



GLOBAL EDITION
May 2010
Number 36

Sub-Arctic Canada
Churchill

Equipment
Wetsuits

Sharks
**Spiney
Dogfish**

Florida
**Blue Heron
Bridge**

Wrecks
Jade Treasures

Profile
Mike Valentine

BALTIC DIVING & WRECKS
Sweden

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COVER PHOTO: *West Coast, Sweden*, by Stein Johnsen

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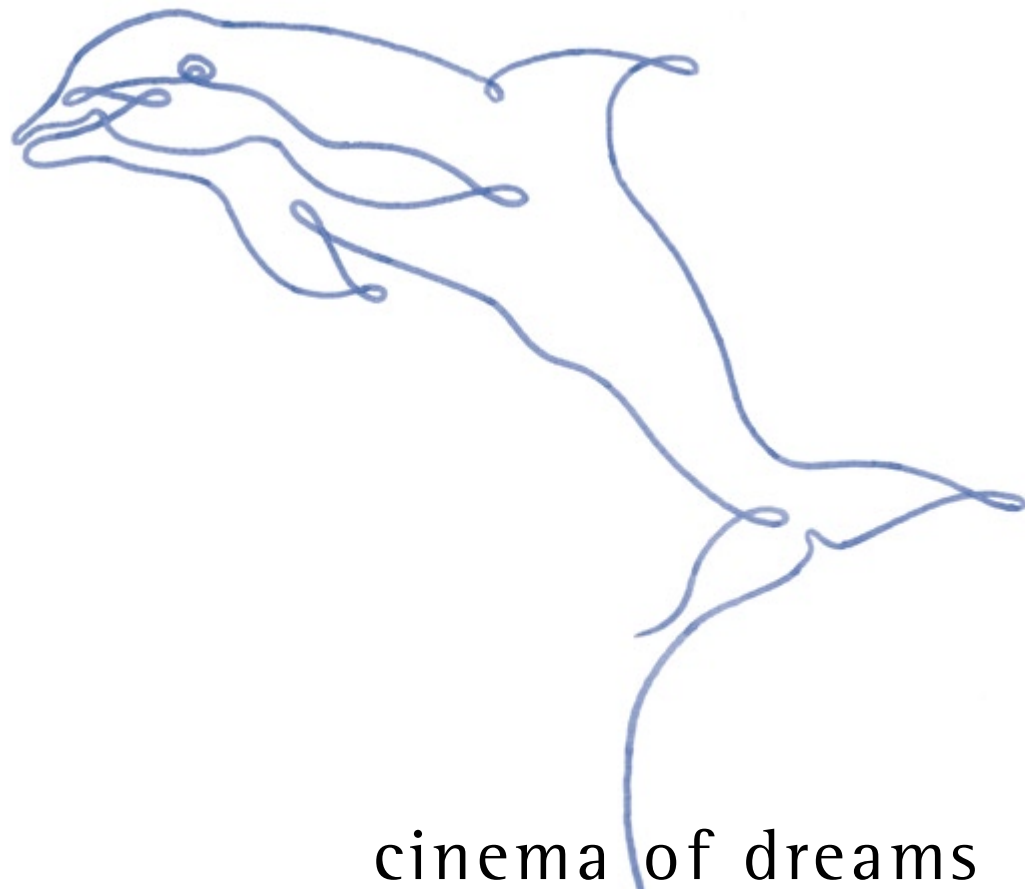
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Cool diving in Our own backyard

The theme of this issue is something that we have wanted to do for a very long time.

While the team behind X-RAY MAG is truly international, spanning several continents from Catherine GS Lim in the East, who faithfully and solidly takes care of our business out of Singapore, to Barb Roy in Canada, the tech-diving grandma of British Columbia, and all our other wonderful editors in the times zones in between, our founding editor-in-chief, Peter Symes, is a native Copenhagen of British-Scandinavian heritage-

Once upon a time, "in another century", Peter and his Scandinavian colleagues, Arnold Weisz and Millis Keegan, were editors of the Norwegian, Swedish and Danish print dive magazines, before pooling their expertise and experience and putting it behind the publication you are now reading.

Over the years, X-RAY MAG has covered exotic locales —such as Tasmania, Lake Baikal and Patagonia—gone to the Southern Ocean and Bikini Atoll, joined scientific expeditions and gorged on coral havens in South East Asia—such as Raja Ampat— and explored the rugged beauty of Iceland, British Columbia, Russia and Norway,

just to mention a few. (Most of our many travel reports are now available on our website.)

While our headquarters are still based in Copenhagen, we think the time has come to invite you inside our very own backyard and the waters upon whose beaches our dear Scandinavian editors played as kids and where they took their first nervous breaths through a regulator.

With this issue, which features Sweden (Denmark and Norway will be featured at another time), we want to put the spotlight on some of the unique diving that the Scandinavian peninsula has to offer.

Scandinavia has some awesome underwater treasures, which have not quite yet received the international recognition they deserve—in particular, the amazing historic wrecks from centuries past, many of which are still stunning and in pristine condition.

While some of the diving can be demanding at times, and a sunny holiday cannot be guaranteed, a few places on the planet can

beat the still pristine beauty and easy access to wilderness above and below the surface that Scandinavia has to offer. This is especially true around midsummer, when the white nights cast almost everlasting sunsets and romantic evenings on the beach, when one can grill seafood on a camp fire and go diving around the clock without needing a lamp.

While most Scandinavians are habitual dive travellers yearning to see as much of the world as possible, none of them have a desire to leave home during these pleasant summer months.

This issue sets out to explain why.

— *Väersågod!* (Bon appetit)



Fresh and delicious *smørrebrød* (open-face sandwiches) in Denmark, or *smörgåsbord* (buffet) in Sweden, served with beer and snaps, is typical of Scandinavian fare for lunch or brunch. Photo courtesy of Elleinterior.se



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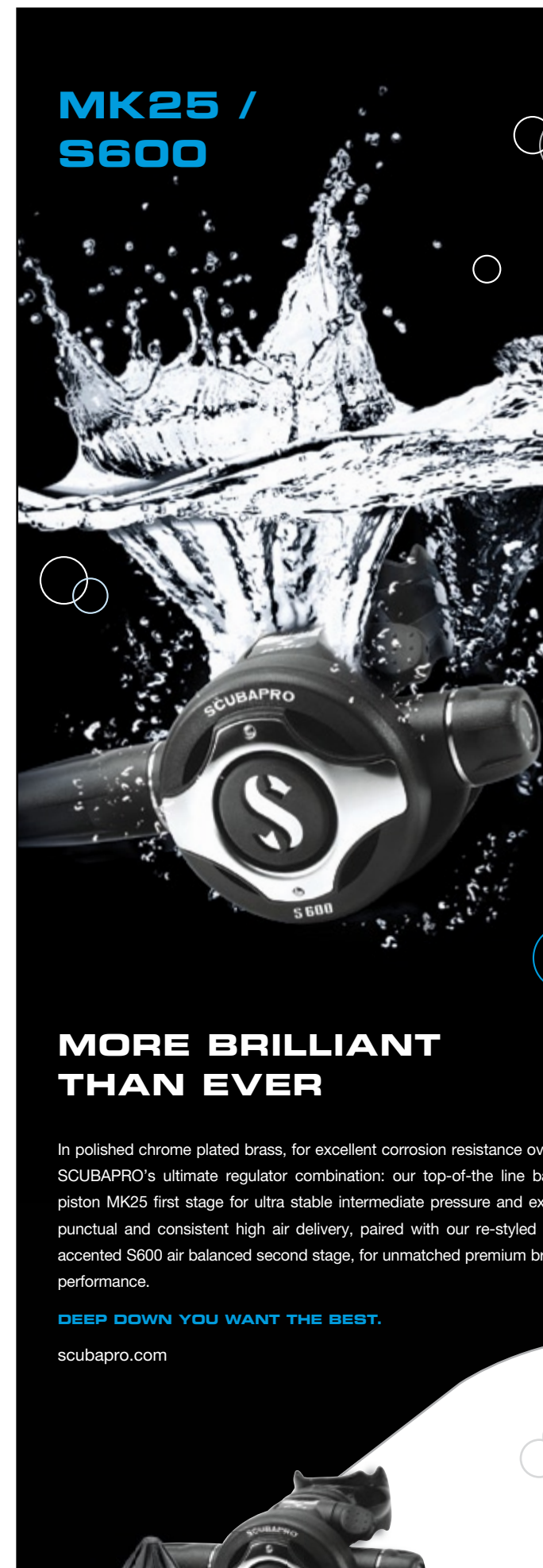
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X-ray mag

News edited
by Peter Symes
& Catherine G S Lim

oceanapolooza NEWS

With wind and wave energy farms, it should be possible to create large areas with biologically productive reef structures, which would moreover be protected from bottom trawling

Off-shore wind turbines also good for marine life

Offshore wind power and wave energy foundations can increase local abundances of fish and crabs. The reef-like constructions also favour for example blue mussels and barnacles. What's more, it is possible to increase or decrease the abundance of various species by altering the structural design of the foundation.

The seabed in the vicinity of the wind turbines had higher densities of fish compared to further away from the turbines and in control areas. This was despite the fact that the natural bottoms were rich in boulders and algae. Blue mussels dominated on the wind turbines that appeared to offer good growth conditions, wrote Dan Wilhelmsson of the Department

of Zoology, Stockholm University, in a recently published dissertation.

"Hard surfaces are often hard currency in the ocean, and these foundations can function as artificial reefs. Rock boulders are often placed around the structures to prevent erosion (scouring) around these, and this strengthens the reef function," says Dan Wilhelmsson.

Not only were the foundations giving a boost to marine life, but interestingly, we might be able to build in features to them in such a way as to enhance conditions to favor those species that need more protection.

"With wind and wave energy farms, it should be possible to create large

areas with biologically productive reef structures, which would moreover be protected from bottom trawling. By carefully designing the foundations, it would be possible to favor and protect important species, or, conversely, to reduce the reef effects in order to minimize the impact on an area," said Dan Wilhelmsson.

Come to think of it, this shouldn't come as such a surprise. There are many instances of sunken boats, planes and other metal and concrete objects having been thoroughly repurposed by the creatures of the deep for their own needs. We already use artificial reefs to rebuild populations of marine life. ■

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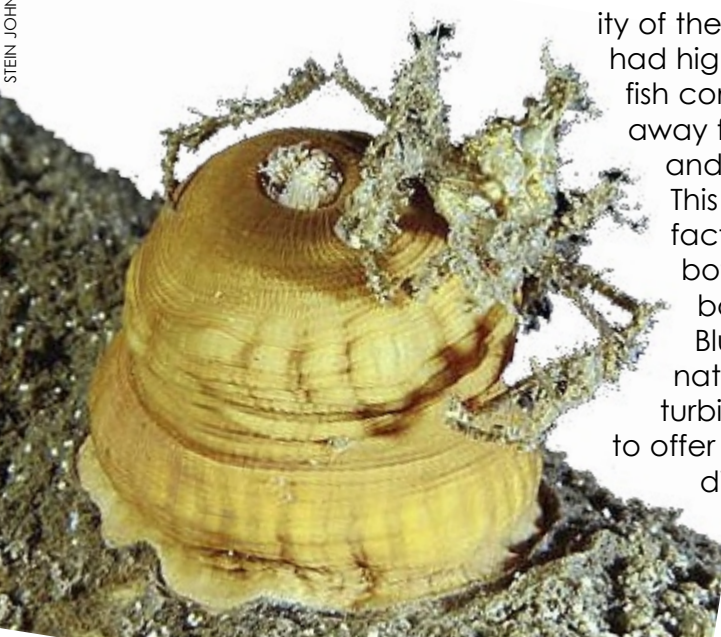


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STEIN JOHNSEN



Marine scientists discover ocean “superhighway” for tiny life forms

Working in a rare, “natural sea-floor laboratory” of hydrothermal vents that had just been rocked by a volcanic eruption, scientists from the Woods Hole Oceanographic Institution and other institutions have discovered what they believe is an undersea superhighway.

Text and images by the National Science Foundation

This superhighway carries tiny life forms unprecedented distances to inhabit the

post-eruption site.

One such “pioneer species,” *Ctenopelta porifera*, appears to have traveled more than 300 kilometers to settle at the site on the underwater mountain range known as the East Pacific Rise.

“*Ctenopelta* had never been observed before at the study site, and the nearest known population is 350km to the north,” said Lauren Mullineaux, a senior scientist in WHOI’s biology department.

The discovery—in collaboration with scientists at the Lamont-Doherty Earth Observatory (LDEO) and the NOAA Pacific Marine Environmental Laboratory (PMEL)—clashes with the widely accepted assumption that when local adult life is wiped out

in a hydrothermal eruption, it is replaced by a pool of tiny creatures from nearby vents.

In this case, however, the larvae that re-settled the post-eruption vent area are noticeably different from the species that were destroyed, according to David Garrison, director of the National Science Foundation’s (NSF’s) Biological Oceanography Program. In addition, the larvae appear to have traveled great distances to reach their destination.

“That raises the question of how they can possibly disperse so far,” said Mullineaux. She added that the findings have implications for the wider distribution of undersea life.

The discovery of hydrothermal vents on the bottom of the Pacific Ocean in 1977 revolutionized ideas about where and how life could exist. The seafloor vents gushing warm, mineral-rich fluids and teeming with life raised new questions that researchers have been studying ever since, including: How can so much life thrive at the sunless seafloor? What is the nature of organisms at hydrothermal vents? How do animals migrate to other vent sites?

Getting from A to B

It was this last question that motivated Mullineaux and her team as they began their study of a vent area on the East Pacific Rise “to gather observations of currents, larvae and juvenile colonists in order to understand what physical processes might facilitate dispersal”, Mullineaux said.

One of the group’s primary challenges was to determine where the organisms around the vent came from.

In for a surprise

As the scientists set out on their mission in 2006, “We got a surprise,” said Mullineaux. “A seafloor eruption was detected at our study site, resulting in changes in topography and enormous disturbance to ecological communities. The eruption was, in essence, a natural experiment.”

By the time the researchers arrived at the site, they found a scene quite unlike that usually observed at a hydrothermal vent.

Normally, such fissures are teeming with life, supported by the hot chemicals that spew from the vents and provide

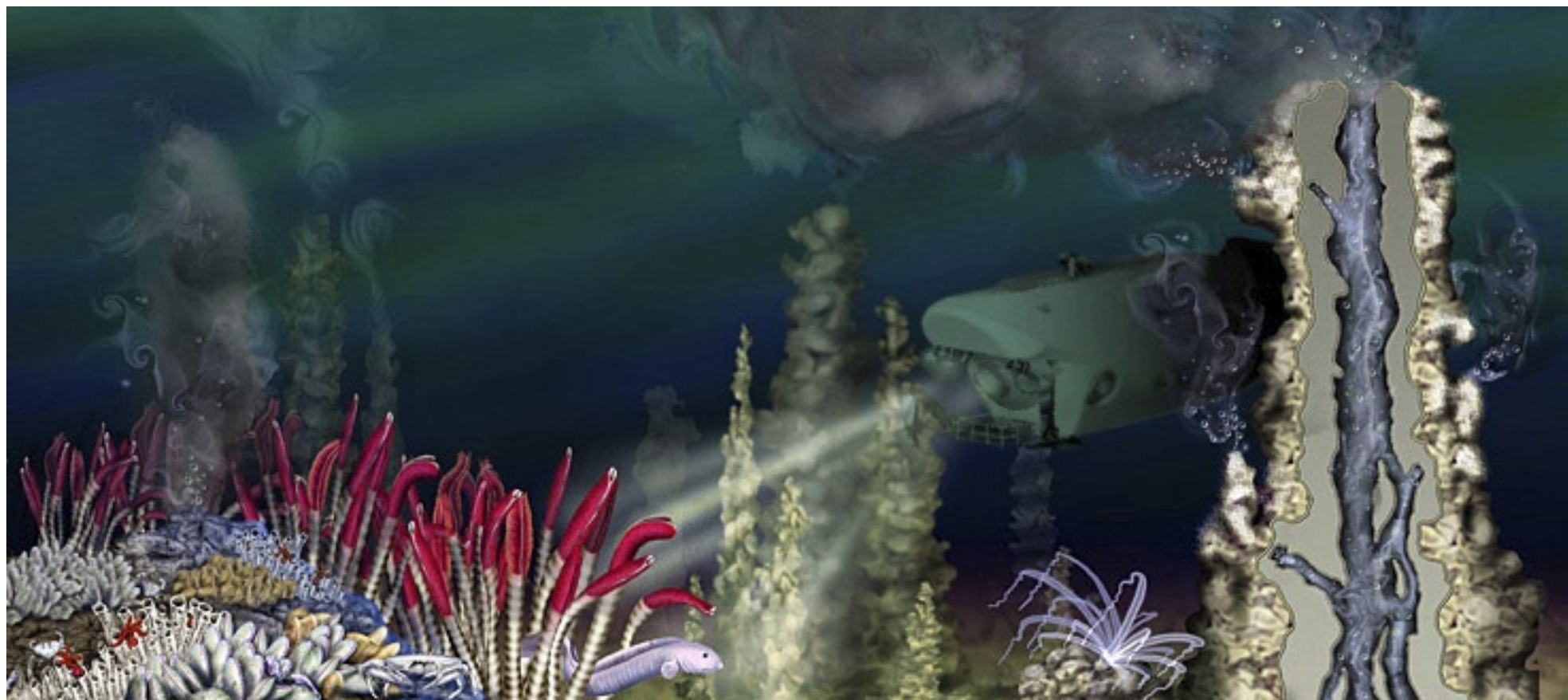


Illustration of life around a hydrothermal vent

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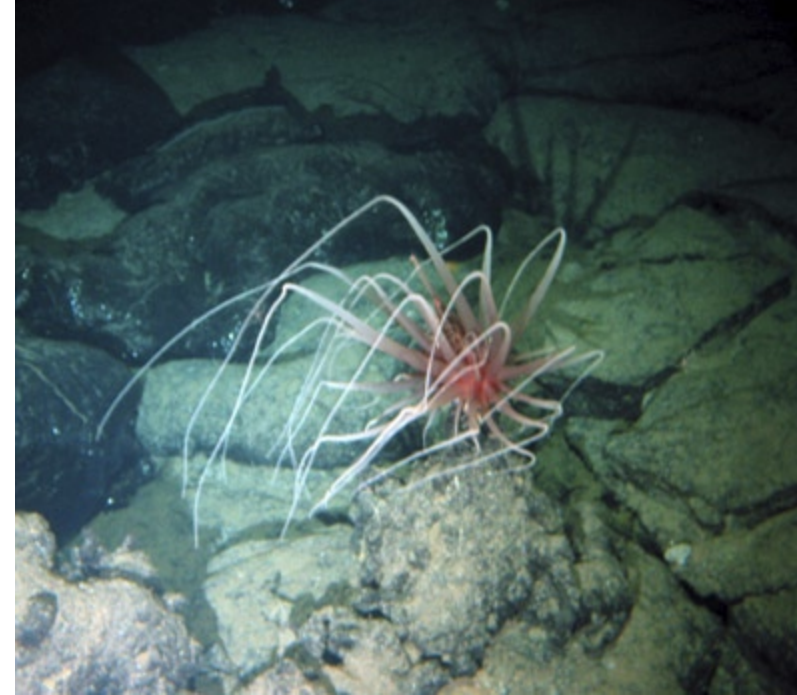
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What the scientists found went against the accepted assumption that most of the organisms needed to re-populate an area come from relatively nearby. But instead, the new larval inhabitants were from a considerable distance away.

food through microbial chemosynthesis, a deep-sea version of photosynthesis.

But at this spot on the East Pacific Rise, near nine degrees north, there was no life. The

eruption had wiped it out. "Although the



How were these weak-swimming larvae propelled such vast distances to the decimated vent area?

McGillicuddy and Thurnherr.

Theoretically, however, even these ridge-crest jets might not quite be able to transport the larvae from 350 kilometers within the time frame of their 30-day lifespan, she said. "Either the larvae are using some other transport or they are living longer than we thought," said Mullineaux.

She speculates that large eddies, or whirlpools of water, several hundred kilometers in diameter, may be propelling the migrating larvae even faster—delivering them to their new home while they are still alive. Or perhaps the larvae are able to somehow reduce their metabolism and extend their life.

The findings present an array of fascinating scientific scenarios that warrant further exploration, according to Mullineaux.

They also may open up new ways of looking at the impacts of human activities on the seafloor, such as seafloor mineral mining, which could alter a vent site in a similar way to an eruption.

Such activity could conceivably foster a greater diversity of species at a vent that has just been mined, or it could cause extinction, Mullineaux said. But such scenarios are still highly speculative, she emphasized. ■

MULLINEAUX'S WHOI CO-AUTHORS ON THE PAPER ARE DIANE ADAMS, CURRENTLY AT THE NATIONAL INSTITUTES OF HEALTH, SUSAN MILLS AND STACE BEAULIEU.

THE PROJECT ALSO RECEIVED FUNDING FROM WHOI'S DEEP OCEAN EXPLORATION INSTITUTE.

vents survived, the animals did not, and virtually all the detectable invertebrate communities were paved over," said Mullineaux. "For us, this was an exciting event. In essence, it was a natural clearance experiment that allowed us to explore how the elimination of local source populations affected the supply of larvae and re-colonization," she said.

What the scientists found went against the accepted assumption that most of the organisms needed to re-populate an area come from relatively nearby.

But instead, the new larval inhabitants were from a considerable distance away.

"These results show clearly that the species arriving after the eruption are different than those before," says Mullineaux, "with two new pioneer species, *Ctenopelta porifera* and *Lepetodrilus tevnianus*, prominent."

The most important finding is that "the processes of the larval stage—as opposed to those of adult organisms—seem to control colonization," Mullineaux said. "We found that a pioneer colonization event by one species, *Ctenopelta porifera*, radically changed the community structure."

Jet set

But a question remained: How were these weak-swimming larvae propelled such vast distances to the decimated vent area?

