Gifts for Shark Lovers Only

X-ray mag

GLOBAL EDITION
November 2009
Number 32

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www.xray-mag.com

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COVER PHOTO: *Pair of Zebra Crabs on Fire Urchin, Lankayan, Malaysia*, by Andrea and Antonella Ferrari
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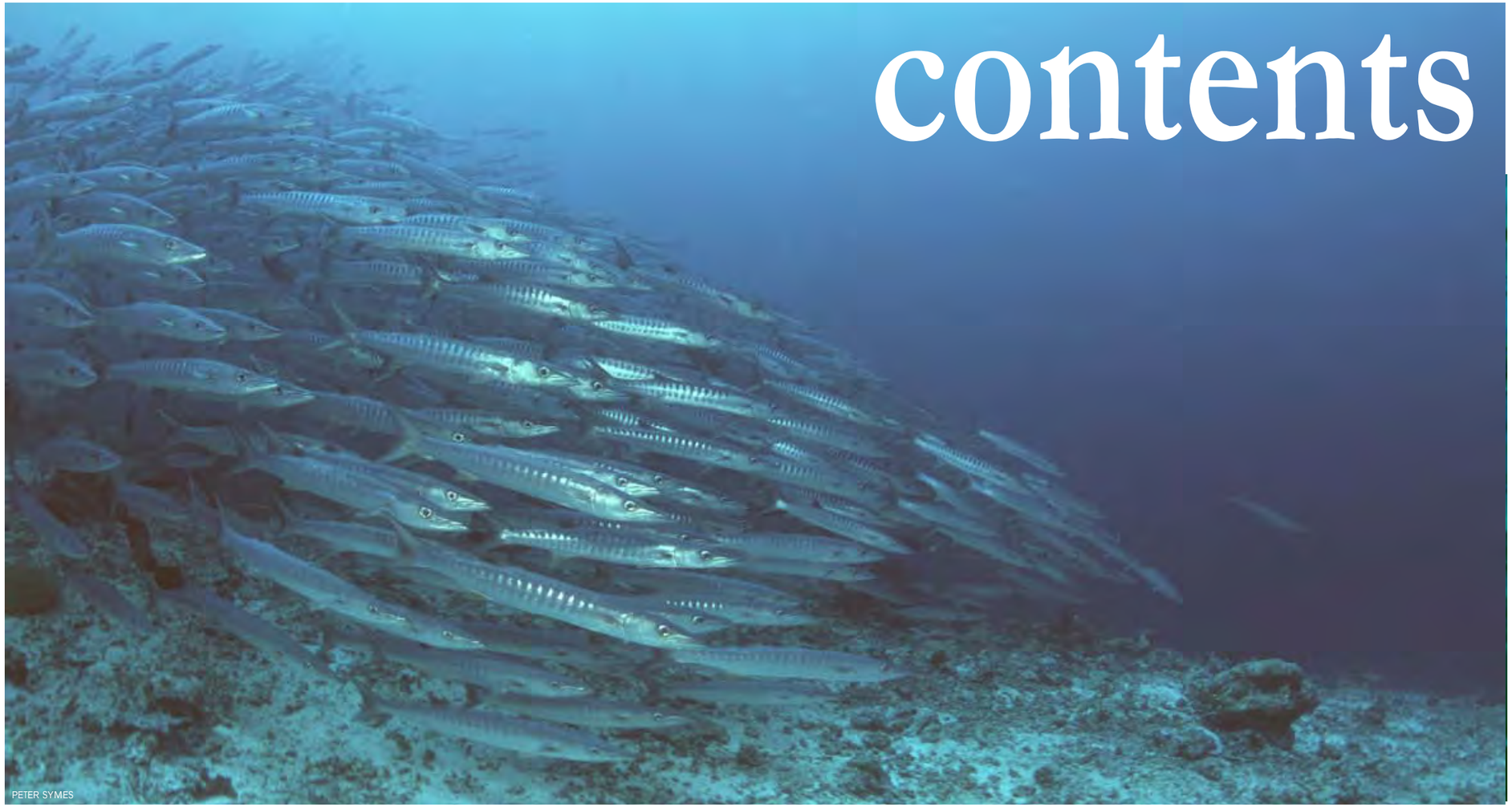
PETER SYMES

The times... they are a-changing

"The strength and beauty of sharks are a natural barometer for the health of our oceans. Therefore, I declare today that Palau will become the world's first national shark sanctuary, ending all commercial shark fishing in our waters and giving a sanctuary for sharks to live and reproduce unmolested in our 237,000 square miles of ocean. We call upon all nations to join us."

Johnson Toribiong, President of Palau,
in a speech to the United Nations General Assembly
on Friday, September 25, 2009

Bravo! This was a landmark speech by a head of state and remarkable news in several ways.

The value of such a sanctuary cannot be overrated. Findings from other no-take zones have clearly demonstrated how significant sanctuaries are for rebuilding dwindling fish stocks. From within these zones, fish populations have often rebounded and replenished stocks elsewhere.

What a long way we have come in a few decades in our appreciation of sharks. Not so many years ago, these magnificent creatures were seen as voracious man-eaters only to be feared and loathed... *The only good shark was a dead shark*—was how the saying went.

Some 30 years after Steven Spielberg's *Jaws* movie first scared the living daylights out of the movie-goers and made us anxious about taking a swim at the beach, we find that dive travellers are paying top dollar for close encounters with sharks, and most recently, in some cases, even swimming in open water (without cages) with tiger sharks and great whites.

Our appreciation of sharks, and the value we place on sharks, has come a long way. Let us hope that the trend continues to spread worldwide. Sharks are worth so much more alive than dead, in terms of both ecology and economy. ■

X-RAY MAG is a founding member of the Underwater Network **Underwater Network.com**

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

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

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X-ray mag

News edited
by Peter Symes
& Catherine G S Lim

piping hot

NEWS

Deep water coral

Massive Black Coral Forest Found Off Southern Italy

Italian researchers have found one of the largest forests of black coral off the coast of southern Italy.

Comprising almost 30,000 colonies, the black corals (*Antipathes subpinnata*) covered ground as large as two soccer fields. As it was at a depth of 50 to 100 metres, researchers used a remote-controlled submarine to film the massive forest.

In addition, they also discovered an extremely rare black coral species, *Antipathes dicotoma*. It is so rare that there are only five fragments of it being stored in museums. This was the first time this coral species had been found alive in its natural habitat.

However, as excited as they must be, the researchers are keeping mum about the site of their discoveries. "The coral we found has a great value, primarily because of its rarity," said Silvestro Greco, head of the environmental agency for the southern Italian region of Calabria.

"If somebody with no conscience knew exactly where they were, I think there would be risks. That's why we have not really disclosed where they are."

Black coral is listed as an endangered species by the Convention on International Trade in Endangered Species. It is brightly coloured, and gets its name from its black or brown skeleton. It is this skeleton that is sought after for use as jewellery.

Simone Canese, chief researcher of the exploration project, credited the progress in underwater technology for the breakthroughs in the filming and study of new marine environments.

"With the recent increase in underwater exploration, more of them [*Antipathes dicotoma*] may be discovered, but we have provided the first images of them, alive, in their environment." ■

ABOVE LEFT: Close-up view of rare black coral. RIGHT: Garden of rare black coral at growing in the wild

Deep-water Corals Receive State Protection

Over 23,000 square miles of deep-water coral reefs in the South Atlantic is now under state protection, thanks to a historic ruling by the South Atlantic Fishery Management Council.

The legislation will protect coral species living in waters off the coasts of the Carolinas, Georgia and eastern Florida, at depths of 400 to 700 metres.

This is a significant move, as the South Atlantic region is home to what is believed to be the world's largest contiguous distribution of deep-water corals. Now, with the legislation, the corals would be safe from the impact of bottom-tending fishing practices.

However, the concerns of the fishermen who work in the region have not gone unheard.

Working closely with fishermen, fisheries managers and coral reef experts, Dan Rader, chairman of the Council's Habitat and Environmental Protection Advisory Panel, outlined specific areas in which fishing would be allowed with gear restrictions.

These "Allowable Golden Crab Fishing Areas" and "Shrimp Fishery Access Areas" help to ensure the continued existence of these fisheries and the communities they support.

According to Rader, "I know of no other example where the finest science available was translated through interactive work with managers and fishermen into world-class protection. This impressive 'win-win' should be celebrated by all those who love the sea, and who appreciate eating sea food they know is harvested in ways that protect its bounty." ■

Hawaii: Scientists Diving to New Depths Make Exciting Discoveries

Diving as deep as 250 feet, scientists on a research trip at the remote Northwestern Hawaiian Islands made some exciting discoveries.

