iron ore, lead, zinc, manganese, bauxite, vehicle assembly, textiles, tobacco products, wooden furniture, domestic appliances, oil refining

Currency Convertable Marka (BAM); Exchange rates: 1 EUR = 1.96 BAM, 1 USD = 1.56 BAM, 1 GBP = 2.84 BAM, 1 AUD = 1.17 BAM, 1 SGD = .98 BAM

Population 4,498,976 (July 2006 est.) Bosniak 48%, Serb 37.1%, Croat 14.3%, other groups 0.6% (2000). Note: Bosniak is the ethnic term used to prevent confustion with the religious term Muslim which denotes an adherence to Islam. Traditionally, the region called Herzegovina, which is contiguous to Croatia and Serbia and Montenegro, has been settled by an ethnic Croat majority in the west and an ethnic Serb majority in the east. Religions: Muslim 40%, Orthodox 31%, Roman Catholic 15%, other religions 14%

Language Bosnian, Croatian, Serbian

Web sites
Bosnia Herzegovina Tourism
www.bhtourism.ba

Una-Aquartius
Bosanska 22
77000 Bihaœ
Unsko-sanski kanton
Bosnia Herzegovina
www.una-aquarius.org

Source: www.cia.gov ■

Entrance to a cave in the River Una, Bosnia

Cindy Dale is an international photo-journalist based in Brussels. For more information or to order images, please visit her website at: **www.cindyloudale.com**

D'Artagnan

KURT AMSLER

Text by Gunild Symes
Photos by Kurt Amsler and Peter Symes

Kurt Amsler, winner of over 100 awards at international photo competitions and a world champion title, turns 60 this year, but you would never know it watching him mountain bike up a steep pass with his black Labrador running at his heels in the hills behind his house, a lovely home that sits overlooking the beautiful Mediterranean and a small picturesque village in the south of France. Kurt says he still goes on dive expeditions around the world, but now he is usually the most senior underwater photographer on the boat. It doesn't bother him. He has two young kids ("I started late," he winks), a lovely wife who is a doctor and plenty of spunk left for adventure.

KURT AMSLER

Kurt Amsler

KURT AMSLER

Diver explores the glorious pink fan corals of the Mediterranean reefs; PREVIOUS PAGE: Large Gargonian fan coral

Kurt explains the humble beginnings of his love for the sea and underwater photography, which began in, of all places, land-locked Switzerland, where he was born and raised near Lake Zurich. At the time, no one dived in Switzerland. There were no dive shops or divers. So, Kurt, the adventurous and resourceful ten-year-old boy that he was, inspired by the books of underwater legend Hans Hass, devised his own underwater breathing apparatus with the help of some friends and the local bike shop, the owner of which loaned the use of the shop's bicycle pump to Kurt on Saturdays. Needles to say, no busted bicycle tires in town could be filled on those days when Kurt was using the pump for his underwater expeditions into the local lake... It was a small sacrifice to make for science.

The apparatus was made of a breathing tube and a lung that allowed the diver to stay underwater for twenty minutes. Kurt could take a gander around the bottom of the lake until the his CO_2 replaced the air in the lung and forced an accent up to the surface. Young Kurt and his boyhood friends would drag the apparatus to the lake in a wheel barrel, much to the chagrin of the local preacher who thought there was something wrong with the boy. The priest actually asked Kurt's father to stop the boy from continuing his excursions under the lake, asking why, after all, God made all the world and its beautiful lands for humans to walk upon and enjoy, why does this boy insist on going underwater in the lake? Kurt's father, who was himself an accomplished photographer and mountaineer, smiled and said, "Why not? The boy is not hurting anyone, and he may just find out something interesting."

Young Kurt and his boyhood friends would drag the apparatus to the lake in a wheel barrel, much to the chagrin of the local preacher who thought there was something wrong with the boy

Indeed, the boy Kurt who wanted to emulate his father's adventurous life, continued to aim for terrain not high in the mountains, but in the opposite direction -- below the water's surface for the rest of his career, to explore the mysterious and captivating scenery and life under the sea.

The Business of Diving

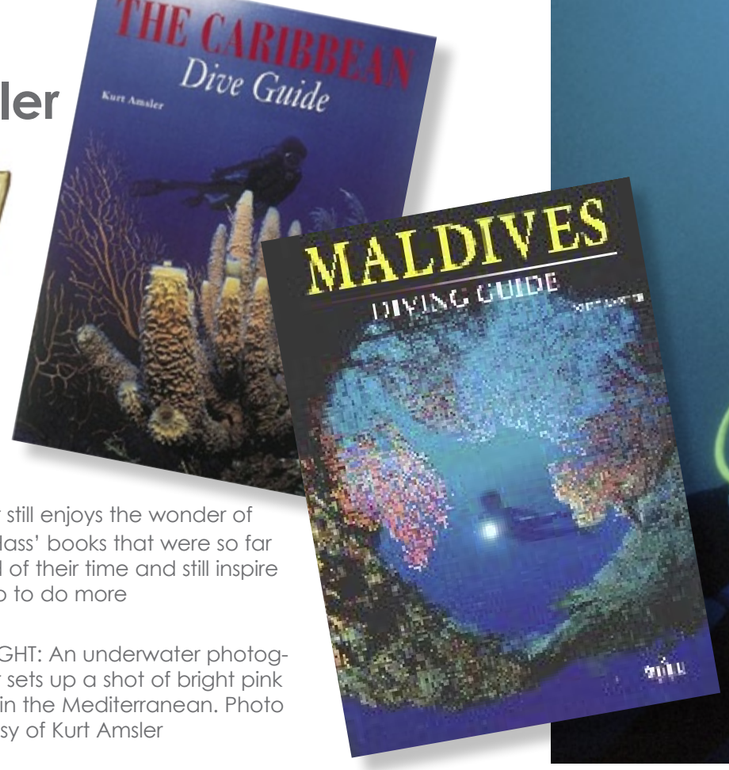
Eventually, Kurt became properly certified as a diver and instructor after completing a four-year degree in professional photography. After diving in the Red Sea and living in Kenya and the Bahamas, he returned to Switzerland to open a small dive school with his

PETER SYMES

ABOVE: Lotte and Hans Hass
LEFT: Master underwater photographer, Kurt Amsler, was inspired to pursue the underwater world by his childhood hero, Hans Hass, a book of whose he is showing. Photo by Peter Symes

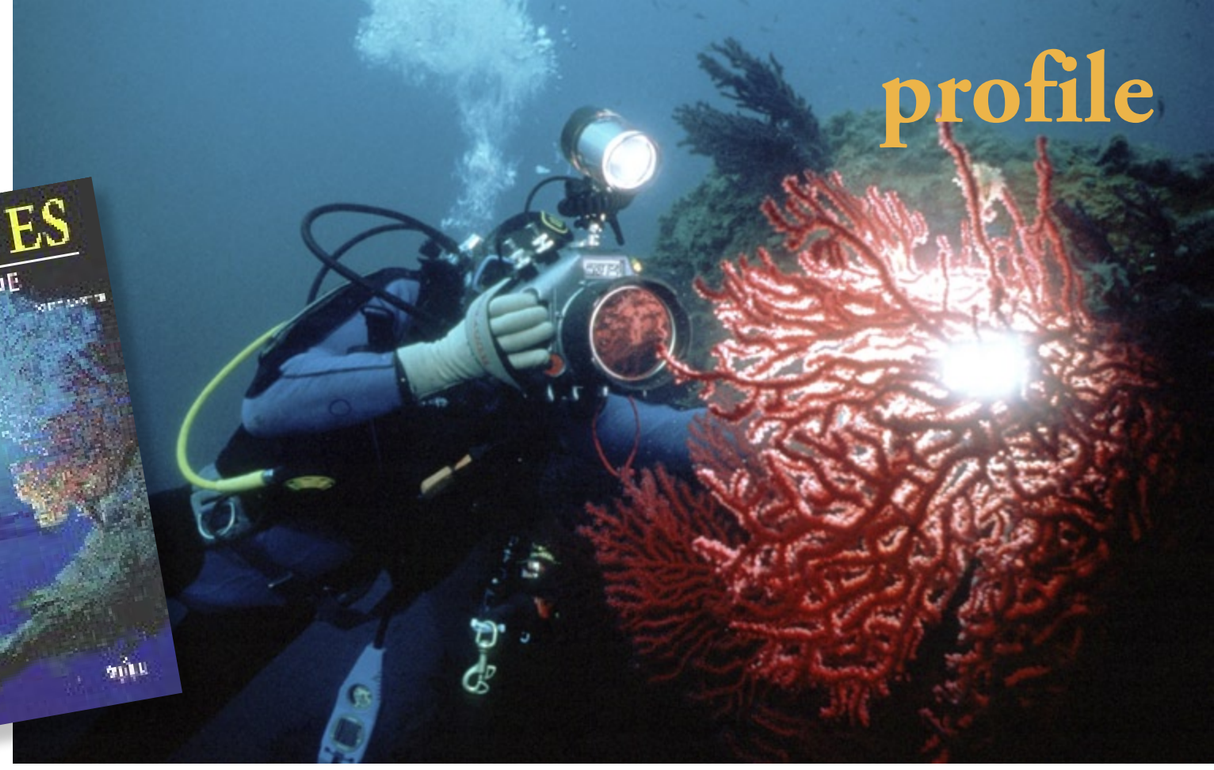
Kurt Amsler


PETER SYMES



Amsler still enjoys the wonder of Hans Hass' books that were so far ahead of their time and still inspire the pro to do more

FAR RIGHT: An underwater photographer sets up a shot of bright pink corals in the Mediterranean. Photo courtesy of Kurt Amsler



buddies. Since diving at the time meant joining a dive club, the dive school was a novel idea. It had never been done there before and people were curious. Kurt said that they had a compressor and everything for a dive shop and went about the business of introducing diving to the local community by offering weekend and evening dive courses, "so people could learn to dive just like learning to drive a car". Kurt set the level of the dive school very high, so the quality of the education was very good.

While living in the Bahamas for three years where he became certified by NAUI as a dive instructor, Kurt learned how to run a dive business and was successful with the operation in Switzerland. "At the time, we made one million Swiss francs with the dive school and the dive shop," said Kurt, "If you tell this to dive shop owners these days, they change colours like an octopus," he chuckles.

The difference then, Kurt says, was that people bought everything: double tanks, regulator, BCD, personal gear. They needed everything with them if they wanted to go diving, since there were no dive centres renting equipment on location. Back then, people had more time and used it to dive.

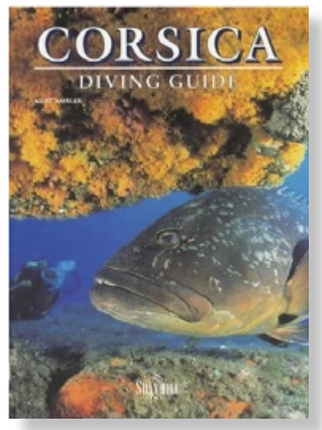
Compared to the prices one paid for dive equipment back then in 1973, these days "what you pay for a tank is peanuts," said Kurt. The same deflation has taken place with certification courses, said Kurt. Nowadays, he says, you pay half as much for open water certification as one did back then. "So, no one makes any money any more," he said. It's an issue that Kurt says plagues the dive industry as a whole today.

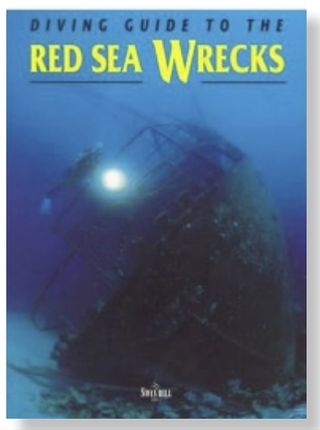
D'Artangan

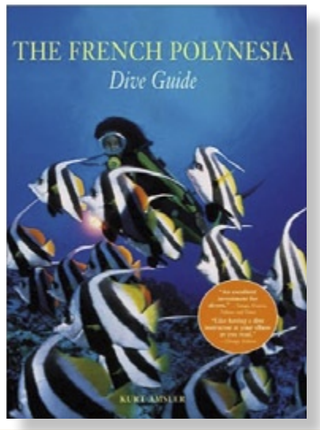
Amsler has never been timid about his opinions on issues that affect the dive industry and conservation today. He sees himself as a proverbial *D'Artangan* of the dive world crusading to awaken the industry and the general public to improvements that could be made to make things work better.