Seemingly the only way the emigrating larvae could get to their new home from so far away, Mullineaux said, would be to ride ocean-bottom "jets" traveling up to ten centimeters a second, such as those identified in the work of



THIS PAGE: Types of critters found living near hydrothermal vents

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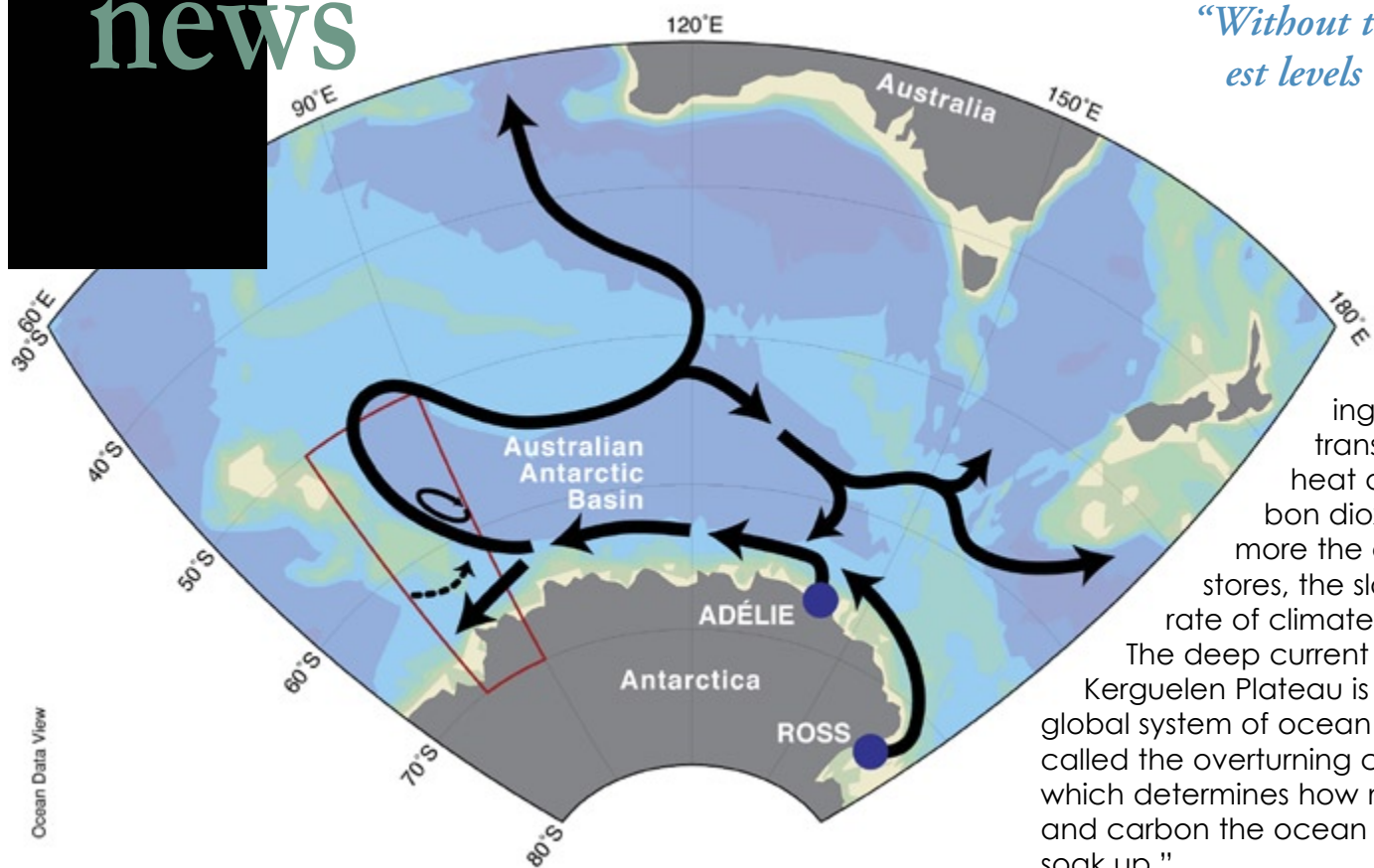
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“Without this supply of Antarctic water, the deepest levels of the ocean would have little oxygen

The ocean influences climate by storing and transporting heat and carbon dioxide—the more the ocean stores, the slower the rate of climate change. The deep current along the Kerguelen Plateau is part of a global system of ocean currents called the overturning circulation, which determines how much heat and carbon the ocean can soak up.”

ured at depths three kilometres below the sea surface.

“Mapping the deep current systems is an important step in understanding the global network of ocean currents that influence climate, now and in the future. Our results show that the deep currents near the Kerguelen Plateau make a large contribution to this global ocean circulation,” Rintoul said.

Antarctic waters carried northward by the deep currents eventually fill the deep layers of eastern Indian and Pacific Oceans. ■

Massive Southern Ocean current discovered

A deep ocean current with a volume equivalent to 40 Amazon Rivers has been discovered by Japanese and Australian scientists near the Kerguelen plateau, in the Indian Ocean sector of the Southern Ocean, 4,200 kilometres southwest of Perth.

Researchers have described the current—more than three kilometres below the Ocean’s surface—as an important pathway in a global network of ocean currents that influence climate patterns.

“The current carries dense, oxygen-rich water that sinks near Antarctica to the deep ocean basins further north,” said co-author Dr Steve Rintoul from the Antarctic Climate and Ecosystems CRC and CSIRO’s Wealth from Oceans Flagship.

“Without this supply of Antarctic water, the deepest levels of the ocean would have little oxygen.

While earlier expeditions had detected evidence of the current system, they were not able to determine how much water the current carried. The joint Japanese-Australian experiment deployed current-meter moorings anchored to the sea floor at depths of up to 4,500m. Each mooring reached from the sea floor to a depth of 1,000m and measured current speed, temperature and salinity for a two-year period.

The current was found to carry more than 12 million cubic metres per second.

“It was a real surprise to see how strong the flow was at this location. With two-year average speeds of more than 20cm per second, these are the strongest mean currents ever meas-

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Text and images by CSIRO

NOAA responds to Gulf oil spill

The National Oceanic and Atmospheric Administration (NOAA) is the leading scientific resource for oil spills in the United States. As such, it has, from the start, been on the scene of the recent Deepwater Horizon spill in the Gulf of Mexico. NOAA is providing coordinated scientific weather and biological response services to government and local organizations.

In the response, hundreds of thousands of feet of boom have been set out to contain the spill, with more ready to be deployed. Remotely Operated Vehicles (ROVs) were used at the source to cut off a section at the end of the riser pipe, which once led from the well to the rig, and then, capped it with a valve. This stopped one of the three leaks, but oil continues to enter the Gulf of Mexico at a rate

of around 5000 barrels (210,000 gallons) per day.

Dispersants are being tested at the sea floor, and if successful, might reduce oil at the surface. A fully rigged collection dome, a large cofferdam-like structure, has been dispatched.

Damage to the environment is being conducted by NOAA's Damage Assessment Remediation and Restoration Program (DARRP), employing the Natural Resource Damage Assessment (NRDA). Based on past experience, NOAA is worried about the impact of the oil spill on fish, shellfish, marine mammals, turtles, birds and other sensitive resources. Impact on their habitats, including wetlands, mudflats, beaches, bottom sediments and the water column is also a concern. They are also evaluating

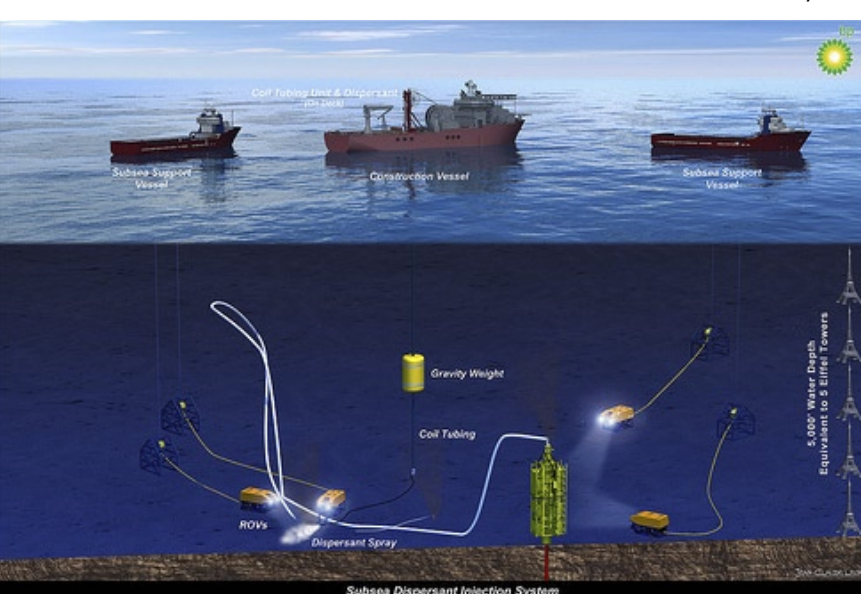
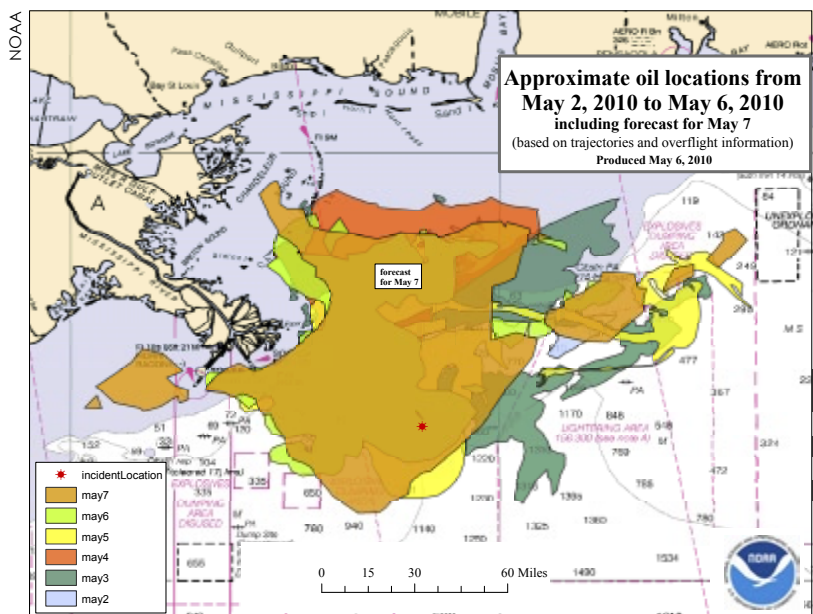
lost uses of these resources, for instance, fishery and beach closures.

High resolution images of the threatened Gulf shoreline are being provided by

NASA, which has agreed to use their ER-2 aircraft, equipped with a highly specialized scanner (the Airborne Visible/Infrared Imaging Spectrometer (AVIRIS) system), at NOAA's request. With NASA's findings, spill trajectories can be forecasted and mass balance calculations can be conducted. NASA's satellite instruments have been employed to detect the extent of the entire oil spill and to see the details of the extent of selected areas of the spill.

Seafood samples are being collected by NOAA Fisheries and transferred to the National Seafood Inspection Lab. In addition, NOAA is conducting marine mammal survey and ocean imaging missions by air in order to gain valuable information about the oil thickness and density on the sea surface. Aerial photographic flights are also being conducted over marsh areas. In addition, seafloor and water column data is being collected from areas near the oil spill source during a mission sponsored by the NOAA Office of Ocean Exploration and Research.

Further updates can be read at: www.noaa.gov



In response to the Deepwater Horizon oil spill following the explosion on 20 April 2010, subsea operations and methods are being used to manage the flow of oil using subsea dispersants before they reach the surface. Graphic provided by BP

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Douglas Rasher, Georgia Institute of Technology checks for effects of seaweed on a coral culturing rack in Fiji



MARK HAY/DOUGLAS RASHER, GEORGIA INSTITUTE OF TECHNOLOGY

Chemicals from Seaweeds Damage Coral on Contact

Field studies have shown that several common species of seaweeds in both the Pacific and Caribbean can kill corals upon contact.

While competition between seaweeds and corals is just one of many factors affecting the decline of coral reefs worldwide, this chemical threat may provide a serious setback to efforts aimed at repopulating damaged reefs.

Seaweeds are normally kept in check by herbivorous fish, according to David Garrison, direc-

tor of NSF's Biological Oceanography Program, which funded the research. But in many areas, says Garrison, overfishing has reduced the populations of these plant-consumers, allowing seaweeds to overpopulate coral reefs.

"We don't know how significant this is compared to other problems affecting coral, but we know this is a growing problem. For reefs that have been battered by human use or overfishing, the presence of seaweeds may prevent natural recovery from happening at all."

Using racks of coral being transplanted as part of repopulation efforts, Mark Hay, a marine ecologist at Georgia Tech, and graduate student, Douglas Rasher, compared the fate of corals

from two different species when they were placed next to different types of seaweed common around Fijian reefs in the Pacific, and Panamanian reefs in the Caribbean.

They planted the seaweeds next to coral being transplanted—and also placed plastic plants next to some of the corals to simulate the effects of shading and mechanical damage. Other corals in the racks had neither seaweeds nor plastic plants near them. The researchers revisited the corals two days, ten days and 20 days later. In as little as two days, corals in contact with some seaweed species bleached and died in areas of direct contact.

"Between 40 and 70 percent of the seaweeds we studied killed corals," said Hay. ■

SOURCE: THE NATIONAL SCIENCE FOUNDATION

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'Black Box' Plankton Found to Have Huge Role in Ocean Carbon Fixation

Eukaryotic phytoplankton actually account for almost half the ocean's carbon fixation by phytoplankton.

Carbon fixation by phytoplankton in the open ocean plays a key role in the global carbon cycle but is not fully understood.

Until now researchers believed that cyanobacteria, overwhelmingly accounted for phytoplankton's role in carbon fixation in the open ocean.

The cyanobacteria or *Blue-green algae* which belong to the *picophytoplankton*—the tiniest phytoplankton—grow in vast numbers in the sunlit surface waters of the oceans. By way of photosynthesis, they 'fix' carbon by converting carbon dioxide into sugars and other organic compounds. Until now, they have been thought to dominate carbon fixation in the open ocean.

Like all bacteria, cyanobacteria are prokaryotes, distinguished from eukaryotes by the absence of a cell nucleus. However, although much less abundant than cyanobacteria, the photic zone also has a high biomass of small eukaryotic phytoplankton capable of carbon fixation.

But what scientists at the University of Warwick and the National Oceanography Centre in Southampton discovered is that eukaryotic phytoplankton actually fix significant amounts of carbon, contributing up to 44 per cent of the total, despite being considerably less abundant than cyanobacteria.

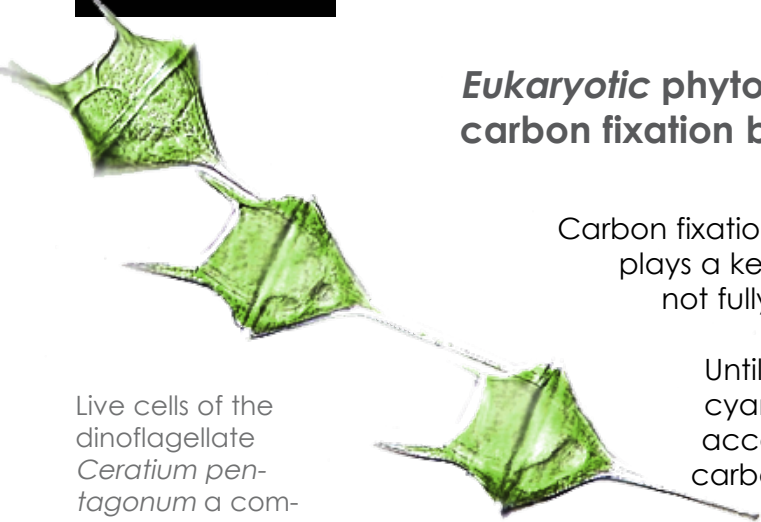
"This is most likely because eukaryotic phytoplankton cells, although small, are bigger than cyanobacteria, allowing them to assimilate more fixed carbon," said Professor Mikhail Zubkov of the National Oceanography Centre. ■

An **eukaryote** is an organism whose cells contain complex structures inside the membranes.

The defining membrane-bound structure that sets eukaryotic cells apart from *prokaryotic* cells is the nucleus, or nuclear envelope, within which the genetic material is carried.

Most eukaryotic cells also contain other membrane-bound organelles such as mitochondria, chloroplasts and the Golgi apparatus.

Almost all species of large organisms are eukaryotes, including animals, plants and fungi, although most species of eukaryotic protists are microorganisms. ■



Live cells of the dinoflagellate *Ceratium pentagonum* a common eucaryotic algae

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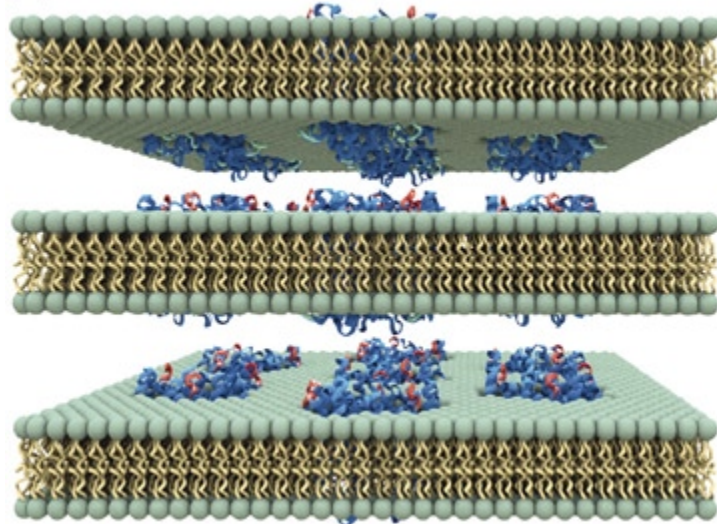
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Ocean Bacteria Can Harvest Energy from Sunlight for Survival

Bacteria in the ocean can harvest light energy from sunlight to promote survival thanks to a unique light-capturing pigment.

Proteorhodopsin is a photoactive protein found in marine bacterioplanktons, which can interact with light and convert it into energy for growth and survival. It consists of a single, membrane-embedded protein that is related to the pigment in the retina that enables human vision in less intense light. It was only discovered in 2000.

As much as half of the surface ocean bacteria have such pro-



Proteorhodopsin sits embedded in the cell membrane.

teorhodopsins, implying a potentially significant role of non-chlorophyll-based phototrophy (*photo-*

trophism, obtaining energy from photosynthesis – ed.) in oceanic carbon cycling and energy flux. However, functional evidence for specific roles for proteorhodopsins in native marine bacteria and the marine environment remains surprisingly scarce. ■

PNAS MAY 15, 2007 VOL. 104 NO. 20 8212-8217

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NASA goes underwater with NEEMO-14

NASA will send two astronauts, a veteran undersea engineer and an experienced scientist into the ocean depths off Florida's east coast this month to test exploration concepts and learn more about working in an unforgiving, treacherous environment. The mission will be held inside the Aquarius Underwater Laboratory near Key Largo, Florida.



Using near-scale mockup vehicles, EVA teams will conduct off-loading, retrieval and survival missions, including the transfer of an incapacitated astronaut from the ocean floor to the deck of the lander.

While inside the Aquarius laboratory, the crew will perform life sciences experiments focused on human behavior, performance and physiology. The mission also includes a study of autonomous crew work. This will include periods of time when there is limited communication between the crew and the mission control center, much like what could happen during missions to the moon or Mars. ■



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Annapolis Update



May 2010 – Anxious divers in Washington State and British Columbia, Canada, await their next wreck dive, the 371-foot long HMCS Annapolis. The retired Canadian military vessel was acquired in 2008 by the Artificial Reef Society of British Columbia (ARSBC) from Crown Assets Distribution with the intent to sink in Howe Sound as a new dive site.

Text and photo by Barb Roy

Since acquisition, the ship has undergone major changes as hundreds of local divers and dive-related businesses have rallied together to prepare the ship for sinking.

"Nearly 1,000 volunteers are approaching 7,000 man hours aboard the ship," tells Deirdre Forbes McCracken, Director of Public Relations for the ARSBC and co-owner of Ocean Quest Dive Centre in Burnaby. "Several volunteers have logged between 160-300 hours each! The determination and dedication can be seen as they continue to work through lunch just to get that one last stubborn bolt apart. After all this work, we are now beginning to see the light at the end of the tunnel."

With hopes of sinking the

Annapolis in September or October of this year, the need for volunteers is still strong, as Deirdre continued: "There are only around 1,000 hours of dismantling, sorting, recycling and cleaning to go before final inspection. We must ensure all standards are met to make the ship suitable for its final resting place on the ocean floor. Therefore, we continue to put out a call for volunteers for every weekend until sinking, along with our mid-week Wednesday Mechanics Team, to disassemble heavy-duty machinery."

Inspections

The ship will soon undergo a series of rigorous government inspections, with the next one through Environment Canada. ARSBC Vice

President, Doug Pemberton elaborated: "This is mainly a hydrocarbon inspection of the fuel tanks and machinery spaces. There can be no traces of hydrocarbons in these areas, if we hope to pass this inspection, and passing this inspection is a crucial step towards getting this project under water."

"A couple of weeks ago, we spent a week-end dismantling and cutting several tons of piping from the engine room and boiler room. It was piled up several feet deep. The following weekend, a crew from the Emerald Sea Dive Club in Seattle came up, and together with a crew of volunteers recruited by Vancouver area dive shops, we removed all the accumulated pipe and machin-

ery, sorted it and staged it for future extraction."

Funding

Part of the project funding comes from the sale of scrap metal and items sold off the ship. Project support also includes donated time and incurred expenses from local businesses like Sea Dragon Charters, a dive charter boat in Howe Sound who currently transports volunteers from Horseshoe Bay to Gambier Island where the ship is being prepared.

"We take the ARSBC volunteers to the Annapolis on a regular basis for no charge," explained Jan Breckman. "This is costly for us in time and fuel, but we see it as an investment in the Pacific Northwest dive industry. The spirit,

excitement, and camaraderie already created by this project is amazing, and the ship has not even been sunk yet!

The project will provide a boost to every aspect of the entire industry, as well as further the ecological development of this region."

Jan and her husband, Kevin, have offered dive charters in Howe Sound for over ten years, and although there are already 25 good dive sites in the area, they feel the addition of a good wreck dive will only add to

the existing selection.

"The Annapolis will provide a great wreck to dive and to train on, close to large populations like Vancouver and Seattle," added Jan. "In turn, increasing the interest in diving because it will be safely accessible to divers from beginner level through advanced. Located within a marine park will not only enhance marine growth, it will prevent fisherman from tying up and fishing on the wreck where divers are."

Once inspections are completed and the vessel passes, large holes will be cut throughout the hull and decks for diver safety. Quite often the ships provide a controlled setting for advance levels of diving, like technical training, which deals in overhead environments.

"Even if visibility is limited and bad for diving, it is great for training!" commented Ron Akesson, Technical Dive Instructor from Adventures

Down Under in Bellingham, Washington. "Having a wreck in Howe Sound will allow us to do wreck training without traveling a day to get to the site. Once the ship is down, I also plan on organizing several fun group dives per year, too."

Members of the ARSBC may be available to give a presentation to your local

Nearly 1,000 volunteers are approaching 7,000 man hours aboard the ship... Several volunteers have logged between 160-300 hours each!

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dive club, if your club or store is located in the Pacific Northwest, if you would like to organize a group of volunteers for a day or weekend. Individuals are also welcome to volunteer.

"We welcome anyone who would like to come out and help—divers and non-divers. We can find a job for any skill," said McCracken.

For more information, see www.artificialreef.bc.ca or email: dmccracken@artificialreef.bc.ca ■





Marine Archaeology 101

So, you fancy yourself the next Dirk Pitt or Indiana Jones on scuba. Seriously, where do you start, if you're interested in learning about marine archaeology?

The traditional route is to enroll at a university, typically taking a Bachelor of Arts degree. But, this will take you three or more years to complete and cost you tens of thousands of dollars.