At the Papahanaumokuakea Marine National Monument, they discovered new coral species, as well as deep-water algae beds that served as nursery grounds for juvenile reef fish like the parrotfish and butterflyfish. In fact, they even got hold of the first specimen of a recently discovered species of butterflyfish.

"We were seeing reefs that no human has ever laid eyes on before," said Randall Kosaki, the research mission's chief scientist and diver.

"The coral reef habitat goes four times deeper than where we've been working prior to this."

During the month-long expedition, Kosaki and his team had been diving with the help of new technology that allowed them to dive deeper than was possible several years ago. As a result, at the 200-foot depth, they found 12 to 15 fish species never seen before at the monument.

The fish population there were thriving, thanks to the fact that fishing did not take place in the protected zone. The relative isolation of the monument (with the only human settlement at a research outpost on Midway Atoll) meant that the reefs were not subject to runoff from housing developments and paved riverbeds. Hence, the reefs at the monument were very healthy.

"At one time, we had 100 sharks around us. It's just something you don't see here on Oahu or any of the inhabited islands," Kosaki said. ■

NOAA

A Holistic Approach to Coral Reef Health

Maintaining the good health of coral reefs is best done in a holistic manner, taking not just the physical health into consideration, but the environmental factors as well.

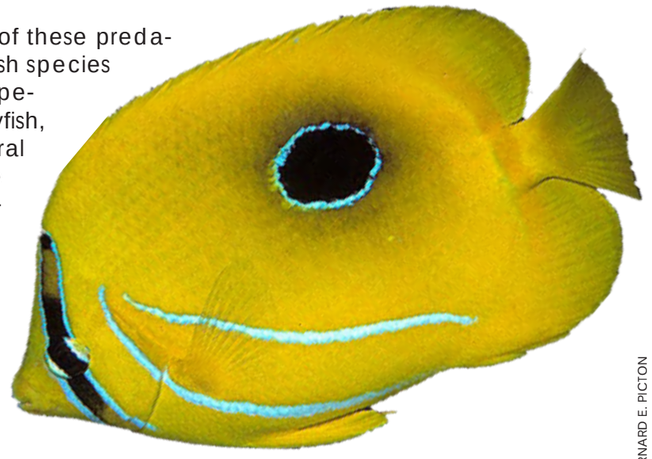
A case in point: Following a major bleaching incident, corals on various reefs in Honduras and Belize recovered and grew normally within two to three years when the surrounding waters were healthy. However, at locations were there was excessive adverse impact (like pollution), the corals did not recover fully, even after eight years.

"You can imagine that when you are recovering from a sickness, it will take a lot longer if you don't eat well or get enough rest," said Jessica Carilli, a graduate student at Scripps Institution of Oceanography at UC San Diego.

"Similarly, a coral organism that must be constantly trying to clean itself from excess sediment particles will have a more difficult time recovering after a stressful condition like bleaching."

Disease and overfishing also affected coral health. In places where there is overfishing, the population of bigger fishes like groupers are either significantly reduced or have vanished.

In the absence of these predatory fishes, other fish species thrive. One such species is the butterflyfish, which feed on coral and appear to be responsible for disease transmission amongst the corals.


BERNARD E. PICTON

Bluelashed butterflyfish, *Chaetodon bennetti*

In a study, scientists compared seven Marine Protected Areas [MPAs] where fishing had been banned for at least five years, and another seven neighbouring sites with similar diversity.

They discovered that the corals at the latter sites suffered more diseases; in some cases, the difference was twice as many. In addition, many butterflyfish were found at the sites where fishing was allowed, leading to a higher incidence of coral disease.

Similar patterns were found at the Great Barrier Reef in Australia.

Of course, other factors do come into the picture. Pollutants like sewerage and fertiliser are bad news for corals, as are the abnormally high water temperatures during the occurrence of El Nino.

Nevertheless, preserving the diversity of the reef appears to boost their ability to cope with certain rising temperatures.

"The general trend is that where you find more functional diversity, you find fewer butterflyfish," reiterated Laurie Raymundo, a researcher at the University of Guam.

Of course, to ensure that predatory fishes are present to keep down the number of butterflyfish, the scientists are not advocating that fishing be banned. Rather, it is about maintaining a balance.

"One of the things that came out of this is that if you have a well-managed MPA, it works to keep coral healthier. [...] So as long you keep certain species there and can control fishing—don't catch in certain seasons or don't catch fish under a certain size, whatever is appropriate —you might not have to ban it completely." ■

U.S. GEOLOGICAL SURVEY

Staghorn coral (*Acropora cervicornis*) has been listed as threatened because their numbers are declining, owing to a combination of natural and anthropogenic stress factors

Reproduction of Farm-raised Corals Spell Hope for Coral Restoration

For the first time, Atlantic-Carribean farm-raised staghorn corals were documented to have reproduced, giving hope for the future of coral restoration.

This discovery was significant in that it proved that transplanted staghorn corals still possessed the ability to survive in the wild, reach sexual maturity, and reproduce.

Working with the marine scientists of the Florida Keys National Marine Sanctuary, students dove and collected gametes released from transplanted corals at Molasses Reef off Key Largo in August.

"This is very much like a great big circle of life," said Dr David Palandro, a research scientist for the Florida Fish and Wildlife Conservation Commission. "Corals were transplanted here, and we're collecting the gametes from those transplanted corals, and we hope to take those gametes and transplant them somewhere else."

Added Ken Nedimyer, president of the Coral Restoration Foundation: "This is real exciting because this is the future of trying to rebuild these reefs." In addition to being involved in coral restoration projects for the past nine years, Nedimyer has been personally involved in the corals at Molasses Reef in recent years.

In 2006, he had harvested inch-long fragments of live staghorn and planted them in a special nursery off the Upper Keys. The following year, with the help of students, the more mature clippings were transplanted into a portion of sand at Molasses Reef.

Then, in August 2009, other students working as part of SCUBAnauts International education group documented and collected gametes from these farmed corals.

The results give hope for the future of the corals. "We're growing a lot of corals in our nursery, and we can replant them on some reefs, but we could never replant all corals on all the reefs," said Nedimyer.

"The goal is to get them reproducing successfully, so they can do what they used to do."

In the northern hemisphere, spawning normally takes place a few days after the full moon in August or September. During this time, larvae are dispersed over a wide area. If they survive long enough, ocean currents might relocate them 10 to 50 miles from the original site, according to Nedimyer.

For the students, the experience gave them to a new realm of knowledge. "All we see on land is how animals reproduce, but we don't really know what goes on underwater. It was awesome," said Nick Johnson, a high school senior from Dunedin, Florida. ■

Diverse fish reduce diseases in coral

Coral reefs with a diverse fish population are healthier than overfished ones.

Scientists showed a reduced incidence of coral disease in areas of the Philippines where fishing is banned, compared with neighbouring areas. The researchers concluded that some types of fish probably carry coral diseases, writing and suggesting that the disease-carrying species thrive where predatory fish are absent.

LEONARDO STABILE

Copperband butterflyfish, *Chelmon rostratus*

Butterflyfish (*Chaetodontidae*), which are not fished, appear the likely culprits in disease transmission. "People like to eat the big predators such as groupers and a few others," said lead researcher Laurie Raymundo. "In some cases, these species are not so abundant, and in others, they've just gone. And the general trend is that where you find more functional diversity, you find fewer butterflyfish," the University of Guam researcher told BBC News.

Diseases have inflicted substantial damage on coral reefs in a number of regions in recent years, notably the Caribbean, where naturally abundant species, such as elkhorn and staghorn, have been almost wiped out in some places. ■

Stop Shark Finning — One Soup Bowl at a Time

Text and photos by Catherine G S Lim

Smashing soup bowls to protest against shark finning was what shoppers and passers-by did at a special event to celebrate World Animal Day in Singapore recently.

Organised by **ACRES** (Animal Concerns Research and Education Society), the three-day event encouraged passers-by at a busy shopping district to throw donated shark's fin soup bowls in an enclosed space. The broken pieces were then used on the spot to create installation art - a 15-metre mosaic of a shark.

"This tradition [shark finning] is not only cruel, it is wasteful and hugely destructive, because when sharks die, the entire marine ecosystem also collapses," said Louis Ng, Founder and Executive Director of ACRES.

