



GLOBAL EDITION
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Discover Solomon Islands

Medical
Diving with
Diabetes

Portfolio
David Pilosof

Deep Diving
Do It Right

Ecology
Stingrays

Travel Tips
For Mermaids
Going it Alone

AWESOME
Australia

TIGER SHARKS BYRON BAY BONDI BEACH
NINGALOO REEF TASMANIA KENT GROUP

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COVER PHOTO
Diver with Big Eye Jacks, by Peter Pinnock

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Holiday Shopping for Divers... See page 75*

14K GOLD SEA TURTLE PENDANT DESIGNED BY EVAN LLOYD
PRICED AT US\$281.25 WWW.LLOYDSLIMITED.COM

Manta Ray. Photos by Wags & Kelly



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There are "Only 50 years left" for sea fish", "UN considers deep sea trawling ban", "Seafood stocks are under siege, scientists say" and "Collapse of All Wild Fisheries Predicted in 45 Years".

Well, these were some random pickings from another bunch of joyful headlines from the past month or so. Almost makes you want to cancel the paper, no?

Of course most of the press corps goes right over the top as usual blowing things totally out of proportion losing track of both facts and common sense. Then, just as predictable, in a knee-jerk reaction, some short-sighted fishermen tries to rubbish the scientists' findings right away in a desperate attempt to protect their livelihoods, as if it were the scientists who had invented the depletion of fish stocks. And so, the pendulum swings and debate goes on in the same predictable grooves with little real action taken.

"Impact of Fishing on Species Found to be Unpredictable"

The longstanding debate on the impact of fishing on the variability of fishing stock in the world's oceans then just got a tad bit more complicated as research published in *Nature* this past October pointed out that the impact of fishing on the populations of fish varies too much to be predictable. That led the researchers to conclude that its impossible to predict whether specific fish populations will collapse or rebound.



These findings which imply that fishing can contribute to a boom or bust swing in the supplies of the targeted fish stock surprised some scientists, who allegedly thought that fishing just caused predictable depletion. But it turned out that sometimes it can cause an

The bottom line is, quite simply, that we don't need complicated science to tell us that the way we effect, interact with and depend on the global ecosystem will be sending the whole planet and humanity down the tubes, if we don't change course dramatically and soon.

increase. That makes predicting the amount of fish stock hard and can lead to the collapse of fishing stocks when a bust follows a boom.

Do'h!

I don't know where the surprise comes in, and which serious researchers were actually surprised. I was dumbfounded. There is nothing new or mysterious in these 'news'.

You see, in my other previous life, I used to be a researcher myself working with ecological modelling, and my special area of interest was looking into the progression of ecosystems over time and defining the limits of ecosystems' structural integrity and which changes are likely if these limits were overstepped, i.e. by external disturbances. In other words, if we compare an ecosystem to a building, how much perturbation

Running Out of Fish Are We Now?

and shaking can it take before it comes tumbling down in ruins and becomes something else?

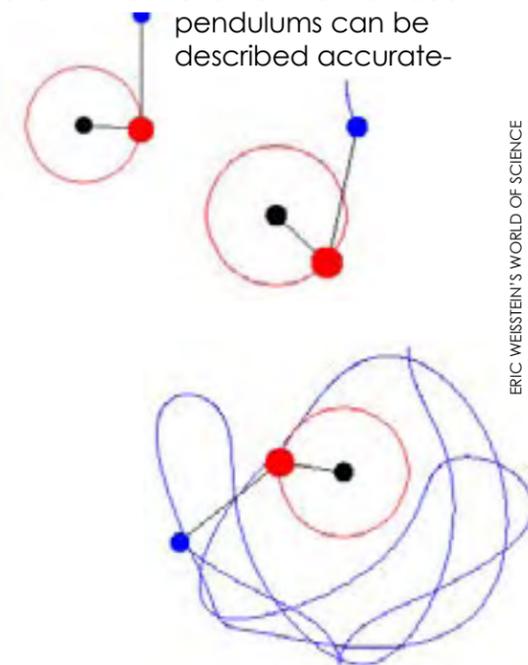
Put simply

Now, to make a very long-winded and technical explanation very short, suffice it to say that once systems get a just a teeny-weeny bit complex, their future behaviour can't be predicted accurately. You have to resort to modellin—for example in computers—where you simulate possible outcomes.

Just consider a simple pendulum. The motion of this can be very accurately calculated.

It was even used in clocks once, right? But suspend one pendulum beneath another and the whole system—even as simple as this and even if the motion of the individual

pendulums can be described accurately-



[Click here to see it in motion](#)

ERIC WEISSTEIN'S WORLD OF SCIENCE

ly—soon exhibits chaotic behaviour.

Ecosystems are also systems of inter-linked subsystems, but way more complex, in what is popularly called the food web.

Can we, from looking at the components, predict where it is all going? No!

The unpredictability of complex systems was already established in the 1930's, so where does the surprise come in again?

Can we, from the whole ecosystem's apparent behaviour and trend and inferences from past experiences and examples, make any reasonable guess-timates as to where we are heading? Did we learn anything from almost wiping out the North American bison, the pacific salmon, the rhino, the tiger? Hopefully, yes!

A final note

The bottom line is, quite simply, that we don't need complicated science to tell us that the way we effect, interact with and depend on the global ecosystem will be sending the whole planet and humanity down the tubes, if we don't change course dramatically and soon.

We just need to open our eyes. The fishes are all gone in some places, and steadily declining elsewhere. The progression of this development doesn't take a scientist to figure out (says this under-signed scientist).

You can start by shopping responsibly next time you go to the supermarket! ■



KURT AMSLER / SOS SEATURTLES

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Want to know why? Turn to page 68 and read on

The "Awesome Australia" travel section in this issue was brought to you thanks to our associates from underwaterwater.com.au:



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This issue of X-RAY MAG and others 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.



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Seen at DEMA 2006 NEWS & Equipment

Impressions from the 30th DEMA Orlando, November 8-11



PETER SYMES

Uh-oh. Time for the annual DEMA report again. Like tax returns, it routinely catches me a bit off-guard that it's already that time of year again. I always struggle a bit with either one as I have to put all my creativity into one report but none whatsoever into the other—but here we go...

By Peter Symes
With additional reporting and photography by
Millis Keegan
Jason Heller
and Eric Cheng

For dive industry professionals worldwide, DEMA is one of the major annual highlights of the year. As is the case with Christmas, anticipation tends to start early nurturing ongoing speculation about what surprises will be unveiled this year by the secretive manufacturers. For the uninitiated, the DEMA show is the biggest and most significant dive trade show on the planet, but it is also a trade show with admission for dive industry professionals only—it is off limits for the general public. In a convention hall that looks like the size of Boeing's 747 assembly building, over 600 exhibitors from all over the world have erected what seems to be a small town of booths and displays big enough to warrant its own tram line.

Along the seemingly endless rows of long isles of booths, pavilions and exhibitions, we find a diverse mixture of established equipment brands—such as Suunto, Mares, Aqualung and many others—blended with a sound undergrowth of sprouting enterprises all vying for the interest of the pro-

PETER SYMES

spective buyers, some of which actually brought some fresh thinking to the table. On the floor, we also find resorts and dive operators from all continents offering their

wares interspersed with training agencies, publishers, environmental organizations, treasure hunters, dive magazines, apparel and jewellery and every imaginable flavour



Ran Vered, David Doubilet, and Howard Rosenstein from Fantasea

JASON HELLER



JASON HELLER

Wayne Hasson, from the Aggressor Fleet, organized busloads of 200 high school students to tour the show floor and learn about careers in diving



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Silly or Great?

We used to be on the lookout for the craziest or most silly invention at the DEMA show, such as the twin tube snorkel or the snorkel with built-in FM-radio. This year, however, we are not quite sure whether the Amphibian fin by brothers Abraham and Ronen qualifies or it is a stroke of genius in disguise. We are all quite familiar with the problematic issue of walking around in fins, right? In this original fin design, the blades pivot up thanks to hinges placed on both sides of the foot. Since the fin is already in two pieces, OmegaAquatics plans to add more features like interchangeable blades in the coming year. Currently available in colors of blue, yellow, green and grey. www.omegaaquatics.com

of ocean-related businesses. So, how was this year's DEMA, the 30th of its kind? I have been to 13 of the past 15, and in these years, it has always been a dynamic marketplace—some years much more so than others. The past couple of years have been disturbingly quiet, with the show in Houston in 2004 being an outright lame show low point. The

dive industry has been struggling since the turn of the millennium, and it has experienced a strong change in dive travel, which 9/11, SARS and the turmoil in the Middle East didn't exactly help. So, it was a pleasure to see that at this year's show, a lot of the 1990's dynamic energy was back. Most of the major manufacturers were back in the show, and there was once more some interesting news

here and there, which will be presented in the following pages. But DEMA is much more than just displaying new inventions and travel destinations, it is also a buzzing meeting place where numerous seminars are held. ■



A typical scene: Bartering on the show floor. Bob Evans, founder and of Force Fin, demonstrates his latest design



Some of our fellow digital media 'accomplices'. Wendy and Jason Heller of DivePhotoGuide (above) and (right) Eric Cheng of WetPixel and Willy Volk of Divester



Ear dryer

The Sahara DryEar ear dryer circulates safe, gentle, warm air inside the ear canal and evaporates the trapped water leaving the natural environment in the ear relatively unchanged. It's the first ever, totally natural way to dry your ears and at the same time minimize the number of infections due to the moist environment in the ears after a dive. www.dryear.net



DEMA SHOW



Now for saltwater

The new Submerge model is a fast u/w scooter that weighs under 50 pounds. With its single 20 cell pack it is supposed to run a minimum of 60 minutes up to 100 minutes. It has the same driveline/motor and construction as previous models, and comes with a three-year corrosion warranty. www.silent-submersion.com



Liquivision

We were looking for something new in mask design, and I think we found it. The mask that you don't have to equalize, is that even possible? The Nirvana-2 says it is, the mask is filled with salty saline water, and the special lenses in the goggle is supposed to correct your vision. Because the goggle is filled with water, it can never fog or leak. It sounds to good to be true, and I can't wait to try a pair. www.liquivision.ca

Analox

It only takes a small concentration of Carbon Monoxide, breathed at pressure, to have an adverse effect on the human body. The Analox CO Clear™, with a fixed alarm, that continuously monitors for high levels of Carbon Monoxide contamination from compressors is a tool to help a filling station to deliver clean air.

www.analox.net



Mares Alikai

Today, we are highly weight restricted when traveling by air, and Mares has taken that to heart when presenting this lightweight BC for women. It folds to a compact size, is comfortable and promises a great buoyancy lift. A special feature to save the back, is the Trim Weight pockets, placed on the tank strap, holding up to 6kg/13lbs.

Will women be attracted by the fact that Alikai means the "Queen of the Sea"? www.mares.com



Status

It's here. The regulator that monitors your use and tells you when it needs service. The Apeks Status compact first stage accomplishes that with a digital display. This could save you some money. The Status is compatible to EAN 40 and comes standard with an environmental dry kit suitable for cold water diving. Four medium pressure ports 3/8" UNF and one high pressure port 7/16" UNF. www.apeks.co.uk



Cobra2

The air integrated Suunto Cobra2 is a full-featured decompression dive computer. It monitors and displays pressure, tracks your rate of air consumption and continuously calculates your remaining air time. Two-gas switching Nitrox, Air, and Gauge modes, and an electronic compass with tilt sensor perfects this tool.

www.suunto.com

MorFin

These fins created with hydrodynamic 'wing' shapes aspire to lift you forward in the water like a small airplane. They can be used with traditional strokes, but their strength shows when using the dolphin kick.