Ok, maybe you're not that serious. Not to worry, there's plenty of other ways to learn about marine archaeology without having to take out a whopping student loan or tie up years of your life.

Societies & Workshops

A good first step is to join a marine archaeology society. This is a great way to share in the thrill of discovery, meet other like-minded folks, and develop the skills needed for researching, exploring and conserving shipwrecks.

If you're fortunate enough

to live on Canada's west coast, there's the Underwater Archaeological Society of British Columbia. Its members are involved in documenting shipwrecks in that province. It's one of the oldest and best-known groups of "avocationalists" in the world, and it works closely with museums and other marine archaeology groups. It also offers training courses from the UK-based Nautical Archaeology Society.

In the United States, similar training is available through organizations such

as the Great Lakes Historical Society. It offers nautical archaeology weekend workshops at its Peachman Lake Erie Shipwreck Research Center. Basic, Advanced and Survey level courses are taught there.

Parks & Preserves

Another great way to experience shipwrecks first-hand is to visit an underwater preserve or marine park. The Dominican Republic's 1724 Guadalupe Underwater Archaeological Preserve is the world's first underwater shipwreck museum. Created in 2002, it's located off Dominicus Beach at Bayahibe. It includes artifacts from the *Guadalupe* and the *Tolosa*—two Spanish Colonial ships that were wrecked in a storm in 1724. Nick-named "the Quicksilver Galleons" because of the large quantity of mercury each was carrying, both ships were discovered on the island's east coast in the 1970's.

One of the ship's anchors and several cannons from each wreck were relocated

Diver with Parrel

A Ming Dynasty dragon: "Traditional Style" blue-and-white porcelain from around 1640 A.D. Wikipedia photo

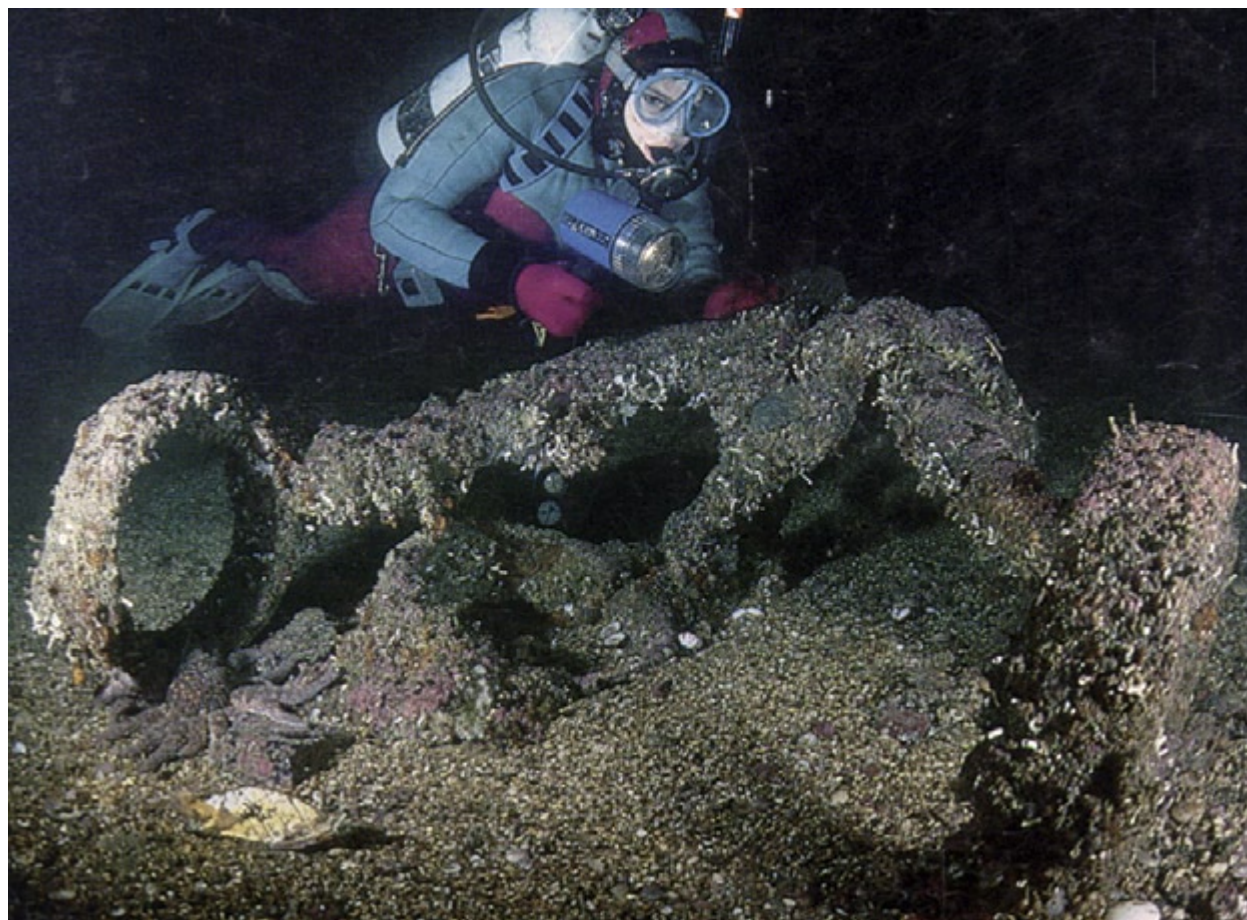


to the quarter acre underwater museum, which lies 100 meters from the beach in 15 feet of water. Staff and students from Indiana University helped create the unique attraction to better educate the public about the archaeology of shipwrecks and the importance of maritime heritage to Dominican history.

Nearby, in deeper water, rests the *Saint*

George, an artificial reef created in 1999 when the former Norwegian cargo ship was deliberately sunk. It's a great wreck dive for both the novice and experienced diver alike.

The 1733 Spanish Galleon Trail is found in the Florida Keys National Marine Sanctuary. The wreck of the *San Pedro* is among one of the most picturesque



wreck rap



of the 1733 wreck sites, due to her location in a white sand pocket surrounded by turtle grass and the prolific marine life that inhabits her grave.

Since the 1500's, more than 800 documented shipwrecks have occurred around the reefs and sand flats of the Florida Keys. These "windows to the past" give the Keys a rich and exciting maritime history.

Travel & Tours

Diving into History is a new live-a-board for shipwreck enthusiasts vacationing in the Belitung region of Indonesia's Gaspar Strait. Divers can experience a handful of 19th century shipwrecks. There's even a yet unidentified Chinese Junk. The wreck is a spectacular sight—a three-meter high pile of blue and white china.

"It's strictly look but don't take," according to tour operator Pascal

UASBC director Al Morgan with a cannon from the 19th Century shipwreck, *Swordfish*. Photo by Jacques Marc

Kainic. Divers are not allowed to remove any artifacts from the wrecks as souvenirs, he says.

Shipwrecks & Social Networking

Another great way to learn about marine archaeology is to join the social networking website, Facebook. There, you'll find plenty of groups dedicated to marine archaeology and wreck diving. A few are: Archaeological Divers Association, Sea Research Society and Wrecks Worldwide.

— Rob Rondeau
Marine Archaeologist
www.procomsurvey.com ■

RELATED LINKS

Underwater Archaeological Society of British Columbia

www.uasbc.com

Nautical Archaeology Society
www.nauticalarchaeologysociety.org

Great Lakes Historical Society
www.inlandseas.org/plesrc/index.html

1724 Guadalupe Underwater Archaeological Preserve, Dominican Republic

www.indiana.edu/~r317doc/dr/index.html

Florida Keys National Marine Sanctuary
floridakeys.noaa.gov/sanctuary_resources/shipwreck_trail/welcome.html

Diving Into History, Indonesia
www.oceantreasures.org/categorie,cruise-amp-wreck-diving,3032874.html

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Stones of Green & Other Treasures

Text by Carol Tedesco

Then I saw the things brought to the King from the new Land of Gold... all manner of wondrous weapons... all sorts of marvelous objects for the human use which are much more beautiful to behold than things spoken of in fairy tales... In all the days of my life I have seen nothing which so filled my heart with joy as these things. For I saw amongst them wondrous artful treasures, and I marveled over the subtle genius of those men in strange countries. Indeed, I cannot tell enough of the things which I saw there before me.

—Albrecht Dürer

The German artist Albrecht Dürer penned this poetic ode to “those men in strange countries” in the year 1520, upon viewing the first of the Mexican treasures sent by Spanish conquistador Hernán Cortés to King Charles V of Spain.

In the year 2010, on a day of high winds and tempestuous seas, I joined W. Keith Webb, CEO of Blue Water Ventures of Key West, and Captain Dan Porter, Blue Water’s Operations Manager, at the Hogfish Bar and Grill, a favorite Key West

haunt. With the weather too rough to work at sea and in no hurry to be anywhere else, conversation soon turned to our favorite subject, the 1622 Fleet *Santa Margarita* shipwreck and the treasures she carried. (If the reader is not familiar with the background history of the *Santa Margarita*, see X-RAY MAG issue #34.) I shared the Dürer quote with Webb and Porter.

“But, there are numerous qualities that can contribute to the perception of an object as precious,” observed Webb. “Dürer was an artist, viewing the treasures through the eyes of an artist. His reverence for creative genius directed into artistic expression is what made these objects so precious to him. An accountant no doubt would have composed an ode of a different stripe.”

“It is an amazing thing—treasure and the forms it comes in,” added Porter. “Not only gold and silver, but works of jade, marble, Italian quartz and even green cut glass have been recovered on the *Margarita* trail in the last few years—all of which, at some time or other, were treasured by someone.”

So, what overall qualities can contribute to the perception of an object as precious? Rarity would naturally rank high on the list. An object is considered rare when it is uncommon or unusual; beauty—a quality that is more subjective and less measurable than rarity; complexity—meaning that creation of the object is labor intensive or difficult to bring to fruition; agreed-upon value—whereby a

specific type of object, such as paper money, is accepted in trade for a variety of objects and services. And then of course there are the magical, mystical qualities that humans perceive or invest in objects to give them power.

The Power of Gold

The Spanish conquistadors believed passionately in the power of silver and gold, and this belief propelled them to sail across vast seas in its pursuit. Christopher Columbus expressed this conviction in a letter to his monarchs, writing, “Gold is most excellent, of gold there is formed treasure, and with it whoever has it may do as he wishes in this world and come to bring souls into Paradise.”

The Spanish quickly learned that the peoples of Mesoamerica—Olmec, Maya, Aztec, Toltec, and others—treasured green stones above silver and gold. The

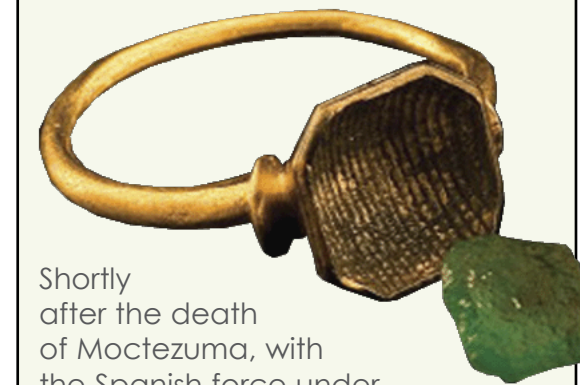
A Costa Rican jade celt exhibits characteristics similar to artifact #50049 (next page). Photo K5177f © Justin Kerr



GREEN TREASURES

A high carat gold ring discovered by Blue Water’s Captain Dan Porter was set, not with an emerald as it appeared at first glance in the murky waters of the Florida Straits, but with a bead of green glass. Photo by Dan Porter © Blue Water Productions.

The Spanish chronicler Bernal Díaz del Castillo, a soldier in the army of Hernán Cortés, documented numerous examples of the Spanish trading green glass beads like this one with “the Indians” for gold, explaining that the Indians thought they were chalchihuites, a green stone that they valued more highly than gold. Photo by Ron Pierson © Blue Water Productions.



Shortly after the death of Moctezuma, with the Spanish force under siege and preparing to retreat from Mexico, Cortés loaded eight horses and more than 80 “friendly Tlaxcalans” with Mexican gold, jewels and silver, as much as each could carry. The rest, Díaz wrote, “over seven hundred thousand pesos in gold” was piled up in heaps for any soldiers willing to carry it. Díaz wrote that while many of the soldiers loaded themselves with gold, he chose to take only four chalchihuites, the value of which later, “served me well in healing my wounds and getting me food.” ■

Spanish soldier and chronicler, Bernal Díaz del Castillo, in his *True History of the Conquest of New Spain* described an incident in which “the great prince Moctezuma”, upon learning that the Spanish were approaching his provinces, sent orders to his governors that they should barter gold for the Spaniard’s beads. “...especially the green beads,” Díaz wrote, “which are something like their chalchihuites, which they value as highly as emeralds.” Díaz described some



The archive of Justin Kerr photographs (research.mayavase.com/kerrportfolio.html) revealed this set of strikingly similar Aztec clay stamps. Photo K7846 © Justin Kerr



Green Stones

A tiny square of embossed gold, discovered by Blue Water Ventures crewmember Jesse Van Houten. Two nearly identical squares have been recovered from the site previous to the February 2009 discovery of this one. Photo by Dan Porter © Blue Water Productions

It blows my mind, the difference only a decade has made in the development of the internet as an indispensable research and information sharing resource. Of course, as with any source, a researcher must be discerning—incorrect and misleading information is just as readily available online as that which is accurate. But, unlike ten years ago,

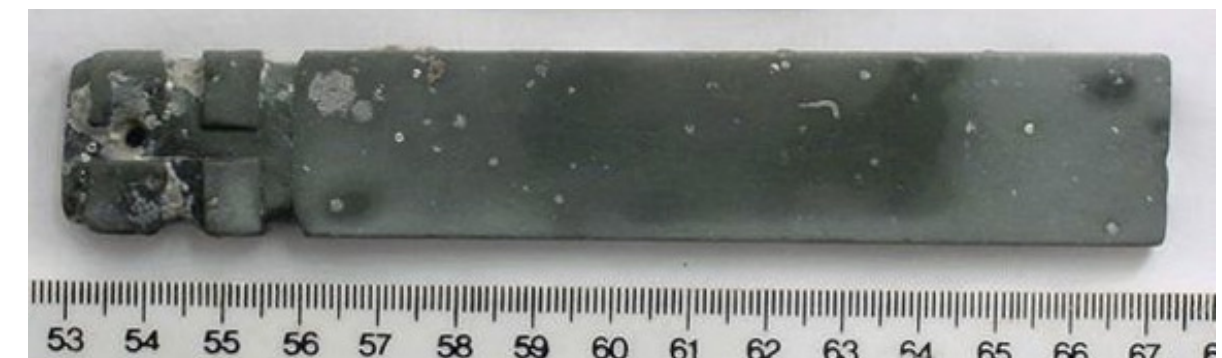
now a researcher can quickly identify and locate the leading authorities on almost any given subject—or at least their publications.

I soon learned that the name *chalchihuite*, or *chalchihuitl*, actually encompassed a variety of hard green stones, and is a word related to the name of the Aztec goddess of lakes, rivers and seas—*Chalchiuhtlicue*—meaning “She of the Jade Skirt”.

The Mesoamerican’s were masters of lapidary work and carved astonishingly elaborate amulets, charms, pendants and tools from many types of minerals, but hard green stones such as jadeite, nephrite, turquoise, aventurine, and serpentine were of the greatest value, and considered sacred.

Kavanaugh and Kibler were able to provide images of three other *Santa Margarita* artifacts carved from green stone. One of these, though not intact, is similar in shape to #50049, being rectangular, with squared edges, carved to a blunt end. However, because of its condition, it is impossible to know if there was once any decorative carving or drilled holes. Of the other two, one is intact and the other sheared into two pieces. Both of these are long and slender, with drilled holes, and thin, tapered ends shaped more like blades than artifact #50049.

Next, digging in with my trusty MacBook Pro and a stack of books written by 16th century explorers, I selected the word *chalchihuite* from the chronicle of Bernal Díaz and hit “Search Google”.



The greenstone “celt” pendant, artifact #50049, discovered by visiting U.K. diver Phill Short. Photo © Mel Fishers Treasures, Inc

chalchihuites as being “worth a vast quantity of gold,” and episodes of the Spanish exchanging green glass bead “chalchihuites” for gold are repeated continuously throughout Díaz’ chronicle and in various other records of the conquest.

The *Santa Margarita* was a Spanish galleon transporting treasures deemed precious by the Spanish, so it is not surprising that the wealth of her cargo was made up of silver, gold and pearls. However, in the past couple of years, as Captain Porter pointed out, Blue Water Ventures has recovered several artifacts that point to Mesoamerican craftsmanship, values and lore. These discoveries include a high carat gold ring, set with a green glass bead of the type that the Spanish would trade for gold; an exquisite, tiny square of patterned gold; and an artifact tentatively documented as a paperweight—possibly carved from aventurine.

Masters of lapidary work

I reminded Webb and Porter that during the summer of 2000, on one of the *Santa Margarita*’s scatter trails, visiting U.K. diver Phill Short had discovered an artifact of obvious pre-Columbian cultural origin (#50049). Searching the internet for similar specimens in that year returned images of fewer than a

dozen comparable artifacts, none of which were shipwreck recovered, each described as jade—though it soon became clear that the term *jade* was being used loosely to describe a variety of hard green stones.

Queries to online professional archaeological discussion lists about the 5.5 inch long, one inch wide, rectangular carved stone artifact were unproductive, though this was not totally unexpected. A decade ago, even if they might have cared to do so, the vast majority of professional archaeologists were loath to work with or advise any private sector historic shipwreck exploration company, regardless of its professional caliber. Those who did risked being blackballed by their peers.

Now seemed like the perfect time to renew my inquiries into artifact #50049 and to see what information might be available to further our understanding of the recent *Santa Margarita* discoveries.

First, I contacted Sandy Kavanaugh, curator for Blue Water’s joint venture partner, Mel Fishers Treasures, and Dylan Kibler, registrar for the Mel Fisher Maritime Museum, to find out if any other green stone artifacts might have been found on the *Santa Margarita* prior to 2000.



Blue Water Ventures CEO W. Keith Webb examines recovered artifacts of bone, pottery, and wood aboard the *Blue Water Rose*. Photo by Carol Tedesco



Double drill holes in this *Santa Margarita* greenstone artifact, probably sheared in two during the destruction of the vessel in the hurricane of 1622, suggest it was worn horizontally, as a pectoral ornament. Photo by Dylan Kibler © Mel Fisher Maritime Heritage Society

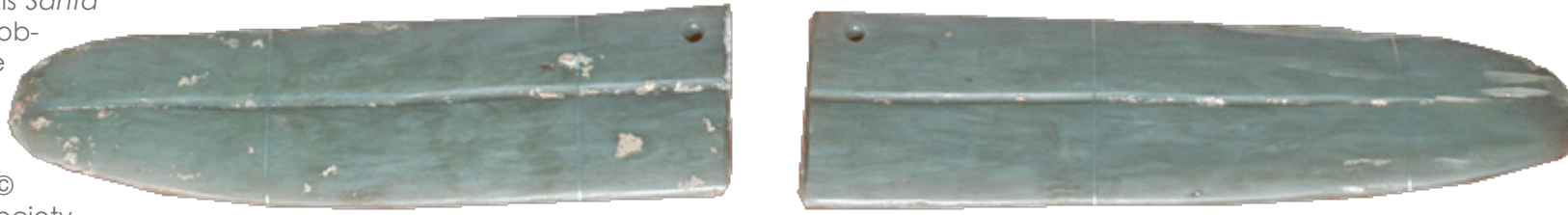


PHOTO K7694B © JUSTIN KERR

A Maya greenstone belt mask with dangles

The motherlode

The path to learning more about jade and other green stone artifacts eventually led, via the Jay I. Kislak Collection at the U.S. Library of Congress web site, to three treasures nonpareil: FAMSI, the Foundation for the Advancement of Mesoamerican Studies, Inc., and Mesoamerican art experts Barbara and Justin Kerr—truly a Mesoamerican researchers resource motherlode.

Sandra Noble, PhD, FAMSI executive

director, created the famsi.com web site to advance the foundations mission “to foster increased understanding of ancient Mesoamerican cultures.” Among its numerous features, the site provides an extensive research department, which, according to Barbara Kerr, is used by scholars worldwide. Barbara and Justin Kerr are Mesoamerican art experts, educators, and publishers. Barbara is a restorer of ancient sculptures and artifacts. Her husband Justin is renowned for his magnificent photographs of Maya vases, captured with his innovative rollout camera—a camera that allows him to create peripheral images of Maya vases in a single exposure. The FAMSI research department provides access not only to the Barbara and Justin Kerr Photographic Collection, but to the Linda and David Schele Image Collection, the John Montgomery Drawing Collection, and the Bibliografía Mesoamericana.

In separate e-mails to Dr Noble and Barbara Kerr, I attached an image of artifact #50049, the 5.5 inch long, one inch wide, rectangular carved stone *Santa Margarita* artifact. Each wrote back almost immediately and shared her first impressions—impressions drawn from decades of training, experience, and knowledge.

Dr Noble wrote, “The shape of your stone made me think of the anthropomorphic “Axe-figures” carved by the ancient Nicoya culture of Costa Rica.”

She then directed me to two Justin Kerr images that display a resemblance in form.

Barbara Kerr wrote, “When I opened the attachment, I thought it looked like an unfinished Costa Rican celt—but maybe it is finished. The sharp edges [as on 50049] appear on K7976 and on the K5177 group; and the surface looks well polished...”

Celts, axe-gods, pendants and dangles

Axe figure? Celt? All along the cyberspace trail that had led to FAMSI and the Kerr's, had been a number of sites showing artifacts with characteristics similar to #50049, variously described as “celts,” “axe-gods,” “pendants,” and “dangles.” What exactly was the difference? What made one object a celt and another an axe-god?

In a nutshell, axe figures are objects shaped like a hand axe. Axe-god figures represent a being and have a face, whether it be human or animal. Ones with drill-holes may be described as pendants (worn vertically) or pectorals (worn horizontally). When intended to be worn hanging from a belt assemblage, which would have been part of a royal costume, they might be described as belt-dangles. Sometimes, the dangles were suspended from a mask and hung from a belt, in which case the artifact might be called a belt mask, or a belt

mask with dangles. What they all have in common is that they began with an oblong stone form called a celt.

Jade

Among Mesoamerican peoples, the precious mineral jade and other similar looking hard green stones were symbolic of water (remember Chalchiuhtlicue—the Aztec goddess of lakes, rivers and seas) and of fertility, rulership, young green maize, and of wind, breath and



PHOTO K2048 © JUSTIN KERR

An elite Aztec warrior in elaborate dress; crafted in gold, he carries a shield, a variety of weapons, and ornaments reflecting his social rank

Pieces of Eight



Silver Treasure Coins of the 1622 Shipwrecks
Nuestra Señera de Atocchia
Santa Margarita
& the Portuguese Carrack *São José*

by Carol Tedesco

Fully illustrated with hundreds of finely detailed photographs, *Pieces of Eight* is more than just a reference book. Carol Tedesco not only explains the subtle nuances of the coins themselves, but places them in the context of their moment in history, explaining where they were coming from, where they were going and why.