Every year, about 100 million sharks perish to satisfy the global demand for shark's fin soup. Singapore, where the event was held, is the world's third largest shark's fin trading centre, according to the UN's Food and Agriculture Organization.

The opening ceremony on October 2nd was graced by local celebrities who learnt more about the issue and pledged to go off shark's fin soup. Then, they had a ball of a time smashing soup bowls and laying the first pieces of the shark mosaic.

ESPN Star Sports presenter Jamie Yeo, who threw the 'inaugural' soup bowl, said, "Some things are created perfect but humans and their traditions are fallible. Therefore, sometimes we need to break the tradition."

After all the celebrities had a go, they penned personal messages on one of the walls that formed the enclosure, and then were treated to a free sampling of doubled-boiled ginseng soup with pumpkin silky beancurd and bamboo fungus, a vegan alternative to shark's fin soup, courtesy of Fairmont Hotels & Resorts. So far, this is the only hotel in Singapore that has made a deliberate choice to stop serving shark's fin soup.

Over the three days, the response was very positive, with the public willingly forking out $2 for every soup bowl. Some even bought several bowls at a time. Donations were also sought, to further the anti-shark-finning campaign, and to fund ACRES' other educational and outreach programmes, as well as wildlife rescue. In total, more than $8,000 were raised.

Several hundreds of soup bowls, complete with spoons, were donated to ACRES for this event. Intended to be discarded anyway, the soup bowls now have a second life, as a meaningful and somewhat ironic second life. After the exhibition, the broken pieces would be used to create permanent works of art for exhibitions and ACRES' education programmes. ■

"Shark's fin coup is so passe."

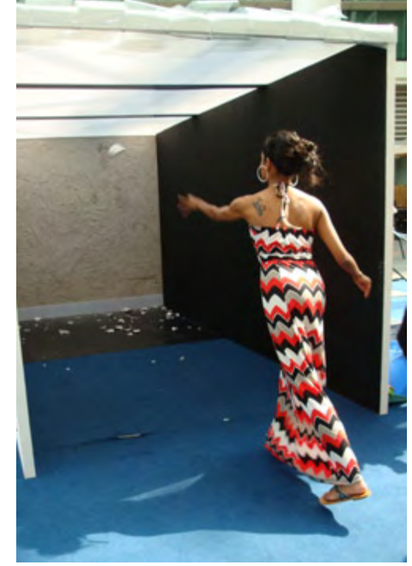
—Melody Chen, television presenter & actress

"Traditions aside, how could one stomach shark's fin soup when there is so much cruelty afflicted in producing such a dish? You don't have to condone such practice to gain status."

—Randall Tan, television actor

"One of my friends told me what happens to the sharks, and after that, I couldn't eat it anymore."

— Passer-by



CLOCKWISE FROM TOP LEFT: Detail from poster for event; Actress throwing soup bowl; Supporter gets shark tattoo; Vegan alternative to shark fin soup; Actor fills in the shape of a shark with broken pieces of soup bowls; ACRES founder, Louis Ng, talks to a reporter about the event and the cause; Shape of shark filled with broken pieces of soup bowls; Families show their support by signing a wall

Dressed in full scuba gear, the government of the Maldives held a cabinet meeting underwater to highlight the threat of global warming to the low-lying Indian Ocean nation. In 2007, the UN Intergovernmental Panel on Climate Change predicted that sea level rise will submerge the low-lying islands of the Maldives within a century

Maldives' government conducts cabinet meeting under water

President Mohamed Nasheed, conducted the 30-minute meeting at a depth of 20 feet off the coast just north of the capital, Male.

Sitting five feet deep in the lagoon, President Mohamed Nasheed and 11 cabinet ministers used hand signals and a white slate to communicate before signing a declaration calling on all nations to "join hands and reduce carbon emissions and bring down the level of carbon in the atmosphere to below 350 ppm". Current levels of carbon in the atmosphere stand at 390 ppm.

Climate change was a serious issue that needed the world's attention, the president said.

The president appealed for a concerted effort to commit to "a better deal" at the landmark Copenhagen climate change summit in December to ensure that "everyone survives". World leaders will congregate in Copenhagen in an attempt to forge a successor to the Kyoto Protocol, due to expire in 2012. ■

Natalia Molchanova set freediving record at age 47

Russian freediver, Natalia Molchanova, has become the first woman in the world to break the 100 meter barrier in Constant Weight, by freediving to 101 meters off Sharm el Sheik, Egypt. Her total dive time was 3 minutes and 50 seconds. ■

WIKIMEDIA COMMONS

‘Turtle Mafia’ on Bali is at it again

By Kurt Amsler

Sea turtles on Bali are once more in danger of being butchered. You can help prevent it. Once again, we ask for your support. We have managed to put a stop to this slaughter before. But now the ‘Turtle Mafia’ on Bali is at it again. The governor of Bali is being pressured to permit the slaughter of thousands of sea turtles for ‘religious purposes’.

About a year ago, we could proudly announce that the campaign to stop the slaughter of sea turtles on Bali had been a success. The cages and slaughterhouses in Tanjung Benoa were all empty and no more turtles were being traded in public places.

While it was still possible to find some animals on the black market, they were harder to find. The number of killed and traded animals dropped around 90 percent since the onset of the campaign.

There were reasons to be proud. After an eight-year battle against the Turtle Mafia, we seemed to have won the war.

The ghost reappears

Yet, the issue is now raising its ugly head again.

Thanks to an intensive lobby by various interest groups, the Balinese Government is now considering permitting the killing and trading of a thousand sea turtles per year for Balinese rituals.

Obviously, such a decision will open the floodgates to uncontrolled killing once again, and it will be impossible to control the number of animals slaughtered.

We need to react now! It is not too late. The opposition and the Pro Fauna organisation is engaged in ongoing discussions on various political levels. But they need our immediate support.

SOS-Seaturtles is already financially supporting the entire administration as well as initiating a petition during which thousands of letters of protest will be sent to the authorities. We are very concerned for Bali’s sea turtles and don’t consider such a decision just a domestic issue.

Watch **this video** from Bali. This movie was filmed a decade ago. Do you want this to happen again? If not please sign our petition on the following **link.**

Thank you for your support! ■

Let’s stop them

PETER SYMES

A bed of the macroalgae bladderwrack (*Fucus vesiculosus*) is home to diverse sealife including this rock-pool shrimp *(Palaemon elegans)*

Although they have many plant-like features seaweeds are not true plants but algae

While there are some plants that grow in the ocean, the majority of the big ocean photosynthesizers are the seaweeds. Although they have many plant-like features seaweeds are not true vascular plants; they are algae. Algae are neither plants nor animals but part of the Kingdom Protista, the kingdom that contains all those single-celled organisms that we glimpsed under microscopes in pond water samples back in elementary school.

No veins and no flowers

Seaweeds are not grouped with the true plants because they lack a specialized vascular system (an internal conducting system for fluids and nutrients), roots, stems, leaves, and enclosed reproductive structures like flowers and cones.

Because seaweeds live in the ocean, surrounded by water, they don't need and have none of the structures that plants use to obtain water and nutrients from the soil. Seaweeds lack the vascular system and roots of a plant; they can absorb the water and nutrients they need directly from the ocean surrounding them.

The leaves of seaweeds are called blades. Technically, they are not really leaves since they lack veins.

Like true plants, seaweeds are photosynthetic and convert energy from sunlight into the materials needed for growth. Within their cells, seaweeds have the green pigment chlorophyll, which absorbs the sunlight they need for photosynthesis and gives many seaweeds their green colouration. In addition to chlorophyll, some seaweeds contain other light absorbing pigments. These pigments can be red, blue, brown, or golden, and are responsible for the beautiful colouration of red and brown algae.

Many seaweeds have hollow, gas-filled structures called floats or *pneumatocysts*. These help to keep the photosynthetic structures of the seaweed buoyant, so they are able to absorb energy from the sun. ■

wreck rap

Edited by
Mathias Carvalho

Lost Fighter Jet Found in California Bay

Pat Macha, an aircraft archeologist who has identified about 3,700 crash sites and visited more than 800 around the Santa Monica Bay seafloor, was part of a search team that have accidentally found and identified the wreck of a Lockheed T-33A jet fighter that disappeared nearly 54 years ago.

Computer expert Gary Fabian is the founder of UB88.org, a group that discovered a missing World War I German U-boat off the California coast in 2003. He was the one who identified "a few little pixels" on a high-definition U.S. Geological Survey image map of the Santa Monica Bay ocean floor.