Mor-fin.com



DEMA SHOW



Wide screen

Designed to be easy-to-read, a large size display was one of the primary requirements. To optimize readability in every circumstance, special attention was also paid to the size and brightness of the numbers when designing this piece —so was maximizing the viewing angle of Nemo Wide. You have an easy four button access to the system and a nice ergonomic design for comfort.

www.mares.com

Aqualung i3

Next step in BC technology is the streamlined Sea Quest Pro QD with an integrated inflation and deflation system. The system has the diver controlling ascent and descent by pulling a lever up and down. The lever is fixed to the BC on the left lower side. Pull up, and air from the tank enters the BC; pull down, and **both** the upper and lower one-way air valve simultaneously releases air from the BC. This makes venting easier if you are in a head down position. For some old timers, this might take some time getting used to, but the nice streamlined design could make up for that. Another neat feature is the flat contour of the valves, they are now actually embedded in the vest rather than sitting on top of it.

www.aqualung.com



Swiss Video Lights

This small and powerful video light gives a natural white light of daylight quality with a color temperature of 5200 Kelvin at 21 watts. It has eight settings ranging from 14 to 28 watts. The light includes a bracket that mounts easily on standard arm systems and to top that off, it adds only 0.27kg to your gear. Burn time is 100-180 minutes. Another good feature is the overtemperature protection that allows you to use the light also outside the water.

www.keldanlights.com



It's smaller than you think



DEMA SHOW

Henderson

Perhaps Henderson's most highly advanced, patent pending material. The material called Insta Dry™ dries in just minutes. It is still warm, has anti-microbial properties and keeps the water shedding. The outer layer is made of durable, non-pilling Micro Mesh high carbon.

www.hendersonusa.com



Hot Down Under

It can get cold while diving even in Florida, but with the help of the "Heated Kidney Belt" you can keep warm under your suit. Put your kidney belt on, and when needed, a push on the right spot will release heat for up to an hour.

www.hotsuits.com.au



And it will lead you through the dive with light. It really doesn't matter how good a dive computer is if you can't see the display when you are diving. The display of the Liquivision F1 - Technical Grade Bottom Timer really shows you big fonts on the display, bright and clear, with a 180 degree viewing angle. You can not miss your dive time and depth unless you close your eyes. www.liquivision.ca



Ladies only

The first and only regulator dedicated to women, writes Mares in their new 2007 catalogue. It is elegant, it is lightweight and comes (except in the US) with a anatomically designed 'jAX mouth-piece' that can be custom moulded. The second stage is built over the Mares Proton.

www.mares.com



Whites Catalyst

Unique above the shoulder to shoulder self entry system CSS – patented Captive Suspension System panels all around the waist and above the knees (360°!) and revolutionary pattern design allowing seven sizes to fit 90% of all human beings!
www.whitesdiving.com

May the Force (Fin) be with you

Bob Evans once again releases a forceful fin, not like any other. As always, a futuristic design, colorful, like nothing before seen. The beauty of his new innovative models are that the blades are exchangeable. You keep the new comfortable footpocket and pick the fin blade that fits the dive you are about to do. www.forcefin.com



Vyper2

The Suunto Vyper2 includes Gauge and Nitrox modes as the predecessor, but with the added feature of gas switching. The Suunto Vyper2 can be programmed in one percent increments for nitrox mixtures between 21 and 100 percent oxygen. It is also possible to adjust oxygen partial pressure between 0.5 and 1.6 bar in 0.1-unit increments. Adjustments can be applied to both mixes. Wear it as a wrist unit with a protective boot, or mount it on a two-gauge console. www.suunto.com



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Let there be light

This new edition of the Neptune Space mask is constructed with parts made of Ergal, a lightweight and durable aluminum compound used in aeronautics for applications requiring high mechanical resistance. These parts have a light gold finish which recalls the helmets of the first deep water divers. The mask design allows divers to make sensitive micro adjustments to the airflow, even when using gloves. Surface treatments protect the mask from salt water damage and tech-polymer protection treatments allow the PREDATOR to be used in extreme conditions. The total weight of the mask is 970 g with a positive buoyancy of just 296 g, creating a light and comfortable fit.

www.oceanreefgroup.com

Side exhaust

The Aqualung Kronos regulator has a combined venturi and breathing-resistance knob to simplify adjustments and also sports a side exhaust system to warm the internal components and

disperse bubbles—which especially photographers will know to value. www.aqualung.com



TB130 Oxy booster

This is a single stage, single acting air-driven gas booster pump (also suitable for oxygen) All components are O₂ clean. Technical Information: Length 600 mm/23.62 in, width 200 mm/7.87 in, net weight 15 kg/35 pounds (without whips) www.airetex.com

AquaSketch



This new gadget, meant to replace the u/w slates has a phosphorescent writing surface that illuminates during night dives. Use the included Graphite pencils to write on a 5-foot roll of blank Vellum and sketch little Nemo if your buddy is boring.

www.aquasketch.com



Arc Lenses

All Atomic Aquatics masks come standard with their special Ultra-Clear optical quality glass with exceptional clarity, light transmission, and no color distortion. ARC technology coatings further improve this already incredible lens material by reducing reflections and by allowing more light in the diving mask. Atomic Aquatics introduced Ultra-Clear to the diving industry and has never used low cost, poor quality green float glass like the other masks on the market. www.atomicaquatics.com

Weezle

Cold feet are a major complaint of divers. Weezle boots use the same innovative materials as used in their undersuits. Available in Compact and Extreme Weights. Instead of having an undersuit sock that finishes at the ankle, we have extended it up the leg to just below the knee. Ankle weight wearers will find that this also adds a layer of comfort not featured in other undersuits and long-legged people will avoid having a cold gap. www.weezle.co.uk



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Aeris mask HUD

Not really the latest news as it was launched by Oceanic mid 2006, but finally we got to try one on. Like a Porsche, this mask is sort of on the pricey side, but the finish is very nice and has a luxurious feel to it. The mask feels good and, most importantly, the HUD display is both clear and easily visible, yet not too imposing. Great for photographers and others who carry stuff around and need to stay focused. www.diveaeris.com



Nitelze LED Wand

15 hours is how long a tiny button battery will last you on this signal wand, or marker, from Nitelze. It is shock and waterproof with a depth rating of 1000ft / 300m. It also doubles as a handy pointer. www.niteize.com



H2Odysea Regulator

The "Magnum" is H2Odysea's third generation regulator. What struck me upon handling it at the show is how compact the first stage was and the exceptional finish. This forged brass first stage, with environmental sealing, screws into any size tank with 3/4" thread. It is mostly used for redundant air systems but can also be used on rebreathers and argon systems. **(no website found)**



Smoke on the Water

No, we are not referring to the classic rock song by Deep Purple but the upcoming look on Atomic Aquatics Splitfin. As an added standard feature, the elegant "Smoke on the Water" model comes with the new spring strap. These have a variable pitch and geometry that both allows for a more comfortable fit and simple one-handed removal. Available in early 2007.

www.atomic-aquatics.com



Whites Legend

This, their first compressed 2mm neoprene dry suit that incorporates the patented Captive Suspension System panels under the arms, waist and above the knees, allows the most difficult technical movements to be achieved effortlessly. www.whitesdiving.com



Clever as Ever

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www.sherwoodscuba.com

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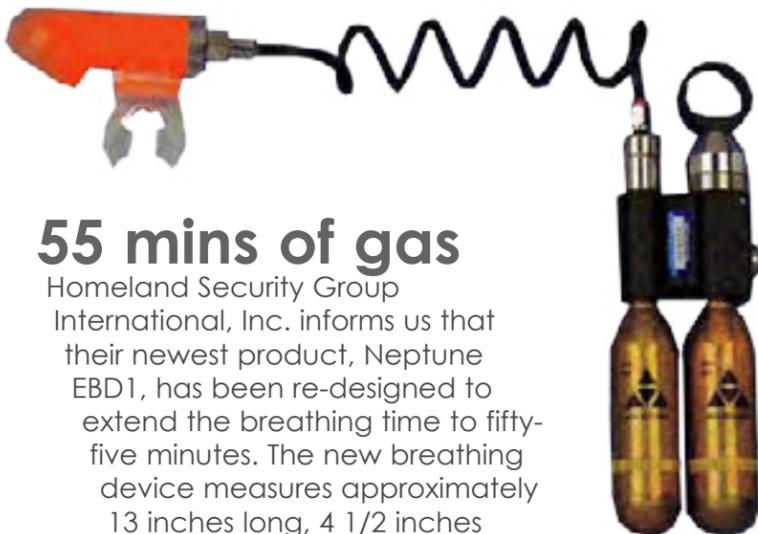
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www.iq-company.com



55 mins of gas

Homeland Security Group International, Inc. informs us that their newest product, Neptune EBD1, has been re-designed to extend the breathing time to fifty-five minutes. The new breathing device measures approximately 13 inches long, 4 1/2 inches wide with a weight of just less than five pounds. The new version, which has not been officially named, will supply 55 to 60 minutes of positive, 2-stage regulated airflow depending on stress.

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The Discovery 1000 is a state-of-the-art submersible that offers panoramic viewing, contemporary styling, hydrodynamic efficiency and extraordinary range, endurance and maneuverability. Originally designed for launch and recovery from a superyacht, the Discovery 1000 is a modular design available in either two, four or six-passenger configuration all based on an identical external framework. A 40 KW diesel engine with hydrostatic drive can be added to each vehicle as an option to increase surface range and speed. The Discovery design prioritizes the following characteristics:

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- * Low hydrodynamic drag

www.ussubs.com



Edited by Peter & Gunild Symes

Coral Transplants Rebuild Reefs Wrecked In Tsunami

New methods of transplanting coral grown to restore reefs off the coast of Thailand hurt by the 2004 tsunami have been developed by researchers assisted by



the first crop was successfully transplanted onto severely damaged reefs. The method will be applied to reefs of Phi Phi and Phuket next.

In addition to the transplant method, researchers have also designed special concrete cylinders with lots of holes in them, which will serve as beds for coral larvae to grow, as part of a new kind of artificial reef. It has been found that the conventional concrete blocks and offshore marine wrecks did more harm than good in seas with strong currents and a lot of pollution or sediment.

Thai marine biologist who heads the project, Naline Thongtham, explained, "Some rehabilitation work in the past unwittingly destroyed the reefs, partly due to inadequate knowledge of coral biology."

Six other countries including Israel and the UK are collaborating on the project to help coral larvae have a better chance of survival after storms or other events cause coral debris to be strewn all over the seabed. SOURCE: SUNDAY TIMES ■

British divers. The corals are grown in floating nurseries, netted cages that are suspended in the sea, which protect the coral from strong currents and grazing fish, increasing the coral's chances of survival.

At a small island near Koh Phi,



FAO



Tiny Fish Learn to Sniff Out Predators

Small fish, big sense of smell... That's what researchers have found in a new study conducted at the University of Saskatchewan in Canada and detailed in the journal *Animal Behavior* that suggests minnows can pick out the odor of a single predator.

The sophisticated sense of smell of minnows was discovered when scientists exposed the small fish to two different batches of water scented with pike, a major predator of minnows. One batch contained the scent of twelve pike fish, the other only two. The small fish reacted more strongly to the latter because the batch contained more "chemicals-per-pike", which suggests that the fish use smell to figure out how far away a single predator is by how concentrated its smell is.

A second experiment with the minnows found that the fish could also distinguish between individual pike. Apparently, the response is learned. The minnows learn to associate danger with the smell of a dead minnow and the smell of a predator. ■



Minnows use their sense of smell to survive SOURCE: LIVESCIENCE

Discovered: The World's Second Smallest Fish

A scientist in Malaysia has discovered a very small fish that grows no larger than 10mm at maturity. Thought to be the second smallest fish in the world, the "Perak fish" as it is unofficially called is still undergoing investigation in order to identify its genus and species.

Dr Khoo Khay Huat of the University Sains Malaysia found the specimen in a peat swamp in Perak. Before he found the Perak fish, he discovered a 1.2cm fish of the *Pseudocypripis Mecromegethes* species in Sungai

Gayau, Mukah, Sarawak. The species name is derived from the Greek words that translates loosely to 'children, small in size'. Huat told reporters, "We call it a childlike fish. We also believe that the two fishes are from the same genus but from a different species."

The scientist will continue to study the small fish species in the peat swamps of Malaysia and other locations before the areas are destroyed to make way for oil palm plantations. SOURCE: UNDERWATERTIMES.COM NEWS SERVICE ■



NATIONAL PARK SERVICE

Crayfish faking sex not war

Researchers have found out that crayfish practice pseudo-sex in order to establish dominance without violence among males.

Pseudocopulation, as it is called by scientists, is used by mammals such as primates to establish hierarchies while easing aggression among males. This is the first time scientists have observed the behavior outside

vertebrate animals. In many cases, it saves the lives of individuals who would most likely be killed by larger and stronger animals.

Neuroethologist Donald Edwards, who has been studying the phenomenon in Louisiana crayfish with colleagues at Georgia State University in Atlanta, told Live Science, "Universally, aggression or its threat is used to set up and maintain dominance rankings within a population of animals. Aggression, however, is dangerous for both dominant and subordinate, so many animals try to discover ways to avoid it." ■

Is It Okay to Eat Toothfish Again?