To be released in 2010 by
SeaStory Press, Key West Florida.
To be on our availability e-mail alert list,
please inquire at lostgalleons@aol.com.

wreck rap



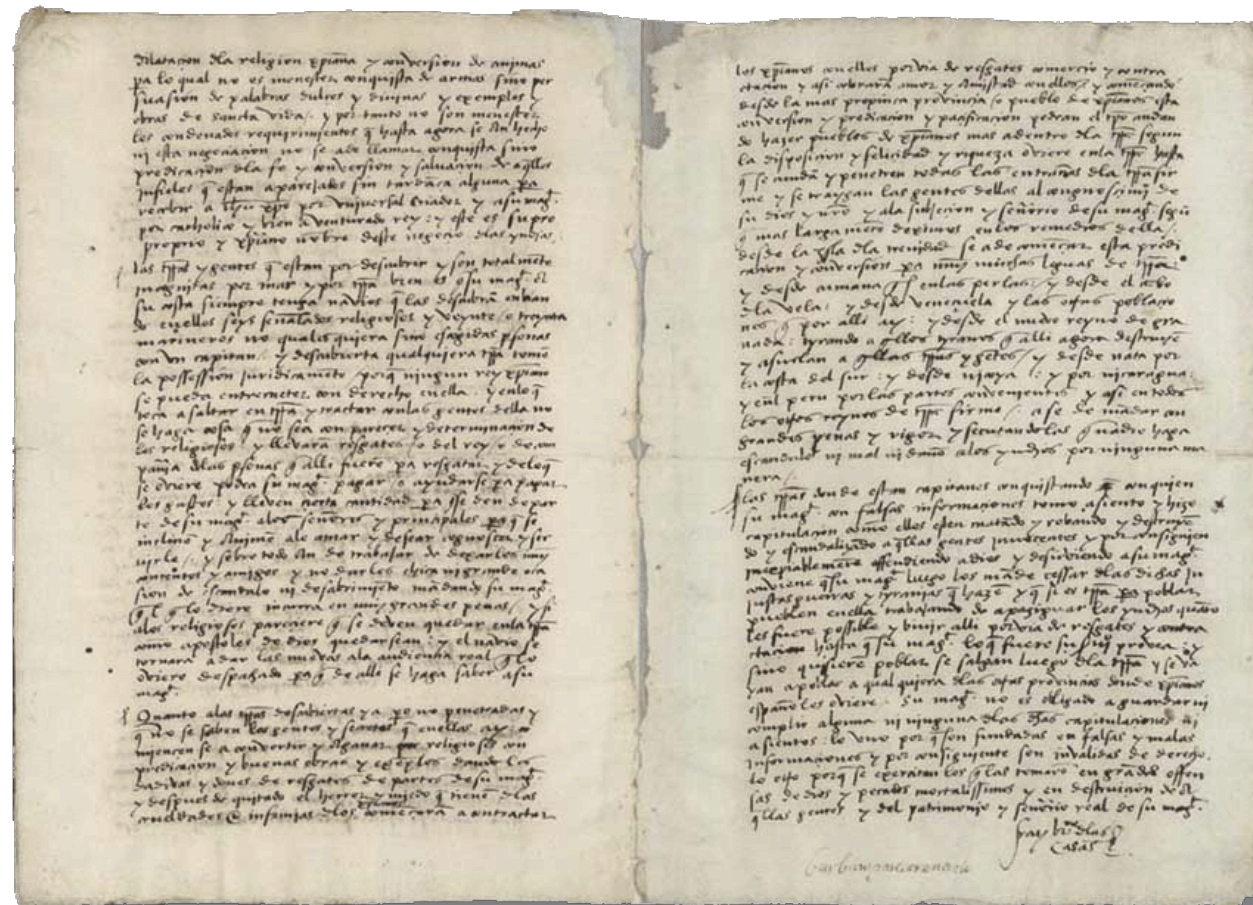
Green Stones



the soul. This concept of jade as sacred and precious was also shared by the Nicoya culture of Costa Rica, and green stone artifacts uncovered there, such as the axe-figures photographed by Justin Kerr, reveal a continuity of style and symbolism with those created by Mesoamerican artisans.

Jade is tough as nails and harder than steel. On the Mohs mineral hardness scale, developed by German mineralogist Frederick Mohs, it measures between 6.5 and 7 on a scale of one to ten.

Nearly 400 years before Blue Water Ventures (BWV) began searching for the remains of the *Santa Margarita*, two 17th century salvors, Captain Gaspar de Vargas and Havana businessman Francisco Núñez Melián, had Florida "Indians" and pearl divers from the Caribbean island of Margarita recover treasure from the sunken galleon. On 21 April 2010, BWV diver Gavin Rall (left above) surfaced with this carved, polished greenstone artifact. Stone amulet-type artifacts like this one, with holes drilled through their breadth, are commonly called "gorgets" and have been located on archaeological sites throughout Florida. Did this gorget fall from the neck of one of Gaspar de Vargas' or Francisco Melián's divers? Photos by Carol Tedesco



While today it may be cut with the use of saws charged with diamond, artifacts like #50049 were cut with... are you ready for this? String.

The late Dr Herman Smith, an expert on the coastal trading practices of the Maya and author of numerous articles, wrote of early Spanish reports that describe the cutting of jadeite being accomplished with the use of a cord drawn back and forth in a sawing motion, using hard sand particles and water as cutting agents. Drill-holes for suspending the piece were bored by twirling hollow bird bones filled with an abrasive, such as hard sand or crushed jade.

A manuscript letter, circa 1528, from Dominican Priest Bartolomé de Las Casas (1474-1566) to Holy Roman Emperor Charles V (1500-1558). Las Casas devoted his life to mission work, and was an advocate for the rights of indigenous peoples of the Americas. Library of Congress, Rare Book and Special Collections Division, Jay I. Kislak Collection, Washington, D.C.



Brian Keegan and Blue Water Ventures investor and crewmember, Hense Robinson, examine pottery sherds recovered from the *Santa Margarita*. Every recovered artifact is tagged and documented with exact location data. Precise documentation allows the team to observe the exact spatial relationship of artifacts and plot the sequence of a ship's destruction. Photo by Carol Tedesco



RIGHT: Map of Mesoamerica, a culturally defined area that includes the lower half of Mexico, Guatemala, El Salvador, Belize and the western tip of Honduras. Dr Sandra Noble, executive director of FAMSI, explained that the Mesoamerican cultures share about 20 traits that are not shared by any cultures north of northwest Mexico, nor south of middle Honduras. These traits include the bar and dot counting system, stepped pyramids, the corbelled arch in architecture, earliest subsistence based on domestication of the "three sisters" of corn, beans, and squash, and the 365 day calendar, to name a few. Image courtesy of FAMSI, the Foundation for the Advancement of Mesoamerican Studies, Inc.: famsi.org

The 1622 Fleet connection

Being of decorative, monetary, and practical use, there is no question of why artifacts like the exotic embossed square of gold or the greenstone "paperweight" would be among a Spaniard's belongings on the galleon *Santa Margarita*. But, what of the pectorals and axe-figures?

Because jade was held in such reverence by New World cultures, carved objects such as axe-figures were bequeathed as heirlooms. Is it possible that an artifact such as #50049 came into the property of a Spaniard through marriage or union with an "Indian" of aristocratic lineage?

Were they stolen? Traded for? Or, since the resilient mineral jade is strong enough to hone the edge of a knife, did a soldier of Spain per-

haps value it simply as a tool with which to sharpen his sword?

I put these questions to Blue Water Ventures chief archaeologist James Sinclair, who stressed that while the transfer of beliefs and culture between the Spanish and the indigenous populations

can seem superficially to be all one way, it was not. "As you can imagine," he wrote, "the acculturation process works to some degree in both directions, and with a couple of generations removed from the actual conquest we can reasonably expect that traditions from both cultures are being mixed and passed along. The value of these green stones, while unknown in classic Spanish contexts, is obviously highly thought of in indig-

enous cultures. Could these beliefs have existed in passengers or servants of passengers aboard the *Santa Margarita*? Undoubtedly.

Did they hold the exact same meaning as those of the uninfluenced aboriginal cultures? We cannot say. However, discoveries such as these provide a fascinating view into the mysteries of a culture, a society, and beliefs that have little to do with those of the conquering Catholic Spanish."

Carol Tedesco is an internationally recognized Spanish Colonial coin expert and historic shipwreck professional who has worked with projects in North America, South America, Africa, and the Pacific. A member of the Explorers Club, she is a popular radio guest and speaker throughout the U.S. on the subject of the 1622 Fleet shipwrecks. Today she con-

WHAT IS IT?

This greenstone artifact (below), unlike any other known 17th century shipwreck recovered artifact, was discovered by Blue Water Ventures crewmember Gavin Rall. Based on the context in which a similarly shaped object was presented in a 17th century artwork, the artifact was tentatively documented as a paperweight.

Curious to know if she had ever encountered anything similar, I sent this image to Mesoamerican art expert Barbara Kerr. Her response assured me that decades spent in the study of ancient artifacts had not dulled her sense of humor. She wrote: "Thank you for the new image. We've never seen anything like it... We speculated from the sublime to the ridiculous—it could be anything from a paperweight to a scale weight to a bacon press..."

To illustrate how some of the most enlightening insights arrive by the most delightfully unexpected means, when I submitted this story to X-RAY MAG's co-publisher, editor

and art director, Gunild Symes, for publication, she e-mailed back with observations unique to her own experience as an artist. She wrote: "Having studied some printmaking and papermaking in art school, I can't help but think that the 'paperweight' artifact has something to do with one of these processes. Because of its shape and handle, it could have been used for letter or envelope folding, embossing or sealing, or for flattening wrinkled, water-damaged paper."

A few days later she had more to add: "It has been such an interesting puzzle for me that I had to Google the history of parchment, paper, glue and bookbinding. Parchment—or velum—and paper are susceptible to humidity, warp easily with moisture. I can

imagine that on a ship crossing the ocean, humidity and water would be a constant problem. Plus, glue at the time took a long time to dry and dried hard and crackly, so a heavy, level weight was needed to keep the layers flat. Bookbinding was an art done by hand back then, most likely by glueing of papers together, so it may have needed a heavy press of some sort. I am not sure about the processes of each, but it is likely that they needed to press whatever layers they used with a weight in a screen, or box. Hence, the shape of the artifact may be formed so it can slide down and fit into a wooden frame, or a sided-tray, holding paper or vellum. The use of greenstone for the artifact, especially with its large size, clean carving, and polished quality, could point to a high social ranking or wealth of the owner, as these were quite valuable stones." (Photo of Artifact 74073 by Ron Pierson © Blue Water Productions.)



Carol Tedesco

ults for some of the most prominent historic shipwreck search and recovery companies in the world. Her forthcoming book, *Pieces of Eight ~Silver Treasure Coins of the 1622 Shipwrecks Nuestra Senora de Atocha, Santa*

Margarita and the Portuguese Carrack São José, published by SeaStory Press, is due to be released in the fall of 2010.

For more information about Keith Webb's Blue Water Ventures of Key West and the treasures of the *Santa Margarita* shipwreck, visit www.bwvkw.com. ■



Edited by
Scott Bennett



Dominica gears up for annual dive fest

The Nature Island Kicks Off Its Signature Ten-Day Event on July 9, 2010



Known as "The Nature Island", Dominica is the largest and most mountainous of

the Windward Islands, encompassing an area of nearly 290 square miles. Situated between the French islands of Guadeloupe and Martinique in the Eastern Caribbean, Dominica's natural diversity is truly unique. Boasting a bevy of natural attractions towering volcanic peaks, lush rainforests, waterfalls and pristine coral reefs, Dominica is a place where humankind and nature live in harmony. Adventurers and nature-lovers alike will revel in a range of eco-tourism options include scuba diving, snorkeling, mountain biking, kayaking, horseback riding, nature tours, hiking/trekking, whale, dolphin and bird watching, sailing and fishing.

Roseau, Dominica and the Dominica Watersports Association, promise to deliver an action-packed ten-day program during its 17th annual Dive Fest from 8-9 July 2010. Dominica hotels and tour operators are offering a variety of dive packages, just in time for the festival. Take advantage of Dominica's island-wide "6 Dive, 5 Pay" Dive Fest special offered at all dive shops between July 1 – October 31.

For more information on Dive Fest and to view their full schedule of events, contact the Discover Dominica Authority at 866-522-4057 or visit the official websites at:

www.dominica.dm/site/divefest.cfm
www.discoverdominica.com ■

'Cattle' class becomes 'cuddle' class as Air New Zealand introduces beds in economy

Having been subjected to ever-decreasing comfort levels in recent years, the new seating is a welcome development for economy travellers. With business class seats becoming more luxurious and economy seating more cramped, Air New Zealand has thrown down the gauntlet

and is giving exhausted economy class passengers a chance to put their head down. Dubbed "Cuddle Class", the Air New Zealand offering applies to the three-seat blocks on its new planes and is being pitched at couples and families with young children. The new seating row can



partially recline, with a retractable platform that can be raised to create a flat space across the footwell.

For couples, the third seat comes at half-price. Whereas, for a family of four, the idea is that one adult can lie down with their children while their partner must make do with an ordinary seat. The airline has also suggested that children could be allowed to use the space as a place area.

The airline has, however, been quick to squash any lingering thoughts from couples wishing to join the "mile high club". "Just keep your clothes on please!" stated Rob Fyfe, the airline's CEO.

Read more: <http://www.dailymail.co.uk/travel/article-1246145/Air-New-Zealand-offer-economy-class-lie-beds.html#ixzz0IBT4X0T7> ■

Senators fight airlines over carry-on baggage fees

U.S. Senate Democrats take aim at carry-on baggage fees after Spirit Airlines became the first U.S. carrier to propose charging passengers to store luggage in overhead bins.

"This latest fee crosses the line and is a slap in the face to travelers," stated Sen. Charles Schumer, D-N.Y. "Our legislation will rein in the airlines and keep air travelers from being gouged every time they board a plane." The effort comes one day after two other senators put forward a bill that

would change how the Federal Aviation Administration regulates carry-on baggage fees.

The legislators were motivated by Spirit Airlines's proposal of to charge passengers up to US\$45 to stow luggage in overhead bins, making it the first airline to charge for carry-on bags. As a result, Schumer and the bill's other co-authors called upon the U.S. Treasury Department to close a loophole they say gives airlines preferential tax treatment for fees on services that are not deemed "reasonably necessary" for air

transportation.

The goal is to ensure that passengers are not penalized for bringing items such as medication, food and laptop computers onboard, the senators said. "So far, one airline has announced their intention to make fees for carry-on bags a reality," he added. "We cannot allow these flood gates to open," stated Senator Menendez. Under current laws, airlines pay a 7.5 cent tax for every dollar they collect in fares, but no tax is imposed on fees collected for "non-essential" services. ■

Need a snuggle bear to bring with you? Find this one at The X-RAY MAG Store where a percent of all sales goes to ocean conservation. Click on the image to buy



Exploring and Diving PALAU



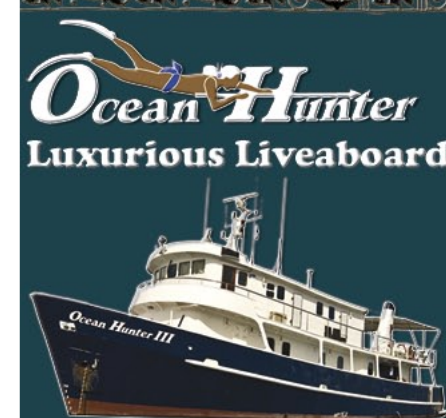
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Commentary

The Weighting Game

Is it too much to ask for there to be some degree of consistency when it comes to rules governing checked and carry-on baggage?

In light of Spirit Airlines' recent proposal to charge for carry-on items, it is increasingly apparent that luggage fees are exasperating issues, which seem to be increasing exponentially. As a diver AND an underwater photographer, airport check-in is a stressful exercise, to say the least. You just never know what will happen. Often, the rules seem to be at the whim of the person on duty at the counter. This point was well-illustrated on a recent trip to Southeast Asia.

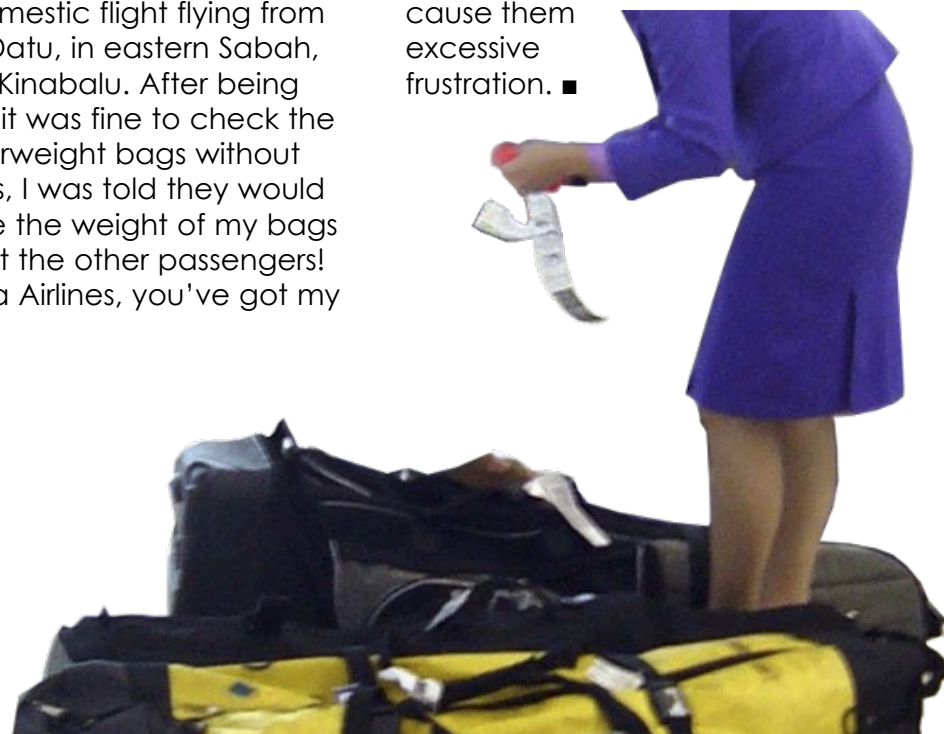
Flying on assignment from Manila to Kota Kinabalu on Cebu Pacific, I really tried to minimize my gear as much as possible. While the airline does provide an option for excess baggage payment at the time of booking, the flight had been arranged for me, and this option hadn't been selected. The agent said I was a good 20 kilos over. To minimize the excess charges, he suggested I take the smaller bag to the departure gate, where it could be checked in there. I still had to

pay US\$50.00, which was a lot less than I would have. I then asked if I could do this in Kota Kinabalu on the way back. "It shouldn't be a problem," he responded. On the return trip, it didn't work out that way. The agent there said she had never heard of this practice, and I would have to pay US\$100.00 for excess baggage, which was essentially the same as the cost of a one-way ticket.

In Malaysia, it was a different scenario entirely. Not only was I not charged excess baggage, but I was also allowed to carry on two bags plus my laptop! However, the real kicker came on a domestic flight flying from Lahad Datu, in eastern Sabah, to Kota Kinabalu. After being assured it was fine to check the two overweight bags without any fees, I was told they would average the weight of my bags amongst the other passengers! Malaysia Airlines, you've got my vote!

This got me to thinking. Why can't all airlines follow this procedure? Seriously, with today's technology, can't someone develop software to keep track of the total baggage weight utilized on a person-to-person basis? If two people are under and one is over, the weight can then be averaged out and everyone is happy.

On that topic, why can someone weighing 200kg get on the plane with no questions asked, yet I get charged excess for camera gear? In a time when airlines need to increase passenger traffic, they should be looking to attract passengers not cause them excessive frustration. ■



AND THE SECOND

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POINT & CLICK
ON BOLD LINKS



Equipment

Top of the Pops



40 years

To celebrate 40 years of manufacturing quality dive kits, A.P.Valves introduces the new special edition BUDDY Commando TD40. Developed to meet the punishing demands of Navy SAR divers in the mid-1980s, the original BUDDY Commando subsequently took the UK and northern European sport, technical and commercial (sat-diver) diving market by storm, out-selling its rivals for over 20 years and still going strong. The special edition TD40 is based on the original Commando blueprint. The new Commando TD40 combines the best of old and new with classic Commando TD looks, lift and build quality together with the innovative comfort, custom-fit and precision buoyancy control features of the contemporary BUDDY re::flex range. Available in yellow/black or all-black.

Apvalves.com



GEO updates into the future

The redesigned 2.0 GEO dive computer allow users to keep updating the instrument as algorithms are refined. With an optional cable, the PC interface can download new software from the company as it is made available. Users can choose between Pelagic DSAT or the more conservative Pelagic Z+ algorithm, with an option to switch on or off deep stop computations. Divers also can switch between two different nitrox mixes – each up to 100 percent – during dives. Four modes allow operation as a watch, normal operation with air / nitrox, gauge with a run timer and free, which tracks calculations when switching between normal and free. It can be programmed for deco and non-deco diving and features audible or vibrating alarms. The control interface allows users to step back to earlier screens while programming the unit. Up to 24 dives are stored in the GEO 2.0's memory and uploaded to a digital logbook. www.OceanicWorldwide.com

Fin design's a new switcheroo

Blades tuck in compactly under the foot pocket for travel or walking on the beach. Drag your foot backward and the jointed polycarbonate blades splay out in front of the

foot pocket, ready for kicking action. Interchangeable blades allow divers to choose the flexibility for the diving conditions. Quick release fittings ease doffing the fins at the end of a dive. Polycarbonate was chosen for its light weight and near indestructibility, allowing Ultimate to extend a limited lifetime warranty on the product. www.SwitchbladeFin.com



Eliminate bad air days

Chances are slim that a tank fill will contain carbon monoxide, but CO is definitely a gas no diver wants to deal with at depth, especially in the special mixes that enable deep diving. The potentially lethal gas can get pumped into tanks filled with a faulty air compressor or if the compressor is downwind from a CO source and its CO filter has been overwhelmed. KWJ Engineering has a handy portable sensor called the Pocket CO Scuba 300 that's designed to allow divers to check tanks for this deadly gas before they jump in the water. Put the key-sized sensor in a leak-proof bag, and then fill it with air from the tank. Within three minutes it will sense if CO is present in concentrations as low as 2 parts per million. www.kwjengineering.com



minutes it will sense if CO is present in concentrations as low as 2 parts per million. www.kwjengineering.com





Deep Outdoors Cold Fusion

Deep Outdoors' Cold Fusion lighting system's array of light-emitting diode bulbs can deliver up to five hours of burn time at the low-beam setting or 3.5 hours on high. It also has

a beacon setting to signal the boat after a dive. And if that's not long enough, the battery unit is equipped with three-pin wet connectors, so the rechargeable lithium ion battery pack can

be switched underwater with a fully charged backup. The light head is fitted with a Goodman handle, which leaves fingers free for gripping. The system is shipped with a battery charger that works with 100- to 240-volt input with a universal switch allowing it to be used anywhere in the world with the appropriate adapter. Charging time is five to seven hours. The rugged machined aluminum system is depth rated to 500 feet and the lamps have a life of 100,000 hours. www.deepoutdoors.com



Turbo charge your kick

ScubaMax has updated its fin design in the FN-320 Mach II Turbo fin. The fin's main design nuance is a trap door near the foot pocket that directs water along the top and bottom of the end of the fin with each kick stroke. This design is said by the manufacturer to more efficiently direct the water along the fin to the tip of the blade instead of allowing it to roll off the sides of the fin, where it simply creates turbulence and drag. The fin is molded from neoprene rubber for flexibility, which can be adjusted to personal preference in stiffness by snipping up to three power tabs between the trap door and the fin blade. The more tabs that are snipped, the more flexible with a caveat: once snipped they cannot be restored to provide additional stiffness. Fins are available in three sizes: small, for men's shoe 6 to 8 sizes; medium, 8 to 10 shoes; and large, 10 to 12 shoes. Straps are attached with quick release connections to ease removal to climb boat ladders or to walk through the surf zone at the end of a dive. The fins are negatively buoyant and available only in black. www.ScubaMax.us



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Cressi Crystal

A new version of the Piuma, made using new, extraordinary Crystal Clear silicone. This material offers a level of transparency that has never been seen before in the production of scuba diving masks. Although it still maintains the hypo-allergenic characteristics of the silicones used previously, Crystal Clear is so transparent that it is virtually invisible once the mask has been put on. In addition to the extraordinary transparency, this silicone boasts exceptional resistance to ageing and yellowing over time that is far greater than that of traditional silicones. Even the tendency to mist up is lower than with traditional silicone materials. The seal on the skirt has an original angle and offers comfort that has been unheard of up until now on a scuba diving mask, even after prolonged use. www.cressi.it



Diving in **Sweden**

World-class diving in a challenging environment

From the rugged west coast, with its dramatic drop-off and unique ecosystems, to majestic wrecks—perfectly preserved over the centuries—and crystal clear lakes, Sweden has everything.