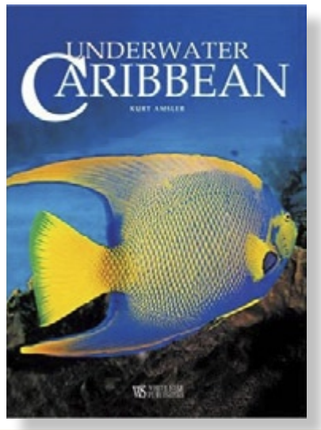
"You know why we have this *miserere* in the diving industry today? Because the diving industry never learned to become professional," said Kurt, "Not like skiing, not like tennis, not like horseback riding, not like golf or mountain biking... they are very professional, and of course, they make money."

Kurt added, "The industry could make a fortune because there are not many sports that are so equipment intensive as diving and a person needs all this expen-



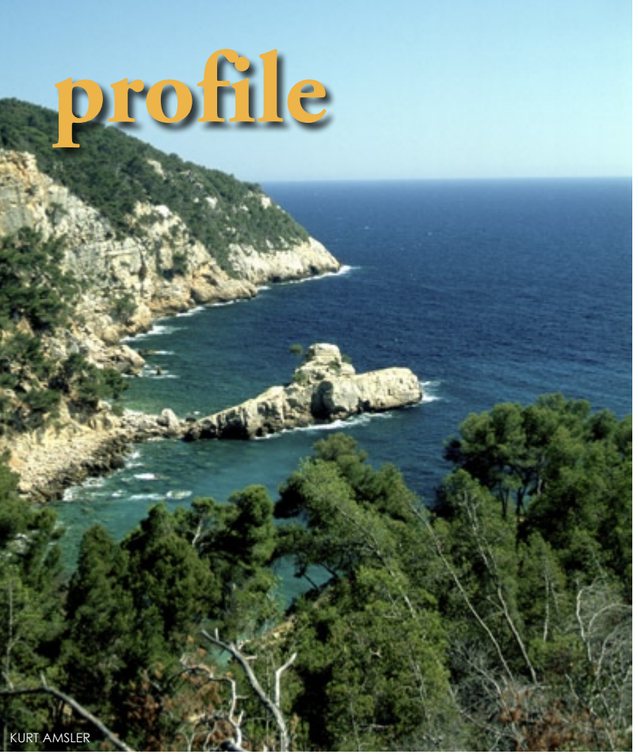






Books by Amsler include: *Corsica Diving Guide, Diving Guide to the Red Sea Wrecks, The French Polynesia Dive Guide, Underwater Caribbean Dive Guide, The Caribbean Dive Guide, Maldives Diving Guide* (click on the book cover to order from Amazon)

RIGHT: Amsler's drum set still comes in handy at the Antibes Festival each year in France. Photo by Peter Symes


KURT AMSLER

Kurt Amsler

PETER SYMES

LEFT TO RIGHT: Amsler's home overlooks the azure blue waters of the Mediterranean

Amsler in his office discusses his work and mission in helping conservation of endangered species of the world

Amsler said that all the awards and recognitions he has received over the years are nice, but the really important benefit of them is the ability to use the fame achieved from the awards as power to help save endangered creatures and promote conservation of the oceans. All photos of Kurt this page by Peter Symes

sive equipment to dive, but the industry never learned to become professional, so it cannot happen."

Kurt said that things did get more professional in Europe after NAUI came and improved conditions previously set by the dive club federation system, but then PADI decided to expand after seeing the potential of how Kurt's school was run. However, as Kurt put it, "They didn't realize that they dug their own hole, because they started to train all these instructors and these instructors need to make money." He said, "If there are thousands of instructors, how is one instructor going to have 200 students per year?" The industry has shot itself in its own foot according to Kurt.

Likewise, manufacturers began to sell equipment too cheaply, explained Kurt, saying that some brands made all kinds of equipment and sold them so cheaply "you could sell them out of the trunk of your car". Kurt said, "Only Scubapro was the serious one. They kept their prices and quality high. You pay the same price for Scubapro anywhere in Europe—it is the same."

Again, Kurt reiterates, "They never learned to be professional. If you don't want to be strict with your prices, you can't make any money. Yes, in the beginning you might lose money, but after, you make money," if you stick to high standards he said.

But the most important point Kurt wants to make is that business professionalism means everything. "Look at the dive shops in Switzerland...There are maybe two who are run by real businessmen. All the rest are something else. They were carpenters, taxi drivers... I don't know what. Nothing against these professions, but it makes a difference. They became divers, then they became instructors, and then they were motivated by the distributors to open a dive shop in their garage. That's it. They don't know how to calculate. They do not keep a 35-45% margin. Maybe they mark up the equipment by 10-15% and bring that in, but they do not calculate in the electricity, the water, the rent, etc. And this is the reason the dive industry is not making money."

In addition, Kurt says appearances matter. He thinks dive shops deal with the wrong people.

"If you want to make money, you have to deal with the people with the money. You have to know how to deal with these people... how to present yourself to them... how you look, how you act, the way you work. And then you have the people with the money."

Personal image also counts. Kurt relayed a recent moment where he found





Kurt Amsler

Kurt Amsler works with his students in the underwater photography workshops he runs Photo courtesy of Kurt Amsler. LEFT: Great White Shark. Photo by Kurt Amsler

Participants of Amsler's underwater photography workshops stay at La Bastide. a cozy country hotel in the small town of Les Lecques by the Mediteranean Sea, where classes are held in the inn's meeting rooms and on the patio outside. Photo courtesy of Kurt Amsler

himself standing in front of a group of instructor candidates he was to train for certification.

"They were like bookkeepers and accountants with bellies out to here. Well, I am usually a guy who says what he thinks. So, I say, I don't see who is the instructor and who is the student," he said, "You look the same as the student when you stand there, and underwater, you move your arms and legs all over the place like the student, so how am I supposed to tell who is the student and who is the instructor?"

Kurt says when he goes to the mountains and looks around at the classes on the slopes, he can tell who is the instructor and who is the student. He said he can *see* the difference. The instructor is dressed as a sporty type and acts and moves like a sporty type. He said, "Then when I see the driving of the individual skiing down the slope, it takes me half a second to know who the instructor is."

Kurt tells his instructor candidates, "Not only do you have to work on the students, you have work on *you*," he takes one look at their bellies and says they might be able to teach a couple classes here and there but, "You will not be accepted by your clients like this."

Favourite dive sites

Amsler has travelled all over the world as one of the pioneers of underwater photography, yet he finds some of his most favourite dive spots close to home in the Mediterranean. Top of the list is a prime spot just half an hour south of his house in southern France.

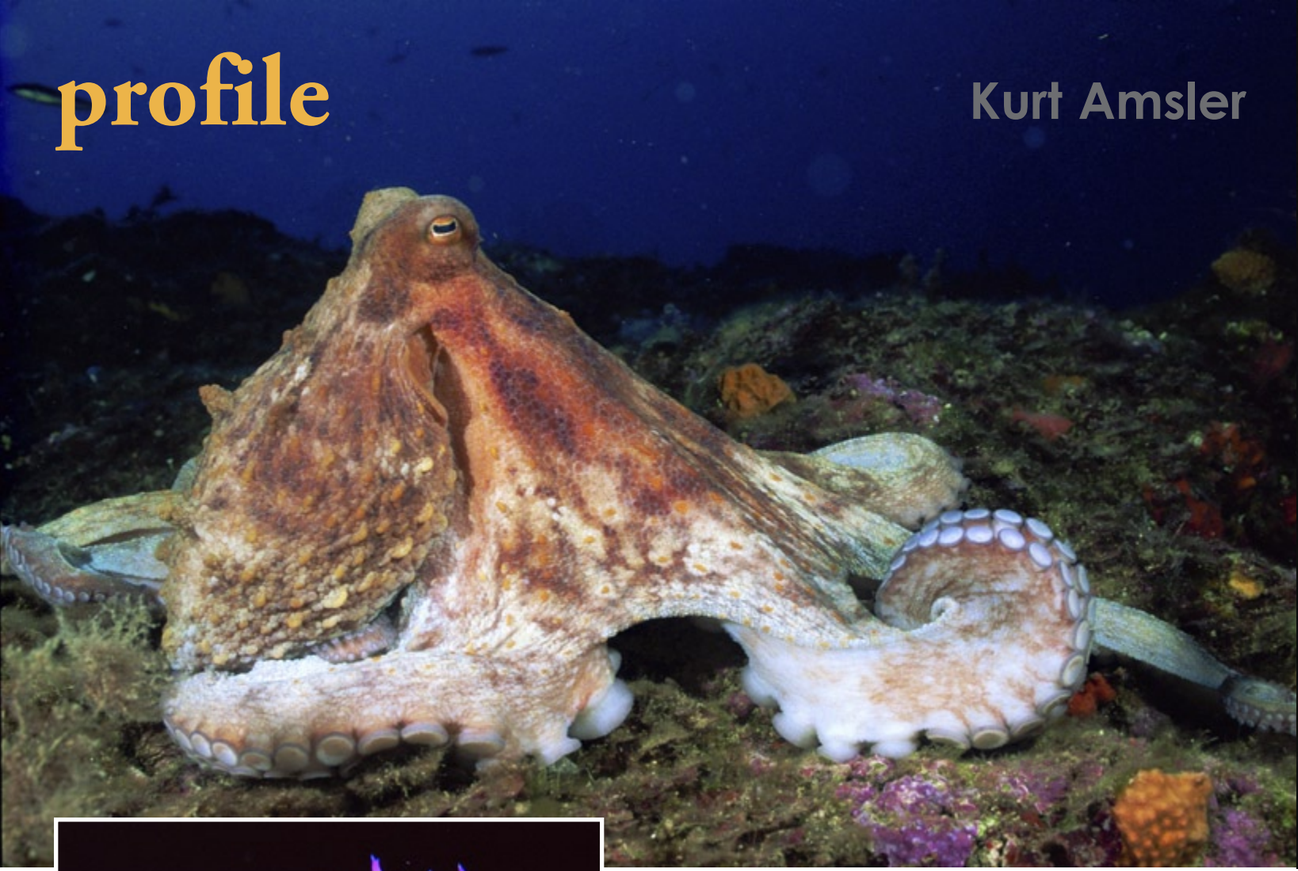
However, widening out to the global level, Kurt says that the Maldives cannot be beat for the ultimate diving experience. "You just go 50 meters from your bungalow and you are on the dive boat. If it is windy on one side of the island, you go to the other. You can go outside the reef, inside the reef in the lagoon, you have all the possibilities," he said, "I have been coming to the Maldives since 1972. Yes, there are more tourists now... too many tourists in my opinion. But I was one of the first tourists, I was number 95."

Conservation action

Kurt served as the manager of Project Aware for seven years. In that time, he ran several successful conservation projects

RIGHT: Kurt's Seacam housing with notes. Photo by Peter Symes

Kurt Amsler



industries. By collecting thousands of names to petition the Balinese government to protect the endangered sea turtle, the organization hopes to pressure the government to take action against the killing of the animal for their meat (gourmet soup), eggs (Asian aphrodisiac) and for their shells to make jewelry and tourist souvenirs. These souvenirs have now been banned in many areas due to the organization's actions.

The sad fact is that tens of thousands of sea turtles still suffer terrible deaths caught in fish nets or at the hands of poachers—many turtles are skinned alive. Now the animal is nearing extinction. To learn more about SOS-SEATURTLE and what you can do to help, please visit the website: **www.sos-seaturtle.ch**

including creation of artificial reefs, planting of reef balls, campaigns to protect specific endangered species such as sharks and turtles in several regions around the world.

"You can only be successful, if people can touch what you do, and that was what I did," said Kurt.

An ongoing project Kurt established in 1980 is the SOS-SEATURTLE organisation, which promotes publicity for this endangered animal in media and the travel and diving

In addition to saving turtles, Kurt was instrumental in the banning of shark fishing in seven Maldivian Atolls. He continues to generously supply his photographs for free to all environmental organisations involved in ocean conservation and animal protection. To learn more about the Shark Project for which Kurt is an ambassador, visit: **www.sharkproject.org**

Learning from the master

Each year, Kurt runs several underwater photography workshops in Les Lecques, a small village on the Mediterranean in southern France. The next workshop this year takes place August 20-26. Up to 12 participants enjoy six theory classes and five boat dives in a fast and comfortable dive boat, quaint lodging in a charming hotel, photo lab with light boxes. Dives cover drop-offs, wrecks and caves. For more information, visit the website at: **www.photosub.com** ■

LEFT TO RIGHT: Octopus; Moray eel; INSET: Nudibranch. All photos this page by Kurt Amsler

Leigh Cunningham

I survived the earlier stages of my diving career due to one reason - "luck".

ADAM BUTLER

Air, Nitrox or Trimix

Manage your pO_2

PETER SYMES

From the Basic Nitrox levels through to advanced Trimix, we base our calculations of dive profiles on a specific partial pressure of oxygen—pO_2. Managing and controlling the pO_2 lies at the foundation of any level of technical diving as it enables us to perform longer, deeper and safer dives compared to diving air. But there are also a few points to watch.