The Marine Stewardship Council in London has certified that a small Chilean sea bass (a.k.a. the endangered Patagonian Toothfish) fishery in South Georgia and South Sandwich Islands in the South Atlantic near Antarctica is selling sustainably caught sea bass. Now grocery chain stores such as eco-conscious Whole Foods in the U.S. are once again offering Chilean sea bass to their customers after a seven year hiatus. Critics of the move worry that customers will get the wrong idea, as the sea bass crisis is not quite over yet. Gerald Leape, the vice president for marine conservation at the National Environmental Trust in Washington told the New York Times News Service, "They may think that all Chilean sea bass are OK now, and that's not true," he said. "The certified fishery accounts for only 10 percent of the total catch. Chilean sea bass are still overfished and depleted." ■



FAO

Not Two, But One Genus for Clownfish

A recent indepth study suggests that clownfish belong to only one genus. The study published in the journal, *Gene*, provides evidence that shows all clownfish descend from a common ancestor. Scientists Santini and Polacco sequenced the cytochrome b gene, 16S ribosomal RNA gene and the first half of the D-loop, of 23 of the 28-32 of clownfish to rebuild a molecular phylogeny. They found that the molecular evidence for the monophyly of the *Amphiprioninae* pointed to a single genus for all members of the subfamily. This finding is at odds with the morphological taxonomy, which divides the subfamily into two genera: *Premnas* and *Amphiprion*. ■



SØREN REINKE

Edited by Peter Symes

North Sea Cod Fishing Ban Urged

The International Council for the Exploration of the Sea (Ices) has recommended there should be a complete ban on cod fishing in the North Sea for 2007 and zero catch was needed for the next two years for North Sea stocks to reach target levels. Any catches that were taken in 2007 would prolong recovery to the target level, their report warned. It said that the stock had been reduced to a stage where productivity was impaired, and that it was at or near its lowest observed level ever. ■



Unmanned Spy Planes May Patrol North Sea

Unmanned aircraft could soon be used to monitor illegal fishing activities in the North Sea, it has been revealed. BAE Systems are working on producing a special type of robotic aircraft similar in design to the planes now being used in the Middle East war zones, but without the weapons and specially designed for fishing surveillance use. A spokesman for BAE Systems said they were so sophisticated that they could pick out a lobster pot the size of a football from several thousand feet up. "They could also be used in the search for men lost overboard or for lost fishing boats," he added. ■

Impending Collapse of Fish Stocks Worldwide

All species of wild seafood that are currently fished are projected to collapse by the year 2050, according to a new four-year study by an international team of ecologists and economists. Collapse is defined as 90 percent depletion. The study published in the November 3rd issue of the journal Science.

The scientists warn that the loss of biodiversity is "profoundly" reducing the ocean's ability to produce seafood, resist diseases, filter pollutants and rebound from stresses such as overfishing and climate change.

"Whether we looked at tide pools or studies over the entire world's ocean, we saw the same picture emerging," says lead author Boris Worm of Dalhousie University. "In losing species we lose the productivity and stability of entire ecosystems. I was shocked and disturbed by how consistent these trends are—

beyond anything we suspected." In 2003, he co-authored a study warning that 90 percent of all large fish—tuna, marlin, swordfish, sharks, cod and halibut—were gone.

The report also contains some positive aspects; The data indicate that ocean ecosystems still hold great ability to rebound. But the scientists found that every species lost causes a faster unravelling of the overall ecosystem. Conversely, every species recovered add to overall productivity and stability of the ecosystem and its ability to withstand stresses. "Every species matters," the scientists say.

"The data show us it's not too late," says Worm. "We can turn this around. But less than one percent of the global ocean is effectively protected right now."

"We won't see complete recovery in one year, but in many cases species come back more

quickly than people anticipated—in three to five to ten years. And where this has been done, we see immediate economic benefits," Worm said.

UN rejected bottom trawling ban

A ban on bottom trawling in international waters failed to get United Nations' support as this issue went to press despite negotiations that lasted long into the nights. The decision has angered environmentalists worldwide, who blamed Iceland for blocking the ban. They said other countries, like Canada, have spoken out against a full ban but always showed a willingness to negotiate. "It's a tragedy that destructive practices are being allowed to continue today after days of talks by world leaders about high seas fishing reform," Bill Wareham of the Vancouver-based David Suzuki Foundation.

SOURCES: ENVIRONMENTAL NEWS NETWORK, CBC NEWS, BBC ■

The analysis is the first to examine all existing data on ocean species and ecosystems, synthesizing historical, experimental, fisheries and observational datasets to understand the importance of biodiversity at the global scale.

The results reveal that progressive biodiversity loss not only impairs the ability of oceans to feed a growing human population, but also sabotages the stability of marine environments and their ability to recover from stresses. ■

Japan agrees to cut its tuna fishing quotas

Life just got a bit better for embattled southern bluefin tuna in the oceans around south-east Asia, New Scientist reports.

After Japan's admission that it had overfished the species by 1800 tonnes in 2005, the country's Fisheries Agency has agreed to halve its existing quota of 6065 tonnes to 3000 tonnes for at least five years, starting in 2007.

Conservationists welcomed the news, which was announced on 16 October in Miyazaki, Japan, following a summit held by the Commission for the Conservation of Southern Bluefin Tuna. But they are still concerned that the proposed cuts are not enough. WWF says that Australia's quota of 5265 tonnes should have been cut too. Virtually all of it ends up imported by Japan.

Overall, the summit nations agreed to a 20 percent cut in the bluefin harvest, down to 11,530 tonnes from the 14,000 taken this year. Japan and Australia account for 80 per cent of the total catch.

Bluefin tuna are also declining in the Mediterranean, where France exceeded its 6192-tonne quota in 2005 by 3000 tonnes. ■



NOAA

"Unless we fundamentally change the way we manage all the oceans species together, as working ecosystems, then this century is the last century of wild seafood"

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Edited by
Peter Symes

Philippines President Moves to Protect "Coral Triangle"

President Gloria Arroyo has enacted a new national conservation policy for the Philippines to protect the archipelagic country's unique and rich nature, with initial focus on the heart of Southeast Asia's Coral Triangle.

"It is the policy of the state to protect, conserve and sustainably use biological diversity to ensure and secure the well-being of present and future generations of Filipinos," said an Executive Order signed by Arroyo at a Nov. 8 ceremony on Verde Island in Batangas City.

The order applies to all of the natural wealth of the Philippines, and specifies initial steps to create marine protected areas in the Verde Passage, known as the "center of the center" of the world's most plentiful shore fish region located at the apex of the Coral Triangle that includes the Philippines, Malaysia, Indonesia and Papua New Guinea.

SOURCE: CONSERVATION INTERNATIONAL ■



Structure of Coral Reef Ecosystems Are Changing



Boulder star coral

Large species of coral that form underwater reefs and create rich habitat for marine life are disappearing from in the Caribbean warn scientists.

Abnormally warm weather, coupled with pollution and overfishing have contributed to a change in coral reef ecosystem structure where larger species are being replaced by smaller varieties, which don't grow high enough to protect the fish, lobster and other sea life that rely on the underwater reefs.

Species such as the boulder star coral, which stretch several yards across, take hundreds of years to grow. In Jamaica, the species has almost been replaced by mustard hill coral, a smaller species unable to make large reefs and around the US Virgin Islands it could be gone in the matter of few decades.

"The big guys are becoming rarer. The small guys are becoming more common," said Edmunds, Peter Edmunds, a biology professor at California State University, who recently began projects near Tahiti and Taiwan, where he plans to compare data with that gathered in the U.S. Caribbean.

A bleached elkhorn coral near St. Croix, U.S. Virgin Islands in 2006. Scientists have issued their strongest warning so far this year that unusually warm Caribbean Sea temperatures threaten coral reefs that suffered widespread damage last year in record-setting heat



U.S. GEOLOGICAL SURVEY

Mark Eakin, director of the U.S. National Oceanic and Atmospheric Administration's Coral Reef Watch, said the coral study documents an even more widespread phenomenon. "That's a general pattern we have seen in other places as well," Eakin said, referring to the Caribbean. "The remaining large coral, such as star coral, is dropping away" and the smaller coral is moving in.

A vital building block of marine life, coral grows and reproduce best at about 27.5° C (81.5 F) the Caribbean, said Edmunds, who has studied Virgin Islands coral for two decades. Edmunds said his research suggests coral in warmer water grows more slowly.

The U.S. government scientists also warned for a second time this year that sea temperatures around Puerto Rico have exceeded healthy levels for coral, saying the fragile undersea life could become more susceptible to damage and disease during overheating.

Don't touch!

The government warning urges scuba-dive operators and underwater researchers in the U.S. Caribbean territories to look for coral damage and use caution around the fragile reefs, which are easily damaged by physical contact. ■

Transatlantic Ocean Array Acts as Climate Alert

Measurements from a network of monitors stretching across the Atlantic Ocean could offer an early warning of "sudden climate change". The underwater instruments measuring the temperature and salinity of seawater will detect any change to currents that regulate Europe's climate, a UK-led team of researchers tells BBC.

The data offered is the most detailed picture of the ocean's circulation patterns. The array of 19 "moorings" is positioned at points 26.5 degrees north in the Atlantic Ocean, providing an insight to the Meridional Overturning Circulation (MOC) that acts as the Earth's "heat pump", distributing heat via the ocean from the equator to northern regions. SOURCE: BBC ■

Read more about the circulation patterns in this previous X-Ray Mag article: **The Conveyor Belt** (from issue 11)

Human Activities Are Boosting Hurricanes

Rising ocean temperatures in key hurricane breeding grounds of the Atlantic and Pacific oceans are due primarily to human-caused increases in greenhouse gas concentrations, according to a study published online in the September 11 issue of the Proceedings of the National Academy of Sciences.

Using 22 different computer models of the climate system atmospheric scientists have shown that the warming sea surface temperatures (SSTs) of

the tropical Atlantic and Pacific oceans over the last century is linked to human activities.

Hurricanes are complex phenomena that are influenced by a variety of physical factors, such as SSTs, wind shear, water vapour, and atmospheric stability. But the important conclusion is that the observed SST increases in these hurricane breeding grounds cannot be explained by natural processes alone. The best explanation for these changes has to include a large human influence," the scientists wrote.

SOURCE: LAWRENCE LIVERMORE PUBLIC AFFAIRS ■



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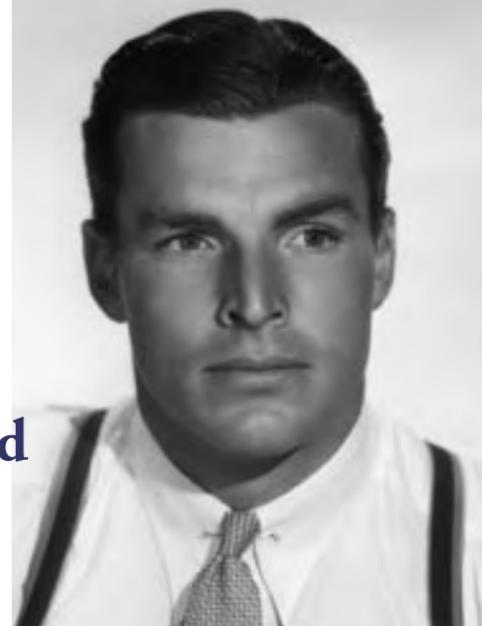
Edited by
Willy Volk

Details On Vanished 'Spy' Diver Emerge

Quite unlike James Bond, not all spy divers ascend perfectly coiffed and ready for their next assignment. In 1956, for example, British spy diver Lionel "Buster" Crabb vanished mysteriously while diving near—and allegedly spying on—the *Ordzhonikidze* in Portsmouth Harbour. At the time, the Soviet ship was carrying Nikita Khrushchev who was in London meeting with senior British officials. Crabb disappeared that night; several months later his headless corpse was found floating along the coast.

Speculations

According to papers recently released by the National Archives, an unnamed, unidentified officer ferried Crabb to the *Ordzhonikidze* and stayed onboard as Crabb dived below the surface. Not surprisingly, news of the the alleged spying incident wrecked attempts at a truce between Britain and Moscow, which indignantly insisted it was being spied upon. In an effort to distance itself from the mess, the Royal Navy engaged in a hasty public relations campaign, insisting it had nothing to do with the "mishap" and releasing a statement from the unnamed officer stating that he had been asked to assist Crabb "entirely unofficially and in a strictly private capacity."



Lionel "Buster" Crabb, a spy diver whose headless body was found floating off the coast months after he disappeared during a mission

Who hired Crabb?