Compiled and edited by
Millis Keegan and Peter Symes
Text by Millis Keegan
Photos by Jonas Dahm

From a marine archeology and scientific standpoint, the Baltic Sea is a paradise. There could be as many as 100,000 shipwrecks dating back centuries in this dark and mysterious sea—Viking ships, trading ships and warships to name a few. No other place in the world is comparable to the Baltic Sea. The wrecks, and structures found in the sea are veritable time capsules lying in wait for us to explore and expand our understanding of the past. It is also a comparatively quite shallow sea. The average depth is only 55 meters deep, so with modern technology, it is not too complicated to find many of our lost histories. These histories belong to the countries surrounding the Baltic Sea.

Granted, diving in the far North is not for the weak-minded, nor for the inexperienced, but it's not as bad as it sounds. Scandinavian divers are known around the world for being able to cope with rather tough diving conditions because this is where we grew up and learned to dive. Anyone who goes through entry level training in murky waters with a visibility of 2-4 m (6-12 ft) at best, a water temperature averaging 8°C to 2°C in the winter to 20°C in the summer, and comes out with a smile, will be ready to face anything else. And yes, we do also dive during the fall and winter months, too, with great pleasure.

The bridge of the steamer *Brigge*

ERIK BJURSTRÖM

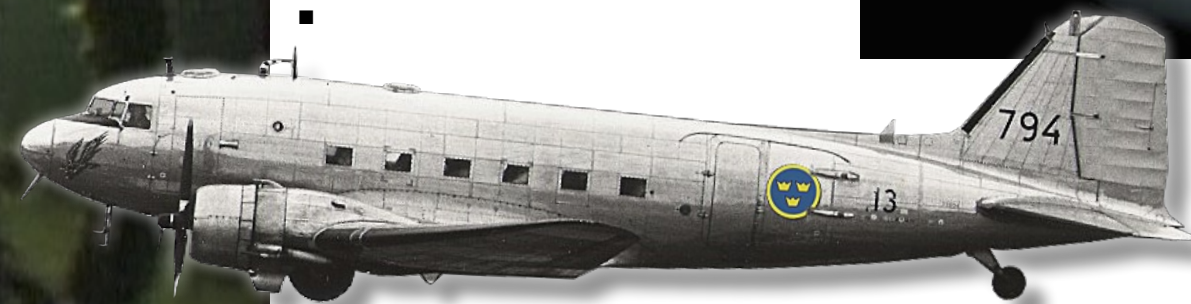
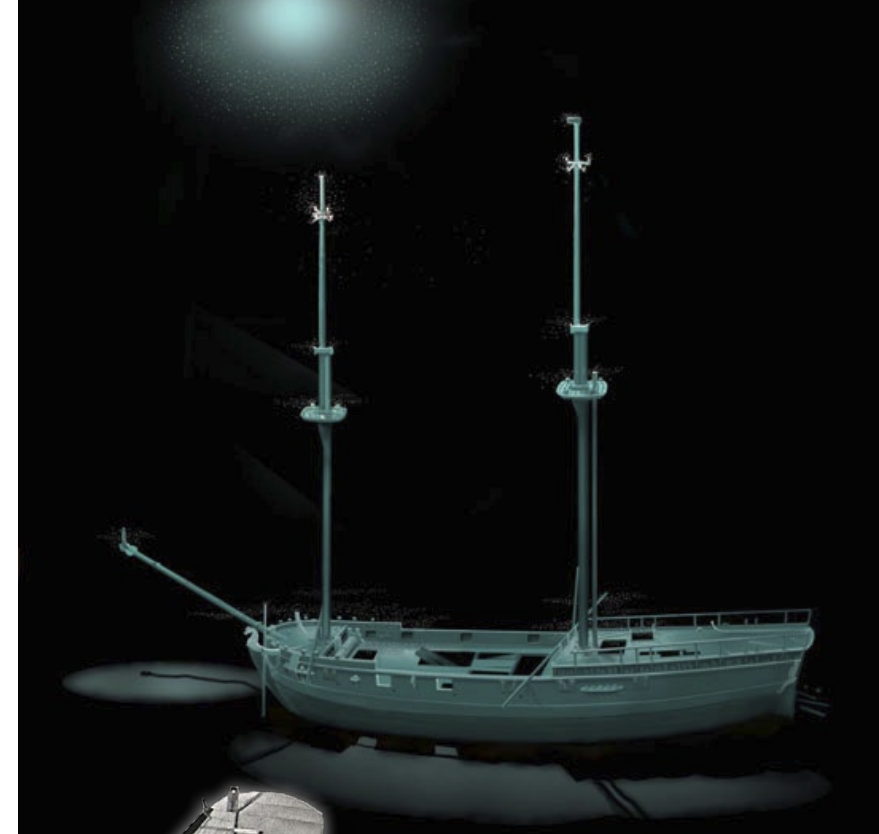


The Mystery Ship

A wooden ship found by the Swedish Navy that, despite a very unusual figure head of a horse, has never been identified or salvaged.

The DC-3

A lost plane presumed to spy on Russia and therefore was presumed to be shot down by the same. The discovery of the plane gave answers to a number of questions and peace of mind to surviving family members.



My most intense diving experience was a 500-year-old wreck in the Baltic in 1992. She was standing upright, mast still there, but the oak planks were as thin as could be, which left her fragile and exposed to careless diving and rough weather. What really got me though, was that she went down in 1492. The visibility was incredible, I saw the entire wreck, and as I swam over the deck, it hit me. When she went down, Columbus discovered America. Columbus discovered America! That was heavy, and even though the ship itself was a simple, small merchant ship, stripped by years of exposure, she was also a monument for the men and woman that explored the world.

— Millis Keegan



Sweden has the highest proportion of divers per capita in the world. We are spoilt for choice. Following are descriptions of just a few of the jewels.

Vasa

One of, if not the most, popular attractions in Sweden is the Vasa ship. Vasa was a Swedish warship that sank during her maiden voyage in 1628. All but forgotten for 300 years, she was salvaged practically intact on 24 April 1961, restored and turned into a museum. Once you

enter the museum, you will stay for hours—it is that good. www.vasamuseet.se

The Champagne Wreck

One of my favorites is the Swedish schooner *Jönköping*, which was sunk by a German submarine in 1916. She carried an order of French Champagne for the Russian Tsar. The bottles were salvaged near Finland in 1998, and they found that the French champagne had been perfectly preserved at a constant 4°C and was ready to drink. Many of the champagne bottles were auctioned off by Christie's in London.



Points of interest

Almost anywhere there is a puddle of water, there is a possible dive site for diving enthusiasts in Sweden. Rivers, lakes, deserted water-filled mines, the Baltic, the West Coast. Some true divers and explorers have been bred in these waters. We cannot list all dive sites here, but we have made a selection based on where you can find a dive center to take you diving.

West Coast of Sweden (1)

There is quite an interesting variety of marine life along the west coast of Sweden. Hence, it is a very popular destination for Swedish divers who get tired of the lack of life in the murky waters of the Baltic. If you have no interest in wrecks, this is the place to be.

Between the 8000 islands of the archipelago and the fiords, there is some interesting diving to be found in terms of marine ecology. Lysekil offers diving in the biologically unique fiord of Gullmarn. Learn more about what you can expect to find here by visiting Havets Hus, "The House of the Ocean" (havetshus.lysekil.se).

Day trips are arranged from a number of coastal cities: Marstrand, Smögen, Hamburgsund, Tanumstrand, Grebbestad and Strömstad. Every place has its own charm. The further north you go, the better the diving gets. That's because the Gulf Stream makes a little turn here and hits a little bit of Sweden. The mixing of cold and warm water provides excellent conditions for diverse marine life.

Väderöarna, meaning "The Weather Islands", are often referred to as the best diving the West Coast can offer. The islands are home to a large seal colony that spends time playing peek-a-boo with divers.

A coldwater coral reef was found not too long ago in the Koster fiord, which earned the fiord the status of becoming a Marine National Park. The reef of *Lophelia pertusa* is found deep, so don't expect to dive on it.

Kullen (2)

Kullen is one of the most distinct penin-

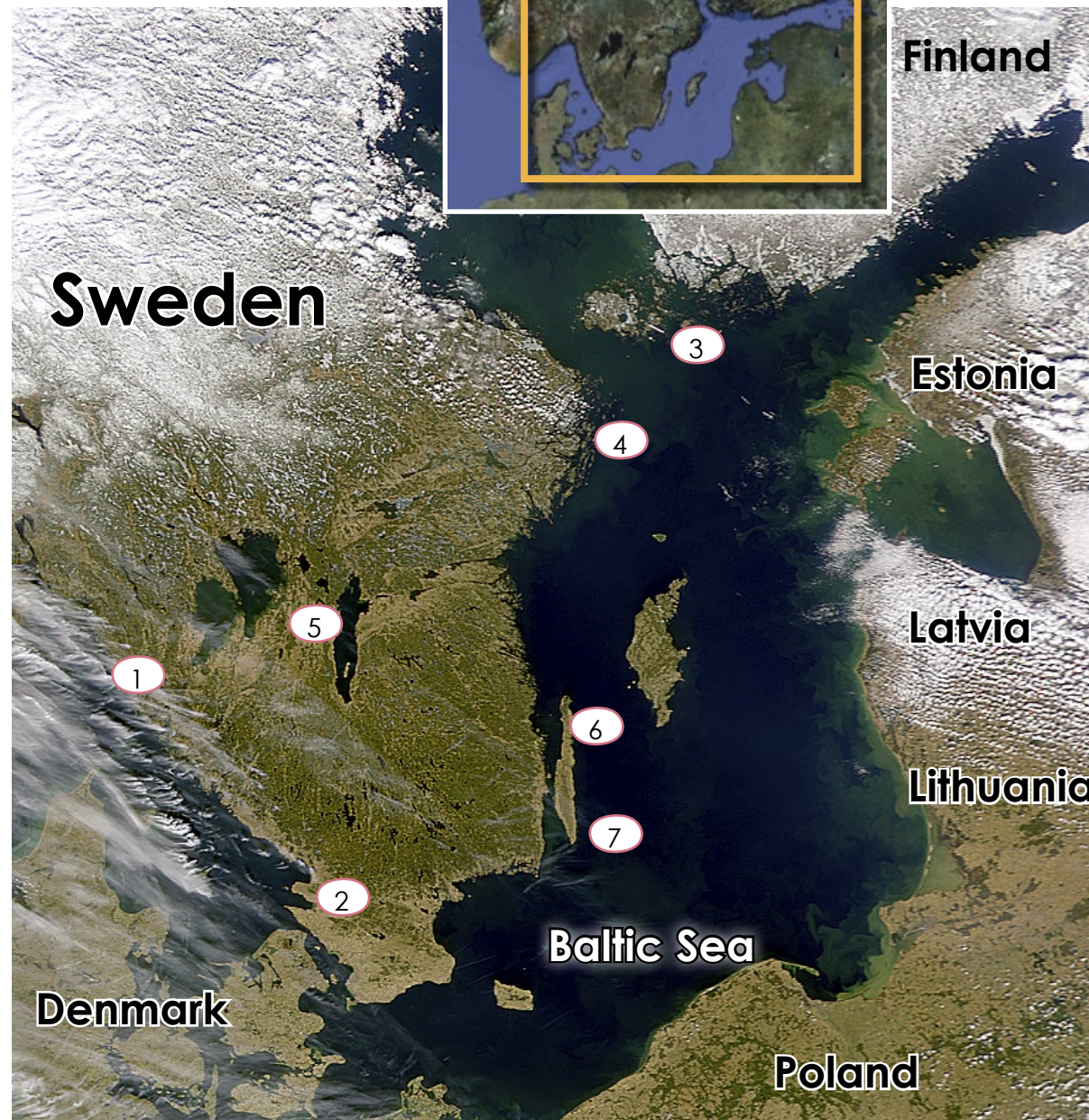
sulas of Sweden. Kullen stands out from the surrounding areas with its rocky, craggy shore, which continues under water. Due to currents that bring nutrients, the marine life is abundant, particularly during summer and autumn. Expect to find shore crabs, hermit crabs, jellyfish, dead mans hand, lot's of flounders, and on a good day, sea trout, cod, mullets and more.

Åland (3)

The Åland islands are situated at the entrance to the Gulf of Botnia and form an autonomous, demilitarized, Swedish-speaking region and historical province of Finland. Åland consists of some 6,500 islands and islets. Due to different regulations regarding diving and wrecks, the wrecks of Åland are pristine, almost always filled with details and in better condition than other dive-able wrecks in the Baltic.

Stockholm Archipelago (4)

The Stockholm Archipelago spreads its islands from Landsort in the south to Arholma in the north. It is the biggest archipelago of Sweden and consists of almost 24,000 islands and islets. It is also the graveyard for more than 20,000 located shipwrecks. Shallow inlets and rocky coasts have sunken more of their fair share of vessels. In the Baltic Sea, you find wrecks from the 10th century or older to wrecks from several wars, including the two world wars as well as tragedies from modern times. The Baltic is all about wrecks. Sure, there's some marine life, but seldom for us to see. An occasional flounder, or a school of small groupers resting on a wreck during a night dive can be seen, but not much more.



The Great Lakes (5)

Sweden has thousands of lakes, but only a couple of them are large enough for merchant ships, *Vänern* and *Vättern*. Wrecks have rested here for centuries without deteriorating in these fresh lakes. The Baltic Sea preserves ships for

thousands of years, but in freshwater lakes, preservation is even better. The visibility in these lakes is almost as clear as glass.

Öland (6)

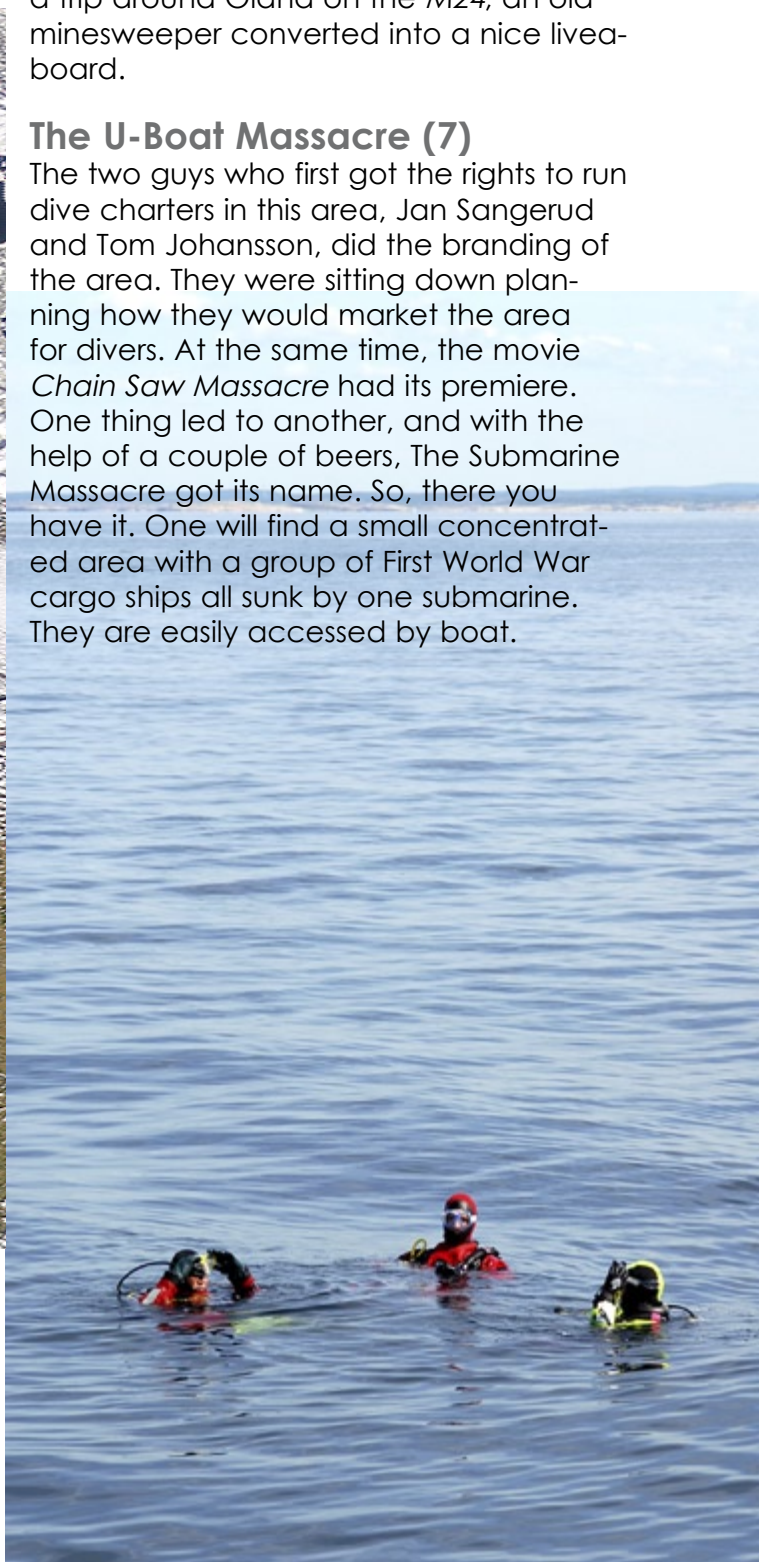
Öland is made up of the two largest

Maps of Scandinavia with locations of Baltic Sea diving points of interest

Swedish islands in the Baltic Sea. The seas have always been rough around this island, and for thousands of years, merchant and cargo ships have passed by this area on their way south or north. Treacherous underwater cliffs have, in every era, been the downfall for a few of those passing ships. For us divers, they are a godsend. This area is a wreck bonanza. The best way to get where the best wrecks lie is via liveaboard. We took a trip around Öland on the M24, an old minesweeper converted into a nice liveaboard.

The U-Boat Massacre (7)

The two guys who first got the rights to run dive charters in this area, Jan Sangerud and Tom Johansson, did the branding of the area. They were sitting down planning how they would market the area for divers. At the same time, the movie *Chain Saw Massacre* had its premiere. One thing led to another, and with the help of a couple of beers, The Submarine Massacre got its name. So, there you have it. One will find a small concentrated area with a group of First World War cargo ships all sunk by one submarine. They are easily accessed by boat.



Stockholm's Archipelago

The inner-city wrecks of Stockholm are easy to get to, but despite the novelty of diving in and around downtown Stockholm, which in itself can be alluring, the wrecks themselves do not have much to offer. Find your way to the outer Stockholm archipelago, and it's an all-together different story. The wrecks there range from interesting to amazing. In pre-GPS times, the more than 20,000 islands in the archipelago were extremely hard to navigate, and quite a few wrecks have gone under during the last millenium. The very same islands that helped cause ships to wreck also protected them from winds and waves. There is no possible way to tell you about them all, but enjoy the following selection of favorite dive sites.



Text by Fredrik Isakson
Photos by Jakob Selbing and Stefan Hogeborn

Sweden

The best way to get wet in Stockholm is to get on a dive charter booked through one of Stockholm's dive centers. A dive charter costs around 500 SEK per dive, and it is usually worth every penny. Do not expect two tank dives per half day. You get one dive in the morning and one in the afternoon. The weather conditions don't always allow a dive on the wreck you wanted to dive, but rest assured that the boat captain knows what he/she is doing and will take you to where diving conditions are best that day. Don't expect to see a lot of fish—in fact, consider yourself lucky if you see a fish. In certain areas, you may see the occasional seal.

Dalarö

Many dive charters take off from Dalarö, a small picturesque little village with a rich history south of Stockholm. This was the final port before the open seas. It took a sailing ship one to two weeks to sail through the archipelago to Dalarö, but it took only half a day by horse and carriage to get there, making Dalarö the place where noble men and owners of the merchant ships joined their cargo for the voyage to other worlds.

Najade and Melanie

The dive boats depart from Dalarö, and it takes a few hours to get to either of the dive sites. Most boats are smaller, so the trip can be a bit tedious, but if you find yourself a little corner of the dive boat and take a little nap, the trip might seem shorter. But first, the best advice as always is, to don your equip-

ment immediately upon coming on board. When dive time comes around, pull on the rig, suit up and jump in.

Donald Duck Wrecks

Both wrecks are located in open water, at a depth that allows Nitrox 32, or possibly 30, as an alternative to air. Swells and waves are a concern. This is advanced diving, and a drysuit is recommended for the major part of the year. Is it worth it? Yes, this is always a great dive, despite the fact that the weather is rarely on your side. The wreck sites fall under a category Swedes like to call "Donald Duck-wrecks", which means that the hull is relatively intact, it sits right side up and displays great details.



Diver inspects the wreck of the *Eldaren*

Stockholm and its archipelago. The square marks the city center on this false colour satellite image



Company may show up

Seals can be seen playing and hunting for fish in the area and on the wrecks, which sometimes can be an eerie wild life encounter when you turn a corner! Even though the seals can add to the dive experience, the wrecks are located within a Seal Protection Area, which means no diving during most of the summer. Sometimes while diving, I keep very still and just wait. On the surface, one sees the seals all the time, and if you're lucky and take it easy, they might visit you on the wreck to take a closer look at the intruders. You need to keep your eyes on them if this happens; they are like black torpedoes in the gray-green water.