Fabian met Macha about five years ago in Huntington Beach, California, while researching for military aircraft wrecks.

Macha told him about his 11 year search for another missing aircraft, a P-51D Mustang fighter flown by World War II Women's Air Force Service pilot Gertrude "Tommy" Tompkins Silver, presumed lost at sea in 1944. Silver's is the only wreckage that has not been found.

Dive operation

Fabian sent the map info to Ray Arntz, owner and operator of a southern California dive company and a fellow member of UB88.org.

Arntz and fellow employees set out to search and found three wrecks using side-scan sonar. Two turned out to be boats. They weren't sure about the third, so they went down to inspect the site.

He saw a fairly compact debris field with a lot of aluminum, which indicated that it was an airplane. They also found landing gears, which corroborated it.

Ray's crew identified a manufacturer's number on a feed mechanism for a 50-caliber machine gun. The engine appeared to be a jet, so he knew it wasn't the Mustang, which had a propeller motor.

At that point, Arntz realized that, "We know it's not what we're looking for."

Researching government documents, the searchers found that the manufacturer's number indicated it was a T-33 Shooting Star, which had disappeared in the area.

"It just matched what we had," Arntz said. "The T-33 was it."

Lost and not found

While looking for one missing plane, Macha and the others came upon an unexpected wreckage.

"It's a funky thing," said Macha. "You're looking for one aircraft, and you find another."

Macha's interest in aircraft wrecks started in the 1960s when he found a crash site while working in a Boy Scout camp in the San Bernardino Mountains.

There are 2,500 crash sites around California, he said, where airplanes and their scattered remains can still be found. Some are listed on his website:,www.aircraftwrecks.com ■

Lockheed T-33 on display

NOAA locates US Navy Ship Sunk in World War II Battle

A NOAA-led research mission has located and identified the final resting place of the *YP-389*, a U.S. Navy patrol boat sunk approximately 20 miles off the coast of Cape Hatteras, NC, by a German submarine during World War II.

Built originally as a fishing trawler, the *YP-389* was converted into a coastal patrol craft and pressed into service after the Japanese attack on Pearl Harbor. The ship was equipped with one 3-inch deck gun to protect the ship from enemy aircraft and surfaced submarines and two .30-caliber machine guns. However, when the ship was attacked on 19 June 1942 by the German submarine *U-701*, the ship's deck gun was inoperative, and the *YP-389* could return fire only with its machine guns and six sailors died in the attack. There were 18 survivors. Weeks after the attack on the *YP-389*, the *U-701* was sunk by Army aircraft in the same vicinity as the *YP-389*.

The wreck is located in about 300 feet of water in a region off North Carolina known as the "Graveyard of the Atlantic," home to U.S. and British naval vessels, merchant ships, and German U-boats sunk during the Battle of the Atlantic. Today, the relatively intact remains of the *YP-389* rest upright on the ship's keel. The wreck site is home to a variety of marine life. Much of the outer-hull plating has fallen away, leaving only the intact frames exposed.

NOAA and its expedition partners mapped and shot video of the wreck using high-resolution camera equipment, multibeam sonar and an advanced remotely operated vehicle deployed from the NOAA ship Nancy Foster. Researchers were able to locate and positively identify the *YP-389* by reexamining data from the Duke Marine Laboratory expedition that discovered the *USS Monitor* in 1973.

Consistent with U.S. and international policy, both the Bedfordshire and the *YP-389* wreck sites are considered war graves and are protected by United States and international laws, including the Sunken Military Craft Act, which prohibits removal of artifacts and any alteration or disruption of the wreck site.

"The story of the *YP-389* personifies the character of the Battle of the Atlantic along the East Coast of the United States, where small poorly armed fishing trawlers were called to defend American waters against one of Germany's most feared vessels," said David W. Alberg, expedition leader and superintendent of the Monitor National Marine Sanctuary. ■

Photo mosaic of *YP-389* shipwreck

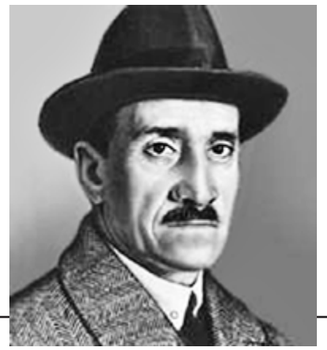
Black Sea Shipwreck

On August 2009, archaeologists found a well-preserved, 100-foot (30m) shipwreck dating back to the 18th or 19th century at a depth of 460 feet (140m), approximately 5.6 miles (9km) offshore, while testing a remote-controlled, deep-submersible research vehicle.

Loaded with stone sheets, the vessel's deck covers "are broken up and the cargo can be seen – marble or granite slabs" according to Sergey Voronov, a top Ukrainian underwater archaeologist. "In those times, active construction was underway in Crimea, and we suppose that the slabs were intended to be used at the construction of one of the palaces on Crimea's southern coast," said Voronov.

Since both masts on the wreck are broken, Voronov believes that the sailing boat capsized and sunk during a storm. "Another possibility is cargo displacement inside the ship."

Nicknamed *Grin's Brigantine* due to its similarity to the ship described in prominent Russian writer Aleksandr Grin's novel, *Scarlet Sails*. The vessel won't be raised anytime in the near future, according to the archeologist. ■



Russian author, Aleksandr Grin

Out with the Old, in with the New

The 138 meter long, 4100-ton, missile-guided frigate *HMAS Canberra*, was sunk off Victoria's coast early in October. Built in 1978 and launched two years later, the Australian vessel served for 24 years before it was decommissioned, in 2005.

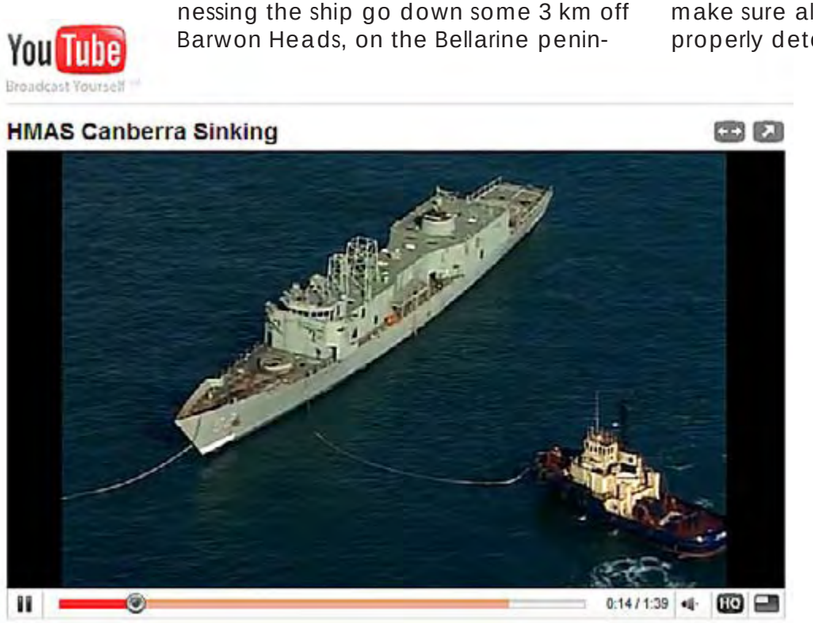
Resting at 30 meters deep, it will become a local scuba diving attraction as well as a new artificial reef that will help with the much needed ocean preservation efforts. It is expected that the new reef will be populated with fish as it began its underwater adaptation.

For wreck scuba diving enthusiasts, such as John Lawler, advocate and founder of Victorian Artificial Reef Society (www.vars.org.au), started in 2006, the sinking was a result of hard lobbying with the Australian Navy.