If the Royal Navy knows, it isn't saying. In fact, those recently released documents state that the unnamed officer "knows nothing of the background to the story and will not be able to answer any embarrassing questions even if they are asked." Nevertheless, Howard Davies of the National Archives said the extent of the cover-up suggests something fishy is going on, and that Crabb's intelligence service handlers did not take proper precautions to protect him or the secrecy of the mission. Until more details emerge—if they ever do—Crabb's family and historians will have to wonder who beheaded the British spy. SOURCE: BBC ■

Free diver Hannah Stacey a mermaid

It's been more than 20 years since "Splash" made waves in movie theaters. If you've been waiting for another mermaid-out-of-water story since then, then your long wait is nearly over. Free diver Hannah Stacey has

Hannah Stacey
UK Freediving
champion



UK FREEDIVING ASSOCIATION

recently finished three weeks of shooting for her role in "Fish Tales," a film about a mermaid who falls in love with a university professor. Hannah, who currently holds the UK's free diving woman's record (54 meters), said the role was a dream come true. Although it took costume designers three-and-a-half months to build her tail, director Alki David said Hannah found her groove immediately: "She's amazing in the tail, she's like a natural. As soon as she put it on, she just took off. She knew exactly what to do and we couldn't stop her." The film, which also stars Kelly Brook and Billy Zane, is expected to be released next summer. Can you say "Eeeeeiiiiieeeeeieie"?

SOURCE: BBC ■



PHOTO COURTESY OF PURE BLUE WATER

Hannah Stacey, UK champion free diver does her mermaid thing

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Edited by
Willy Volk



FILEPHOTO/WIKIPEDIA

Fishing Trawler Nets Unusual By-Catch

Fishing trawlers are well-known for destroying marine ecosystems and decimating local fish populations. Consequently, even if you didn't need another reason to detest trawlers, here's one more: a man diving off the coast of Portland, on the UK's Dorset coast, was recently hauled up in the net of a trawler, the Shiraz. Due to the diver's quick, unscheduled ascent, he immediately started to suffer from the bends. A coast guard helicopter was summoned to the Shiraz, which delivered the diver to a specialist recompression chamber, where he was treated and later discharged. It's unclear if the diver was using a diving buoy while underwater. As such, the Coast Guard is investigating the incident. SOURCE: BBC ■

Cave Diving Expert Rick Stanton to Speak at Oztek'07

If you're not familiar with cave diving, you might be surprised to know that the discipline actually has two distinct styles. Some cave divers choose to dive through flooded caves and rarely leave the water. Other divers treat flooded sections simply as obstacles to finding a dry portion of cave, where they can celebrate with cheese and crackers. Not content with mastering just one of these styles, British technical diver Rick Stanton is a recognized expert in both disciplines. Concentrating

on the long deep siphons of France, Spain, and Italy, Stanton is known for combining caving techniques with long and deep multiple sump systems, transporting large amounts of diving equipment through the dry sections of the cave,

all in name of exploration. In the last 8 years, Stanton has become increasingly interested in technical cave diving using rebreathers -- often two at a time! In 2004, Stanton was one of two divers tapped by the British government to attempt the rescue of six British soldiers trapped in a Mexican cave by flood water. Over the years, Stanton has developed and manufactured two CCR units, including a unique side mount, fully-closed circuit rebreather, which was instrumental in his achieving the British cave diving depth record of 90 meters at Wookey Hole. If you're interested in hearing about his exciting—and often dangerous—exploits, you should plan to attend the OZTEK'07 Diving Technologies Conference and Exhibition, scheduled for March 17 and 18, 2007, Sydney, Australia. In his presentation, Stanton will no doubt thrill audiences by sharing stories about how righteously cool he is.

SOURCE: FINSONLINE ■



DIVEOZTEK.COM

Rick Stanton

File photo:
Jean-Michel
Cousteau in
Antibes 2005



YANN SAINT-YVES

Think your library of underwater images has everything? I bet you don't have a shot of this...

In his charity exhibition "Quiet," photographer Michael Muller claimed he wanted to portray the enveloping stillness and silence one experiences underwater. To achieve this goal, Muller showcased images of objects and people submerged in water. No surprise there. However, one of Muller's images—"The Sinking Fear"—might surprise you. It features actress/model Eva Mendez in a couture gown swimming in front of a

\$63,000 (including options) 2007 Mercedes GL450 SUV-



PHOTO COURTESY OF MERCEDES BENZ

ended in a giant tank. Although submerging a 5,249-pound vehicle might sound simple, Muller insists it wasn't. "After rigging up the GL450 to the crane, we dropped it in the tank and I jumped in with my gear to start shooting," said Muller, a certified diver. Surprisingly, the GL450 floated initially; Muller claims he was forced to clamber onto the roof of the SUV to facilitate its sinking. Hmm....usually, when you think of a \$63,000 vehicle in water, you imagine people hauling it UP from depth.

SOURCE: MSNBC.COM ■

Jean-Michel Cousteau Bashes the Late Steve Irwin

In the last issue of X-Ray, we mentioned the death of "The Crocodile Hunter," Steve Irwin. Since then, world-famous marine explorer/environmentalist Jean-Michel Cousteau has revealed that, while he believes Irwin's death was "very, very unfortunate," he disagreed with the Australian's hands-on approach to nature television. Claiming Irwin would "interfere with nature, jump on animals, grab them, hold them, and have this very, very spectacular, dramatic way of presenting things," Cousteau dismissed Irwin's technique as counter-productive and merely a way to draw in television viewers. To define his personal approach, Cousteau explained that, "You don't touch nature, you just look at it. And that's why I'm still alive. I've been diving for over 61 years - a lot more years than he's been alive - and I don't mess with nature." Cousteau expressed this opinion while promoting his recent 6-part PBS special called "Ocean Adventures." Ironically, during one of the episodes, Cousteau was filmed grasping the dorsal fin of a great white shark and "riding" the fish for several minutes. Excuse me, Mr. Cousteau, but that sounds an awful lot like touching nature.

SOURCE: THE SYDNEY MORNING HERALD ■

The late Steve Irwin,
Australian conservationist



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www.underwater.com.au



Edited by
Willy Volk



A first look at what is believed to be a new species of piranha. The fish is one of a number of apparently new animal species discovered during a survey by Conservation International (CI) scientists of the Orinoco and Ventuari rivers in Venezuela



A lifeboat from UK's Royal National Lifeboat Institution. Since the RNLI was founded in 1824, its lifeboats have saved more than 137,000 lives. RNLI is a charity dependent on private donations. Further information: www.rnli.org.uk

Cousteau versus Cousteau

Speaking of Jean-Michel, his father's widow, Francine Cousteau, has spoken out against a 1,500-unit condominium development on Hawaii's Big Island that Jean-Michel is helping build. The 434-acre project—Sea Mountain at Punaluu, which will consist largely of condominiums but will also include a hotel and a resort—would be the biggest single development ever undertaken on the east side of the island. Claiming she is “extremely concerned about the potential environmental implications of the Sea Mountain resort,” Francine -- Jacques Cousteau's second wife and president of the Cousteau Society -- openly opposes the venture. Though Jean-Michel insists he will make the project environmentally and culturally sensitive, the project has drawn opposition from



environmentalists who say it will harm threatened and endangered species, like the hawksbill turtle. Cousteau's nonprofit organization, the Ocean Futures Society, has been involved in a number of similar projects in places such as Fiji and the Cayman Islands, and he insists his society would take its name off the project if it is not completed in an environmentally conscious manner. SOURCE: MSNBC.COM ■



Divers Break Record for Underwater Dancing

On October 27, 74 divers plunged into a pool at Sydney's Olympic Park Aquatic Centre. Their goal: to set the world record for underwater dancing. The divers were required to dance simultaneously for ten minutes to set the record. No word yet on what song the divers sluggishly boogied to. Though Guinness World Records has not yet confirmed the record, the photos of the event speak for themselves. SOURCE: EN.CE.CN ■

David Swain Denied Re-trial in Wife's Death

In 1999, American diver Shelley Tyre was vacationing in Tortola with her husband, David Swain. While diving with him one day, Tyre mysteriously drowned. Although Tortolan authorities ruled the death accidental, Tyre's family brought a wrongful death suit against Swain, alleging he had been motivated by money and was pursuing an affair with another woman. Swain maintained his innocence and collected hundreds of thousands of dollars after his wife's death, including two insurance payments. In court, the prosecution alleged that Swain attacked Tyre from behind, restricted her air supply, and held her underwater until she drowned. During the trial, Swain acted as his own lawyer—though he was absent for most of the proceedings—and dismissed Tyre's death as a “tragic accident.” A jury found Swain guilty earlier this year, and awarded Tyre's parents more than \$3.5 million in damages; thanks to compounding interest, the award now stands at more than \$6 million. For his part, Swain has declared bankruptcy and asked the Rhode Island Supreme Court for a new trial, claiming that Superior Court Judge Patricia Hurst denied him his right to an attorney by refusing to delay the start of his trial after one of his lawyers grew ill from cancer. However, earlier this month, the State rejected the re-trial, on the grounds that Swain failed to raise this issue while the trial was underway. SOURCE: BOSTON.COM ■

Diver “Missing” for 56 Hours Will Not Be Charged

One Saturday morning in September, 35-year-old Guernsey-resident Matthew Harvey told his family he was going for a solo dive in a shallow bay off the Channel Islands. Several hours later, after Harvey had failed to return from the dive, his family notified local authorities, and police frogmen, lifeboat crews, and coastguard helicopters began to search for him. Missing for 56 hours, Harvey astonishingly appeared 200 yards from shore -- exhausted but alive -- claiming he'd been knocked unconscious by a motorboat and swept out to sea. Naturally, media outlets went crazy with the story, marveling at Harvey's miraculous 2-and-a-half-day ordeal. Some news sites even reported that a pod of dolphins brought him to safety. However, on the British mainland, people reported having seen Harvey at a pub while he was “at sea,” and a Guernsey storage facility report-

ed that Harvey had deposited his dive gear with them for safekeeping. In reality, Harvey hadn't been knocked unconscious: he left his dive gear at the storage facility, took a ferry to the British mainland on Saturday, and returned to Guernsey on Monday morning. Despite the fact that the rescue effort cost in excess of £10,000, Guernsey Police duty inspector Jean-Pierre Le Breton said no charges will be brought against Harvey. The motives for Harvey's disappearance remain a mystery; although no “other woman” has been implicated, many wonder about Harvey's mental health. So far, the best excuse has come from Harvey's father: “He just lost his mind. It was some sort of breakdown. He just decided to get on that ferry in a moment of madness. To get back into the water like that was a cry for help. He told me that he has no recollection and cannot account for what he did.” SOURCE: SCOTSMAN ■

Katie Melua Sets Record for Deepest Underwater Concert

Guinness World Records has confirmed that British singer Katie Melua has entered the record books by playing the world's deepest underwater concert. Melua and her band performed for commercial oil workers 303 meters below sea level on the Statoil Troll A gas rig in the North Sea. Claiming the concert was the “most surreal gig I have ever done,” the 22-year-old singer underwent extensive medical tests—and even survival training in Norway!—before switching on her mic. SOURCE: BBC ■



Katie Melua at work

John Chatterton in action

Edited by
Willy Volk

PHOTO COURTESY OF JOHNCHATTERTON.COM



Nanologix Retains John Chatterton as a Consultant

NanoLogix, Inc., a nano-biotechnology company engaged in the research, development and commercialization of technologies for alternative sources of fuel, recently announced that deep sea diver John Chatterton has been retained as a consultant for the firm. A former commercial diver, Chatterton is a U.S. Coast Guard licensed captain, and holds numerous commercial, scuba, and rebreather diving certifications. Currently, Chatterton co-hosts the Deep Sea Detectives television series, which showcases his groundbreaking diving adventures. Documentaries about Chatterton's diving expeditions and discoveries have also aired on HBO and PBS. In August of 2005, Chatterton and his partners explored the RMS Titanic, diving to a depth of approximately 12,500 feet in MIR submersibles. Chatterton is probably most famous, however, for his work in the discovery

and subsequent identification of the German submarine U-869, off the coast of New Jersey. The story of the discovery was turned into a bestselling book by Rob Kurson called *Shadow Divers*, and the movie rights were purchased by 20th Century Fox. Bret Barnhizer, Energy Marketing Consultant for NanoLogix, said, "John and I first worked as a team when we served together in Vietnam in 1970 and 1971... As a deep sea diver, John's knowledge of the technical aspects of rebreather devices and gas mixtures as they apply to biological processes is directly relevant to our patented hydrogen bioreactor system."

SOURCE: PRNEWswire.COM ■

Marine Biologist Brad Norman Honored

Australian Brad Norman, a marine biologist who has spent 14 years researching whale sharks at Ningaloo Reef in Western Australia, has been chosen as a Laureate in the 2006 Rolex Awards for Enterprise, which recognize outstanding contributions to humanity, science and the environment. Assembling data and photographs from divers all over the globe, Norman has created an online library of whale shark encounters from around the world.