We are all aware that as we descend the gas in our lungs and body tissues compress and becomes denser. The deeper we go and longer we stay, the more of the inert gas Nitrogen (and in the case of diving with trimix, also helium) our tissues will absorb and hold. Oxygen on the other hand is utilized in the metabolism, with carbon dioxide (CO_2) being a resulting waste product. So, first of all, while diving deep and breathing gasses with elevated pO_2, we want to keep our levels of exertion down as much as possible and metabolism and CO_2 production down. As work load increases, levels of CO_2 could reach dangerous levels as it leaves divers more prone to oxygen toxicity and nitrogen narcosis. (As well as giving you a very undesirable headache.)

Weighing pros and cons

Breathing any gas at elevated partial pressures comes with both advantages and risks. The most obvious advantage is when you increase the pO_2 and conversely lower your pN_2 (partial pressure of Nitrogen) you reduce nitrogen absorption, and with it, all the issues around decompression. As every Basic Nitrox diver will know, even modest increases in oxygen content can lead to significant longer no-decompression limits.

On the other hand, each individual gas may cause, in some cases similar, in other cases very different, potentially dangerous symptoms that could lead to the diver failing to return to the surface.

Know the partial pressures

That is, if we don't know how to manage the partial pressures our breathing gases. Using Dalton's law, we can exactly calculate the partial pressures of oxygen, nitrogen and helium at any depth. We can thus also calculate our dosage of these gases.

And nitrogen isn't the only gas that can cause a problem when you breathe it for longer times at elevated pressure. Oxygen toxicity is, for one, another issue we need to get a grip on when venturing into any sort of technical diving.

Breathing oxygen at elevated partial pressures for an extended time can be toxic and lead to confusion and loss of muscle control, and ultimately seizures and convulsions, which under water will most likely result in drowning.

Limits

The NOAA time limit for an single exposure to a pO_2 of 1.6 bar is 45 min. For a pO_2 of 1.3 bar the limit is at a somewhat more comfortable 180 mins. NOAA is the National Oceanographic Atmospheric Administration in the US. Based on their studies, all training agencies state the absolute maximum PO_2 breathed during a dive should not exceed 1.6 at any stage, with 1.4 being the recommended max PO_2 for the bottom phase.

Personal limits

The exact PO_2 or point where O_2 has a toxic affect on the central nervous system will vary greatly from individual to individual, as well as an individual from day to day, or from dive to dive.

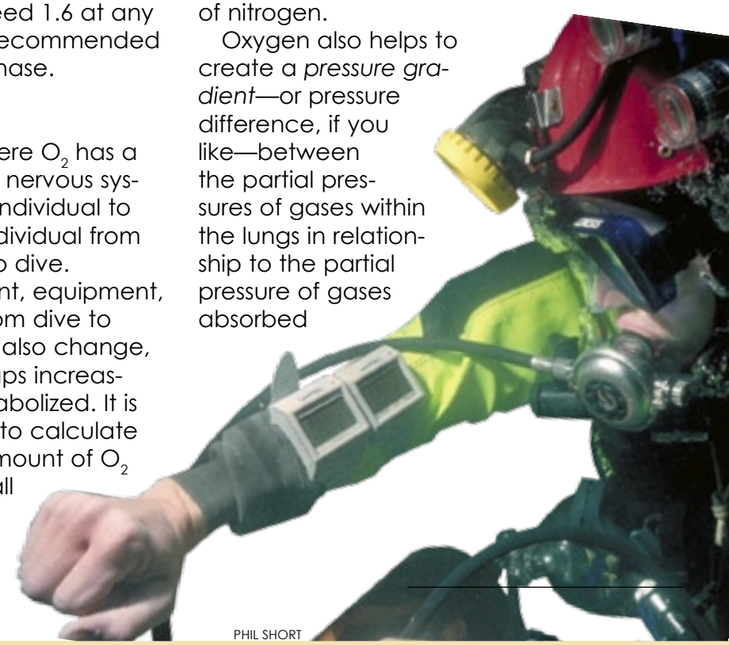
If the type of environment, equipment, mission or task changes from dive to dive, exertion levels could also change, hence, altering and perhaps increasing the amount of O_2 metabolized. It is unfortunately not possible to calculate and establish the exact amount of O_2 metabolized considering all these variables. So, if you think you may be exerting more than normal on a specific dive, chose to breathe a lower pO_2 if you have the option. I would recommend lower than 1.3 bar during dives with a heavier work load.

NOAA have also established the fact that a time limit at specific pO_2's is another factor that must be taken into consideration; The higher the pO_2 the shorter the time limit would be before O_2 has a toxic effect.

Oxygen is our friend

So, let's try to put things into perspective and recap. Oxygen is good, it's our friend. The higher the oxygen content in a nitrox mix, the smaller the proportion is of nitrogen.

Oxygen also helps to create a *pressure gradient*—or pressure difference, if you like—between the partial pressures of gases within the lungs in relationship to the partial pressure of gases absorbed



PHIL SHORT

Managing you pO_2

within the tissues. It is this pressure difference that forces the inert gases to move out of the tissue – we term this *inert gas elimination*. The inert gasses are N_2 and He and culprits behind decompression related problems such as the bends (aka DSC or DCI). The less inert gas in the mix, the less inert gas gets absorbed in the tissue, giving us the option to extend bottom time or to just take advantage of the extra safety less absorption of inert gas is giving us.

But...

If limits—pressure or time, or a combination of both—are exceeded, oxygen will be less forgiving than nitrogen or helium. Nitrogen Narcosis and High Pressure Nervous Syndrome (HPNS) the effect of Helium on the body under high pressure) do not lead to drowning or embolism as a bad hit of oxygen toxicity could.

However, as long as the oxygen dose (pO_2) and time limits are not exceeded and we have good general diving technique (low levels of exertion), it's highly unlikely we would experience oxygen toxicity-related problems.

Having said that, NOAA did once succeed—with the help of the US Navy and in a dry chamber—to induce an oxygen seizure in a human subject at a pO_2 of 1.3. This is the lowest inspired pO_2 on record that a oxygen seizure has been induced. Having said that, the dude in the chamber was over-exerting to an extreme degree during the experiment. But even so, the experiment clearly emphasized the necessity for low exertion levels while breathing elevated pO_2's during a dive.

And don't forget...

So it seems oxygen is the primary gas we need to keep within recommended limits.

But the wise diver should not forget and overlook the potential hazards related to nitrogen narcosis while focusing on issues with oxygen. In my experience in deep diving, I've seen many more divers having serious problems with nitrogen narcosis rather than oxygen toxicity. Recreational training agencies have put a depth limit on air diving to max 40m. This was established due to the fact that most divers (without specific deep water technical training) begin to act irrational beyond this depth, putting themselves and possibly other divers at risk, combined with the fact that the NDL becomes impractically short.

Don't push it

Traditionally, the mix that divers sometimes push depth limits with is air! Few divers with any sort of technical training would consider pushing beyond the recommended depth with an enriched air/nitrox mixture due to the increased risk of oxygen toxicity. However, I've met many a recreational diver happy to push past 40 meters without specific deep diver training with air—in some cases, well beyond 60 meters. Although the pO_2 of air does not exceeded NOAA recommendations until we reach 66 meters, divers should take the effects of nitrogen narcosis seriously, or risk ending up as a statistic.

HPNS

For the tec diver using trimix, the gas toxicity story becomes much more complicated by adding a third gas, helium, which has it's own list of potentially dangerous symptoms when the helium content is high and the descent was very fast. It is not something that the mix diver needs to consider in the first 100m. But for the more experienced mix diver pushing past 100m, the effects of HPNS (High Pressure Nervous Syndrome) could become an issue. Symptoms include vomiting, diarrhea, micro sleep and probably the most common "tremors", normally starting in the arms below the elbow. A slower rate of compression (descent rate) will reduce the severity of the tremor, but obviously a too slow descent will increase decompression time and overall gas needed.

Some deep mix divers choose to increase the nitrogen content below 100m, as nitrogen tend to act as a buffer, reducing the severity of the tremor. A sensible balance in this case is the key. Shaking around at depth is definitely something we would like to avoid but not to the point where clear logical thought processes and problem solving gets impaired due to too high nitrogen dose! ■

Leigh Cunningham is the technical manager and TDI Instructor Trainer for Ocean College, Sharm El Sheikh.

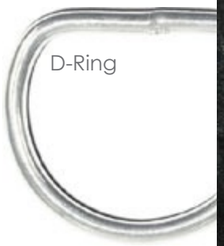
Probably best known for his records - Leigh once held the record for the deepest dive in the Red Sea, and is the current holder of the record for deepest wreck dive - and attempts of reaching extreme depths, he also has a wide range of teaching credentials to his curriculum: TDI instructor trainer, DSAT Tech Trimix instructor, PADI MSDT IANTD Technical diver instructor CMAS 3 star instructor

Photography

By Jason Heller
& Dan Beecham

Reef Hook

Carabiner



D-Ring

Underwater photography requires more than your basic dive gear and cameras. Sometimes it's the often overlooked accessories and customized set ups that help you safely and conveniently capture the shot in difficult or unexpected conditions. Some accessories simply make your life a little easier, while others help you avoid ditching your camera in an emergency. Most accessories are relatively inexpensive and readily available at any photo or dive shop and online. The following are items that we can't live without.

GUNILD PAK SYMES

Rigging Your Gear

for Convenient and Safe Underwater Photography

Reef hook

Anticipated or unexpected currents can create conditions that are difficult to shoot in. Plan to bring a reef hook along in order to hook into a "dead" piece of rock and stabilize yourself in order to shoot the action. Some destinations have constant currents such as the Galapagos for example. Usually the best pelagic and schooling action is found in areas with fairly strong currents, so a reef hook can be the difference between capturing the shot and holding on for dear life. Reef hooks can be purchased at dive shops, or you can make your own with simple items available at any hardware store.

BC with D-rings

Be sure to use a BC with enough d-rings to support clipping multiple items to yourself. Clipping cameras, torches, slates or other items to your BC when not in use is the most convenient way to keep your hands free to shoot or to hang on when needed (or when you forget your reef hook!).

Clips & Carabiners

Double sided carabineers with quick release plastic clips can be invaluable, particularly for those who dive with more than one camera, or for use during stops or long swims. One side of the clip should be attached to a d-ring on your BC, while the other side is attached to the camera housing. When doing a deco or safety stop, your camera can be quickly and safely attached to your BC in a streamlined fashion, keeping your hands free for an added margin of safety and energy savings. Note: keep your camera and

Surgical tubing

strobes on while clipped to your BC. The quick release clips can easily be unlocked when an interesting subject comes into view so that you can capture the shot.

Wireless air integrated computer

A wrist mounted, wireless, air integrated computer gives you all the information you need in one place. The most convenient part is that the computer is close by your camera, so taking your eyes away from your viewfinder and shifting a few degrees to look at all of your vital dive information can't get easier. A small back up gauge is certainly recommended, although it is very rare that the wireless device will fail. Redundancy however is the best policy when it comes to life support systems. Stuff the back up gauge in your BC pocket to keep a streamlined profile.

External diopter

Those who shoot with compact cameras have a slew of options for interchangeable lens accessories that can be swapped while underwater. This offers compact shooters the ability to take one camera underwater to shoot both macro and wide angle. SLR users do not have such an option. When shooting with an SLR, you must first decide on a macro or wide angle set up before getting wet. For macro shooting, the most common options are a 60mm or 105mm lens. Carrying an external diopter that fits over your lens port can effectively help to increase the versatility of what you are able to shoot with any given set up. There are just a few manufacturers that provide these external diopters, and they range from 20% magnification to +2 magnification. Some of the diopters are made to be mounted to the camera port while others are made with a soft skirt that fits snugly around the port. In the latter case, a neoprene pouch clipped to your camera housing or BC will come in handy to prevent loosing the diopter.

WOODY MAYHEW

External diopter

Lens Caddy

If you shoot with a compact camera, a must is a 'lens caddy' that mounts onto your flash arm and allows you to quickly change lenses without having to rummage around in BCD pockets for items. This same system can also be used for color corrective filters. These can also be placed into the caddy and removed and replaced as needed.

Surgical tubing

Does carrying your camera from your hotel room to the boat get a little uncomfortable at times? Do you get concerned when handing your housed SLR system from the water up to the boat staff at the end of the dive? Surgical tubing may provide the solution. The material is very durable and when doubled up and secured to your camera arms or handles, can make a great shoulder harness or handle for your camera system. You can buy surgical tubing in most well stocked dive shops and it usually comes in the standard latex color or in black.