Najade

A German ship, built in 1910, which were transporting a cargo of oranges and tobacco when she ran aground on

Almagrundet 12 April 1933. She managed to back off the ground, but the collision caused severe damage. She was anchored, but it did not take long until she gave up and sank. Fortunately for divers, she settled on hard bottom at

34 meters (112 ft) where the visibility is great. There are a lot of fun details to explore, and she is simply one of the best wrecks in Stockholm.

The only disadvantage would be the distance to the wreck and the exposure to the weather. At the same time, that is the reason she is such a great lady to dive.

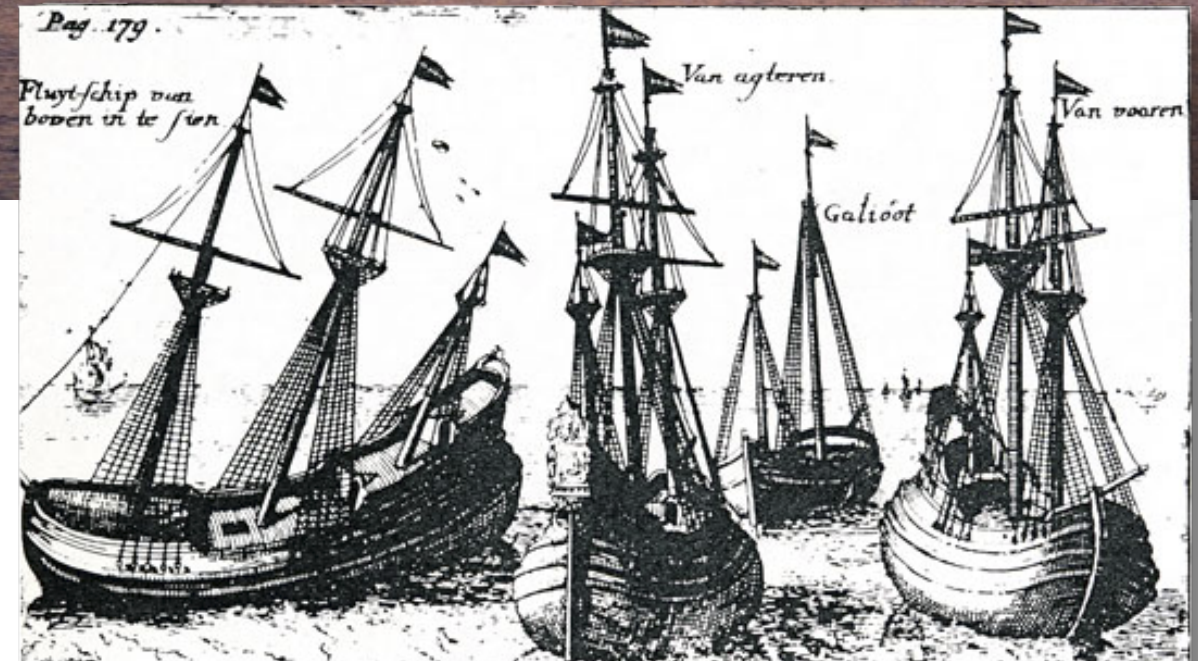
Melanie

The *Melanie* is an old steamer laying on her side. The hull is designed differently from modern motor ships. Her design caused her to land on her side after going down. She was also designed to be sailed and had masts. She is longer and wider than the *Najade* at 77m (250 ft) long and 10m (32 ft) wide.

There is a safety concern—since *Melanie* rests in such an angle, it confuses the mind. When you reach the deck,

it gets rapidly deeper, so keep an eye on your dive computer. Take a peek into the galley, and if you have the proper training, there is much to penetrate here from stem to stern. The visibility is fair, but the water is eerily milky around the *Melanie*. Still, she is a great ship, a good repre-

sentative of the steamers that used to sail around the turn of last century. She carried 3,000 tons of coal in the hold, loaded from France when she went under. Her destination was Scotland via Stockholm. It was winter, late in January 1907. Ice laid in drifts on the surface and made it difficult to see any shoal or reef in these hard to navigate waters, so she ran aground and sank, resting at 35m (115ft)



The wreck of the *Melanie*

sentative of the steamers that used to sail around the turn of last century. She carried 3,000 tons of coal in the hold, loaded

The Swedish archipelago is a picturesque place to live, and one can have good diving virtually at one's doorstep



south of Innerbådan, Biskopsön.

This is probably one of Stockholm's most popular dive sites. It doesn't get much better than this, weather permitting. On a good day, you can get two great dives in—*Melanie*, with her old charm, and the slightly newer *Najade*.

How to get there: By boat

Best time: Late summer and autumn

Depth: Approximately 35 m/115 ft

Conditions: Visibility here is often very good. There can be a current, but it is not very common. But there is a constant swell here, so manage your seasickness. You have to be able to handle yourself on a moving boat. If you are inexperienced, ask the staff about the best way to get up that ladder, that's where most accidents happens.

Sappemeer

She went aground and sank 7 November 1969, and is thus a relatively young wreck in

Après plongée—Scandinavian berries ripen late in the season at high latitudes but end up saturated with flavor



Sappemeere is such a fun wreck, and you might find yourself eye to eye with a seal inside the wreck

they have fun doing it. For visiting divers not so used to the cold water environment, this is a great wreck to start with. Diving still has to be done cautiously and with knowledge. For example, visibility gets really bad, really quickly in the engine room. Divers have died in this wreck, and even seals make their way in without finding their way out again, and believe me, that can be a scary unexpected sight. Ghostlike. Last fall, you could still see at least one carcass if you peeked through any of the portholes on port side.

The wheelhouse and a part of the superstructure up front have collapsed and are a jumble of scrap. Smack in the middle of this heap lies the radio, and wires criss-cross in all directions. But you still have the feeling of the wheelhouse where parts of a wall and some rafters remain. The limestone the vessel

was loaded with is spilling out of the hold.

Sappemeer is simple fun, and it makes her a good wreck. Because of her size, 51m/167 ft long and 8.5m/27 ft wide, she is easy to grasp, and one gets a good feel for the wreck really quickly.

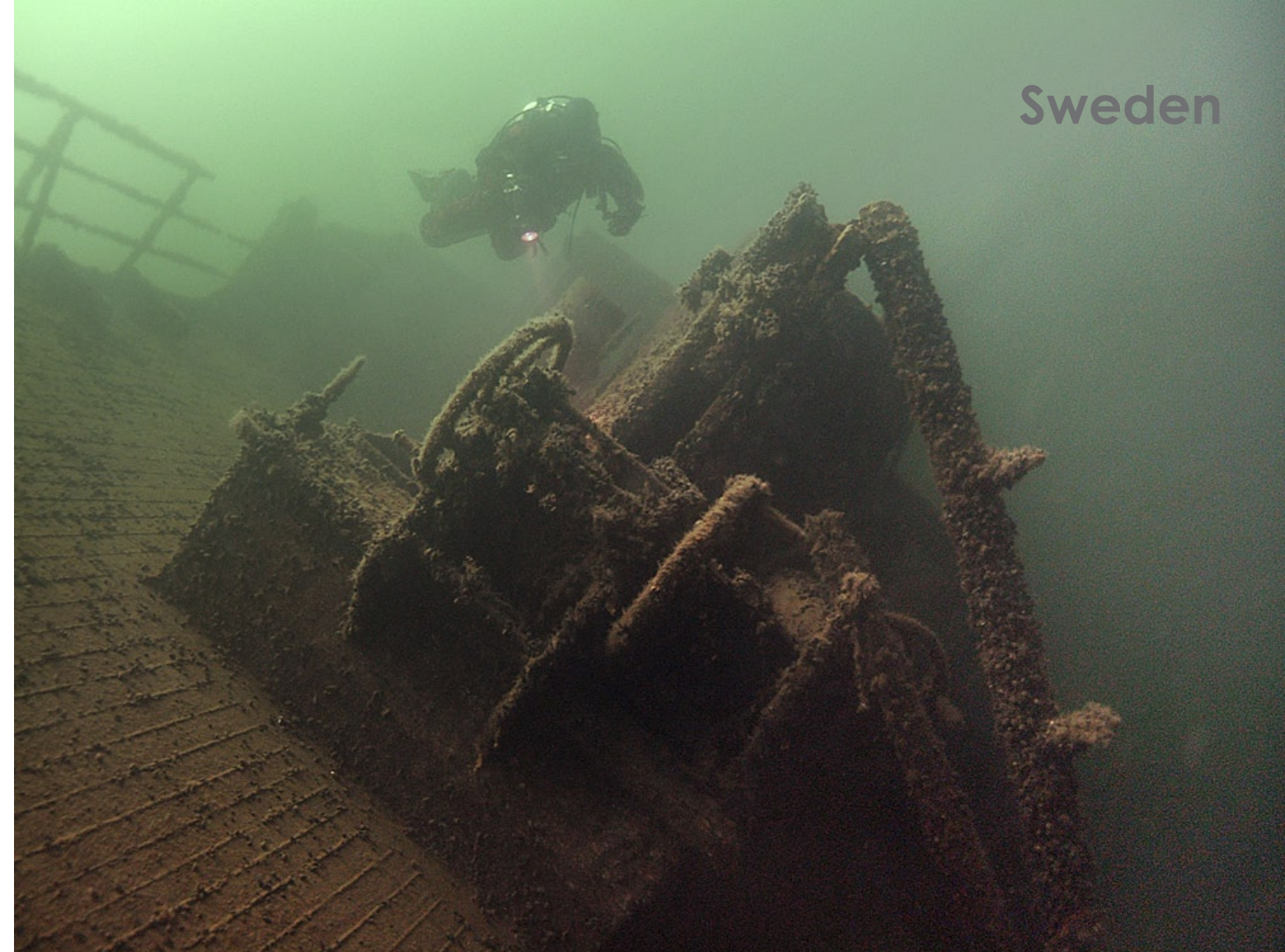
How to get there: By boat

Best time: The entire season, even off season if weather permits.

Depth: 16 m/52 ft - 25 m/82 ft,

Conditions: Visibility here range from 5-20 m/16-60 ft. Rare to encounter current, surface current can appear some times.

Photography: Quite suitable for wreck photography, due to her laying relatively shallow, light reaches down to the wreck and the limestone cargo reflects the light from the surface, which helps.



Ingrid Horn

The *Ingrid Horn* is a very temperamental old lady, and she decides whether you have a good dive or not. The number of swear words used here... Well, when she lets you enjoy your dive, she is absolutely wonderful. The *Ingrid Horn* lays pretty much smack in the middle of a high traffic channel, so this is one dive you really need to know what you are doing. You do not want to come up under a 20-tonnare on its way to Stockholm; you make your way back to your entry point and that's that. The way to get to the wreck is via a marker that leads to an underwater rock. From that rock, you follow a line leading into nothingness that will land you on the aft. The first thing you see is the spare steering wheel. At that point, you are at 24m/79 ft depth.

It is not far, but for many divers, this is the turnaround point. Sure they see the

wheel, if they are less than four feet away, but that's it. The visibility can be miserable due to the heavy traffic. Another reason for aborting the dive is that divers run low on air at this point. No shame in that... well, ah, —whom are we kidding—there is shame in that, but it happens.

A sliver of light is still with you at this point, and you can explore the area with some day light. The aft creates an overhang and that causes some confusion if you haven't familiarized yourself with the layout of the wreck, since you all of a sudden can find yourself with a roof above your head, not knowing how that happened.

Here, you find the spare propeller, a powerful piece that



Sweden

The *Ingrid Horn* is a very temperamental Grand Old Lady, some days you will be lucky to even reach the aft without having to turn back for various reasons. Illustration of the *Ingrid Horn* (below) by Jakob Selbing

gives you an idea of the size of the *Ingrid Horn*. If you follow the profile of the stern to the bottom, you will also find the base of the under water rock. Look up and you'll see leaning over is the stern covered with rust. A mighty sight.

The wreck is cracked in several places, which is the reason I choose to follow the port rail downward. The starboard railing is more difficult to follow. A compass cannot be trusted in these

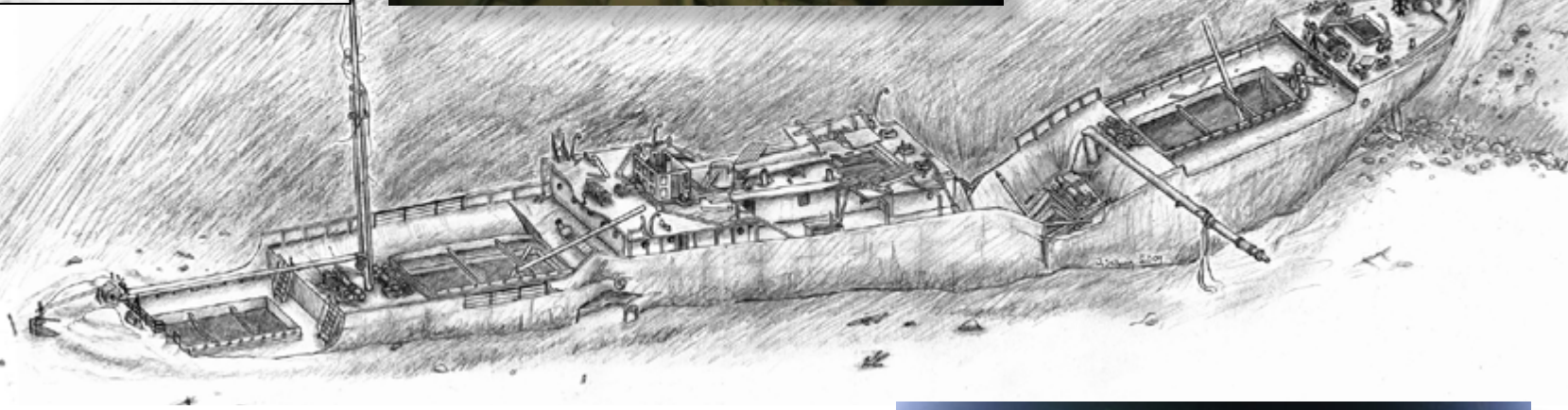
waters and on huge iron ore filled wrecks, so having full control over your bearings is a must.

The visibility quickly deteriorates, but once in a while, the wreck shows a nicer side, and thus begins a fantastic little wreck trip. After you have passed the fallen mast, there is a jerk in the gunwale, but it is still relatively easy to maintain orientation on this side.

Shortly thereafter, you will begin to discern the superstructure, which holds lots of room and spaces to check out. It gets deeper after you pass the superstructure at 35m/115 ft.

Soon, the front of the wreck partly disappears into the hard muddy bottom. After a number of dives, I still have a lot to explore, and I don't have a full picture of her. On the best of dives, you realize you want more and more, and I guess that is part of the charm with this wreck, that one has to explore her piece by piece, and one never knows whether dive conditions will allow a dive at all.

The superstructure needs more attention, and at some point I hope to reach the bow! The *Ingrid Horn* is a large ship. Unless you are on mixed gas and just happen to have the right mix in



your tanks, you will not circle the whole ship, and that's just the way it is.

The *Ingrid Horn* is 89m/292 ft long and nearly 13 m/ 43 ft wide and was loaded with iron ore when she sank after a collision 31 July 1917. The entire crew except for one person went down with the ship, please respect the fact that this is also a grave site.

How to get there: By boat

Best time: Spring and autumn weather permitting, but you never really know with Ingrid...

Depth: 24 m/79 ft to 38 m/125 ft.

Conditions: Visibility varies from bad to worse, with very few exceptions. This is one of few dive sites where you might have to deal with bad current – or not at all depending on Ingrid's mood.

Gas mixes: For air in the tank we recommend the aft part, and a pony bottle. A standard mix for many is probably 32% Nitrox and if that's your choice, do not go passed the superstructure. In the

whole, though, Ingrid is not that deep, so using a thinner Nitrox, perhaps a 28%, or maybe a 25/25, the so-called "Stockholm mix", will allow you to see the part of the wreck that is bored down into the mud.

Harburg

Harburg, a German steam freighter from 1919—54m/177ft long and 9.5m/30ft wide—sank after a collision with the tanker ship *Tinny* in 1957. She carried iron ore and had a crew of 14 men. The boiler exploded in the crash, and the machinist was shot through one of the ventilation shafts by the pressure from the explosion. He was later picked up out of the water by rescuers and survived the ordeal. Ten men died, eight where never found. This is one of those places where you are very aware that you are diving on



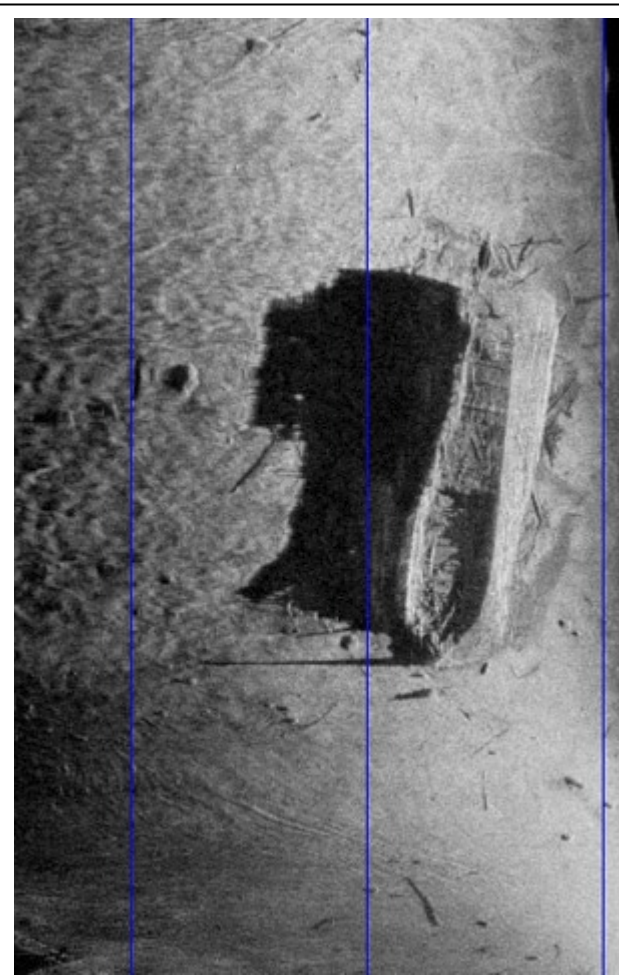
a gravesite. Harburg is located near Stockholm City, just outside Lidingö.

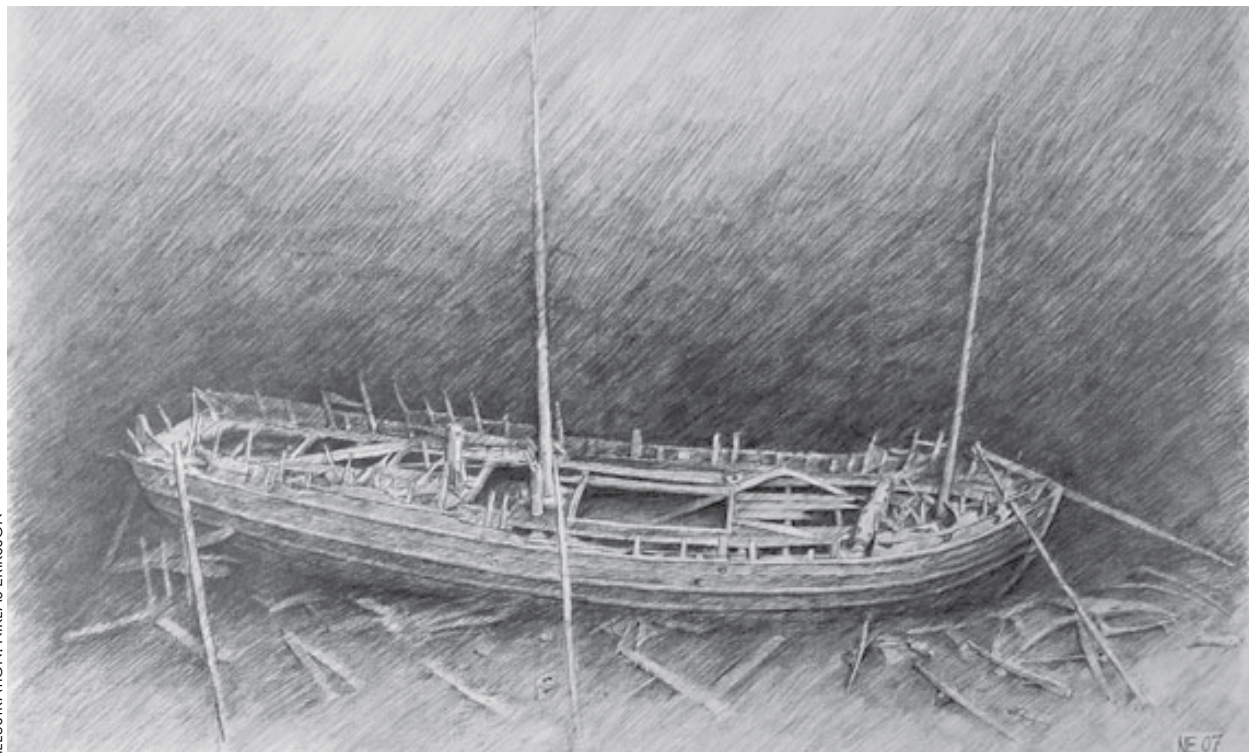
The wreck rests in a steep angle with the aft ship being the first point you reach and the bow deep in the mud. As you descend, the stern suddenly appears, just hanging there in the water. It's really a strange feeling. This wreck is a resting place for deceased sailors. There are a lot of details to explore and in an old, I think it's a cabinet for storing hoses, there are some bones, and

Ana Maria—The Perfect Wreck

A brutal winter storm forced *Ana Maria* to seek shelter in Dalarö around the end of the 17th century, and a skeleton crew was left behind to care for the ship. Apparently bored by waiting out the long winter, the crew fancied visiting with *Ahmans Widow*, who lived around a muscet shot away. Rumour had it that she knew how to serve a good beer, and then some.

The lowest rank, the Galley Boy, was left behind to tend the ship and the stove. Of course, a fire broke out, and the ship sank, creating a perfect dive site to visit hundreds of years later. Alas, diving her is presently prohibited, thanks to careless divers damaging the wreck. ■





The Dalarö wreck

About 30m below the surface at Edesön outside Dalarö in the Stockholm archipelago is a very well-preserved wreck from the 1600s. The site is scattered with objects: ceramics, bottles, tools of various kinds as well as baskets and boxes. A cannon is still sitting in its mount on the half deck

Nordic Blue Parks—sustainable accessibility

Text by Pernilla Flyg, Curator, Archaeology Unit, Swedish National Maritime Museums

The Baltic Sea was formed by the Ice Age. Submerged Stone Age settlements remind us of a time when the coastlines of the region looked very different from today.

these factors interact to create unique conditions for the preservation of wooden shipwrecks. They loom in the dark on the seabed through centuries, masts reaching up towards the surface.