This work has helped monitor the status and abundance of Earth's largest fish, considered "vulnerable" to extinction by the World Conservation Union. Despite Norman's work, however, little is known about the population numbers, breeding habits and habitat preferences of the whale shark. Norman's use of the data of thousands of people in the conservation of whale sharks was described as "visionary" by the Rolex Awards. Appropriately, Norman plans to use his £53,000 award money to devote two years to training local authorities, tourism operators and 20 research assistants around the Pacific, Atlantic and Indian oceans to observe, record and protect whale sharks. He may pop a bottle of bubbly, too. SOURCE: DIVEMAGAZINE.CO.UK ■



Whale shark

FILE PHOTO: TIM HOCHGREBE

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Diver Outreach Program Unveiled by Oceana.org

In line with its ongoing efforts to encourage ocean users to protect, conserve and restore the oceans, Oceana has unveiled a new website called www.oceana.org/dive which is dedicated to the SCUBA diving community. The new website is a key component to the organization's diver outreach program. For eco-

conscious divers, the website will serve as a reference tool from which they can learn more about threats to marine ecosystems. They can also find fun ocean facts and other divers committed to the ocean's future. There are hopes that the website will encourage the scuba diving community and other con-

servation-minded individuals to become engaged in the organization's campaign to stop destructive trawling and increase the protection of deep-sea coral and sponge habitat, which more and more divers experience personally in their dives around the world. SOURCE: OCEANA.ORG/DIVE ■

Beautiful Oceans Science Diver

Want to learn more about diving and coral ecology at the same time? Now you can with Beautiful Oceans new courses for the Science Diver. Beautiful Oceans lets divers go beyond basic dive training and gain knowledge about the coral ecosystems they love and the creatures that inhabit them. With the Science

Diver education, divers gain fascinating insights into these creatures' lifecycles, behaviors and relationships with other organisms through linked land-based tutorials and discovery dives with a trained Science Instructor.

Upon completion of at least one science course, a certified SCUBA diver receives the dis-

tion of Science Diver. After completing all five science courses, the diver receives the title, Master Science Diver.

Science Divers are recognized for their knowledge of and commitment to the world's coral reefs. For more information about the course, visit: **Beautifuloceans.com** ■



Scientists Discover Bacteria That Use Radiated Water as Food

Deep inside a gold mine about 2.8 kilometers below Earth's surface researchers from Indiana University have found a self-sustaining community of bacteria that rely on radioactive uranium to convert water molecules to useable energy, according the journal Science

Many scientists have been skeptical of subsurface bacterial communities being completely disconnected from surface ecologies fed by the sun's light but new evidence points out that the bacterial communities are indeed permanent—apparently millions of years old—and depend on radiation from uranium ores for their existence.

The scientists sampled the flowing fracture water which contained hydrocarbons and hydrogen not likely to have been created through biological processes, but rather from decomposition of water exposed to radiation from uranium.

DNA analysis revealed a vast number of bacterial species present, but the samples were dominated by a single new species related to hydrothermal vent bacteria from the division *Firmicutes*. Analysis also suggests subsurface *Firmicutes* were removed from contact with their surface cousins anywhere from 3 to 25 million years ago.

Firmicutes do not use radiation directly as a source of energy, however. Radiation emanating from uranium minerals in or near the fracture allows for the formation of hydrogen gas from decomposition of water and formation of sulfate from decomposition of sulfur minerals. *Firmicutes* are able to harvest energy from the reaction of hydrogen and sulfate, allowing other microbes in the fracture community to use the chemical waste from the *Firmicutes* as food. ■

Lampreys Have Been Around for 360 Million Years

Scientists from South Africa and the US have uncovered a remarkably well-preserved fossil lamprey from the Devonian period in an ancient South African lagoon. The find of the 4.2-centimeter fossilized specimen reveals that the blood-sucking, eel-like fish of today hasn't changed much in 360 million years.

The ancient lamprey attached its toothy, sucker-like mouth to, for example, prehistoric sharks almost exactly the same way that modern lampreys latch onto other fish today. This jawless mouth sets the lamprey and its cousin, the hagfish, apart from all other modern vertebrates—animals with backbones.

Like modern lampreys, the ancient lamprey had a backbone made not of bone but of cartilage—the generally translucent, somewhat flexible substance that gives human noses and ears their shapes and that makes up shark skeletons. Unlike bony fish, only a handful of lamprey fossils have ever been found, because cartilage usually decays too fast to become fossilized. Perhaps most important, the new lamprey fossil is the first to give us a good view of the mouth.



GREAT LAKES FISHING COMMISSION

Lamprey's mouth.



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The lamprey fossil is only 4.2 cm wide — and 360 million years old

It is believed that jawless marine animals were the first vertebrates and that they emerged sometime after 540 million years ago. When the fossilized lamprey lived, there were probably many types of jawless vertebrates. Of the 46,000 known species of vertebrates, lampreys and hagfish are the only surviving jawless vertebrates. The evolutionary split between jawless and jawed fish probably happened close to 500 million years ago.

SOURCE: NATURE ■

Sea 'Monster' Fossils Found in the Arctic

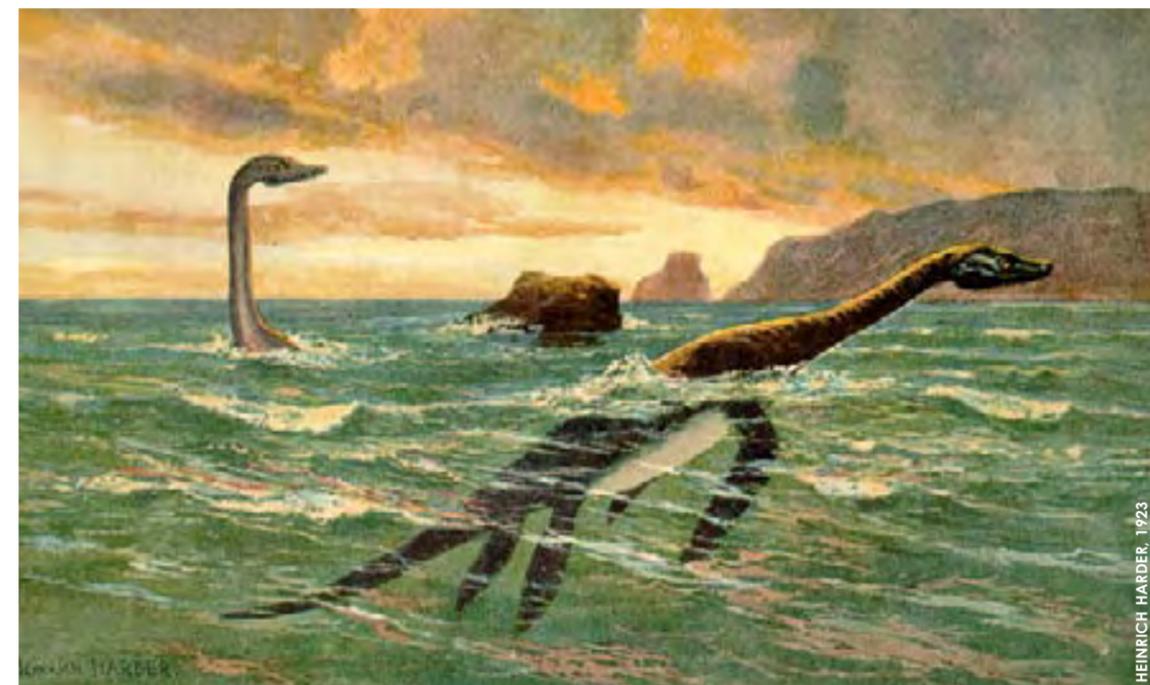
Norwegian scientists have discovered a "treasure trove" of fossils belonging to giant sea reptiles that roamed the seas at the time of the dinosaurs. The 150-million-year-old fossils were uncovered on the Arctic island chain of Svalbard. The finds belong to two groups of extinct marine reptiles—the plesiosaurs and the ichthyosaurs. These animals were the top predators living in what was then a relatively cool, deep sea.

One skeleton, which has been nicknamed The Monster because of its enormous size, may measure more

than 8m in length. Palaeontologists from the University of Oslo's Natural History Museum discovered the fossils during fieldwork in a remote part of Spitsbergen, the largest island in the Svalbard archipelago.

Jorn Harald Hurum, co-director of the dig, said he was taken aback by the sheer density of fossil remains in one area.

"You can't walk for more than 100m without finding a skeleton. That's amazing anywhere in the world," he told BBC News. ■



HEINRICH HARDER, 1923

West Australian Fish Fossil Find Rewrites Land Mammal Evolution



AUSTRALIAN NATIONAL UNIVERSITY (ANU)

A primitive fish that swam in tropical reef systems before life clambered up on land had more advanced features than previously thought, a new study finds.

Gogonasmus was an ambush predator, about 12 inches long. Once the species died out, the skeletons got buried by layers of shale in what is called the Gogo Formation.

A 380 million-year-old fossil fish called Gogonasmus fossil fish has been unearthed in the West Australian Kimberley. The specimen, whose middle ear and limbs resemble those of land vertebrates, could be one of the missing links between fish and four-legged land vertebrates, bringing researchers closer to the point when life reached the water's edge.

The fish's skull had large holes for breathing through the top of the head but importantly also had muscular front

fins with a well-formed humerus, ulna and radius—the same bones that are found in the human arm. The new fossil proves that features of land-living tetrapods (four-legged vertebrates) evolved much earlier in their evolutionary history than previously thought. This means that humans can trace their evolutionary roots, and adaptations for life on land, further back in time, to more than 380 million years ago.

The research findings are published in the journal Nature. ■

wreck rap



Polluce

Case closed

The trial for the three British divers accused of modern-day piracy was held in October. They were accused of stealing items from

the *Polluce* wreck and damaging the artistic and cultural patrimony of property belonging to Italy, and were facing up to four years in jail. The men recovered quite a coin stash—silver, gold and diamonds—and

they initially claimed that they had consent from both the British and Italian governments to do so. The prosecutor did not agree, he claimed that the divers used false paperwork to get access to the wreck.

Today, the men on trial claim that everything is returned, and that they are sorry. ■

Get the full intriguing story about the *Polluce* wreck in X-Ray Mag #7 and #8



A Future Reef with a Lot of History

The *Texas Clipper*, who served America well through a number of wars and occupations takes the plunge in the Gulf of Mexico next year as part of The Texas Parks and Wildlife's Artificial Reef Program. A lot of history follows her on this, her last mission as an artificial reef on the sandy bottoms of the Gulf.

The *Texas Clipper* was originally a troop transport ship in World War II. She ferried troops into battle and brought back wounded. After that, she was part of the American occupation at Sasebo, Japan. She was decommissioned in 1946. From 1948 to 1958, she served as one of the post-war four aces for American Export Lines. Then she sailed in

the Mediterranean as a cruise liner. Her longest mission was as a training ship for the Texas Maritime Training Academy, from mid 60's to 1996. I am sure she will be remembered by many students, fondly or not. Those with a dive certificate will have a chance to relive their time on board next year when the *Texas Clipper* takes the plunge to settle on the sandy bottom of the Gulf of Mexico off Port Isabel. She will be more than a typical artificial reef. Chances are that she will become a world class diving destination, an oasis for marine life in an otherwise vast expanse of open Gulf of mostly sand and mud bottom. ■

The Edmund Fitzgerald, Stuff of a Legend

15th November 2006 was the 31st anniversary of the sinking of the *Fitz* in eastern Lake Superior. Not one of the 29-man crew survived. No one knew why *Edmund Fitzgerald* went down.