Black skirt mask

Many photographers prefer to dive with masks that have a black skirt. This reduces the ambient light that enters the viewfinder and allows you to shoot more comfortably without straining your eyes in bright conditions. However, this can also be augmented by using color enhancing (preferable) or color correcting lenses on your mask. You will notice the difference that the color enhancing lenses have when scanning for macro critters or other scenarios that may otherwise lack contrast underwater. The only downside is having to answer all the questions on the dive boat about why your mask is pink.

WWW.TUSA.COM

Critter stick

This point will most likely meet with some criticism, and this is not meant in any way to condone harassing or abusing marine life. Many photographers find that bringing along a chopstick or other small stick (with rounded edges as to not harm any marine life) can come in handy when shooting macro among hydroids, swaying corals or seagrass, or to gently persuade shrimp or other creatures to come out from their hiding places. Apparently, a radio antenna with a red tip will provoke pistol shrimp to reach out or attack the red tip, allowing for a good image. When using a critter stick – always, always, always respect the marine life. This is not a tool to be used to harass or abuse the beautiful and delicate wildlife and should be used with the utmost of care.

Chop sticks from the local take-away make for excellent 'critter sticks'

When using a critter stick – always, always, always respect the marine life.

Cable ties

Between your dive, photo and travel gear, cable ties can come in handy for so many purposes, we could dedicate an entire article to the subject. Regarding photo gear specifically, cable ties can be used to attach items to one another or to yourself. Diffusers can be secured to your strobes, external diopters attached to camera housings, aiming lights to camera arms, and of course any other accessory secured to anywhere convenient. Black ties can be used and barely noticed anywhere on your gear, while brightly colored ties are handy for extra security on photo cases or luggage when traveling.

SMB

Safety first. Too many photographers forget this, and think that because they've got a camera in their hands they're invulnerable. It can often be difficult to inflate your SMB when you've got your hands full of cameras. With this in mind, photographer Steven Frink developed an SMB that is easily deployed even with two cameras in your hands. Aqualung licensed Frink's design and it is now marketed as their SOS system. The SOS is easily inflated with one hand by tugging on the release cord located where a rear dump valve would normally be found, and then by inflating the BCD as normal with the low-pressure inflator.

Closed Circuit Rebreathers and Twin Hose Regulators

The ability to get closer to marine life provides obvious advantages to underwater photographers. Many creatures, including several species of shark tend to head down to the depths when divers on scuba invade a reef; but will tolerate the presence of divers on closed circuit rebreathers. Along with making you silent underwater, CCR's make the characteristics of your buoyancy much more appropriate for underwater photography.

CCR's are becoming more readily available to recreational divers every season. The gear is getting cheaper and safer. But for the time being, they do not appeal to the majority of divers. A popular alternative for many divers is a twin hose regulator. With a twin hose your regulator, the second stage, is located alongside the first stage—meaning a small amount of exhaust bubbles comes out at the back of your head rather than in front of you, close to your subject. At present, the Aqualung Mistral is the only twin hose regulator currently in production.

There are obviously many other ways to customize your camera and dive gear. We have outlined only the top items that we personally bring along to make our lives easier. Some of these recommendations have been passed down from photographer to photographer, while others are our personal preferences. We hope that the outlined recommendations will help you add a margin of safety and convenience to your underwater shooting. ■

Magic Filters

by Jason Heller

Magic filters, developed by marine biologist and underwater photographer Alex Mustard and marketed together with Peter Rowlands of UWP Mag, hit the market last year and have quickly become a staple in the accessory bins of photographers worldwide. The filters only work with digital cameras. The gel filter sits in the bayonet behind the lens as opposed to a screw on front mounted filter. The basic premise behind the filters is that they work with the white balance of your digital camera to allow for colorful ambient light images at depths beyond that of normal filters. To enable them to work properly, the white balance must be adjusted every few meters, but what a difference they make. I tested the filters with a 10.5mm lens on a D100 camera on the *Liberty* wreck in Bali earlier this year and was very pleased with the results. The increase in depth of field gave me the ability to shoot the entire wreck, at depths south of 50 feet. These images would not be possible with strobes nor with traditional filters. In shallow water, the filters bring out the vivid colors of the reef and its inhabitants. I look forward to more shooting with my magic filters and definitely recommend picking up a set and seeing what they can do. ■

www.magic-filters.com

Memory Cards: Keeping Up With Camera Performance

Lexar Media, Inc., a leader in advanced digital media and accessories, announced that it has increased the performance of its popular Professional 8GB CompactFlash® memory card to 133X. This performance improves the digital imaging workflow for both professional and advanced amateur photographers working with and managing large files. Lexar's new card is capable of a minimum sustained data write speed of 20MB per second and is currently available in CompactFlash Type I flash memory card format, the most popular format for today's digital SLR cameras. Lexar's new 133X 8GB CompactFlash will be available in August for the suggested price of $424.99. **www.lexar.com**

SanDisk Extreme IV line of CompactFlash digital film cards is targeted at photographers who require the highest possible performance. Minimum read and write speeds of 40 megabytes per second makes these the fastest flash memory cards in the world. Extreme IV CF cards carry a lifetime limited warranty.

SanDisk Extreme IV Compact Flash
4GB - $319.99 / €255
8GB - $639.99 / €509
Available from July 2006
www.sandisk.com

FujiFilm *Aquamask* Case for FinePix A400 and A500

The 'Aquamask' housing for Fujifilm's four MegaPixel FinePix A400 and five MegaPixel FinePix A500 digital cameras is one of the few protective, waterproof casings available for entry-level digital cameras. Depth rated to a modest 10 feet and with a tough shell that can also protect the models from sand, dust and dirt, it is also ideal for a day at the beach.

Ikelite house for Olympus Stylus 810

This compact digital housing is molded of corrosion free clear polycarbonate, it is virtually indestructible with heavy duty walls that allow it to operate safely to 60m (200 feet). All functions of the camera are accessible, except the print button. A flash diffuser is included. **www.ikelite.com**

Sea&Sea YS-27DX

The new YS-27DX from Sea&Sea features a beam angle of 105°x84°, and a guide number of 20 meters. The guide number control function can be used to regulate the light intensity in 9 stages from 1.7 up to 20 in 1EV steps.
www.seaandsea.com

New 10.2 MP Nikon DSLR to be Released on August 9th

In a move to compete with the Sony Alpha, Nikon released a teaser campaign touting a new 10.2 megapixel digital SLR that we can guess is the successor to the D70s. Possibly by the time you are reading this issue of X-Ray Mag, the model would have been confirmed. Can it be a D80 or D90? On a separate but related note – the influx of new DSLR's is making it difficult for the housing manufacturers to keep up the pace-

Currently, getting your hands on a D200 housing is difficult at best, and even finding a retailer with a D200 in stock can be quite a challenge. The housings companies get no special treatment from the camera manufacturers, to whom underwater photography is a small market. Deciding on which models to develop housings for and guessing at production quantities can be a challenge. ■

D2xs

Nikon has announced the D2Xs, a subtly upgraded D2X. The main improvements are a larger 2.5" LCD monitor, modified metering in high-speed crop mode, a longer lasting battery, black and white mode, Adobe RGB in all color modes, up to 3 custom tone curves, and 1/3 step ISO boost options. ■

Adobe Purchases Rawshooter, Launches Beta-version of Lightroom

Adobe Systems has acquired the technology assets of Pixmantec ApS, makers of digital imaging software that provides advanced workflow management and processing capabilities for digital camera raw files. The acquisition strengthens Adobe's leadership position in raw processing.

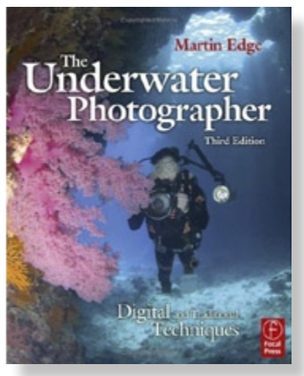
Camera RAW workflow software enabling digital photographers to efficiently download, browse, view, prioritize, compare, edit, correct and convert large batches of digital camera RAW image files. Adobe plans to integrate Pixmantec raw processing technologies into Lightroom.

Lightroom is Adobe's coming image management and workflow software. A beta release can be downloaded for free from Adobe's website until Jan. 30, 2007. ■

"Water Visions"
– a New Book by Mirko Zanni

Having spent years and years wandering the seven seas together with his inseparable cameras, Mirko Zanni accumulated thousands of images, portraying every kind of living creature. Then came the long and laborious process of elimination to arrive at a selection of the best 225 pictures - the most significant, the most exciting to shoot "Water Vision". It's a work of art, down to the last detail with specific aspects that give it a unique position in the current market. With 256 pages, the format of the book is 23cm by 33cm, 66cm when the book is opened. But that's not all. As well as the pictures, Mirko is the author of the accompanying text, together with Licia Paris. Every one of the nine themes have a written introduction so that the reader can enter into the spirit of the marvels under the water's surface. From the spectacular rocks of the river Verzasca, to the frozen mountain lakes, to the inhabitants of the blue depths, and submerged deserts, not forgetting Neptune's gardens, seething with an infinite amount of creatures. All the animals presented in this book have been classified by their Latin as well as their common name, both in Italian and in English. **www.mirkozanni.com**

The fresh third edition of UK-based Martin Edge's The Underwater Photographer: Digital and Traditional Techniques is now and getting raving reviews. No less than 408 pages. Seen on Amazon for around $25



Viewfinder

Hugyfot have released a 45° viewfinder to go with all their underwater housings. The new viewfinder costs € 795 Euro when ordered together with a new housing, but Hugyfot/GreenForce can also fit it onto older housings for an additional €100.
www.hugyfot.com

Imageviewer

Don't have a laptop? This Media Storage and Viewer Stores up to 10,000 photos or more than 14 hours of video. Comes with a large 3.6" true TFT color screen display and a Compact Flash card slot and rechargable battery
www.mymediagear.com

Pre-announcement:
Indonesia's First International Underwater Photo Competition

DEEP Indonesia 2007 is proud to announce that together with DivePhotoGuide.com and Wetpixel.com, will be hosting a world class international photo competition.

Photographers will compete in 7 categories to win premium dive travel packages to some of the top photo destinations in the world, photo equipment, dive gear and more!

The contest includes a category for images that focus on conservation and the marine environment, one specifically for entries taken by compact digital cameras, and one specifically for Indonesian entrants. The categories for this inaugural event will be: Reefscapes, Divers, Animal Portrait, Animal Behavior, Compact Camera, Environment and Conservation, and the Indonesian Category. Complete details, prizes, sponsors rules and regulations will be posted by August 2006 with an official call-for-entries. ■

Winning Images from the BP Kongsberg Image Competition 2006

Images from the deep oceans are not something that most of us have the ability to shoot. Most deep sea images are dull and scientific feeling. However, this unique competition brings the best of deep ocean images to the forefront of our attention and furthers the awareness of the unknown realm. Through close collaboration with key players in the oil and gas industry, the "Scientific and Environmental ROV Partnership using Existing Industrial Technology" (SERPENT) project aims to make cutting-edge ROV technology and data more accessible to the world's science community, sharing knowledge and progressing deep-sea research. In association with BP, Kongsberg and the National Oceanography Center, Southampton, SERPENT has organized a photo and video competition that resulted in some truly unique images. The winning images and video footage can be viewed online at:
www.serpentproject.com

Photoevent Calendar by Jason Heller

August and September are big months for competition deadlines. Good luck!

X-ray mag

DivePhotoGuide.com

Aug 10th
6th Marmara Festivali Underwater Photo and Film Competition – (Turkey)
► www.marmarafestival.org

Aug 15th
The 7th Annual San Diego UnderSea Film Exhibition – (USA)
► http://sdufex.com

Aug 21st
Scylla wreck photographic competition – (UK)
► www.national-aquarium.co.uk

Aug 30th
The Santa Barbara Ocean Film Festival – (USA)
► www.ocean.com

Sept 1st
XARIFA Unterwasser Foto&Video Festival – (Germany)
► www.uwfv.de

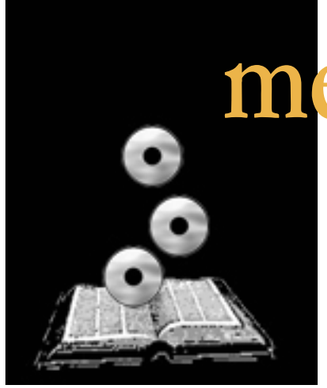
Sept 7th
Vodan 2006 – (Solvenia)
► www.drustvo-vodan.si

Sept 15th
33rd World Festival of Underwater Pictures – (France)
► www.underwater-festival.com

Sept 15th
Popular Photography & Imaging Annual Reader's Picture Contest– (USA)
► www.popphoto.com

Sept 22nd
2006 LAUPS International Competition – (USA)
► www.laups.org

Sept 30th
Canon (US) National Park Photo Contest – (USA)
► www.photoworkshop.com



media

Books Films Games DVDs

Edited by Peter Symes
& Gunild Pak Symes

POINT & CLICK ON BOLD LINKS

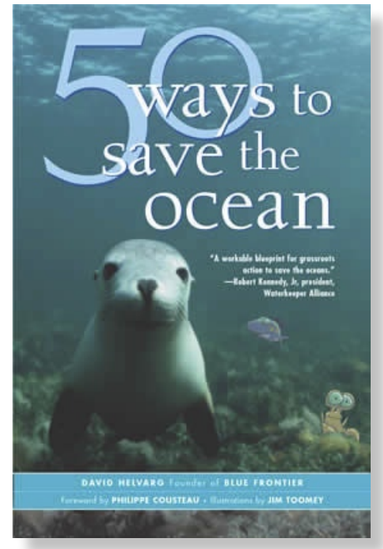
Fun Games for Free at the BBC!