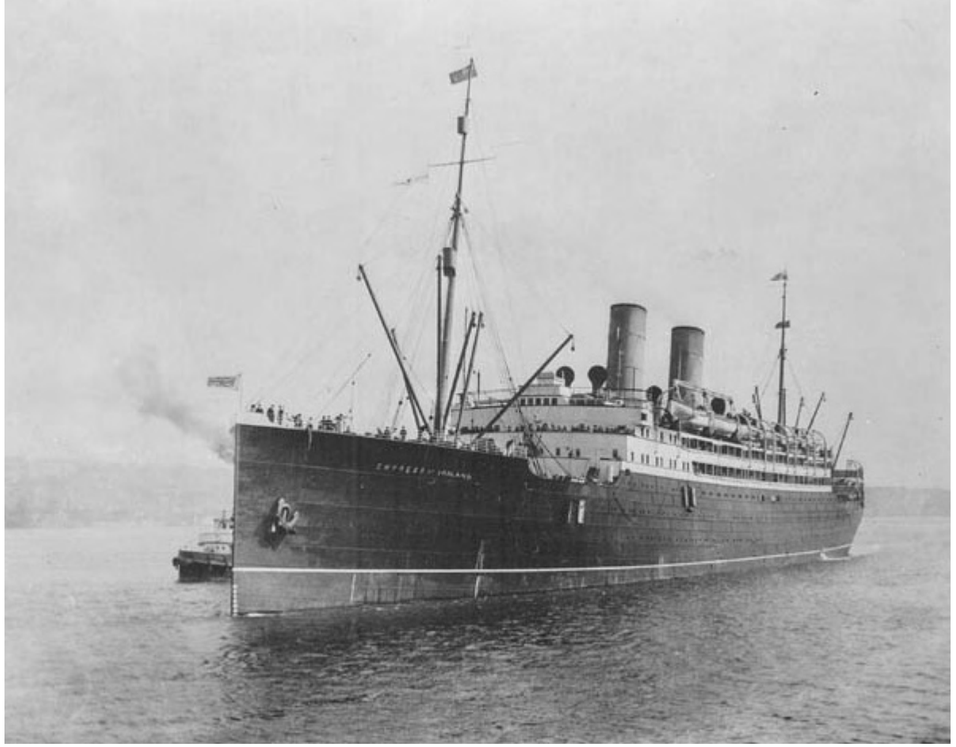
"As a scuba diver, I'm extremely excited about diving on a wreck like this," declared the 66-year-old diver, after witnessing the ship go down some 3 km off Barwon Heads, on the Bellarine peninsula. "It's like Christmas," he added. The area is populated with 46 other wrecks, and is locally known as the "Ship's Graveyard".

Recreational diving will be allowed once commercial clearance divers make sure all sinking charges had been properly detonated and moorings are installed by Parks Victoria, the government's preserve authority,(www.parkweb.vic.gov.au) sometime at the end of the year.

Mr Lawler, cannot wait to visit the site. "As soon as it's open, if the weather's fine, myself and some of my diving buddies will be out on the site as quick as we can." ■



Click on the image to see the report on the sinking of the HMAS Canberra



RMS Empress of Ireland, 1908. She was an ocean liner operated by Canadian Pacific Steamship Company. On the morning of 29 May 1914, the Norwegian collier, *Storstad*, crashed into the side of the *Empress of Ireland*. With severe damage to her starboard side, she sank within 14 minutes. A total of 1012 passengers and crewmen were lost

Empress of Ireland shipwreck named National Historic Site

Nearly a century after the *Empress of Ireland* sank in the St. Lawrence River and took the lives of more than 1,000 passengers and crew, the wreck of the elegant luxury liner that represents Canada's worst maritime disaster has finally been declared a national historic site.

The *Empress* was a luxury passenger ship that offered 570 feet of elegance and first class luxuries. Teak decking, gold trimmed plates, first class dining, first class music room where a five- peice stringed orchestra would perform and spacious sleeping quarters; the *Empress* was a beautiful ship.

The steamship crossed the Atlantic Ocean regularly for about a decade before it left Quebec, on 29 May 1914, with 1477 people aboard and travelled down the St. Lawrence Seaway where it was caught in a heavy fog. While approaching the mouth of the river in the evening a lookout spotted a ship rapidly approaching the *Empress* on the starboard side. The *Storstad* had taken action to pass the *Empress* port to port but instead ran the ship directly across the path of the *Empress* and collided with her on the starboard side bow area. The engine room flooded within minutes with the brackish seawater, which shorted out the ship's engines, water tight doors, and the electricity. The *Empress* was only able to get one S.O.S. message out before they lost power and sank in 30 metres of water. ■

This Ancient Roman marble statue from c. 191-192 CE, which was also found in an underground chamber in the area of the Horti Lamiani in 1874 and is now housed at the Palazzo dei Conservatori, is of the Greek god Triton, who was the son of Neptune, god of the seas

Blue Grotto reveals ancient roman statues

Celebrated for its incredibly blue waters and mysterious silvery light rays, the Grotta Azzurra (Blue Grotto), is one of Capri's top attractions. The grotto was roman Emperor Tiberius' private swimming pool (42 B.C. - 37 A.D.).

A number of ancient Roman statues were recently discovered lying beneath its waters, according to the results of an underwater survey.

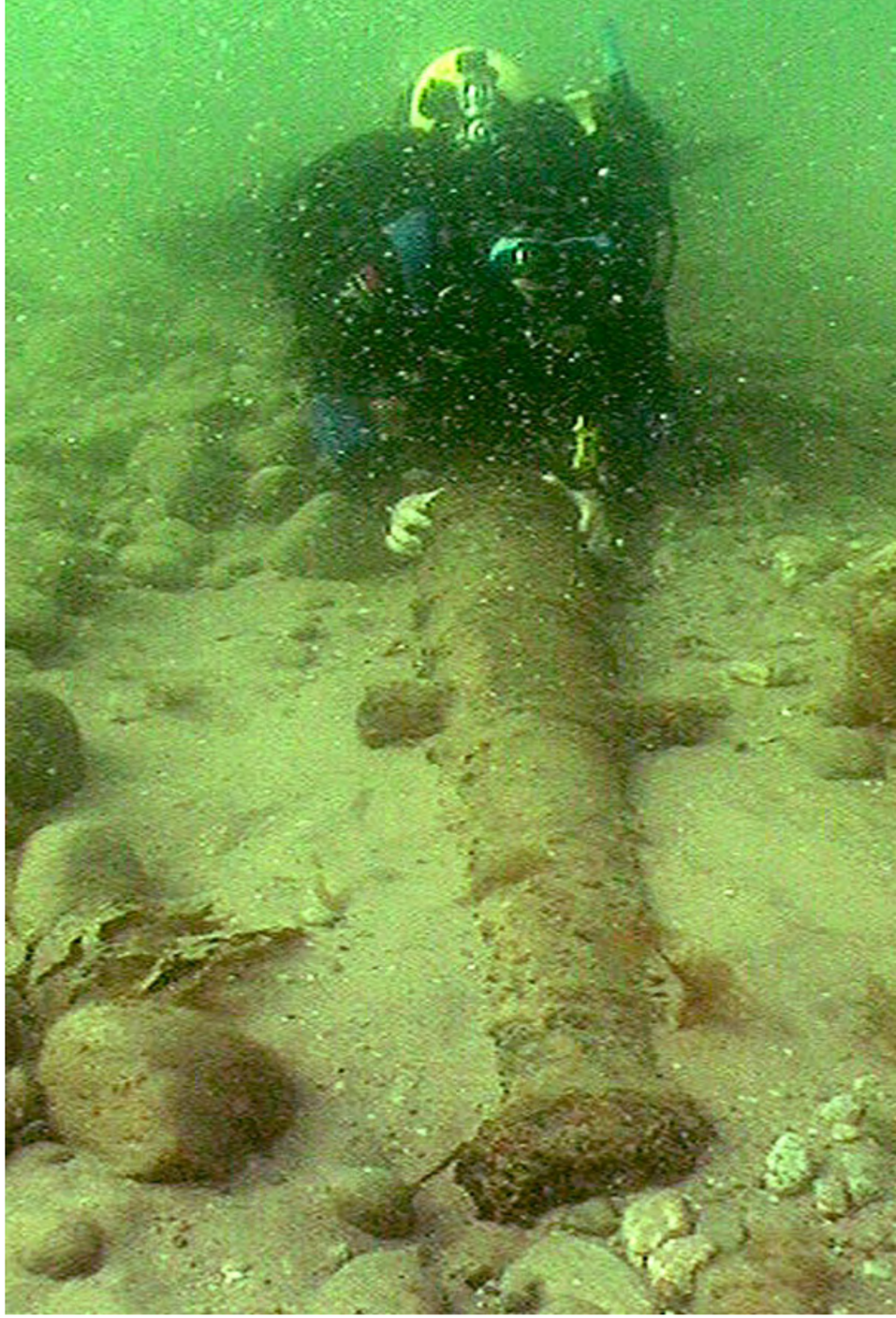
Rosalba Giugni, president of the Mare Vivo environmentalist association (www.marevivo.it), declared: "A preliminary underwater investigation has revealed several statue bases which might possibly hint to sculptures lying nearby,"

Carried out in collaboration with the Pompeii archaeological authority (www.pompeiisites.org), the Mare Vivo project aims at returning the Blue Grotto to its ancient glory by placing identical copies of Tiberius' statues where they originally stood. ■

YouTube
Broadcast Yourself™

Click on the image to watch a video taken inside the Blue Grotto

RIGHT: Diver investigates half-buried canon. BELOW LEFT: Children examine a model of a shipwreck



Shipwreck Appreciation & Conservation

Many divers already know that you shouldn't remove artifacts from a shipwreck. In addition to being illegal in most parts, doing so can also be dangerous. Diving some wrecks requires specialized training and experience.