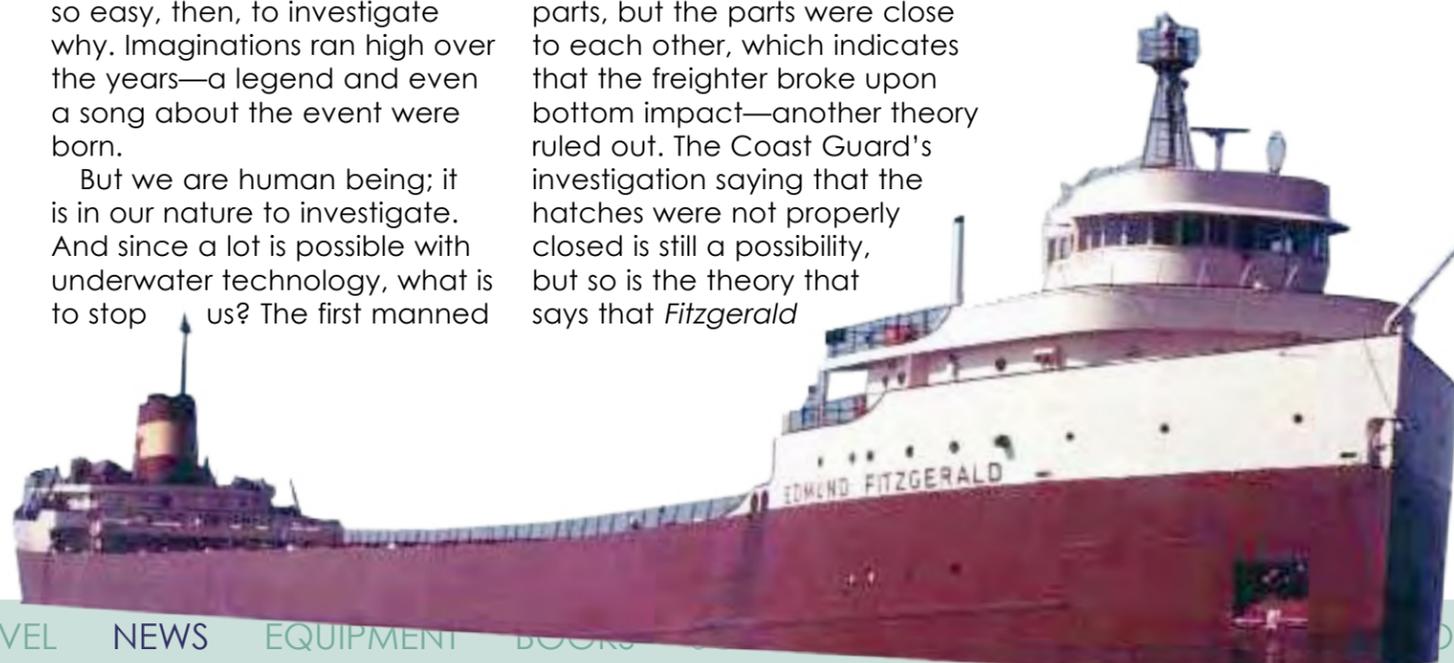
A number of theories as to why she sank have been bounced around over the years, and up to this day, it is still a mystery. The freighter went down in a full-blown storm with hurricane force gusts and huge waves. The Coast Guard investigated the sinking. Their theory was that the hatch covers might not have been secured. Another popular theory was that she broke in two sections due to the wave actions. Only one way to find out, right? Look for your self. Well the wreck made a landing 530 feet down. Not so easy, then, to investigate why. Imaginations ran high over the years—a legend and even a song about the event were born.

But we are human being; it is in our nature to investigate. And since a lot is possible with underwater technology, what is to stop us? The first manned

dive was made in 1980, with Cousteau in one of his mini subs. Starting in 1989, the Great Lakes Shipwreck Museum sent down an underwater robot with cameras. In 1994, Harbor Branch Oceanographic-Florida, visited the wreck with a submersible, and even though the project at hand was to study the ecology of the bottom of the Great Lakes, three days were spent diving on the *Fitz*.

Other dive expeditions have tried to solve the mystery. What they found was that the wreck indeed was broken in two parts, but the parts were close to each other, which indicates that the freighter broke upon bottom impact—another theory ruled out. The Coast Guard's investigation saying that the hatches were not properly closed is still a possibility, but so is the theory that says that *Fitzgerald*

could have scraped a sandbar due to an inoperative radar. So today, November 2006, where do we stand on this mystery from the past? Even though one theory is ruled out, there are many more to investigate, and despite all the underwater technology, we still have a mystery. the *Fitz* is deep in mud, well settled. So, at this time, the hull can't be inspected for damage—hence, still a mystery for future divers and investigating minds. ■



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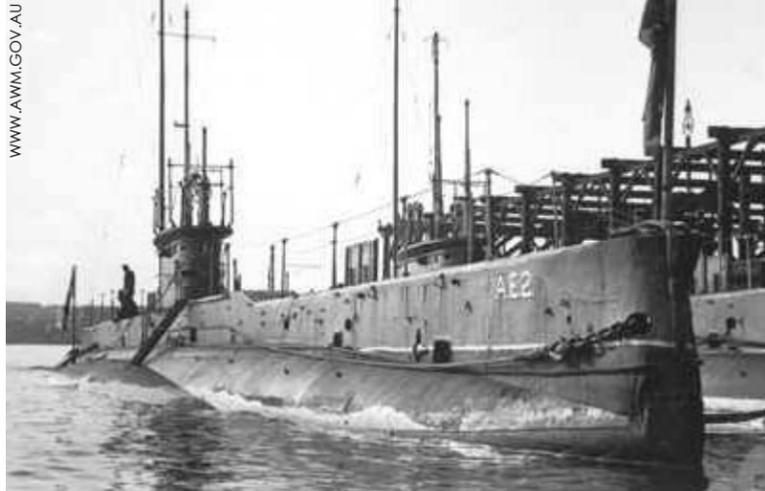
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wreck rap



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USS Grunion SS-216 1. Aug 1942

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Shadowy Object Off Alaska Coast May Be Lost WWII Sub

For decades, relatives of the *Grunion's* 70 lost crewmen had no information beyond fragmented U.S. Navy records, and a few rumours, about where and why the sub went down. They knew the *Grunion* had sunk two Japanese submarine chasers and heavily damaged a third in July 1942 near Kiska, one of two Aleutian islands occupied by the Japanese. They knew her last official radio message to the sub base at Dutch Harbor, on July 30, 1942, described heavy enemy activity at Kiska Harbor. They knew she still had 10 of her 24 torpedoes during that communication. They knew Dutch Harbor responded with an order to return to the base, but they didn't know if *Grunion* ever received it. Until a few years ago, the clues were too sparse to justify a search, said Bruce Abele, whose father, Mannert Abele, was the *Grunion's* commander.

Four years ago, a man who had heard about the *Grunion's* disappearance emailed Bruce the links to several *Grunion* websites. One site held an entirely new clue, a note from a Japanese model ship builder who said

he thought he knew what had happened to the *Grunion*. John Abele contacted the man, Yutaka Iwasaki, who translated and sent him a report written in the 1960s by a Japanese military officer who served in the Aleutians. It described a confrontation between a U.S. submarine and the officer's freighter, the *Kano Maru*, on July 31, 1942, about 10 miles northeast of Kiska—the *Grunion's* patrol area.

The sub dispatched six or seven torpedoes. All but one bounced off the boat without exploding, or missed, the officer wrote, although the hit knocked out his engines and communications. He said he returned fire with an 8-cm deck gun, and believed he had sunk the sub.

The Abeles then hired a marine survey firm, Williamson and Associates which after six hours of negotiating, agreed to send sonar technicians and equipment aboard a Bering Sea crab boat to the frigid waters licking the base of Kiska volcano. The U.S. Navy, citing lack of resources, is not involved in the search, and the Abeles prefer to keep the cost to themselves.



An underwater sonar image of a black shape near Kiska Island that may be the *USS Grunion*, which sank off the island at the tip of Alaska's Aleutian chain in 1942

For more than two weeks, the *Aquila* carefully towed a sonar cable from east to west and back again inside a 240-square-mile grid that the survey team had plotted using information from naval archives and the *Kano Maru* officer's account. In mid-August, the sonar picked up a 290-foot-long object with the sharp angles and jutting shadows of something man-made wedged into a terrace on the steep underwater slope of the volcano.

The *Grunion*, however, was 312 feet long. The Williamson team believes the bow may have plowed beneath a mat of thick sediment, hence the apparent shortage of about 20 feet. Skid marks show the vessel slid to rest about 1,000 meters from the surface. SOURCE: ASSOCIATED PRESS ■

WILLIAMSON & ASSOCIATES

Divers to Explore Historic Gallipoli (WWI) Submarine

Australians may soon know more about one of Gallipoli's untold stories—the Australian submarine *HMAS AE2*. It is referred to as the Silent Anzac and it was the first allied submarine to penetrate Turkey's Dardanelles as part of a wider submarine campaign that paralyzed enemy shipping in the Sea of Marmara. It was also the first allied submarine to be lost after entering the Dardanelles, off the Gallipoli coast, in 1915. The sub entered the straits of the Dardanelles on April 25, 1915, as the Anzacs first landed on the beaches.

Its Australian crew dodged minefields, evaded patrol craft and survived heavy shellfire before torpedoing a Turkish gunboat. But *HMAS AE2* came under attack from a Turkish torpedo boat, resulting in the crew losing control of the vessel and being forced to abandon ship. Thirty-five people survived when it sank, and now it lies about 75 metres under water.

Now the story of the vessel will be told in detail. The Australian Federal Government and the Submarine Institute of Australia are contributing about \$800,000 to survey and preserve the *HMAS AE2*.

The Minister Assisting the Minister for Defence, Bruce Billson, says Australian divers will carry out the survey sometime next year. "To see how we can best preserve it, how we can best bring to life the story of the *AE2* and then to consider options for its long-term management and care," he said.

Mr Billson says it is too early to know if parts of the submarine can be brought to the surface and restored. "At this stage it's a little too early to know," he said.

SOURCE: ABC NEWS ■



Oriskany DVD

Oriskany CVA34 – Status Report 06.19.06 to be released by the end of 2006 by ClearVis Productions, features the biggest vessel ever to be intentionally sunk to create an artificial reef. See the Books Section on page 77 for details.



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Wrecks of Two Mysterious Submarines Discovered Off the Coast of Orkney, Scotland

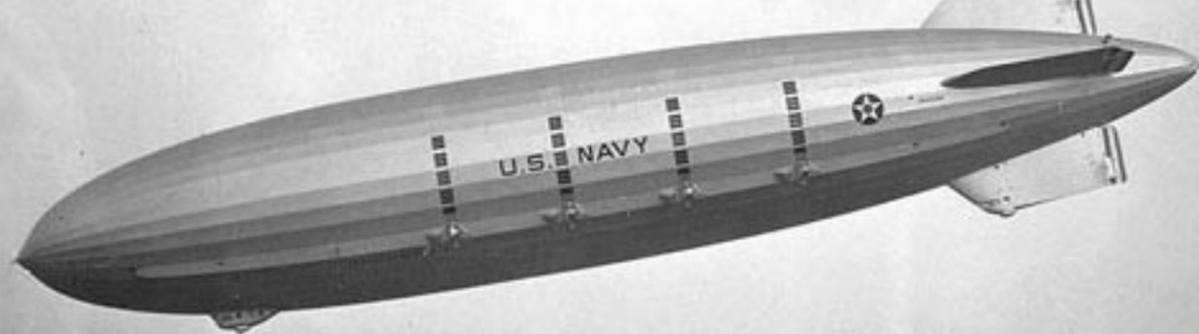
A survey team discovered two wrecks lying in about 70 metres of water to the east of Sanday Sound in an area where there were no reports of war-time sinkings, a coastguard official said.

Grainy images of the submarines were captured using the latest three-

dimensional sonar device, but their identity and nationalities are not known. An Orkney diver speculated that the vessels might have been German U-boats sunk during the Second World War. There were reports that the Royal Navy had successfully depth-charged U-boats, but this took

place several miles away.

Rob Spillard, hydrography manager of the Maritime and Coastguard Agency, said the sunken submarines were something of a mystery. "We have no idea which subs they are, which nationality or who died in them," he said. SOURCE: THE SCOTSMAN ■



Lost and found - USS Macon

USS Macon (ZRS-5) was a massive airship made for scouting in the service of U.S. Navy. She was designed to carry five F9C Sparrowhawk biplanes. The planes were kept inside the hull, in bays. A trapeze was used for launching and retrieving the planes. She looked impressive, like a giant blimp, but she had a short career.

During a storm she went down after only two years of service, 1933 - 1935, and got lost off the coast of California. The storm threw the USS Macon into an updraft; the structure was compromised and trailing cables punctured the rear cells. She fell slowly from the sky; it took almost 20 minutes. Then, she went down. Almost the entire crew survived, thanks to life jackets and warm water.

She was lost for a long time, and it was The Monterey Bay Aquarium Research Institute (MBARI) that found her in 1991, or at least, the debris field left of the Macon. Artifacts were retrieved that helped identify the wreck, and video clips, sonar images and photos were taken.

The MBARI returned in 2005-06 to conduct an archeological research project in the bay.