Play 13 Flash games with marine and ocean themes on the BBC Nature & Science webpages. Great for kids of all ages. Read the fact files and infobursts. In *Dive to the Abyss*, you have been selected to lead an important dive expedition in a deep-sea submersible. In *The Icebreaker*, you discover polar animals and the strange properties of ice in the freezing Southern ocean while aboard the icebreaker ship *Ice Queen*. In *Webs of Life*, you descend to the colourful world of corals beneath the waves to see how food chains work. In *Journey to the Deep*, you explore the ocean's habitats and encounter an array of marine animals as you venture from a familiar rocky shoreline to the weird waters of the deepest abyss.

www.bbc.co.uk/nature

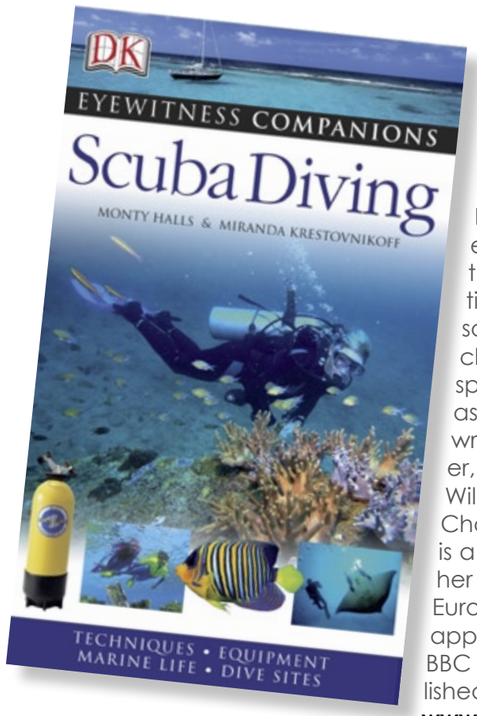
Ship Simulator 2006

Developer : VSTEP
Publisher : Lighthouse Interactive
Price: €29.99 Boxed, €26.99 Downloaded
A revolutionary new ship simulation game, Ship Simulator 2006 gives you the chance to steer various ships in different environments. With its realistic graphical quality and dynamic behavior, the game is not just fun, but educational. You can learn a few things about ship maneuvering including 'parking' your vessel and dealing with weather. Ship Simulator 2006 has nine different playable ship types, including a container vessel, yacht, small container ship, inland cargo ship, harbour patrol ship, tug boat, power boat, taxi boat and the *RMS Titanic*. There are three different environments in which you can steer them: Rotterdam Harbor, Hamburg Harbor or Thailand's tropical paradise islands of Phi Phi. Thirty-one predefined missions include navigatation to waypoints or the rescue of swimmers. There is also a built-in scenario editor to build your own scenarios.
www.shipsim-secure.com



50 Ways to Save the Ocean

by David Helvarg, Philippe Cousteau (Foreword)
Paperback: 208 pages
Publisher: Inner Ocean Publishing
Date: March 28, 2006
ISBN: 1930722664
Price: US$12.95
Want to save the ocean? Here are 50 ways you can help. Written by environmental activist, this book is an informed introduction to the innovative ways you can help preserve the oceans and marine life. Which species are endangered and what fish should you not eat? How can you save energy and how will it help the seas? What is proper diving, surfing and tide pool equipment? What is an ocean-friendly aquarium? and how can you support your local marine education? These and many more questions are answered.This guide is recommended reading for ocean lovers everywhere. **www.amazon.com**

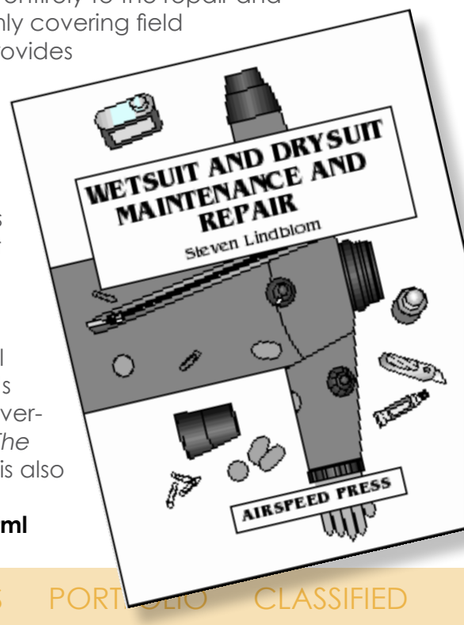


The Eyewitness Guide to Scuba Diving

by Monty Halls and Miranda Krestovnikoff
Publisher: Dorling Kindersley
Date: 3 August 2006
Price: £14.99
Designed to complement the training courses for new divers, this guide will help expand the knowledge and diving ambitions of certified divers. Illustrated with lavish photos of some of the world's top dive destinations and clear diagrams of the science underlying the sport, the book is full of helpful hints and tips as well as in-depth information on marine life written by experts. A former Royal Marine officer, Hall has written/presented stories for BBC Wildlife Magazine, Diver, National Geographic Channel and Discovery Europe. Krestovnikoff is a zoologist and tv presenter well known for her role on the Wreck Detectives for Discovery Europe and World Gone Wild for Fox. She also appeared as the natural history expert on the BBC series Coast in 2005 and has stories published in Diver, Sport and Dive magazines.
www.dorlingkindersley-uk.co.uk

Wetsuit & Drysuit Maintenance and Repair

by Steven Lindblom
184 pages,
Price: US$40
This is the first book dedicated entirely to the repair and servicing of divesuits. Thoroughly covering field and shop repairs, the guide provides helpful information for individual divers who wish to maintain their own suits and dive shop technicians who want to offer professional divesuit servicing. Topics covered include replacement of seals, boots and zippers, valve servicing, patching and alterations, popular modifications, accessories, commercial P-valves and drygloves. There's also a how-to on low-cost DIY versions. Steven Lindblom wrote *The Dive Light Companion,* which is also available from Airspeed Press.
airspeedpress.com/divesuit.html



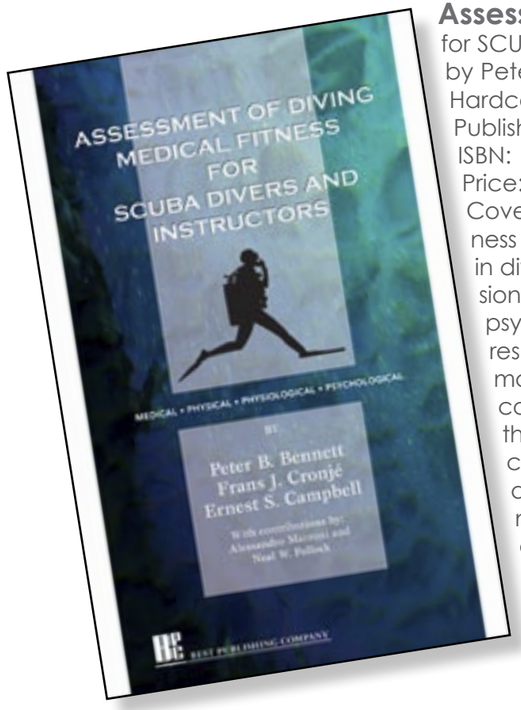
media

Books Films Games DVDs

Cool Waters Emerald Seas

by John Collins
Hardcover: 200 pages
Publisher: Atrium
Date: July 1, 2006
ISBN: 095353538X
Price: US$22.98

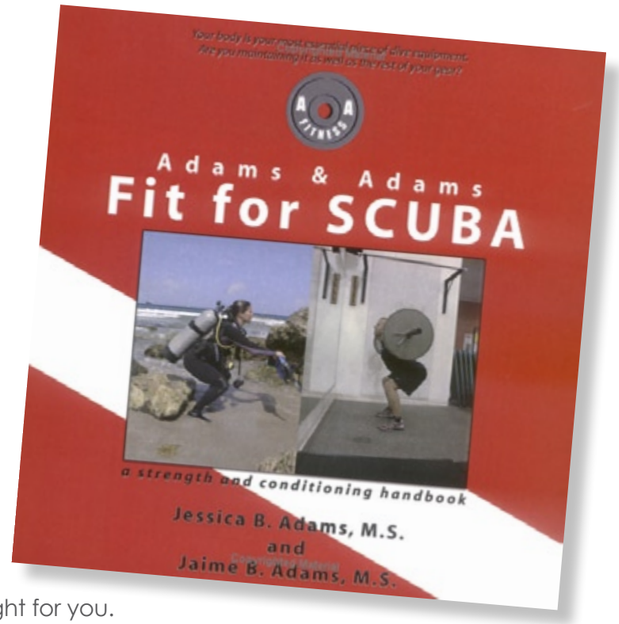
From the north Atlantic bordering western Europe, to the cold Pacific of North America to the Great White sharks of South Africa, John Collins' photographic portrait of just a portion of our planet's great ocean world is an exquisite compilation of some of his best work accumulated over the past 20 years diving the seas around Ireland, Scotland, Canada, South Africa and Tasmania. Illustrating the colourful and bizarre marine life below the ocean's surface are 120 photographs from his voyages. Beyond mere documentation, Collins photographs poetically interpret the underwater world as seen through the eye of the photographer, while also conveying the mood of exploration. He is one of our own. As a favourite X-RAY MAG contributor, we warmly recommend Collins' astonishingly beautiful book of underwater images. **www.amazon.com**



Assessment of Diving Medical Fitness

for SCUBA Divers and Instructors
by Peter B. Bennett, Frans J. Cronje, Ernest S. Campbell
Hardcover: 241 pages
Publisher: Best Publishing Company, June 1, 2006
ISBN: 1930536313
Price: US$29.99

Covers the role of the instructor in evaluating the diving fitness of students including topics such as the history of fitness in diving, pressure and the body, gasses and decompression, risk of incapacitation and loss of consciousness and psychological aspects of diving. Diving fitness is a diver's responsibility according to the authors who discuss health maintenance and diving nuisances. The book also covers common and important medical conditions and disorders that impact diving including cardiovascular, dermatological, gastrointestinal, genito-urinary, head, eye- ear-nose and throat, immunological, musculo-skeletal conditions, neurological, psychological and psychiatric, respiratory and other medical conditions. Positively reviewed by Dr Hillary Viders, Founder of the Women Divers Hall of Fame and President of the Academy of Underwater Arts and Sciences. See her review here: **www.amazon.com**
Also available at: **www.bestpub.com**



Adams & Adams Fit for Scuba

by Jessica B. Adams
and Jaime B. Adams
Paperback: 138 pages
Publisher: Infinity Publishing
Date: April 14, 2006
ISBN: 0741431114
Price: US$14.95

Belly bulging a bit? Maybe it's time for a workout. Scuba diving has unique physical demands. Why not start your very own strength and conditioning program? With this book, you can choose from a variety of exercises selected with the scuba diver in mind. Do it at home or in the gym. This book will help you create a program that is right for you.
The authors are avid divers, scuba and fitness instructors interested in improving safety for scuba divers by participating in dive research internship programs offered by Divers Alert Network. At Duke University, each has participated in internships at the Environmental Physiology Laboratory. Both have M.S. degrees in Exercise Physiology and are personal training instructors for the National Council on Strength and Fitness. They say that if you exercise regularly, you will feel more prepared to handle the physical demands of scuba diving. **www.amazon.com**

Movie

An Inconvenient Truth

Studio: Paramount Classics and Participant Productions
Director: Davis Guggenheim
Producers: Laurie David, Lawrence Bender and Scott Z. Burns
Catagory five hurricanes, floods, droughts, killer heat waves and epidemics on a scale we have never seen before...That's what the majority of the world's scientists forecast for us if we do not change the way we affect the environment within the next ten years. With the worst storm season ever recorded in American history, 2005 marked the year when humanity took notice and one man stood to focus his attention on a last-ditch effort to help save the planet from irrevocable change. That man is former US Vice President Al Gore, who in this compelling documentary film directed by Davis Guggenheim takes us on his personal quest from the time he was an idealistic college student just aware of the massive impending environmental crisis looming large on the horizon to the day he almost became President... Gore is convinced there still is time to make a difference. **www.climatecrisis.net**

Text and photos by Peter Symes
Product Photos: AP Valves

The AP1 was the humble beginning that got it all started back in 1969

AP Valves & Ambient Pressure Diving

Buddy Double Gold has been used by the Royal Navy since 1983

AP Valves went from an Automatic Mouthpiece to Closed Circuit Rebreathers in a generation. We went to Cornwall to talk with CEO Martin Parker about how to connect the past with the future.