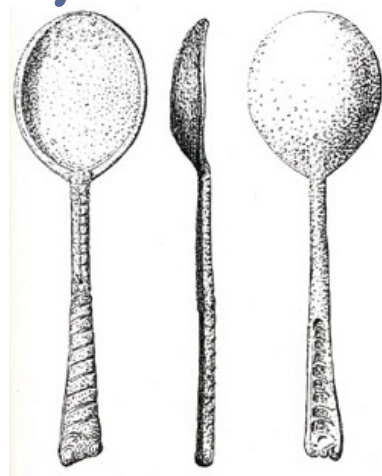
These factors also interact to make the Baltic Sea a habitat for special flora and fauna. But, the natural and cultural resources of the sea are under constant threat from pollution, looting, deterioration and insufficient legal protection.

We want to diminish this threat by developing sustainable marine tourism combining outreach with protection. The Nordic Blue Parks projects

aims to open underwater parks combining culture and nature experiences. Once on the bottom, a shipwreck can turn into an artifi-

cial reef, a habitat for plants and animals. Through the Blue Parks, visitors will also be able to visit the most fragile shipwrecks. With guided dives, ROV-tours, or computer animation, the Blue Parks will welcome all visitors, not only divers.

Museums and cultural and natural heritage authorities in Sweden, Finland, Denmark and Norway are partners in the Nordic Blue Parks project. In Sweden, Blue Parks are being developed in Dalarö near the capital city of Stockholm, and in Axmar historical iron works along the coast of northern Sweden. ■



my imagination tells me that it may one of the crew members. When and if you penetrate the narrow corridors of the ship, be aware that the steep angle makes it harder and more advanced, so be sure that you have the proper training.

How to get there: By boat

Best time: Spring and autumn

Depth: Around 30m/99ft

Conditions: The visibility can be really good for being almost in the city, but don't expect more than a few meters. There are no currents at this dive site that I'm aware of.

Eldaren

Eldaren was used as a training target for the Swedish Navy. They torpedoed and sunk it in 1979. You will find the torpedo hole on the starboard side. This wreck, being kind of new, is really suited for penetration, but as always, be sure to have proper training. She is hard to get to. The travel time for most of the dive boats are a bit on the long

side, and the wreck lies in a spot that makes wind and weather conditions one of its weak points. But if Lady Luck is on your side, you might get excellent visibility in the 20-30m range. That's because of the bottom conditions. *Eldaren* rests in a shallower spot. All around it, the bottom falls off to a much greater depth.

Take your time to explore its length of 51.5 meters. It has a beam of 7.9 meters and was in its prime, a tank coaster.

Other interesting points of interests are the superstructure in the aft part, the rudder, the torpedo hole on star board side at 28m/92ft.

How to get there:

This is a boat dive, many of Stockholm's dive boats do trips go there, but its really weather sensitive.

Best time: This is a good dive site all year round.

Depth: 35 meters



Conditions: Visibility is often very good, sometimes 20-30 meters. There can be a strong current, so be prepared.

Gas choice: I recommend a Nitrox 32 as a good choice of gas for diving *Eldaren*. ■

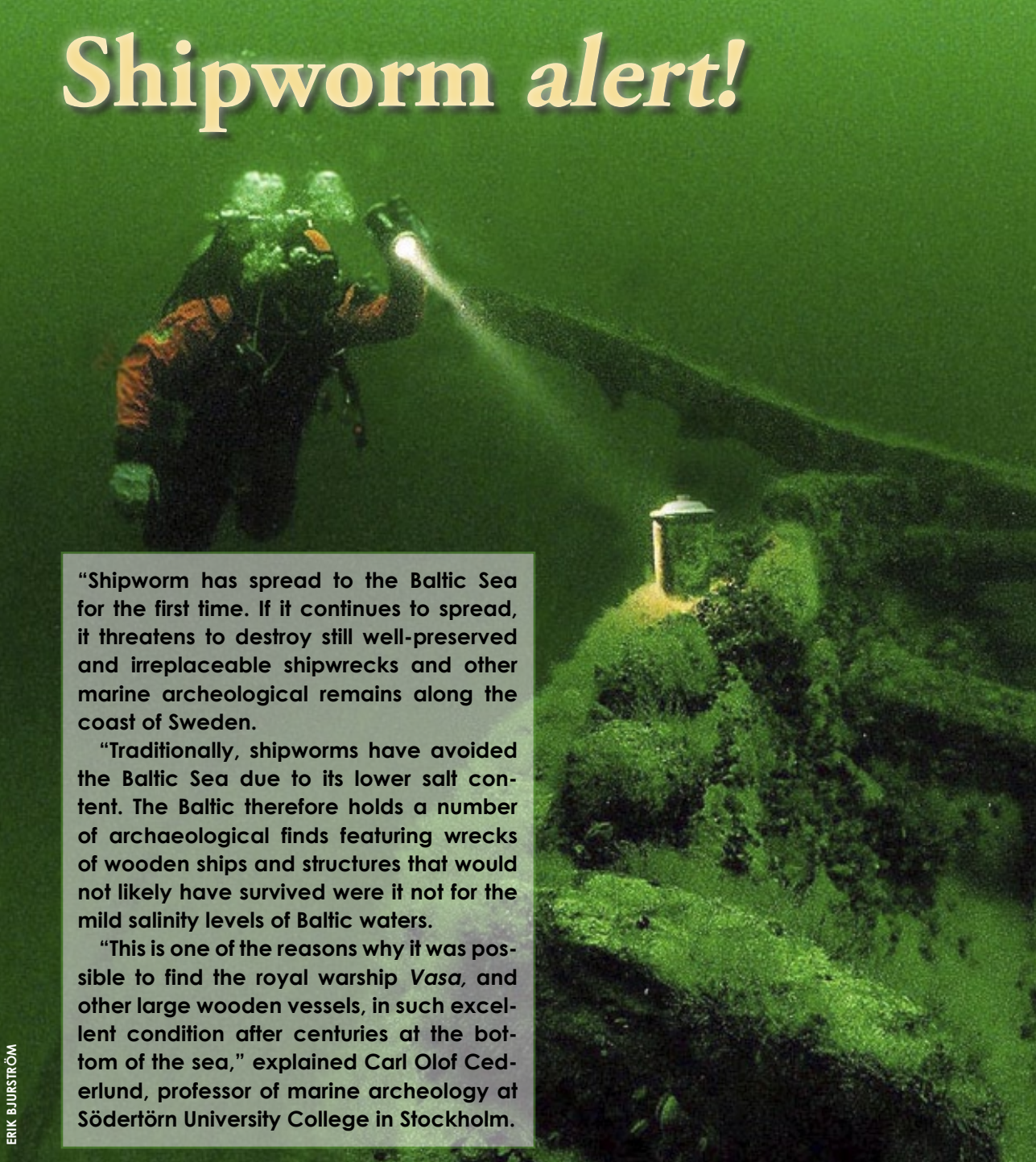


This sea is dark, cold and relatively shallow. The water exchange is slow, salinity levels are low, and shipworms are mostly absent. All



Picnic on the Swedish archipelago

Shipworm alert!



“Shipworm has spread to the Baltic Sea for the first time. If it continues to spread, it threatens to destroy still well-preserved and irreplaceable shipwrecks and other marine archeological remains along the coast of Sweden.”

“Traditionally, shipworms have avoided the Baltic Sea due to its lower salt content. The Baltic therefore holds a number of archaeological finds featuring wrecks of wooden ships and structures that would not likely have survived were it not for the mild salinity levels of Baltic waters.”

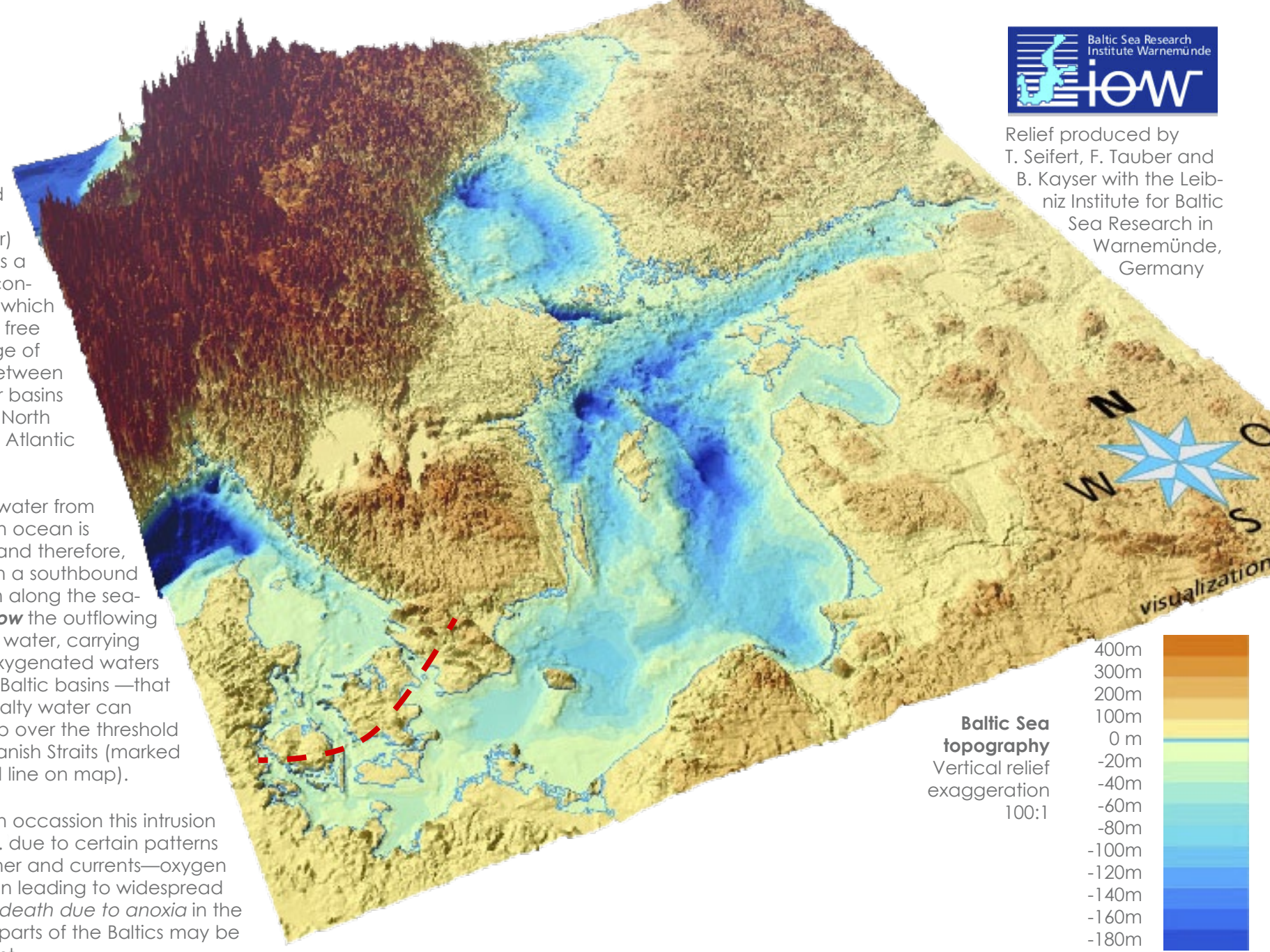
“This is one of the reasons why it was possible to find the royal warship *Vasa*, and other large wooden vessels, in such excellent condition after centuries at the bottom of the sea,” explained Carl Olof Cedertlund, professor of marine archeology at Södertörn University College in Stockholm.

ERIK BJURSTRÖM

The Danish straits constitute a vertical threshold (it gets shallower) as well as a narrow constriction, which limits the free exchange of water between the inner basins and the North Sea and Atlantic ocean.

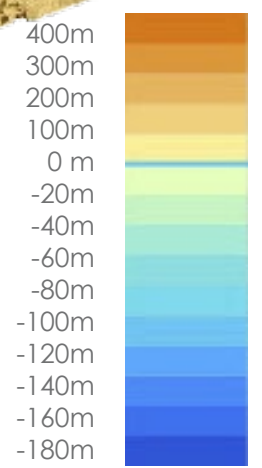
The salt water from the open ocean is denser, and therefore, creeps in a southbound direction along the seabed **below** the outflowing brackish water, carrying with it oxygenated waters into the Baltic basins—that is if the salty water can creep up over the threshold in the Danish Straits (marked by a red line on map).

When on occasion this intrusion fails—i.e. due to certain patterns in weather and currents—oxygen depletion leading to widespread *bottom death due to anoxia* in the deeper parts of the Baltics may be imminent.



Relief produced by T. Seifert, F. Tauber and B. Kayser with the Leibniz Institute for Baltic Sea Research in Warnemünde, Germany

Baltic Sea topography
Vertical relief exaggeration 100:1



The topography of the Baltic Sea is key to understanding the unique features of this shallow body of water, which was, as recently as the stone age, a fresh water lake.

Text by Peter Symes

The Baltic Sea, which occupies a basin formed by glacial erosion during the last few ice ages, is the largest body of brackish water in the world. The low

salinity which is maintained as a result of abundant freshwater runoff from the surrounding land, is a result of glacial meltwater from the last ice age that ended about 10,000 years ago combining with an intrusion of saltwater from the North Sea when the straits between Sweden and Denmark opened.

Before the end of what is known as the Weichsel glaciation, the Baltic was a fresh water lake name the Ancylus lake, which had no connection to the open sea. Some egress continued from the lake through the Göta and Steinselva

A matter of Topography & Salinity

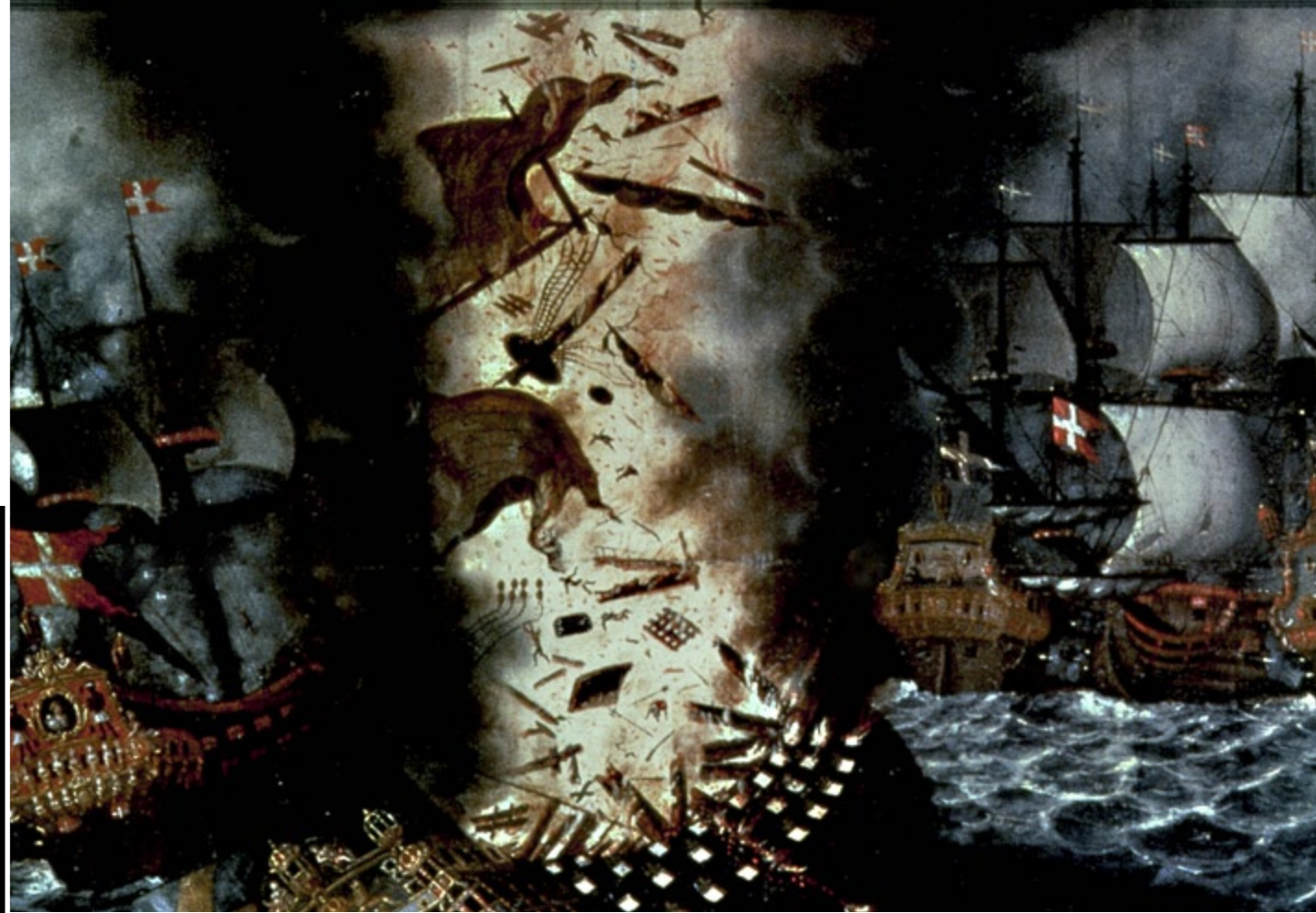
Rivers, which exit Lake Vänern to the Kattegat. Salt water did not enter the lake, however, which became entirely fresh as the lake rose above sea level. The date at which the flow was certainly blocked is about 8000 BP, when nearby Lake Vättern (part of the waterway system) became dissevered from Ancylus

Lake. The lake was filled by glacial runoff, but as worldwide sea level continued rising, saltwater again breached the sill about 10,000 years ago, forming a marine Littorina Sea, which was followed by another freshwater phase before the present brackish marine system was established. ■

Ancylus Lake around 8700 years BP. Note that the Danish straits do not yet exist



WIKIPEDIA / CREATIVE COMMONS



Painting portraying the sinking of the *Kronan*

***Kronan* (The Crown) became the flagship of the Swedish fleet in 1675. At noon of 1 June 1676, the warship—which was one of the largest ships at the time and Sweden’s first three-decker warship—capsized, exploded and sank during a battle between the Swedish and a Danish-Dutch joint fleet in what became known as the Battle of Öland. All but 42 of her 850 crew perished.**

Text and dive photos by Erik Bjurström



The hull is broken apart, but a large section of the port shipside is intact and laying with the outside facing the bottom clay.

The better-preserved parts of the wreck have yielded large quantities of artifacts. After two-thirds of the site had been excavated, 20,000 objects had been catalogued.

In 2005, a chest was salvaged from *Kronan* that contained 6,246 silver four-öre coins and 168 mark and thaler coins, all minted

in 1675. This is the largest homogeneous Swedish treasure found to date.

During 2007’s excavations, lots of skeletal remains were excavated from the site.

Check out the exhibit regalskeppetkronan.se ■

LEFT TO RIGHT: Diver inspects grave site; human skull on *Kronan*; Wooden sculpture on wreck; Detail of canon



Kronan

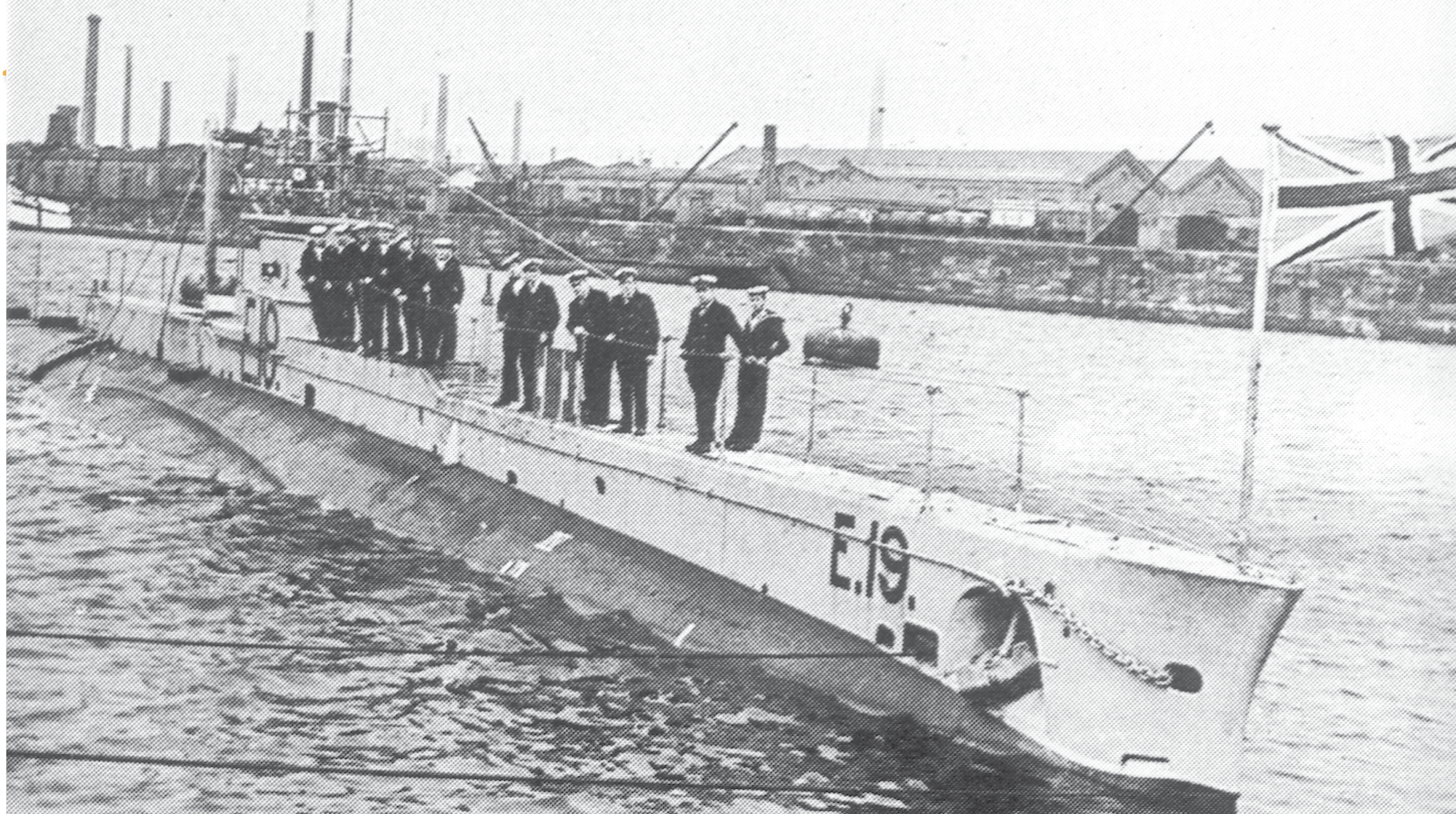
During the manoeuvres, *Kronan* turned sharply against the enemy without closing her gunports or reefing her sails, and as she heeled over in the strong southwest wind, water started pouring into the gunports, capsizing her. As she was sinking, a lamp in the gunpowder store allegedly fell off its hook and ignited the gunpowder, causing a violent explosion. The ship sank quickly, taking all but 42 of her 850 crew to a watery grave. The doom of the *Kronan* is considered

one of the greatest maritime disasters in Swedish history. She rests at a depth of 26m about six kilometers off the coast of Öland.