Researchers from NOAA were brought in, and video clips from the site are now available to the public through the OceansLive Web Portal, a service of the NOAA. Researchers are mapping the underwater wreckage with an underwater robotic explorer. With the help of 10,000 images captured, they will make a photo mosaic of the site.

The hope is to get the site listed on the National Register of Historic places. The wreck site has not been released to the public, and it will remain a secret for now. No diving is allowed. Not only is it too deep for recreational diving, it is also considered a U.S. Navy gravesite.

SOURCE: NOAA & MBARI.ORG ■



NOAA & MBARI



Scenes from the USS Macon wreck

NOAA & MBARI



NOAA & MBARI

US Navy Divers Survey WWII Aircraft



Two U.S. Douglas Torpedo Bomber Devastators, which played an important role in World War II, were surveyed by a team of divers from the USS Safeguard assisting the Naval Historical Center and The International Group for Historic Aircraft Recovery.

Lost since the early days of the war, the wrecks were investigated over four days of diving during which data and samples were collected for scientific analysis to find out if the wrecks were suitable for recovery and preservation later.

Safeguard's commanding officer Lt. Cmdr. Doyle Hodges told Navy News: "This was a unique opportunity for Safeguard to be involved in the conservation and preservation of an important part of naval history." He added, "Just the process of getting to the wreck site in the Marshalls gives you a good appreciation for the bravery of the Sailors who took these aircraft with rudimentary navigation systems across thousands of miles of open ocean. Additionally, the diving conditions in the lagoon were terrific."

Immediately after the bombings of Pearl Harbor in WWII, the planes went directly after the Japanese headquarters on the Marshall Islands, but were lost in this first U.S. offensive strike. Launched from the USS Yorktown (CV5), weather conditions made their mission difficult, and the pilots of the bombers could not make a path for return on the sortie. They ran out of fuel and ditched in the large central lagoon near the Jaluit Atoll where they lay at rest today. SOURCE: NAVY NEWS ■

Pollution Leaking from WWII Ships in Chuuk Lagoon

Sunk more than 60 years ago, some Japanese war vessels are leaking greater amounts of diesel, oil, fuel and toxic chemicals into the island-dotted lagoon of Chuuk, which has some of the best diving sites in the world.

Speaking on the subject at the Stockholm Convention on Persistent Organic Pollutants (POPs), Joe Konno, former Director of the Chuuk Environmental Protection Agency, said, "The rate of leakage is rising

dramatically."

It could be one of the biggest environmental catastrophes to hit the shores of one of the most populous states of Micronesia as 57 wrecks made up of cargo ships, destroyers, transports, submarines, tugs, tankers, carriers and other vessels rest on the sea bed carrying enough raw power and munitions now used by locals to blow up areas of the lagoon and its reefs for illegal fishing.

During WWII, the U.S. viewed this Imperial

Navy base as primary target. The U.S. unleashed Operation Hailstone at the location for a two-day aerial bombing campaign, which was carried on with several more confrontations until the end of the war.

Environmentalists are very concerned with the imminent environmental threat these wrecks impose on the area and suggest a cooperation between Japan and local government should be developed to take care of the problem. SOURCE: KASELEHIE PRESS ■



Roman Shipwreck Bearing Gifts of Fish Sauce

Delicacies to thrill the richest palates of the Roman Empire filled the storage hull of a shipwrecked first-century vessel. Nestled inside some of the hundreds of meter-tall amphoras, or clay jars, on the ship were 2,000 year-old fish bones.

Archeologists were delighted with the dazzling find which should provide a lot of information about life in the ancient world.

The cargo of amphoras was discovered in 2000 by boaters when their anchor lodged itself in one of the two-handled jars. Years of red-tape later, Carles de Juan was able to begin exploration of the site, which is located off the coast of Alicante in Southeast Spain.

Estimated at 30 meters long with 400-ton cargo capacity, the vessel is twice the size of most other Roman shipwrecks found in the Mediterranean according to de Juan who told Associat-

ed Press that the freight has approximately 1,500 well-preserved clay amphoras, used to hold a condiment, fish sauce, highly prized by rich Romans.

Archeologists not related to the project such as, Javier Nieto, director of the Center for Underwater Archaeology of Catalonia agree that the shipwreck is very important not only for its size and easy access that it offers—just 25 meters (80 feet) below the surface at about 1.5 kilometers (one mile) from the coast—but also because of the fine condition of the cargo.

"For archaeologists, a sunken ship is a historic document that tells us about ancient history and how its economy worked," Nieto of Barcelona told Associated Press. "This ship will contribute a lot."

It is thought that the ship probably sank in a storm while sailing back to Rome

from Cadiz in the south of what is now Spain. It must have been a terrible storm because it was not common for such a vessel to be so close to shore.

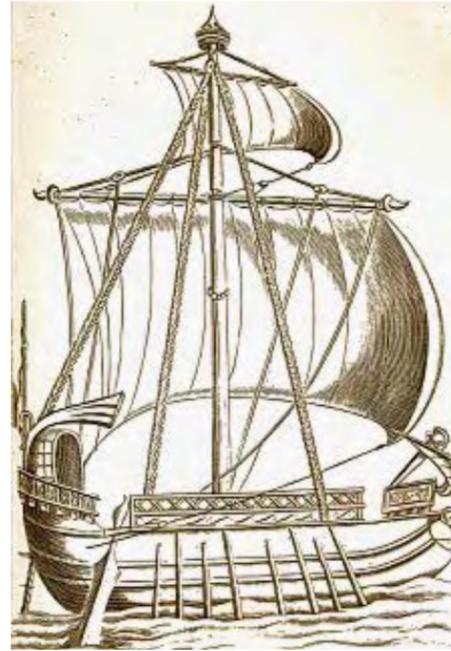
"The crew did not care about the cargo or money or anything. They headed for land to save their lives," said de Juan.

Unfortunately, the wreck site was not immune from raiding by pirate scuba divers who stole some of the amphoras after the first announcement of the find in 2000. The action forced the Valencia government to construct a thick metal grating to protect the jars and cover the remains.

Because the seals on the amphoras were not hermetically sealed, the fish sauce isn't in them anymore having not been able to 20 centuries under the

sea. But fish bone traces do remain inside and can help researchers figure out how the sauces were made according to de Juan.

"We knew it was an important find but had no real idea until now," said de Juan. "It is an exceptional find." SOURCE: ASSOCIATED PRESS ■



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Found: Civil War Schooner?

Officials aren't saying yet, but a wreck discovered off the coast of south Baldwin County in Alabama, USA, might very well have been a blockade runner in the Civil War.

Remains of a wooden ship were noticed by local residents after high tides and strong waves revealed parts of the vessel at the surf line near Fort Morgan. The 150-foot ship was found charred near the beach level. Over history, hundreds of ships ran aground in this area, so civil war experts speculate whether or not exact identification of the ship can be made. However, there are military reports that a schooner, *Monticello*, was beached and deserted eight miles from Fort Morgan, then burned by the Union Navy in 1862. Further investigation will be needed to get to the bottom of the mystery. SOURCE: PRESS REGISTER ■

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Aquariums in the News:

London's New Coral Reef

The £85m Biota Aquarium in London will be installing an enormous coral reef made up of living colonies from the Pacific and Indian oceans. London zoo marine specialists are "growing" the reef for the aquarium designed by Sir Terry Farrell as part of a 1.5£ billion scheme to rejuvenate the London Docklands. To be completed in 2009, the reef is planned to reach 9ft high and 24ft across in a tank with tropical fish for an exhibit in which visitors can be immersed as they walk through the aquarium. A team from the Zoological Society of London is supervising the project. ■

Public Supports Vancouver Aquarium Expansion

Over 4,000 people took part in a public survey which found higher than expected support for a proposed expansion of the Vancouver Aquarium. The expansion proposal includes a 30% increase in the size of the Aquarium at a cost of \$80 million. Improvements mainly benefit marine mammals which may include whales and dolphins if they are returned back into the wild if the public has its way. It is hoped that the construction will start next spring so the facility will be completed by the 2010 Winter Olympics. ■

U.S. aquarium docs examine whalesharks

Scientists at the Georgia Aquarium in Atlanta met with a whaleshark for a ground-breaking check-up. With the help of around 50 staffers, a stretcher big enough to hold a mini-bus and a hose transporting up to 300 gallons of liquid anesthetic, they examined Ralph, a 22-foot (6.6-meter) male, one of four whale sharks at the aquarium. Not much is known about the world's largest fish, so researchers hope the study will produce new information about the mysterious animal of massive size and wide-ranging habitat. Ralph and Norton, the other male whale shark at the aquarium, traveled from Taiwan to Atlanta last June luckily before they met their doom as seafood in Taipei. Two females, Trixie and Alice, joined them a year later at the aquarium where they live together in their 6 million gallon tank. SOURCE: ASSOCIATED PRESS ■



FILE PHOTO: TIM HOCHGREBE, UNDERWATER.COM.AU

Bering Strait Appeared Earlier Than Thought

Researchers from Woods Hole Oceanographic Institution in Massachusetts, USA, have set the record straight on the Bering Strait. According to new findings, it actually appeared 1,000 years earlier than believed. This would have made human travel by foot across the bridge impossible 1000 years earlier too.

The scientists reporting to Geology magazine found evidence along the ocean floor where sediment deposits were deep enough to show a view of geological history. From this data, they calculated that the

land bridge between what is now known as Alaska and Siberia flooded 11,000 years ago to make the Bering Strait.

Sediment core samples collected from new core sites north and west of Alaska in the Chukchi Sea revealed skeletons of animals called foraminifera that were radiocarbon dated and could be traced to specific water and atmospheric temperatures. The findings suggest that the first humans to come across the bridge to settle in the Americas came much earlier than previously thought. SOURCE: REUTERS ■

Tsunami Risk in the North Sea?

Over 8,000 years ago, a tsunami hit Europe. Since then it has been very quiet, right? Not so, says a new study which reveals that there have been a number



NOAA

of deep-sea earthquakes around Europe since the last big one hit. Scientists say that cities and towns on the North Sea coast are at risk next time a landslide hits the continental slope.

Researchers sifted through libraries of ancient texts, church documents, and historical chronicles from as far back as the year 1089 in Great Britain to find a disturbing number of reports and descriptions of earthquakes that came more frequently and in greater magnitude than previously thought. Further research has been done by Scandinavian scientists investigating landslides and underwater cliffs off the Nor-

wegian coasts where the last big tsunami hit.

Could a tsunami hit Europe again? Scientists speculate upon several ways it could happen involving an

unstable continental slope and the affect an earthquake or rising temperatures and water levels may have on methane hydrates: gas-containing ice caps which keep the sand attached to the slopes like a kind of weak glue. If water levels or temperatures change enough, this 'glue' may fall apart, said Angus Best of the University of Southampton to the scientific journal Eos. Gaps in our knowledge of this subject causes concern in the scientific community who suggest that further research be conducted to better understand the risks of a tsunami in Europe and how to protect ourselves when it comes. SOURCE: SPIEGEL ONLINE ■

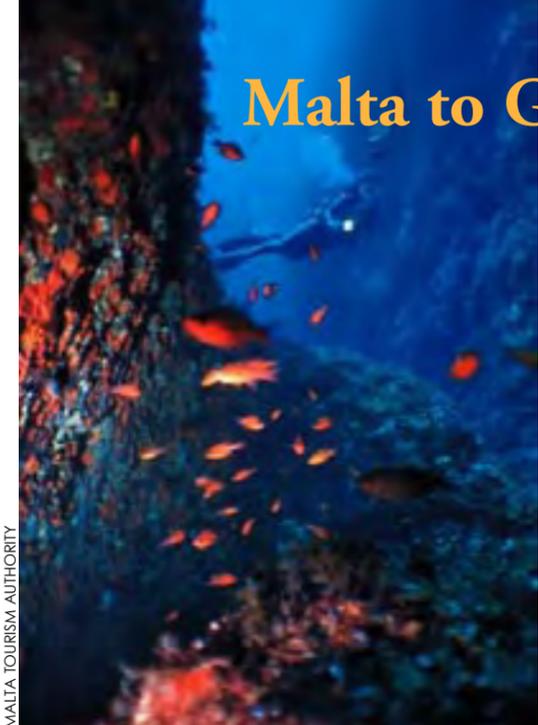
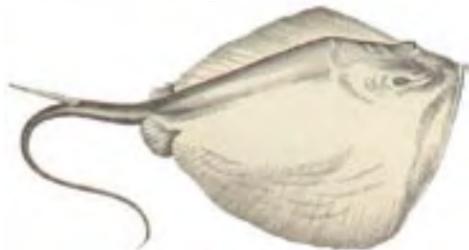
Edited by Peter & Gunild Symes



No Major Fall Out in Dive Tourism from Irwin Death

Despite recent doom and gloom reports from some dive news agencies, the death of popular Australian TV personality and conservationist, Steve Irwin, who was killed by a stingray in the fall of this year, has had minimal negative impact if any, according to spokesmen for the Queensland dive tourism industry and the Cayman Islands Tourism Association (CITA), which promotes Stingray City and Sand Bar as local attractions to millions of tourists each year. Indeed, Steve Broadbelt, Chairman of the Water Sports Committee of CITA said that there has actually been a slight rise in numbers of tourists visiting the attractions as compared to the same time last year. While the area is currently experiencing its low season, attendance has been better than expected and may have even been positively affected by the media coverage. Meanwhile, in Australia, tourism agencies are reassuring visitors that the reefs are safe and expect no negative change in the numbers of tourists taking part in scuba diving activities. SOURCES: CAYMAN

NET NEWS & ABC NEWS ■



MALTA TOURISM AUTHORITY

Malta and Gozo offers some of the most exciting diving in the Mediterranean

According to The Times of Malta, a group of investors—including a fish farmer, a hotelier, and members of the diving community—are proposing a new “highly innovative marine tourist attraction.” The attraction

Malta to Get a New “Marine Adventure Park”?