I couldn't quite help muse myself on the flight to Newquay that I seemingly had to go to the end of the world on my quest to find out what drives one of the most high-tech profiled dive manufactures. Well, perhaps not quite, but at least almost all the way to Land's End where England ends and the next beach beyond that is in South America across the ocean. But come to think of it, if you, like A.P.Valves, export your goods to more than 50 countries across the globe, location doesn't really matter. However, I must grant that Cornwall is beautiful, greeting me with green rolling hills, picturesque villages and spring flowers all over the country side making it a nice place to live and work.

The diving along the rugged coast is also excellent I am told and the water surely looks clear and alluring but venturing below the surface will have to wait until another good time regrettably. I am already close to running late with my appointment with Martin Parker, the CEO of AP Valves and its off-spring company, Ambient Pressure Diving, which now produces the Inspiration and Evolution rebreathers.

From the outside, AP Valves looks like most industrial complexes, however, it is not architecture but what goes on inside that interests me. Inside, I am greeted by both Martin Parker and the always smiling Nicola Finn whom many dive show regulars would also recognise.

I am also greeted by the characteristic aromas of a metal workshop—oil, metal shavings, fabrics—and the clanging, grinding and hissing noises. In the workshops workers are busy turning raw metals – in the form of blocks, rods and tubes into components for dive equipment. Benches, lathes and various robots compete for floor space with pallets of goods going in and out.

In another room, other workers busy themselves over rows of industrial sewing machines manufacturing the various models in A.P. Valves renowned Buddy range of BCD's. Where a long string of other manufacturers have long since moved their labour intensive parts of their manufacture to low-salary countries in predominantly the far East, A.P. Valves have resisted this trend. Everything is still clearly made in-house, and while I am being given this tour by Martin Parker, I can't help picking up his hands-on approach and knowledge and interest in all the parts of the manufacturing process, which perhaps explains a lot.

AP Valves retains control over the whole process from initial idea, to design, tool-making, machining, moulding, assembly, testing and quality control right through to the finished product. I can't help catching

The Evolution CCR is the pinnacle so far of the company's almost four decades of evolution

manufacturer

Workshop where bouyancy compensators are being sewn

a glimpse of some very old and very worn equipment on a shelf labelled "customer service". Perhaps most manufacturers would prefer that I'd focus rather on something more glamorous, but I found it quite telling that this, apparently 10, 15 or even 20-year-old, equipment is still in use and will still get serviced "a friendly customer aftercare that is second to none" they call it themselves.

Before proceeding to something more fanciful, I am told that many customers in the UK prefer to send their gear in directly to the factory for servicing as the turnaround time in known to be fairly short and the factory itself will always be the most qualified repair shop.

Long history

A.P. Valves go back quite at while. It was founded by Martin Parkers parents, David & Angela Parker in 1969 and started, I was told, in a garden shed. David and Angela Parker were active sports divers themselves and saw that there was a need for a more effective emergency breathing system. They set out to invent one and the result was the now famous, and historic, A.P.Valve automatic mouthpiece, which in a case of out of air emergency would allow the diver to breathe more easily from an inflated buoyancy device, which in those days would be a horsecollar style vest. Providing air on demand for at least a critical first moment, this device went on to become a lifesaver for several generations of divers. The present day Autoair Octo-inflator and the AP200 power inflator descends directly from this first now 35-year-old invention.

Since the early days, AP Valves has experienced a strong growth from a small family-run business to a leading international manufacturing company supplying sport and professional divers, search and rescue, coastguard and armed forces world-wide.

Stacks and pellets of raw materials are tucked in between machinery in the workshops

AP Valve

"Brother and Buddy" - one of those juxtapostions that are irristible for a photographer. AP Valves manufactures as much as possible in-house

Buddy Arctic is a classic horsecollar style vest which can be worn either in its folded form or opened up as a full buoyancy vest, offering over 17kg of lift.

Buddy Explorer comes with 0.4 litre, 232 bar emergency air cylinder included as standard, an Emergency Net Cutter and an integral Surface Marker Buoy pouch. First-owner Lifetime Warranty

Designed and built by divers

The founders were divers and so are all the present day staffers. Today, every area of the factory from the design office to the boardroom, from the sales office to the shop floor is staffed with divers of all training backgrounds and experience, writes AP Valves on their website.

Ambient Pressure Diving (APD), which produces the Inspiration and Evolution Closed Circuit rebreathers is legally an entity separate from A.P. Valves, a different company, and this is partly due to isolating liability issues which, as most are aware, plague the litigious US market. It is also somewhat physically separated from A.P. Valves in as much as the rebreather production are placed in a new building squeezed in beside the old one on the lot.

Does AP Valves and Ambient Pressure Diving have a particular business philosophy or business model? What principles govern you?

Martin Parker: AP Valves concentrates on the general diving products including marketing it's range of Buddy buoyancy compensators and it's products are sold through conventional dive stores. APD concentrates on rebreathers, we don't sell a rebreather to a diver unless they have done a training course. This necessitates selling via specialised training outlets.

The new Buddy Blast is designed so that divers can operate it easily with cold hands or gloves in an emergency. There are no tiny buttons to locate - you just grip the body of the unit and squeeze the spring-loaded halves together to activate.

manufacturer

If you take the time to look at our product ranges, you'll find very little resemblance to anyone else's products. We pride ourselves on NOT being being a "me-too" manufacturer. We rely heavily on our R & D, our own test diving teams and input from customers to create products that are specifically required for their specific needs. That doesn't mean we try and re-invent the wheel every time, but the more we can satisfy niche markets and the more we can specialise, the better we are equipped to thrive.

Unknown to the Sport diving world is the extent of our military business - having the ability to manufacture a bespoke jacket to meet the individual group's requirements and make it with a non-magnetic signature when necessary has led us to the position we are in now, supplying many Navies and often with great penetration, for instance - wherever the British Ministry of Defence have divers, they use a Buddy jacket (Ships divers, clearance divers, Search and Rescue, Engineers etc).

Having said that, the Sports diver is by far our largest customer, but we use the same guidelines wherever possible—find the niche market or find the USP. This often starts with something as simple as manufacturing something to satisfy my diving needs. I wanted a rebreather, I met someone who had a prototype, I met someone else who could do the electronics and together we developed the Inspiration rebreather. But the initial drive for me was to simply manufacture a piece of kit for myself. I have found that often works, having been using this principle since 1978, we of course always bear in mind the European Standards, good design practise and always have an eye on the final manufacturing procedure so we can produce the product in a cost effective manner.

we don't sell a rebreather to divers unless they have done a training course.

As regards to a business model, we are very difficult to categorise; there aren't many manufacturers who make 95% of all products in-house and do the distribution and sales and marketing, and so we tend to look at the real specialists in each field and try to emulate their strengths.

For instance, in R & D you have to say the Formula One teams really has the edge in getting a new design through to "market". Using the same fabric cutting machine as Renault Formula One, it has been a great privilege to visit their operation and see the investment and know-how in Research and Development, and now some years later, AP Valves is recognised as a "Beacon" company in the UK—particularly for its R & D side.

we tend to look at the real specialists in each field and try to emulate their strengths

Another example is the simple processing of orders. Amazon is one of the slickest operations, and we need to aim to be on a par with them and so are introducing an online ordering system for dive shops. Trade customers will have 24-hour access to their account online, and we hope to be able to offer 24-hour dispatch on major items and same-day dispatch for spares. But of course to do this the manufacturing systems within the factories need some changes too, and changing to a paperless system with computer flat-screens in every manufacturing cell along with new manufacturing control software all helps to focus the efforts.

AP Valves is family business. What advantages or disadvantages comes with that?

Martin Parker: I see nothing but advantages. The main advantage of course is that decisions can be made quite quickly.

We tend to take a medium to long term view when it comes to investing in new systems, processes or designs—we don't have the pressure to satisfy share holders in the short term. This is actually very important. Some investment decisions, for example, in production machinery, are pretty easy to make—how much will that machine or process make us, is it worth keeping it in house or should we have that done by someone else? But, when it came to the new ANSTI machine, for example, or some of the investments made in product research and development then those decisions are made with a 5 to 10 year plan in mind.

Is passion for diving a necessity or advantage when running a dive equipment manufacture?

Martin Parker: Without a doubt, passion is essential. That's what gives us the drive to progress continuously. It's also infectious, and having a team around me

The Buddy Nexus was designed to be "the first affordable, multi-mode dive computer designed for the full span of your diving career." It can be used for both conventional scuba diving on air, for technical diving with up to two mixes and for closed circuit diving with a constant pO_2 Rebreather.

The EVOLUTION Closed Circuit Rebreather weighs just 24kg with 2 x 2 litre onboard cylinders. It is compact, light, streamlined and a 1/3 smaller than the Inspiration from which it was derived.

Buddy vests are offered with a First-owner Lifetime Warranty. Judging from the very well worn speciemens sent in to Customer Service, owners appear to stick with their Buddy's for a very long time

manufacturer

The Buddy Redwing is designed to be used by technical divers

Testing the BCD's. Do they hold pressure over-night?

Passion is fine, but you need the systematic approach too.

that shares the passion is a real bonus. However, passion on its own isn't enough. You need the people who enjoy systems, making the system work so the company runs efficiently and methodically. It's combining the two that we are good at here at AP. One without the other reduces effectiveness. It's having the people on the telephone and the dedicated people to handle after-sales service that makes us stand apart from most companies in most industries, not just diving. Passion is fine, but you need the systematic approach too.

What started the venture into the rebreather business and when and why did it become a significant area of operation?

Martin Parker: Over the years, we get people approaching us with ideas and they simply want us to manufacture it for them or they want us to market and sell it and they want a royalty. Our rebreather story started in 1985 when we were approached with an idea for controlling flow into semi-closed rebreathers—an idea which might yet see the light of day. It was 10 years later, though, before we were approached again, and again, it was to manufacture a semi-closed rebreather. At the same time, we were approached by Draeger to help them with their new rebreather, which later became known as the Atlantis and later still, the Dolphin. While this was going on, in my spare time I was doing an open circuit Trimix course and my instructor, Dave Thompson, just happened to be playing with a Closed Circuit prototype. We got together and created the Inspiration.

Martin Parker, managing director of A P Valves and Ambient Pressure Diving demonstrates their ANSTI test facility

There seems to be a significant amount of people around who are either skeptical or outright consider rebreathers dangerous. What would you say to them?

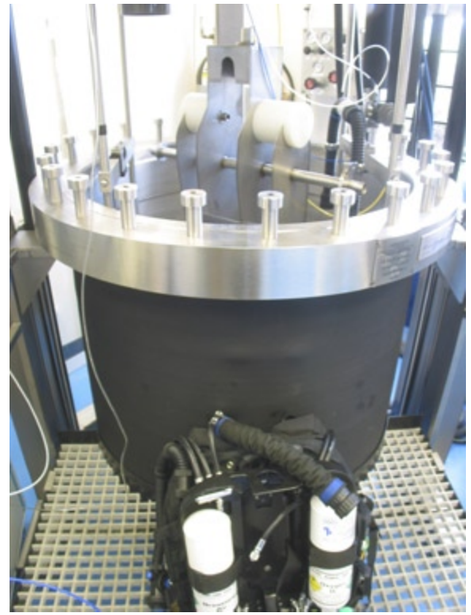
Martin Parker: This happens with every piece of new diving equipment. It took many years before dry suits gained the foothold they deserved and the same goes for the Fenzy before that and dive computers afterwards. In the late 80s, the importers of dive computers were vilified in the National Press (The Telegraph) for endangering the lives of divers just to satisfy their monetary ambitions. Well, to some extent of course they are right, but then diving is dangerous. Rebreathers bring different risks, but the key issue is that they are known risks, and known risks can easily be managed. Rebreathers virtually eliminate the main killer in conventional SCUBA—running out of air—and for some types of diving—mixed gas deep diving for instance—rebreathers are in my opinion much safer than open circuit. Once a diver gets an Inspiration, he finds it's a tool to be used for all his diving, and they very rarely go back to open circuit.

Selfsealing Surface Marker Buoy

Will rebreathers ever become cheap enough to win significant market shares from open circuit scuba? And what will it take to get to such a point?