In the province of Quebec, Canada, all divers are required to have a special license. Simply having a certification card from a recognized dive instruction agency, such as PADI, isn't good enough. Every diver must have their ability assessed by a provincially-accredited instructor before they can dive. This can mean a foreign diver, even a highly qualified and experienced, and/or vacationing one, having to perform a skills test in a swimming pool.

Likewise, it's becoming increasingly common for novice divers to be restricted from diving some "advanced" wrecks. These are typically deep-water wrecks or wrecks that have other hazards and require a high degree of diving skill and experience.

One such wreck is the *Empress of Ireland*—which lies at the bottom of the St. Lawrence River near Rimouski, Quebec. The late great liner is a spectacular but challenging dive. It's been called, "the Mount Everest of scuba".

And, for good reason. A handful of recreational divers have died on the wreck. In addition to requiring a provincial diving license, every *Empress* diver is also required to be "Advanced" certified and have at least one hundred dives under their belt beforehand.

Fine, jail or worse

Most jurisdictions have laws that govern specific dive sites, such as shipwrecks. You can be fined, or worse, end up in jail for taking artifacts from a shipwreck. Any judge will tell you, "Ignorance (of the law) is no excuse."

The important thing is to make sure you know the relevant local laws before you dive. Better yet, before you arrive. Your travel agent, or dive tour operator, should be able to tell you about the rules and regulations pertaining to a particular site.

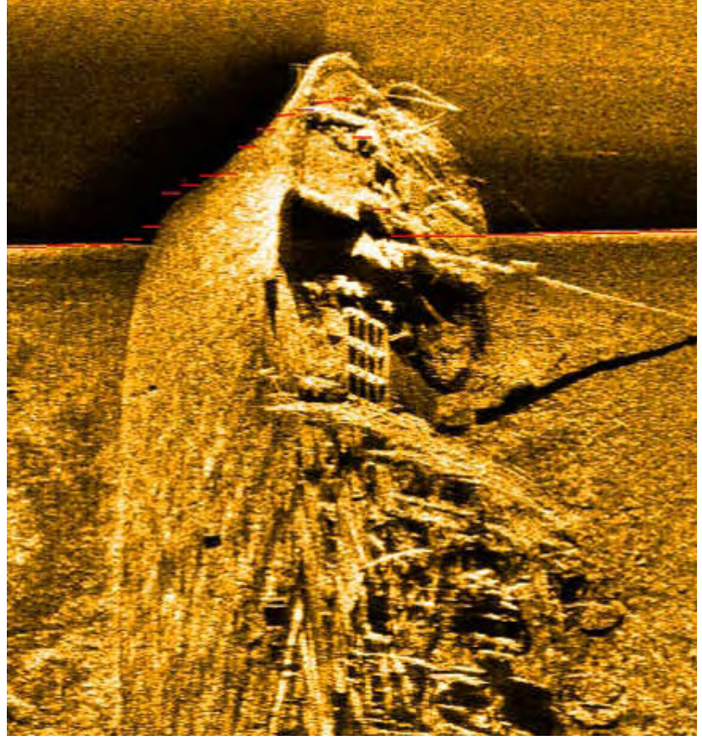
A military ship remains the exclusive property of its flag country at the time of its sinking. If you remove an artifact from such a wreck, you may find yourself in an international court, or up against a foreign government. Some war wrecks, such as the Civil War causalities, *Monitor* and *Alabama*, are off-limits to recreational divers.

A diver may also be required to purchase a permit or license before they can dive. The money generated from the sale of such permits is used to interpret and conserve the site.

Removing artifacts can also cost you your life. Not only can it be physically demanding, but being involved in such activity can cause a diver to lose track of their bottom time or depth—putting them at risk. Overexertion can also increase a diver's risk of decompression sickness.

In addition to risking injury, or a lawsuit, there's another good reason not to remove artifacts. Every time a diver removes something from a shipwreck, there's one less thing for the next diver to see.

wreck rap



Not politically correct

In the old days, taking artifacts demonstrated a diver's prowess. If a ship's bell or bridge gear was there, it meant you were the first to dive the wreck. So, you took it. But, like lots of other former past-times, such as big game hunting and scalping Indians, taking artifacts from shipwrecks is no longer socially acceptable.

Once an artifact is removed from the water, it quickly deteriorates. If you remove something and it's not properly conserved, it will likely turn into a pile of rust. And, when you take an artifact, you reduce the historical and archaeological significance of the wreck that it came from.

I can't tell you the number of times I've returned to a shipwreck to find that artifacts have been removed—often illegally. And, sometimes in their pursuit of artifacts divers have destroyed parts of the ship. Surveying the damage, you feel violated. If you've ever had your house or apartment robbed you'll know what I'm talking about. But, what's most frustrating is knowing that most divers were acting out of ignorance.

Likewise, it's equally frustrating when you're taking divers on a tour of a wreck to find that artifacts have been removed. You've told them about what they can expect to see on the dive. When it's not there, they feel cheated, and you feel foolish.

Wreck diving can lead a diver into areas of academic research and study. I know lots of divers who would, otherwise, never have found their local public library. Researching shipwrecks can be a rewarding activity in itself. A friend of mine calls it, "his drug of choice".

The old adage, "take only pictures and leave only bubbles", is still the best approach when it comes to appreciating and conserving shipwreck artifacts. And, it's a good way to meet other divers, hone your skills and stay interested in diving. ■

—-Rob Rondeau
Marine Archaeologist
ProCom Diving Services
www.procomdiving.com

CLOCKWSIE FROM TOP LEFT: Sonar scan of a wreck; Examining and researching found artifacts; Let others also enjoy a display of found historical artifacts from a ship wreck

wreck rap

1911 Dreamland Bell found

In May 1911, Coney Island's Dreamland Park was in flames for a full 18 hours and burned itself into the sea, destroying the pier around it.

In September 2009, local divers discovered a 500-lb bell that sunk to the ocean floor with the rest of the park 98 years after the flames died down. It is three feet high and inscribed with "James Gregory, NY, 1885"—founding member of the Gregory Brothers Circus.

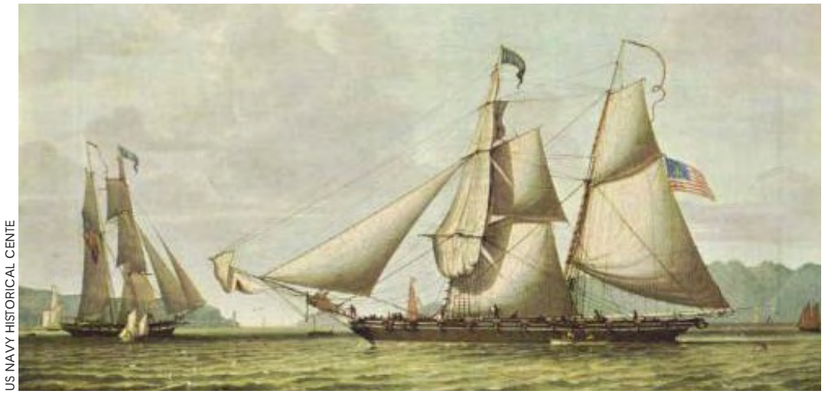
Diver Gene Ritter, part of the recovery team, declared that he knew the bell existed, but never dreamed he would find it. "I thought it would be buried in mud. I was stunned, especially over the incredible shape the bell is in."

Ritter found the bell quite recently, but it has been 18 years since he first came upon Dreamland's remnants in the ocean.

As to the bell itself, it is yet uncertain if it will ring once again, after being fully restored. ■

The Dreamland Bell of 1911 and diver Gene Ritter who found it under the waves. Image courtesy of the website dedicated to the find, in construction, www.dreamland-bell.com

US Navy Shipwreck from War of 1812 to be excavated



US NAVY HISTORICAL CENTE

The shape and arrangement of sails on an American privateer schooner, brig or brigantine, are quickly movable to much more radical angles. English seamen have written that they saw privateers escaping "sailing directly into the wind."