By Willy Volk

would allow divers and snorkelers to swim with sunfish, rays, groupers, sea hounds, dog fish, angel shark, tuna, lampuki and other fish in one of two netted enclosures that resemble modern, large-scale fish farms.

The difference between fish farms and these enclosures is that these fish would be held only for viewing (as opposed to eating). Roughly 10 times the size of Monterey Bay Aquarium, and capable of accommodating up to 125 snorkelers and 75 divers at any time, within the enclosures, the investors plan to install replicas of megalithic temples and ancient shipwrecks to serve as artificial reefs that'll provide habitat for the fish. From the sky, the two enclosures would resemble a ship's portholes. As it would sit half a mile offshore, divers would have to access the area via boat.

The “highly innovative” attraction is currently saddled with the com-

pletely innovative-free name Marine Adventure Park. According to a spokesman for the park, “Instead of looking in as one does outside an aquarium, one snorkels and scuba dives among the fish and in many ways interacts with them.” The spokesman also claims the Park will adopt a “Noah's Ark” approach to stocking the enclosures, meaning there would not be a large quantity of fish inside the Park, but a healthy and interesting variety.

This sounds like a really interesting concept, meant to make up for the fact that divers and snorkelers are seeing fewer fish while on their excursions. If you're interested in learning more about the proposal, check out the Marine Foundation's PDF proposal or Powerpoint presentation. Although there aren't any designs of the Park, I think you can probably imagine what a giant net enclosure looks like. ■

Galapagos Marine Patrols Get a Leg Up On Poachers

An overhauled U.S. Coast Guard cutter has started patrol duty in the waters of the Galapagos Islands in order to catch poachers at sea. It is the first National Park vessel fast enough to outrun them. Now, park officials finally have a way to catch illegal fishermen that threaten the highly cherished marine life and diverse ecosystem of the Galapagos. Rebuilding of the 95-foot cutter, *Yoshka*, was made possible by funding from the WWF.

The *Yoshka* hails from an illustrious career in its previous life having played an important role in the Cuban missile crisis helping to transport refugees to Miami in 1965. Now, after badly needed repairs, the cutter is again able to reach a top speed of 22 knots and navigate for 7-12 days without refueling, and serve once again on missions to save lives, this time that of precious and endangered sea life. ■



The U.S. Coast Guard Cutter, *Yoshka*

Philippines, Malaysia and Indonesia to Fight Terrorism With Better Border Patrol

In order to deter operatives of the Southeast Asian regional terrorist network, Jemaah Islamiyah (JI), from entering into Mindanao, the Philippine Government is seeking to work with Malaysia on bettering boarder patrols.

A proposal from the Defense Secretary Avelino Cruz to the set up sealanes along boarders so officials can effectively monitor the movement of ships was given to Malaysia and Indonesia. According to Cruz, established sealanes would let legitimate traffic flow through the area while helping authorities from the three countries check vessels found outside the lanes. Thereby, strengthening control over unauthorized boarder crossings and illegal activity.

These measures come none too soon as about 30 JI militants are now operating in the Philippines while other bombers and leaders are being hunted in Sulu. SOURCE: SUNSTAR IN MANILA ■

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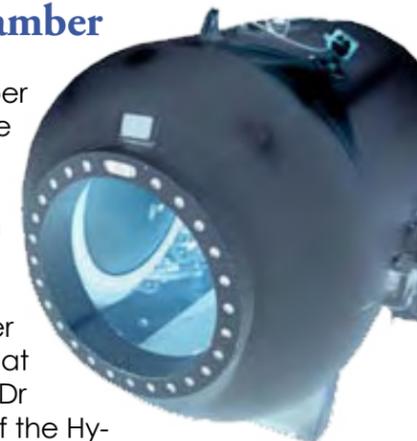
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Dahab Gets a own Hyperbaric Chamber

A nine-person chamber is now available at the new hyperbaric medical center in Dahab, Egypt, at the northern end of the Red Sea. Although used, the Italian-made chamber is certified and in “great shape” according to Dr Adel Taher, director of the Hyperbaric Center in Sharm El Sheikh.

The Dahab center will help victims of decompression illness more quickly than before when patients had to be evacuated to the Sharm El Scheikh center to be treated. It is also hoped that the chamber will be used for research purposes in coordination with the Italian National Research Center and DAN-Europe. Dr Taher told DIVE that a new recompression chamber will be purchased for Sharm El Sheikh, which will operate in tandem with the current chamber in order to lessen its work load. ■





In Jules Verne's Footsteps

Text by Yann Saint-Yves

Sea Orbiter. Wow. It sounds like a novel by Philip K. Dick or a Stanley Kubrick movie, doesn't it? But the Sea Orbiter is not science fiction but a serious project on its way to become reality. A new Odyssey could soon take its beginning...

Jacques Rougerie is an architect, well known for his incredible boats, which allow passengers to enjoy "undersea sightseeing" through huge plexiglas hemispheres. Long

hulls, short hulls, sailing boats with underwater windows to the sea, underwater houses, motor boats—that was his leitmotif between the 70's and the 90's. As every other visionary, he was considered an original and a dreamer.

Right... However, Jacques Rougerie is one of those very rare individuals who actually transforms his dreams into reality. His very special boats can be seen all around the world, allowing everyone to discover underwater marvels seated dry and comfortably in the company of the whole family. In a way, his recipe is simple: Aluminium hull, methacrylate panoramic windows, and a particular organic

design. Jacques believes that living in the sea, with the sea, is a way to bring its mysteries to light. During one of his recent dreams, he envisioned an incredible boat, able to cruise freely among the longest ocean currents, as the biggest planktonic entity ever met. As a classical boat suddenly put in vertical position, above and below the water surface at the same time.

Scientific project

Sea Orbiter is not just an impressive boat, it is also a scientific project. Understanding the great ocean currents and their impact on climate and marine life was the first goal of this project. On the other hand, living under the surface is similar to conditions on space crafts where humans need life support systems and have to live in confined spaces while dealing with food, health and energy for long periods of time in relative autonomy. So, it was only logical that NASA took an interest in the project too. After all, they've been training all their astronauts underwater since 1946. Also, the European Space Agency, various environmental protection agencies and scientific organisations have shown interest including Institut de Recherche et de Développement, Woods Hole Oceanographic Institution and the National Oceanographic and Atmospheric Administration. Together, they created the scientific program behind the Sea Orbiter.

The vessel

Imagine a "classic" ship, then cut off the superstructure and seal the deck. Then, place a lot of "plexi" windows along the hull and put a weight of more than 400 tons at the rear end. You finally add a huge underwater wing-shaped



Jacques Rougerie

disc all around the now vertical structure for stabilisation. Well, that's the idea anyway...

In reality, it's much better and really quite beautiful. A three-meter high model was first presented in Paris during the centennial anniversary of Jules Verne's disappearance (1905) in the Musée National de la Marine. The model, built by MARINTEK in Trondheim, Norway, captivated the imagination of thousands of visitors in the museum. Sea Orbiter is to reach about 51 meters in height and 23,8 meters in width. Twenty meters of the structure is visible above water with 31 meters below the surface.

Clean energy

Originally the project wanted to use 100% "green" energy. But technical solutions for long trips were not efficient enough, and in the end, two of two diesel engines were included for moving the vessel long distances if needed. But this is only for the first model, as the next Sea Orbiter should use some cleaner engine technologies such as hydrogen cells and electric motors. For the rest, fans and solar panels should provide enough energy for life support, steering the

Jacques Rougerie's passion for ocean projects goes back a long time. Undersea Village is from 1973



vessel and running scientific equipment on board. Crew members will mainly be scientists, divided into two groups since the lowest part of the vessel can be isolated, like a compression chamber, meaning that a part of the team can live in saturation for some time. The pressurized deck has direct access to the ocean, allowing scientists to dive whenever they need to, with great savings in time, as they would need no, or at least very reduced, decompression stops. One of the advantages for the scientists is that they will be able to observe the marine life and natural organisation of species around this life shelter. In a few weeks, scientists

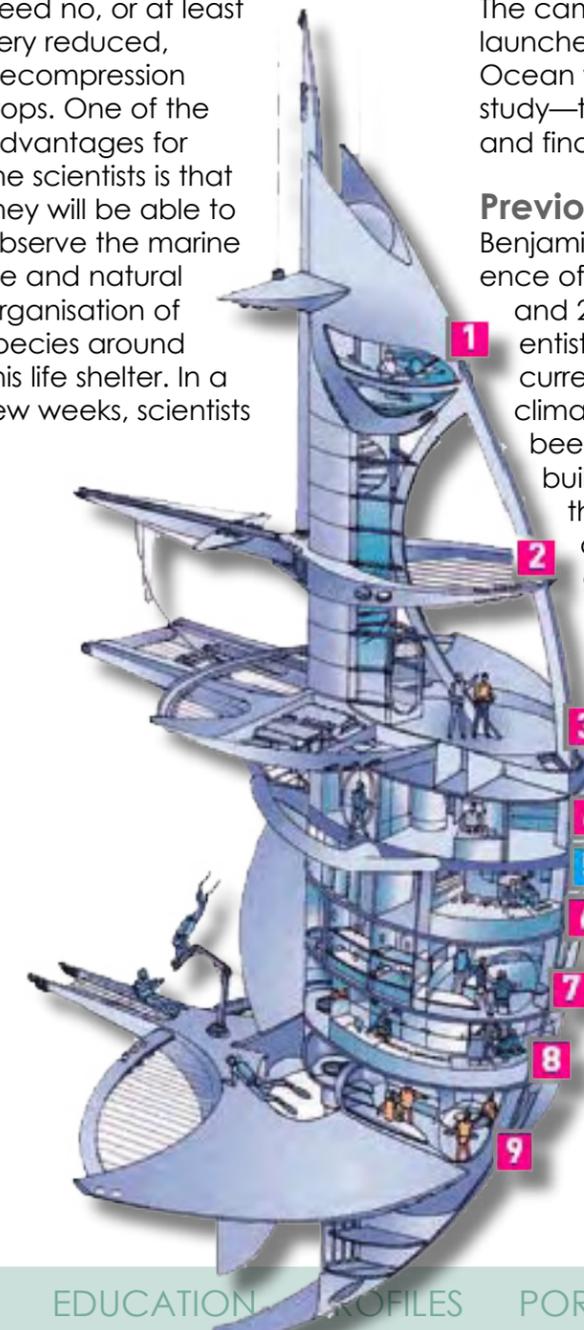
may have a complete representation of marine life living at their doorstep. The first missions could last up to two years.

Missions

The campaigns should be first launched in 2008-09 in the Atlantic Ocean with the Gulf Stream study—then, the Pacific Ocean, and finally, the Indian Ocean.

Previous projects

Benjamin Franklin proved the existence of the Gulf Stream in 1769, and 200 years later, many scientists guessed that this marine current has a huge effect on climate. Jacques Piccard has been requested by NASA to build a submarine for studying this current : from the 14th of July to the 14th of August 1969, the *Ben Franklin* with six crew members aboard, drifted in the Gulf Stream at a depth of 100m to 600m. ■



1. Upper lookout deck, bridge
2. Trampoline deck, relaxation zone
3. Surface deck
4. Access deck, workshops
5. Sea level
6. Service deck, bathrooms
7. Atmospheric deck, living quarters
8. Research deck, laboratories
9. Pressurised deck, living quarters