Martin Parker: There is always going to be the holiday diver market revolving around a one-hour dive time, and these will always use open circuit. There will be a growing number of operators who will change their organisation to allow 1.5 hour plus dive times on rebreathers, and in fact, already there are specialist operators offering this

Diluent inflator on a CCR rebreather



In 2004-5, Ambient Pressure Diving installed a custom specified ANSTI 200m Test Facility with a fully integrated laboratory system specifically designed to test a range of life support systems under hard conditions—simulating depths down to 200m and water temperatures between -4°C to +50°C. The data derived from this unique test facility, which is the premier system of its kind, not only ensures that AP Valves and APD's products meet life support equipment European Standards and enable them to remain at the cutting edge of CCR manufacture for years to come, but the company also has the stated intention of putting "this extensive research ability" to the benefit of the knowledge-base of the rebreather diving community as a whole. ■

Close-up of the Head-Up display unit (HUD) on Inspiration/Evolution mouthpiece

for the enthusiast diver, the guy who dives nearly every week. Then, for sure, they will change to a CCR. There is no point in spending 20 minutes on the bottom on a 30m dive when you can spend an hour there on a CCR.

Rebreathers virtually eliminate the main killer in conventional SCUBA - running out of air

The one thing that will drive the price down is competition: We are investing heavily in tooling to allow us to produce units in larger and larger numbers. The advantage to that is we reduce the manufacturing cost and that makes us fitter and leaner to give the new competitors a hard time. The Inspiration created the rebreather market, and that was nearly 10 years ago. I have to say it has been lonely being the only CCR out there—and hopefully, we'll see some proper competition over the next few years. Competition is good for us.

Will it always require some sort of advanced training to dive with a rebreather or will technical advances lower the bar?

Martin Parker: Well, that depends on how far you want to go. I can teach someone to dive a rebreather safely in a couple of days, would they be equipped to dive it to any depth ? No, of course not. In fact, they wouldn't have had enough repetition of the skills to make them second nature, even to change the batteries. So, I think the course should remain, at a minimum, 4 to 5 full days. For sure, technical advances will lower the need for diver skills, in say calibration, exchanging sensors at 18 month intervals, changing scrubber material, but the advances will also increase the capability of the units allowing the divers to go further for longer. Then, the divers will still need extra skills and training. I don't see training as a barrier to sales, both activities compliment each other.

Will it become more commonplace to see divers with rebreathers rather than scuba on the beaches and on the boats, aside from certain special events and outside the tech diver circuits?

The one thing that will drive the price down is competition

Martin Parker: For us, I have always seen our market as the technical divers. They are the ones that HAVE to use a rebreather. Some may not realise it yet, but they will. The filtering back towards the sport level is definitely occurring, but how fast that happens is anyone's guess. When I set out, I thought it might take 20 years before divers actually start on a rebreather, instead of using open circuit. But here we are at nearly 10 years into that and some of the training agencies are planning rebreather courses for very basic level divers.

It is often heard in the dive industry that it is going through a recession. Is this really the case? And if so, what are the challenges that the industry is facing and what should be done to stay vital or to revitalise the industry?

Martin Parker: Good question. I think society is changing. The kids these days are used to a quick buzz. They play Nintendo—they want to have an instant gain for their pain. But worthwhile pastimes, like diving, like flying, take a commitment both in terms of finance and time, but then the rewards are much longer lasting. Right now, it's clear our market is the 35 to 60 age group with a few exceptions outside that range, and I think there is a decrease in the youngsters taking up the sport as a pastime. From our point of view, we concentrate on making sure we take a good slice of the pie that is available, and the products from both companies are designed to last in an environment where the customer dives as often as every week or even every day. This type of diver doesn't want flimsy materials that look good until they get wet or last for just a year before it needs replacing.

I think there is a decrease in the youngsters taking up the sport as a pastime.

One area of the market that is always growing is the holiday market. More and more people are trying diving while they are abroad, but that doesn't necessarily result in extra equipment sales. The challenge is going to be to attract those divers to take it up as a hobby at home, and the resort instructors can help with this. Telling their novice customers that the water is cold, the visibility is poor and the diving isn't such good quality at home is actually a short sighted thing to be telling the prospective diver. Encourage them to stay in the Sport and they will get more repeat bookings. So, I think the way forward to enlarge the market generally is to find a better way to tap this market.

On which areas are we most likely to see technological developments and innovation when it comes to dive equipment? Is there any area that needs it more than others?

Martin Parker: Personally, I'd like to buy the technology that will replace the chemical scrubber, and I'd like to see longer lasting oxygen sensors. With CCR, we are already at the stage where we are purely replacing the oxygen the diver uses, and so are as gas efficient as we will ever be.

When do we see the next big development come out of AP Valves/APD?

Martin Parker: Our R & D program is continuous. There are product launches for both companies planned for October this year, March and October next year. Our long term project is patented and development starts in summer 2007. ■

X-ray mag Business Directory

To order a directory listing:

Call or email to reserve space 30 days before publication. Text due 15 days before publication date. Send link and text info to: **BizDir@xray-mag.com**

€195 PER YEAR:
Six serial text listings (60 x 15 mm, 3 lines x 30 characters per line incl. spaces). Must be prepaid with credit card through PayPal.com and text received no later than 15 days before publication.

FORMAT:
LINE 1: Business name, city/state or province, country
LINE 2: Slogan or services/offers
LINE 3: Website or email address (active link)

INFORMATION:
www.xray-mag.com
BizDir@xray-mag.com

Dive Operators AMERICAS

At the Water's Edge, MA, USA
When you just gotta dive!
www.lovetodive.com
Captain Slate's Atlantis Dive Center
For the very best diving in the Florida Keys ***www.captianslate.com***
Tiedeman's Diving Center, NY, USA
Long Island's Premier Scuba Ed Facility
www.tdconline.com
Tuneffe Island Lodge
A private Caribbean Island
www.tuneffelodge.com
Utila Dive Center, Honduras
Welcome to the Whaleshark experts
www.utiladivecenter.com
Utopia Village *—Coming 2007: Dive, Fish, Relax in Utila, Honduras. Opening specials sign up* ***www.utopiautila.com***

Dive Operators EUROPE

Dive Academy Gran Canary Island
Europe's most southern dive center
www.diveacademy-grancanaria.com
Diving World, Netherlands
Dive travel specialists
www.divingworld.nl
Dykkercenter Langeland, Denmark
Cabins & Wreck diving in Denmark
www.dykkercenterlangeland.dk
Eden Roc Amigos Del Mar
Costa Brava Irish owned, reef, wrecks, caves, Clubs & individuals welcome
www.eden-roc-dive.com
Media-Sub, Erstein, France *—Underwater video and photography equipment and service* ***www.mediasub.com***
Profondo Blu, Ustica
An underwater paradise in the Med
www.ustica-diving.it
Scuba.Lu, Luxemburg *—Diving Luxemburg-Worldwide expeditions*
www.scuba.lu
Timuna Sea, London, UK
Premier diving specialist in East London
www.timunasea.com
West Wales Diving Center, UK
Longest serving dive center in Wales
www.westwalesdivers.co.uk
Zapp Divers, Denmark
Dive tours around Jutland
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

Dive Operators ASIA

Bali International Diving Professionals
Specialists in Macro to Pelagic Sights
bidp-balidiving.com
Big Bubble Center, Singapore
Taking the mystery out of scuba diving
www.bigbubble.com
Delphis Diving, Maldives
Since 1982. Safe, personal & organised
www.delphis.com.mv
Ocean Adventures *—Philippines Welcome to the world of wonder*
www.oceanadventure.com.ph
Sipadan Water Village Resort, Sabah
Luxurious diving resort in Borneo
www.swvresort.com
Tioman Scuba *—Finest diving at the best price in Peninsula Malaysia*
www.tiomanscuba.com

Dive Operators AUSTRALIA

Abyss Scuba Diving, Sydney Australia
Scuba diving in Australia is worldclass
www.abyss.com.au
Aquapro Dive Services Australia
Your first choice for instructor training
www.aquaprodive.com
Deep Sea Divers Den, Australia
Diving Great Barrier Reef & Queensland ***www.diversden.com.au***
Eagle Hawk Dive Center, Tasmania
Tazmanian Peninsula dive specialists
www.eaglehawkdive.com.au
New Zealand Dive Experiences
Expand your diving and underwater photography horizons in Kiwi country
www.nzdivexperiences.com
Ningaloo Reef Dive, Western Australia
Preferred operators on the West Coast
www.ningalooreefdive.com.au
Perth Diving, Australia *—Western Australia's premier diving organisation*
www.perthdiving.com.au

Liveaboards

Adventure H2O, Indonesia *—Luxury dive travel in Bali, Komodo, Raja Ampat, Manado* ***www.adventureh2o.com***
Nautilus Explorer Liveaboard, USA
Diving Mantas to Icebergs
www.nautilusexplorer.com
Ocean Rover *—Cruises in Thailand, Myanmar, Indonesia and Malaysia*
www.oceanrover.com
SMY Ondina *—Dive Indonesia*
www.smyondina.com
www.thebestdivingintheworld.co
Star Dancer Liveaboard, Australia
Peter Huges Diving Adventures
www.peterhughes.com
Swanido, Biak, Indonesia *Discover the Hidden Treasures in Cenderawasih Bay*
www.swanido.com

SCUBA & UWP Clubs

Aalesunds Sportsdykkerclub, Norway
På Voldsdalsberga ved Borgundfjorden
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
Bottom Bunch Dive Club, San Diego, US
Promoting safe diving and having fun
www.bottombunchdiveclub.com
British Sub Aqua Club (BSAC), UK
Where sport diving began...
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***
Northumbria Sub Aqua Club, UK
Dive training and trips
www.divenorthumbria.co.uk
Saddleworth Sub-Aqua Club, UK
Based in the Pannine hills of Lancashire
www.saddleworth-subaqua.co.uk
Southern Division Diving Club
Netherlands: Dive with us, you can't sink lower! ***www.sd-diving.nl***
The Dive Club, NY, USA
Diving Long Island by boat & car
www.thediveclub.com
Tufts University Scuba Club, MA, USA
New adventures, new buddies
www.ase.tufts.edu/scuba
Underwater BC Photography Society
Vancouver, British Columbia, Canada
www.ubcps.bc.ca

Dive Shops

Watersport, Copenhagen, Denmark
Located in Amager Strandpark

WATER SPORT.DK

Carlsens Dykkercenter, Denmark
Education, Equipment & Service
www.cdcdyk.dk
Deep Six Underwater Systems, USA
New Paltz, NY —We ship worldwide
www.deep-six.com
Divers Supply, USA *—Shop us for the best prices, equipment and service!*
www.diverssupplyusa.com
Dykkercentret, Denmark
Danish dive shop & online store
www.dykcen.dk
Diveshoppen, Denmark
In the heart of Copenhagen
www.diveshoppen.dk
LondonDivingNet *—The best place in London to learn to dive*
www.londondiving.net
Ocean Dive Explorers, Denmark
TDI/SDI Scandinavia
www.oceandive.dk
SuperDive.dk *—Copenhagen dive center, tours and trips PADI, NAUI and NAUI Tech NAUI representative in Denmark*
www.superdive.dk
Simply Scuba, UK & International
One-stop online dive shop
www.simplyscuba.com
Thyges Dykkercenter, Denmark *—IAHD 5 star PADI instructor development ctr*
www.thygedive.dk

Dive Travel Agents

Penguin Travel International, Europe
Dive travel to Lake Baikal & White Sea
www.penguintravel.dk
US Dive Travel Network, USA
Not just a vacation, an adventure!
www.usdivetravel.com

Illustration by Simon Cooke. This cartoon and other scuba funnies are available on t-shirts and greeting cards at: **www.thecartoonery.co.uk**

X-ray mag

Business Directory

Publishers

Best Publishing Co, Flagstaff, AZ, USA
Scuba diving & hyperbaric medicine
www.bestpub.com
Oceans Enterprises
Diving and Underwater Books
www.oceans.com.au
Pine Belt Publishing
Onlline Book Distributors
www.pinebeltpublishing.com

Dive Manufacturers

Cochran
Undersea Technology
www.divecochran.com
Dive Junkie, Singapore *—Fun, fashionable and expressive scuba dive t-shirts*
www.divejunkie.com.sg
Diving Unlimited International, USA
Unlimited comfort, performance, quality
dui-online.com
Fourth Element, UK *—High tech, high quality dive clothing and design*
www.fourthelement.com
MB Sub Diving Lamps, Germany
Underwater torch, compact, photo, video & HID lights ***www.mb-sub.com***
Nocturnal Lights, CA, USA —Advanced *lighting systems for diving, UWP, video*
www.nocturnallights.com
NEW! Mask Saver & Mask Saver Deluxe
The ultimate mask straps for comfort and safety ***www.oceangoods.com***
Reefling Clothing
Divewear that inspires diving
www.reefling.com
Silent Diving Systems, USA
Closed circuit rebreather distribution
www.silentdiving.com