The first *USS Scorpion* was a sloop-rigged self-propelled floating battery in commission in the United States Navy from 1812 to 1814.

The wreck, which is one of the war's most significant artifacts, was discovered nearly 30 years ago, but after a limited, month-long excavation of the site east of Upper Marlboro in 1980, the wreck was reburied under four feet of mud and sediment to protect it from decay.

The US Navy, which still owns the flotilla, is considering whether to excavate the site and possibly raise the vessel as part of its plans to commemorate the bicentennial of the War of 1812. ■

travel news

Edited by
Scott Bennett

Smile with a crocodile!

Come face to face with one of the world's biggest and most dangerous predators in the Philippines.

Being in the water alongside a saltwater crocodile is an experience most divers would like to avoid at all costs. Philippines-based Buwaya Adventures now offers the unique opportunity to observe and photograph salt-water crocodiles in their natural habitat. Get up close and personal with these magnificent reptiles in the mangrove swamps of the island of Palawan. Most images published in magazines feature salties in the clear waters of coral reefs, but now divers will be able to observe them in their preferred habitat.

Excursions will be guided by German photographer Dieter Heimig and his Philippine wife Maygen. Both are long-time Philippines experts, having led more than 30 excursions to some of the island state's most far-flung regions. Safety is paramount, thanks to strict safety precautions and a team of professionals including a trained biologist and a crocodile expert. ■

SOURCE: SALTIES.DE

Media sensationalism surrounding dive deaths plague Queensland industry

Already hurting from the economic downturn, worldwide publicity surrounding high-profile fatalities has continued to plague Queensland's dive industry.

The recurring headline "dive death" is partly responsible for crippling the the local dive industry according to North Queensland tour operators. Although the state's tourism industry is flagging generally, dive tourism has declined 30 percent in the past 12 months. The release of the film *Open Water*, loosely based on the disappearance of divers Thomas and Eileen Lonergan off Port Douglas in 1998, did nothing to help the situation. Since then, the death of honeymooner Tina Watson, left to drown by her husband Gabriel `Gabe' Watson in 2004, garnered international headlines, as did the ensuing court case earlier this year.

The industry is also incensed at coverage of people who die of medical conditions while diving, which can leave businesses struggling to convince tourists that scuba diving and snorkelling in Queensland is safe. One problem was that the media was too quick to brand fatal incidents "dive deaths" regardless of the circumstances, Queensland Dive Tourism Association general manager Col McKenzie said, "You can come to Australia, and Australia will give you world-quality diving which is very, very safe, but we can't guarantee you won't suffer a heart attack," Mr McKenzie said. A spokesman for the Maritime Union of Australia said there had been two deaths involving the North Queensland dive industry in the past 12 months. ■

SOURCE: WATODAY.COM.AU

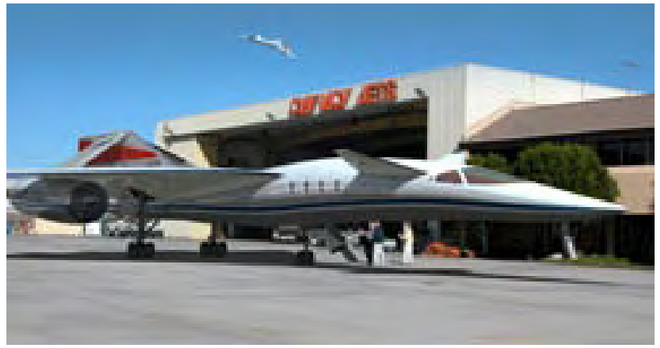
Two new artificial reefs created in the Bahamas

Stuart Cove's Dive Bahamas has announced two new wreck dives are now accessible to scuba divers visiting Nassau. The result of a joint effort between Stuart Cove's and the Bahamian government, the *Anthony Bell* and the *Long Island Lady* are the latest in a series of wrecks established off the coastline of this popular island destination. To date, nearly 20 wrecks have been created to help increase the health of the underwater environment.

The *Anthony Bell*, a decommissioned 90- foot tug boat, was sunk in 50 feet of water off the south side of Goulding Cay in mid-August. The *Long Island Lady* is a fishing boat that sat neglected in the Nassau harbour for a number of years. After being thoroughly cleaned up by volunteers, the vessel was then moved out to her sinking this past June. The 70-foot vessel sits on a rocky bottom at about 40 feet next to the tongue of the ocean wall that drops down to 6500 feet.

Click on image to watch the sinking of the *Anthony Bell*

Stuart Cove's Dive Bahamas offers a variety of wreck diving packages in additional to other diving options. For additional information, go to www.StuartCove.com ■ SOURCE: EXAMINER.COM



New supersonic aircraft is set to revolutionize 21st century air travel

With a non-stop range of more than 4,000 nautical miles, the Quiet Supersonic Transport (QSST) is set to revolutionize air travel in the 21st century. Up to twelve passengers will be able to travel in large cabin comfort to global destinations in half the time taken by converntional aircraft.

Flying at uninterrupted supersonic speeds over land and sea, QSST is the only jet with a patented design to revolutionize travel with a low "shaped sonic signature" which is over 100 times quieter than the recently retired Concorde. Advanced technologies will help to reduce takeoff and landing sound, making it virtually indiscernable to people on the ground below.

J. Michael Paulson founded Supersonic Aerospace International (SAI) in 2000 to fulfill his late father's dream of making quiet supersonic flight a reality. SAI's vision, plan and team, coupled with Lockheed Martin's superior technical design, will make this concept a reality. ■

SOURCE: SAIQSST.COM

Edited by
Arnold Weisz

POINT & CLICK ON BOLD LINKS

Equipment

Crank it up!

Beuchat VR200 Evolution

Designed for diving in temperate or cold waters and fitted with Beuchat's patented "anti-freeze system". The second stage is fitted with a thermal exchanger which protects the system from freezing during cold water dives. According to the manufacturer this design makes it very stable down to 100 meters depth.
4MP ports and 2 HP ports, balanced and adjustable second stage and adjustable venturi flow.
www.beuchat.fr

Mares Icon HD

The ICON HD computer is a true full-color display computer. It comes with a screen made using LCD (Liquid Crystal Display) with TFT (Thin Film Transistor) technology. The Icon allows you to reprogram the processor as it comes with a rewritable chip for software upgrades. Further features; Nitrox mode with 3 different oxygen mixes, integrated interface, rechargeable lithium batteries, map function and pictures function. Air integration upgrade will be available from spring 2010.
www.mares.com

BARE Scuba Kayak

The inflatable dive Kayak is designed to provide stability and versatility. By incorporating three fins in the rear, this kayak has great tracking ability in waves and wind, and is extremely stable and manoeuvrable. In the rear is a tank cradle to secure your gear as you paddle. 420 Denier Nylon top deck with tarpaulin rear deck and underside, heavy-duty nylon straps with buckles to secure tank and equipment, metal "D" rings to clip your equipment to prior to entry and exit, velcro straps to secure paddle, inflatable seat with high back support for comfort. Weight: 40 lbs Max Capacity: 425 lbs **www.barescubadiving.com**

AquaLung Pro LT

The Pro LT weight-integrated, jacket style BC is the latest addition to AquaLungs family of "Pro" BCs. It packs features, style and durability into an affordable package. Weight integration features the SureLock™II (patented) mechanical lock and release mechanism. The weight pockets align themselves. A simple, single-pull release is all that is needed to jettison the weights in an emergency. A new, proprietary backpack has a built in traction pad to reduce tank slippage as well as a built in carrying handle. **www.aqualung.com**

Tusa IQ-750 Element II

The Element II can be operated as an Air computer, Nitrox (EANx) computer, a digital depth gauge/timer or as a free dive depth gauge/timer. Features include: Water-activation, 2 Mix Gas Switching ability, a large alphanumeric and backlit display, audible and visual alarms, advanced user safety settings, and PC download/upload. The IQ-750 adds a Deep Stop function for enhanced safety. The deep stop mode is activated when a dive exceeds 80 FT (24M) for more than 1 second. Upon ascent. Additional features; advanced 3 button puck-style module in wrist boot, audible and Flashing Icon Alarms, 1 touch log access, automatic altitude adjustment from sea level to 14,000', a user-replaceable battery. **www.tusa.com**

Trying out Poseidon's Discovery / CIS-Lunar Mk 6 Closed Circuit Rebreather

Don & Dive CCR

Poseidon's compact Closed Circuit Rebreather is fully automated and aimed at the recreational diver. We wondered how well it met its design target, so we took it for a spin.