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
Swedish divelink index
www.dykcentralen.se
Lines & Shadows *—Home of the best source of UWP, travel & adventure*
www.linesandshadows.com
NauticFriend.com *—The Ultimate Worldwide Watersports Directory*
www.nauticfriend.com
Onderwaterfoto, Netherlands
Digital UWP Forum
www.onderwaterfoto.net
One Ocean *—Earn frequent diver points toward equipment & travel*
www.oneocean.com
Patrick Musimu, Freediving Champion
Accept No Limits
www.patrickmusimu.com
Scuba Duba *—Online diving resource for news, equipment, buddies & travel*
www.scubaduba.com
Scuba Spots *—The World's Oldest, Largest Scuba Directory*
www.scubaspots.com
Scuba.start4all.com *—Diving directory in cooperation with Diving World*
www.scuba.start4all.com
ScubaDiveSites.com, Australia
Listing Dive Sites Worldwide
www.scubadivesites.com
UK Diving *—UK Scuba Diving Resource & Network*
www.ukdivers.com
Underwater Australasia *—Australia & Asia Pacific's most popular dive portal*
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

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

UWP Manufacturers

Media Sub, France *Underwater photography & video equipment and services*
www.medisub.com

UWP Competitions

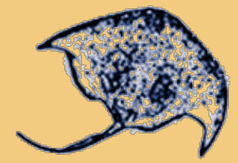
National Wildlife Photography Awards
Deadline: July 15th, 2006
www.nwf.org
Santa Barbara Ocean Film Festival
Deadline: August 30, 2006
www.ocean.com
XARIFA Unterwasser Foto & Film Festival
14-15 October 2006, Germany
www.uwfv.de/xarifa
World Festival of Underwater Pictures
25-29 October 2006, Antibes,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

UW Photo, Video, Film

Alex Mustard, PhD, UK
UWP and Marine Biologist
www.amustard.com
Amos Nachoum Big Animals
Worldwide expeditions & adventure
www.biganimals.com
Bill Becher Outdoor & Adventure
Writing & Photography —CA, USA
www.becher.com
Cathy Church, Cayman Islands
UWP Center, Classes, Trips, Services
www.cathychurch.com
City Seahorse, Dallas, TX, USA
UWP & Raja Ampat stock & tours
www.cityseahorse.com
Edwin Marcow, UK
Marine & Wildlife Photographer
www.edwinmarcow.com
Jack Connick, WA, USA
UWP & Graphic Design
www.opticalocean.com
John Collins Photography, Kinsale, UK
Cool Waters-Emeral Seas
www.johncollinskinsale.com
Jon Gross & Keith Clements, WA, USA
Marine Life Index
www.seaotter.com
Michael Portelly, UK
Director and Cinematographer
www.portelly.com
Nonoy Tan, Metro Manila, Philippines
Underwater images of the Philippines
nonoytan@yahoo.com
Poppe Images, Philippines
Marine Iconography of the Philippines
www.poppe-images.com
Thomas Peschak, South Africa
Africa's Oceans and Coasts
www.currentsofcontrast.com
Tony White, UK
Underwater imagery at its best!
www.seaofdreams.co.uk
UV Foto, Norway
Underwater photos of Stein Johnsen
www.uvfoto.no
Water Ventures
Travel, diving and culinary images
www.waterventures.no

WATER VENTURES
Images & features

Wet & Weird



News edited by Gunild Symes

Making waves: Press under pressure

Yet another underwater record for the record books. Twenty-one Austrian journalists took part in an underwater press conference in a lake. The reporters claim to have broken the world's record set by 15 journalists in an underwater press conference that took place in Las Vegas last year.

A new book on diving by Austrian authors Leo Ochsenbauer und Klaus-M. Schremser published by Europics was the focus of the Austrian press conference where fully outfitted journalists met 16ft below the surface of Traun Lake in Austria.

Armed with special waterproof pens and paper, the 21 reporters asked the tough questions while an underwater flipchart was set up for the presentation.

A public notary witnessed the event, so the group plans to submit their claim with the Guinness Book of Records. ■
Source: Ananova

Great Farting Fish!

New studies reveal: Farting may save a fish's life

Killer whales click and whistle underneath large schools of herring to scare and herd the fish upwards into a baitball at the surface of the sea where the whales will then slap their great tail fins to stun the fish for a tasty meal. But some fish manage to escape under the cover of a veil of their own gas. Yes, indeed, it seems that fish fart to flee according to two papers presented at an Acoustical Society of America Meeting in Rhode Island, USA, this year.

Scientists say that as the fish ascend, air bubbles are released from the anal ducts of the herring. It is not known whether or not fish that remain at one depth will release gas because they are faced with a predator, but it is known that the bubbles released can confuse or scare a predator, thereby making it easier for the fish to escape. While scientists say the fish may be doing this to avoid becoming dinner, they admit that the expelled gas might also just be inadvertant. ■
Source: Discovery News

C H I H U L Y

S E A F O R M S

Effortlessly I glide through a sapphire sea, admiring sparkles on the underside of slick, moving wavelets rimmed with light, gently cupping an ephemeral bit of living jelly in my hand, then turning to glimpse a dazzling sight: corals, sponges, anemones, in a riot of soft pinks, blazing reds, luminous oranges, all marked with the disciplined wildness that I love in nature—and in the Seaforms. I want to touch my tongue to the ice-clear blue smoothness of one, taste the colors allow the texture to merge with the skin of my fingertips, feel the links between humankind and that realm where most of life on earth is concentrated—the sea.

— Sylvia Earle on Chihuly Seaforms

One of the most reknown and revered glass artists of our time, Dale Chihuly, is a legend in the art world having taken the art of glass to new heights. His glass works are exhibited in over 200 museum collections around the world.

Known for his organic forms and environmentally sensitive creations, Chihuly has also created glass installations for various environments beyond the conventional gallery including bridges, glass houses and botanical gardens in the US, the Royal Gardens in London, the canals and piazzes of Venice and the Tower of David Museum in Jerusalem where over one million visitors came to see his work. In these installations, the artist juxtaposed monumental, organically shaped sculptural forms with beautiful landscaping and established an immediate and direct interaction between art and nature.

Chihuly was born in Tacoma, Washington, USA, in 1941 and was introduced to the glass arts while studying interior design at the University of Washington. Upon graduating, Chihuly

Text by Gunild Symes
Photos courtesy of Dale Chihuly

Dale Chihuly
Norse Blue Seaform Set with Yellow Lip Wraps, 2002
10 x 28 25 inches. Photo by Scott Mitchell Lean

PREVIOUS PAGE: Detail of Wichita Art Museum Persian Seaform Installation, 2003, by Dale Chihuly. Photo by Jan Cook

Dale Chihuly
Bombay Brown and Almond Seaform Set with Dark Lip Wraps, 1998
12 x 26 x 14 inches
Photo by Scott Mitchell Leen

Dale Chihuly
Octopus Hovering on Coral Orange Base, 1999
29 x 17 x 17 inches
Photo by Scott Mitchell Leen

Dale Chihuly
Pale Green Seaform Set, 1986
7 x 22 x 22 inches
Photo by Teresa Nouri Rishel

Chihuly

enrolled in the first glass arts program in the country at the University of Wisconsin. At the Rhode Island School of Design, he continued his studies. It was at this school where Chihuly established a glass program and taught for more than a decade.

A change in his creative process came when, in 1968, Chihuly was awarded a Fulbright Fellowship to work at the Venini factory in Venice, Italy. While in this beautiful city, Chihuly observed the team approach to blowing glass. This team approach was to become a critical element in the way Chihuly works today. Shortly after the fellowship, Chihuly cofounded Pilchuck Glass School in Washington in 1971. Since then, Chihuly, with his international glass center, has led the avant-garde in the development of glass as a fine art.

The Seaforms call forth associations with water, marine life and movement without depicting them and that's why they so persuasively affect us as art.
— Joan Seeman Robinson, Artforum

Seaforms

Chihuly developed the Seaforms series over time. The forms, which have reappeared in ever-evolving configurations since 1971, allude to Chihuly's childhood in Tacoma, where he developed a love of the sea and recognized its importance to the Pacific Northwest economy.

With the Seaforms series, Chihuly investigates the play of natural light on and within glass, finding ways to exploit its translucency and transparency. The effect is breathtaking and draws forward, in an almost tactile manner, the delicate fragility and fluid elegance of nature and life under the waves of the sea.

In a video clip on his website, Chihuly explains, "Glass is defined as a super-cooled liquid that is transparent like water. So, the idea that the [Seaform] objects look like they come from the sea is no accident. They are almost like water itself."

Chihuly goes on to say that animals and plants in the sea often look similar, and that in the sea, everything has an organic and moving quality. Marine life is often very transparent like the water in which they live.

At the time of the development of the Seaforms, the artist was experimenting with making glass thinner and more transparent without losing its strength. He used an optical mold which gives glass a texture like corrogated cardboard and makes the glass thinner and stronger. He found that when the glass was blown with this corrogated pattern, it looked like a seashell. So, the basket-like creations he made with this corrogated glass naturally became seaforms.

Chihuly continued to push the glass to get a more aquatic feeling and take the developing Seaforms into different directions. For instance, by creating and using a new mold with fins, it made the glass forms look like sea anemone.

Always artistically inquisitive, Chihuly, wanted to see what some of these new Seaforms looked like under water, so he placed them in the lap pool in his studio. Thereby, one could swim over the forms as if swimming over a natural reef.

The artist likes to juxtapose the man-made and the natural. So, when people look at the Seaforms under the water, they wonder, "Are they man-made, or did they come from nature?" Chihuly says that this is an important part of his work.

For more information, please visit the Chihuly website at: **www.chihuly.com** ■

Dale Chihuly
Topaz Seaform with Black Lip Wrap, 1999
8 x 17 x 10 inches
Photo by Scott Mitchell Leen

Chihuly

Dale Chihuly
Seaform Basket Drawing, 1982
30 x 22 inches
Photo by Teresa Nouri Rishel

Dale Chihuly
Seaform Basket Drawing, 1998
30 x 22 inches
Photo by Teresa Nouri Rishel

Dale Chihuly
Cirrus White Seaform Set with Clove Lip Wraps, 1999
11 x 18 x 12 inches
Photo by Scott Mitchell Leen

Chihuly

William Morris (left) and Dale Chihuly (right) in the hotshop at Pilchuck Glass School Stanwood, Washington, 1985. Photo by Corrine F. Kolstad

UPCOMING EXHIBITS - USA

AUGUST 8 – AUGUST 13, 2006
CHIHULY IN TACOMA
MUSEUM OF GLASS, TACOMA, WASHINGTON

APRIL 30 – OCTOBER 31, 2006
GLASS IN THE GARDEN:
CHIHULY AT THE MISSOURI BOTANICAL GARDEN
MISSOURI BOTANICAL GARDEN, ST. LOUIS, MISSOURI

JUNE 25 – OCTOBER 29, 2006
CHIHULY AT THE NEW YORK BOTANICAL GARDEN
NEW YORK BOTANICAL GARDEN, BRONX, NEW YORK

APRIL 30 – DECEMBER 10, 2006
GROUP EXHIBITION: GLASS: MATERIAL MATTERS
LOS ANGELES COUNTY MUSEUM OF ART
LOS ANGELES, CALIFORNIA

MAY 4 – OCTOBER 15, 2006
GROUP EXHIBITION: A TRANSPARENT LEGACY:
STUDIO GLASS GIFTED TO SAM FROM THE COLLECTION
OF JON AND MARY SHIRLEY
SEATTLE ART MUSEUM, SEATTLE, WASHINGTON

JULY 14 – SEPTEMBER 14, 2006
CHIHULY EXHIBITION
THE LOWE GALLERY, ATLANTA, GEORGIA

AUGUST 3 – SEPTEMBER 7, 2006
CHIHULY EXHIBITION
FOSTER WHITE GALLERY, SEATTLE, WASHINGTON

AUGUST 5 – SEPTEMBER 10, 2006
CHIHULY EXHIBITION
WILLIAM TRAVER GALLERY
TACOMA, WASHINGTON

SEPTEMBER 14 – OCTOBER 15, 2006
CHIHULY EXHIBITION
MARLBOROUGH GALLERY, NEW YORK, NEW YORK

OCTOBER 7, 2006 – FEBRUARY 25, 2007
FIORI: A CHIHULY GARDEN OF GLASS
FRANKLIN PARK CONSERVATORY, COLUMBUS, OHIO

IN OUR NEXT ISSUE

Island Diving in the New World
Vancouver Island
The Galapagos

COMING IN OCTOBER
Subscribe now FREE!
www.xray-mag.com