Poseidon's Discovery was listed in Popular Science magazine's Best of What's New awards in 2008

The mouthpiece is fitted with a bailout switch—the lever on the top left. Flip the lever to horizontal, and you breathe from the open system instead of the closed circuit. Essentially, it is a regular second stage that has been combined with the rebreather mouthpiece

It was not without some positive anticipation that I went to Poseidon's compound on the outskirts of Gothenburg—Sweden's second largest city. As long term readers of this magazine are aware, I have been following the development of their new rebreather from the sidelines for quite a while. Now, I was going to take it for a dive.

Getting it going took just a few easy steps. First, you analysed and verified your breathing gas with an analyser—a routine of which any nitrox certified divers are well familiar. Next, you assembled the unit, which was quickly done. The components—loop, electronics and canister—all seemed to just snap or click into place with no further ado.

Once it had been rigged, the user then performed what is referred to as a 'negative test', during which the diver creates a vacuum in the breathing loop simply by sucking out air and then closing the mouth piece. The hoses should remain deflated. If they popped back into shape, it meant that the unit wasn't tight, and all connections and seals had to be rechecked.

Once this test was passed, the unit could be switched on, and from here on, the electronics performed another 35 different tests, including a 'positive test' during which the loop is slightly over pressurized, again to check for leaks—prompting the user to i.e. open valves or close the mouthpiece.

The diver just has to follow the instructions. The whole sequence takes three to four minutes after which the unit is ready to dive.

Into the water

So, I slipped into the harness and tightened the buckles. The unit was no heavier to wear than a standard scuba system and felt like a compact backpack. I slid into the water and immediately got to appreciate the silence that is the hallmark of rebreathers.

At first, I found the unit to be a bit top-buoyant, but that is not unusual in rebreathers due to the breathing loop. This is often countered by placing some of the weights somewhere on top of the unit. In this case, tightening all the straps for a snug fit did much of the trick, and it soon felt very comfortable.

The low weight and compact profile of the unit, where the centre of gravity sits so much closer to one's body than in other and much bulkier rebreathers, was something I soon came to appreciate. When diving a closed circuit rebreather, I often feel embedded in bulky equipment like a medieval knight in armour who has to be hoisted onto his horse. By contrast, this unit was light and as easy to wear as a standard open circuit system.

Bailout valve

My only gripe was that the mouthpiece was tugging on my jaw, but that seems to be a common problem for all rebreathers. Switching to open circuit in case of a bail-out is simply accomplished by flipping the lever on the mouthpiece. Opening and closing it comes easy.

I did a couple of standard routines such as taking off the mask and going on open circuit and back, and again, the task load at any given point seemed pretty similar to what you would do with a standard scuba system. I ended up getting a little water into the mouthpiece, but a barrel-roll to the right drained the water into the water trap and down the counterlung from where it could be purged. That manoeuvre also cleared that annoying gurgling sound.

Clearing a mask while on closed circuit is also similar to performing it on open circuit except that the diver needs to exhale just the exact amount of air, and no more, to purge water from the mask in order not to waste gas unnecessarily.

Comments

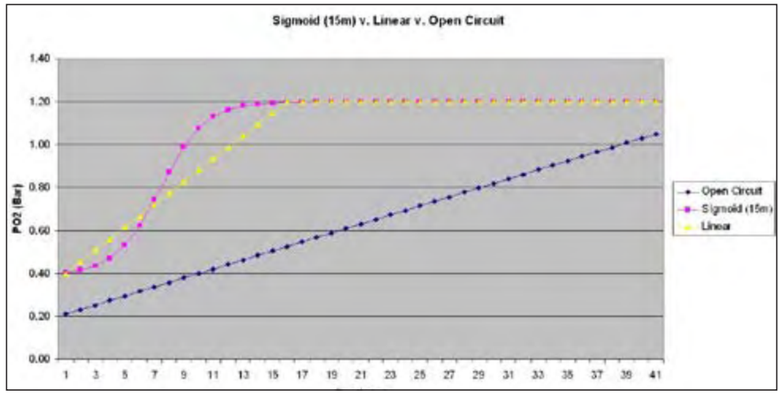
Overall, I found diving the Discovery was an uncomplicated, relaxed and enjoyable experience—a bit like driving an automatic car rather than a stick shift.

The build felt reassuringly solid and well thought out with the few kinks seen on the prototypes now ironed out. According to Poseidon's Jens Sjöblom, the unit has now been extensively tested and dived in many parts of the world under a wide variety of circumstances, and the software has undergone 42 builds during the process of refining it.

The unit is supervised by what is called a Resource Management Algorithm, the function of which is, put simply, to combine or merge the functions of the dive computer with the monitoring of onboard supplies (gas, battery life, scrubber, etc) and operation (i.e. sensor integrity) into a single instrument display that tells you everything you really need to know—essentially, how much dive time the diver has left before he or she runs out of air or goes into deco.

Limitations

As the Discovery is specifically built with the recreational diver in mind, not the tech diver, it comes with a number of



The Discovery performs an automatic smooth transition from low ot high setpoint (the sigmoid purple curve). See sidebar for furhter explanation.

preset limitations. It is rated to max 40 meters and is not meant for decompression diving, though it will continue to function and provide life support should the diver accidentally end up in the decompression zone or exceed any other limits.

Should this happen, or any other problem, an alarm will go off. A cascading system of alerts with a light and a vibrator on the mouthpiece as well as buzzer in the battery compartment will draw the diver's attention to the display on which is shown what the issue is.

Notable feature

If I am to pick out from my extensive notes a notable function, or feature, my choice would be how the Discovery handles pO_2-setpoints. In most rebreathers, the diver changes the setpoints up and down at his or her discretion; typically the switch is made around six meters. Switching to the highest point means injection of oxygen into the breathing loop creating a buoyancy spike, which has to be countered i.e. by simultaneously dumping gas from a suit or BCD. The Discovery removes both these potential stressors by applying a smooth and automated transition of the pO_2-setpoint which goes from 0.5 bar pO_2 at the surface to 1.2 bar pO_2 at 12 meters. This way, there will be no sudden or discernable changes in buoyancy, nor does the user need to worry about doing the changes.

Facing the music

As with so many other rebreathers, this one too has been greeted with both criticism and scepticism—just like what the Inspiration CCR was subjected to when it came out. Some of it is fair, factual and relevant, but most of it not.

Is it perfectly designed? Surely not—no machine ever is—and accidents will ultimately happen. But the Discovery seems quite well-designed, and from what I am able to judge through just a single try dive, asking a lot of probing questions, and going over the documentation, it is evident that at lot of time, money and good thinking was sunk into the development of this unit.

At a glance, it thus appears to have fulfilled its design criteria of being a straight forward automated CCR for the recreational divers to use. How the market is going to take to it is another question—only time will tell.

The unit is CE-approved, weighs 15 kg including tanks but excluding harness and wing. ■

Setpoints explained

A Closed Circuit Rebreather can be likened to a transportable nitrox-blender, which always provides the diver with the optimal blend of breathing gases. With enriched air nitrox, we would usually want the oxygen content to be as high as possible, and the content of nitrogen—which is the culprit in DCS—as low possible.

But too much oxygen is not good either. Prolongued exposure to high partial pressure of oxygen can lead to seizures—not a good thing when you are underwater. So, within recreational diving, the upper limit is conventionally set at at 1.3 bar partial pressure oxygen (pO_2). In the case of the Discovery, 1.2 bar pO_2 has been chosen.

This partial pressure is what the rebreather is trying to maintain at a constant level by varying the oxygen-% in the breathing loop in response to the changing depths.

However, there is a snag with this fine principle; It is impossible to achieve a partial pressure of 1.3 bar at the surface where the ambience pressure is only 1 bar. If the rebreather tried to achieve this level, it would just keep inflating the breathing loop with oxygen perhaps until it popped like a ballon.

Needless to say, we would need to start off with a lower oxygen partial pressure. This is conventionally 0.7 bar pO_2, which at the surface where there is 1 bar translates into 70% nitrox.

Once one is below the surface, one wants to go from the 0.7 bar to the 1.3 (or 1.2) bar pO_2. When the change is performed manually, typically at a depth of 6-10 meters, it is referred to as *changing setpoints*.

On many rebreathers, this is done by flipping some switches. Descending, one changes from a low to a high setpoint, and when one ascends, one switches from a high to a low setpoint. ■