Excavation

The wreck of the *Kronan* was located in 1980 by marine archeologist, Anders Franzén, who had found the wreck of the *Vasa* in 1956. The ongoing excavation of the *Kronan* has become the largest underwater archeological project in Sweden.





Led by the charismatic Captain Francis Cromie, the British submarine flotilla became a vital element in the struggle taking place in Russia in 1917. In contrast to the headlines made by British submarines in the Gallipoli campaign, few people are aware that during the First World War, British submarines operated in the Baltic for three years under the most extreme conditions

Under the command of Lieutenant Commander Francis Cromie, the British Submarine E-19 was able to sink several German ships, most notably on the 11 October 1915, when she sank four German transport ships just south of Öland within a few hours and, remarkably, without any casualties.

Text and dive photos by Erik Bjurström

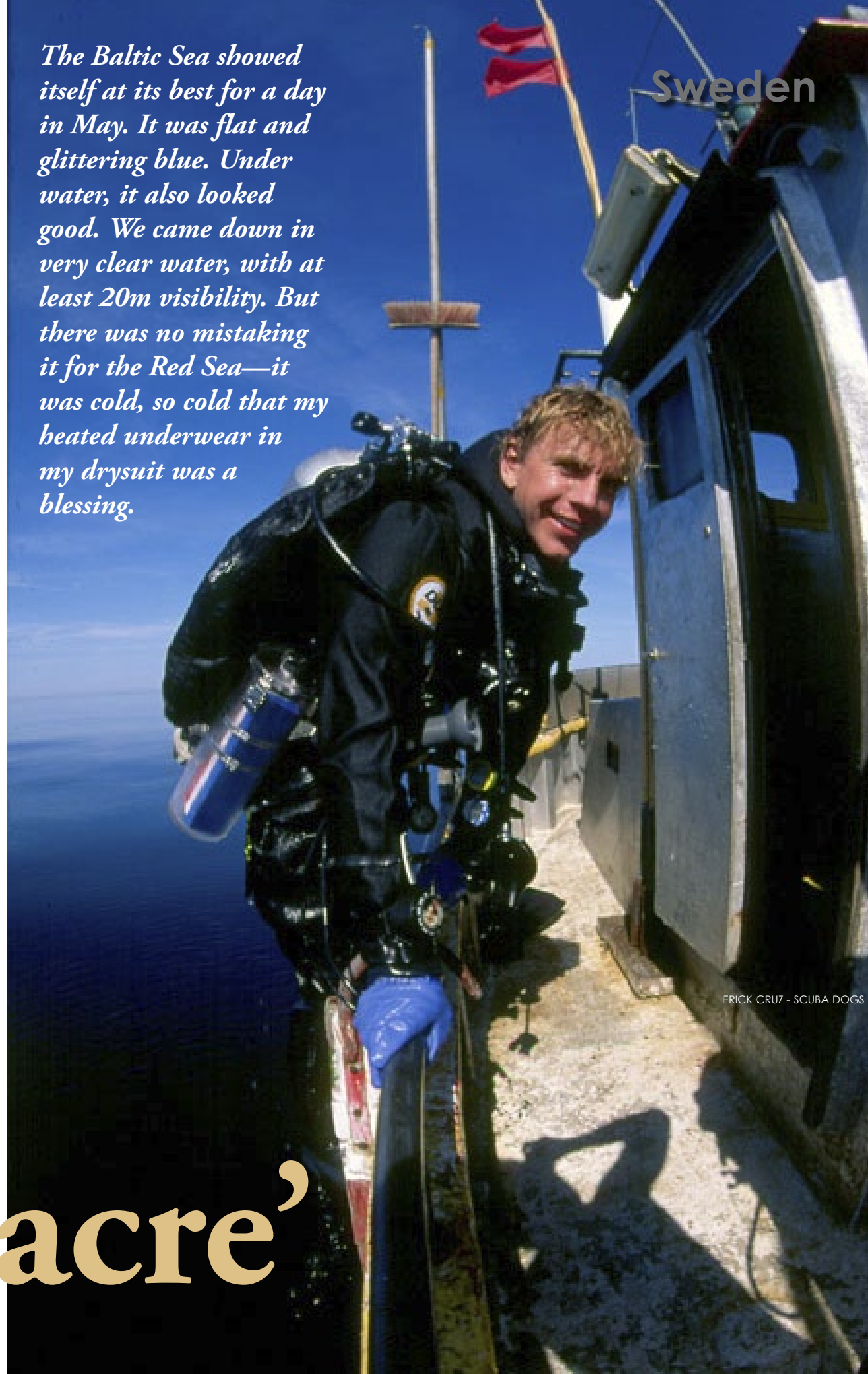
The shotline missed our target and we ended up on the flat bottom at 40m (130ft). My compass and intuition took me in a certain direction, and then I saw the bow of a big ship. The sun penetrated all the way down, and we could see the whole vessel. It was a magnificent

scene. Approaching along the bottom, the bow looked enormous, as it rose above us. The two big anchors were still in place, draped in trawl-nets. We swam over the rail onto the foredeck. It was very clean and in amazingly good condition. The teak deck was intact. For some

reason, algae was growing only on the caulking in between the teak ribs, creating a beautiful pattern. Two huge anchor winches were standing on the deck.

A scene like this could probably only be witnessed in the Baltic. The proximity to the main trading route between east-

The Baltic Sea showed itself at its best for a day in May. It was flat and glittering blue. Under water, it also looked good. We came down in very clear water, with at least 20m visibility. But there was no mistaking it for the Red Sea—it was cold, so cold that my heated underwear in my drysuit was a blessing.

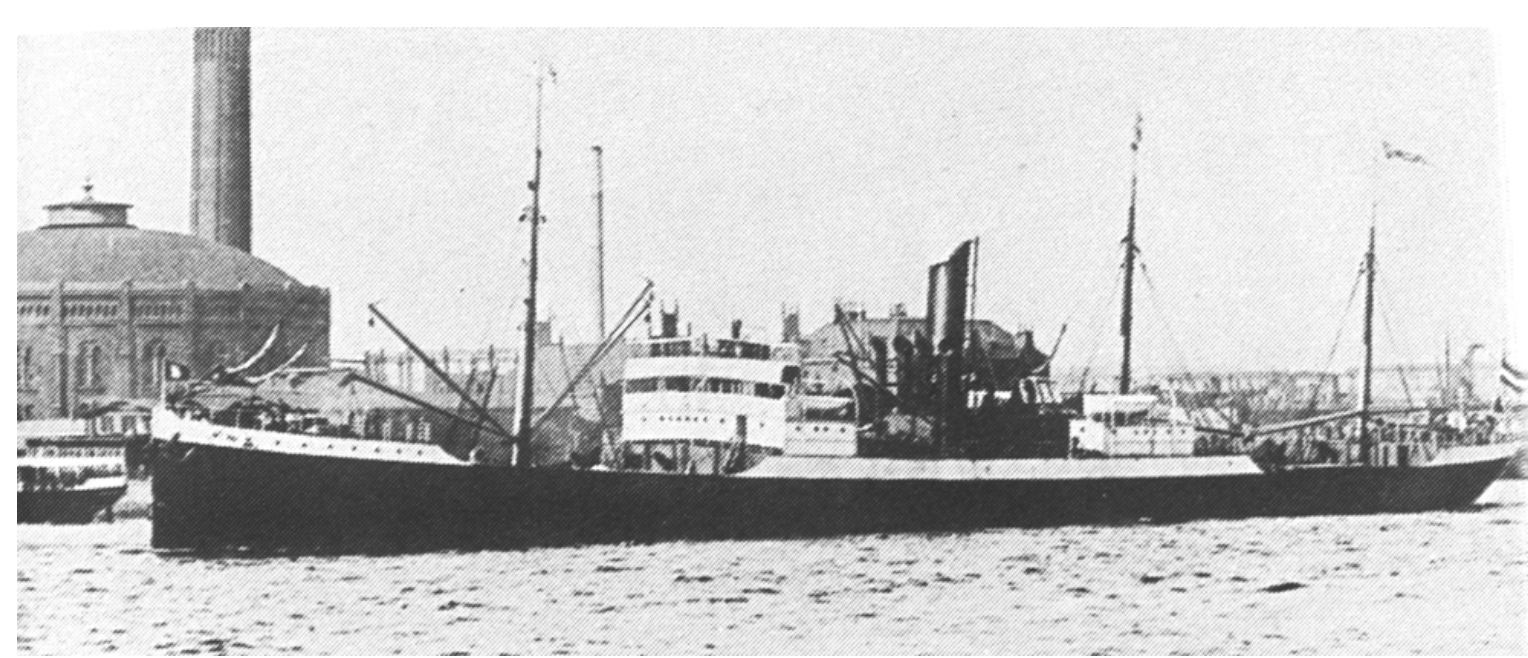
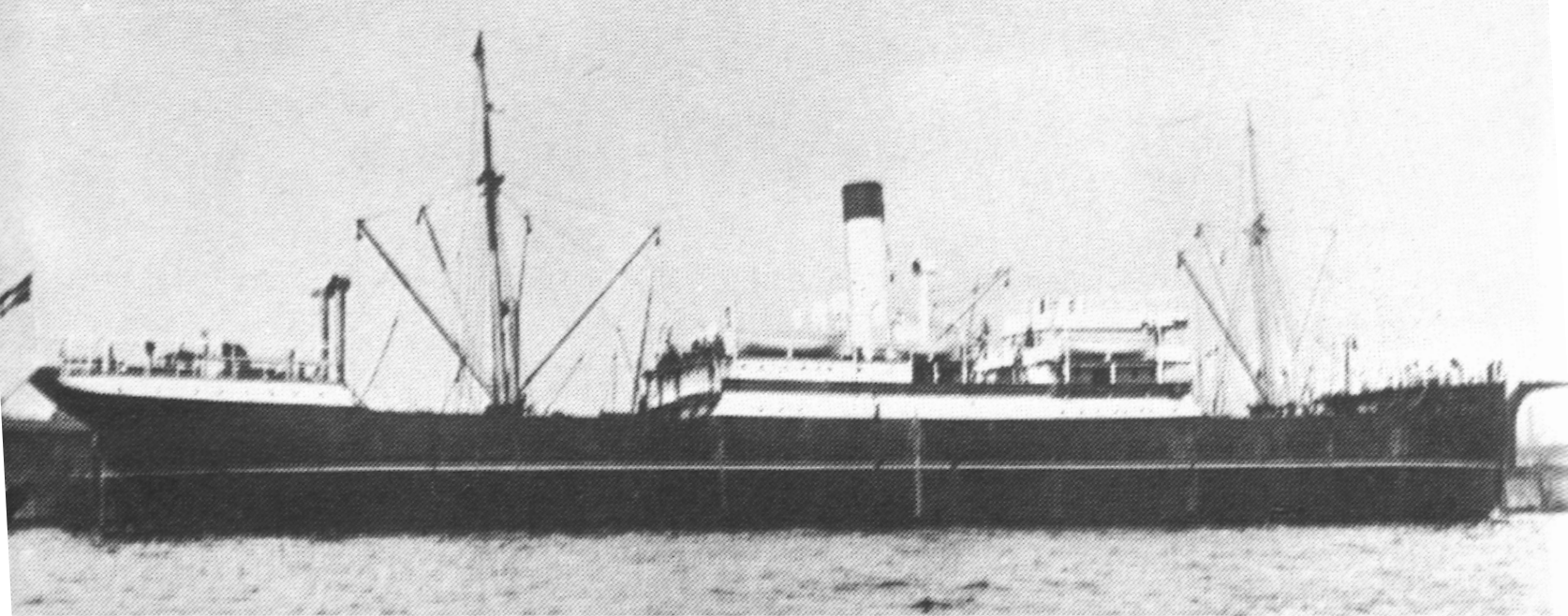


ERICK CRUZ - SCUBA DOGS

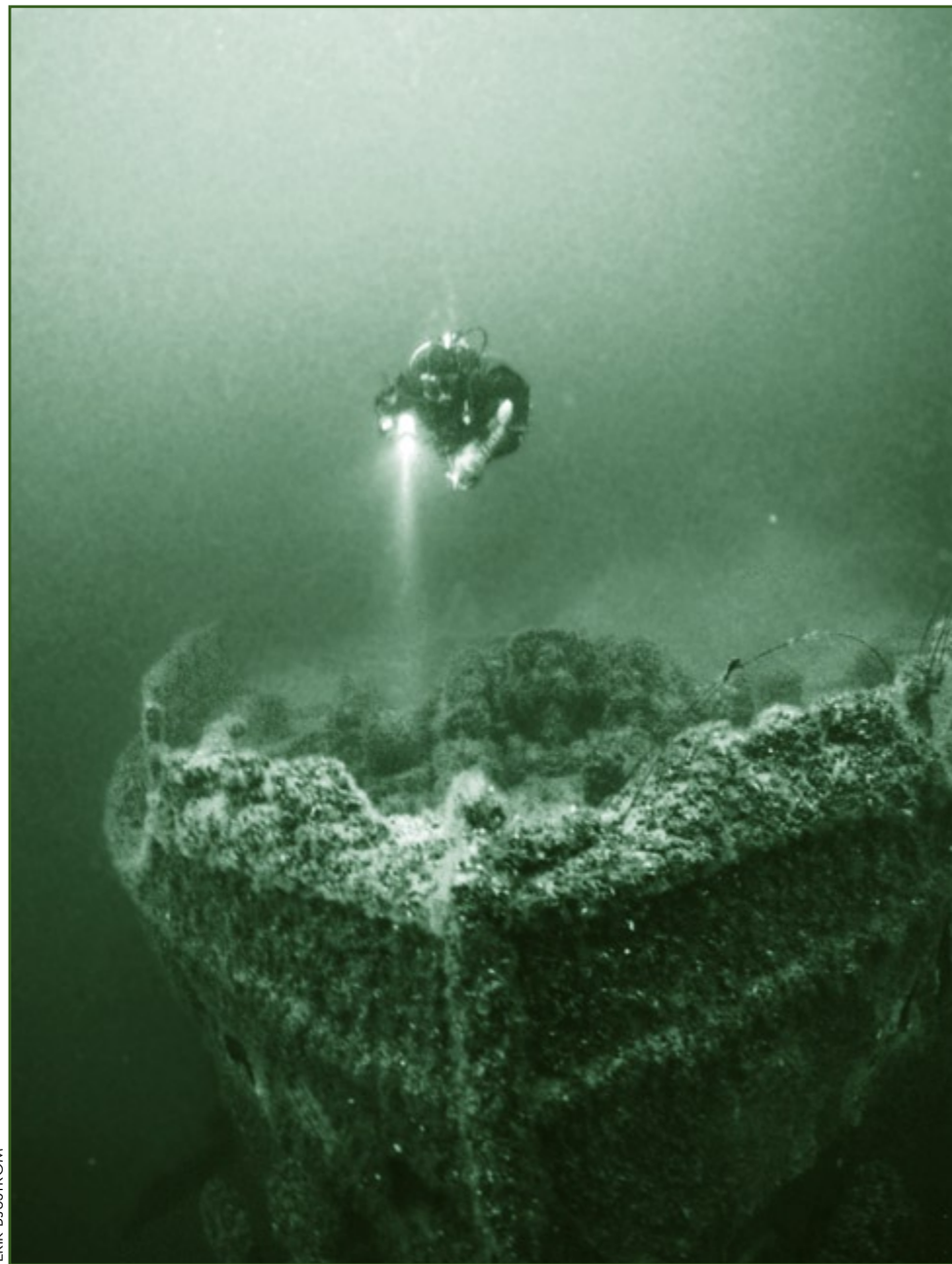
‘The U-boat Massacre’

— an almost unbelievable tale from the First World War





SS Nicomedia



ERIK BJÖRSTRÖM

ern and western Europe; the relatively shallow depth in open sea; the fact that because of darkness, cold, low oxygen levels and lack of woodworm, wrecks are extremely well preserved—all this makes the island of Öland at the south-east corner of Sweden one of the most interesting marine archaeological sites in the world.

With the excavation of the *Kronan*, a 17th century man-of-war, came the realisation that the conditions for diving in deep water in the open sea outside Öland were excellent. Visibility deeper down is often like that of tropical waters, though the light can be poor because of plankton at the surface.

In shallow, coastal waters, the wrecks get eroded by currents and storms. Soon, only a heap of timber, or a clean steel hull, remains. But deeper down, the wrecks are intact. And I mean *intact*, up to the funnel. In many, you can swim into the captain's cabin and sit down at his desk.

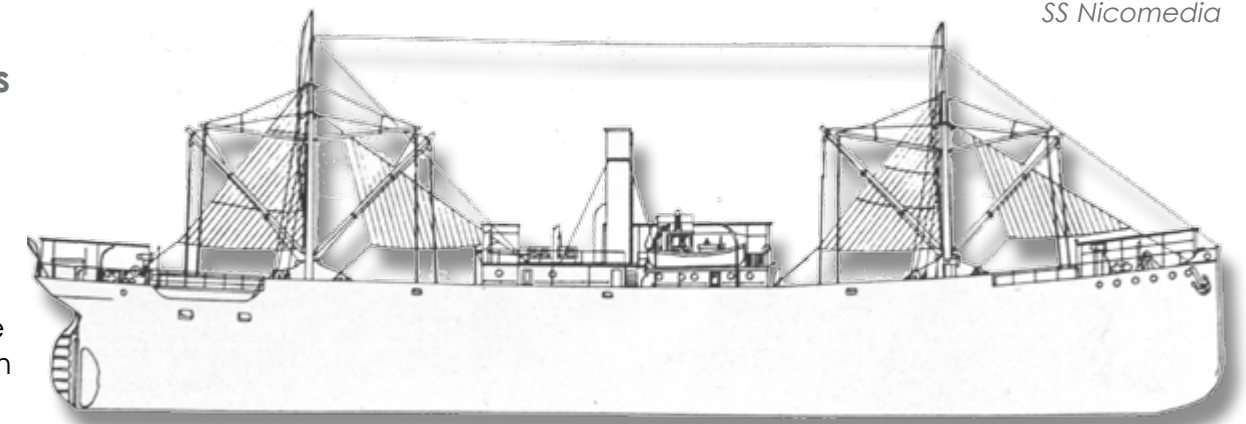
The first spectacular find was made in 1982. These were vessels that were the victims in the *E-19* or *U-boat massacre*.

A group of divers got a tip from a fisherman about a big object on the sea-floor ten nautical miles south of Öland. It was the wreck of the German steamer, *SS Nicomedia*. Research into its history revealed a fascinating forgotten story from the First World War.

A Gentleman's Touch

The English submarine *HMS E-19*, under the command of Lt-Cdr Francis Cromie, was the last of five subs to slip through the small strait of Oresund and enter the Baltic Sea in September 1915.

Its task was to disturb the iron ore traffic through the Baltic that was vital to the German war effort. The command did something rather unheard of in a war. He managed to destroy and sink five vessels without using any torpedos, and without anyone getting hurt in the process! A myth was born, which the divers named, *The U-Boat Massacre*.

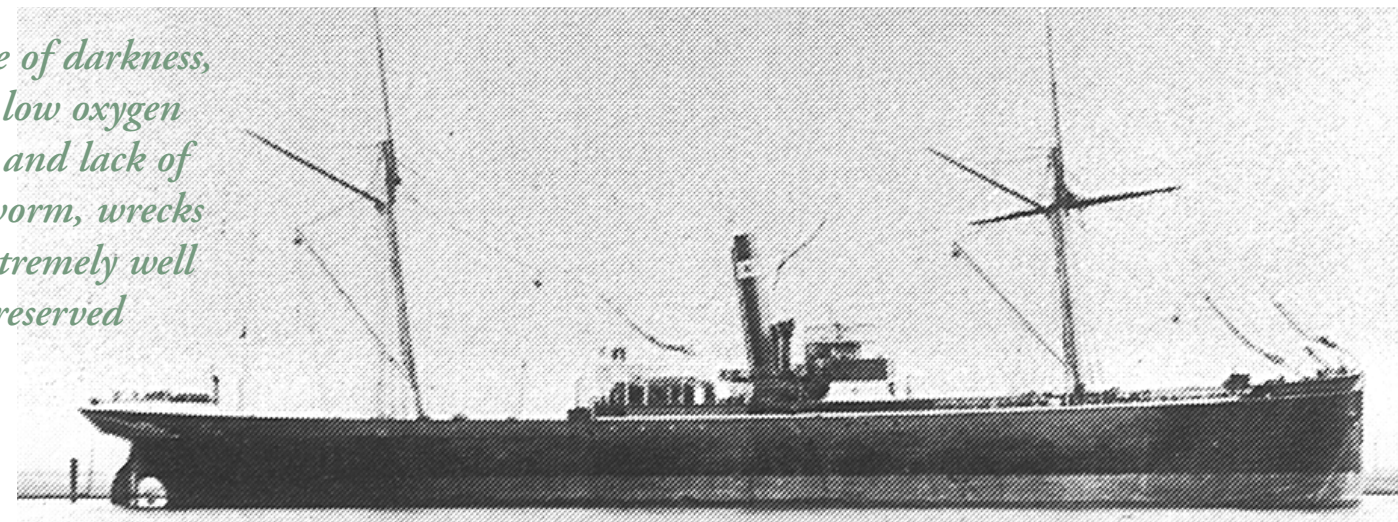


SS Valter Leonard

October 1915

Cromie had a bad time in the south Baltic on 10 October 1915. He attacked the German steamer *Luleå*, but not one of his four torpedoes had worked, and one had changed course and made a turn aiming for his own vessel. The torpedo missed *E-19* by only 15m. He had had to write off the action. But the next day, he would make up for it.

Because of darkness, cold, low oxygen levels and lack of woodworm, wrecks are extremely well preserved



The most beautiful and romantic of the wrecks is the *Gutrune*, 97m long

SS Walter Leonard

Lying south of Öland at 8:30 am on 11 October 1915, Cromie sighted the SS *Walter Leonard*, a 1261-ton freighter carrying iron ore and pulp to Germany. After identifying her as German, Cromie politely asked the crew to man the lifeboats, requested a passing Swedish ship to pick them up, and at 11:15 am, sank the *Walter Leonard* with explosives.

Another ship, the SS *Germania*, spotted the *Walter Leonard* going down and tried to flee, but ran aground on the coast. The crew abandoned her and *E-19* went up

After identifying her as German, Cromie politely asked the crew to man the lifeboats, requested a passing Swedish ship to pick them up and at 11.15 sank Walter Leonard with explosives.

cedure of evacuating the crew before opening the valves was repeated. Time: 3:00 pm.

SS Nicomedia

Just before dark, Cromie sighted his final victim, the SS *Nicomedia*, a steamer of 4391 tons.

The same procedure was repeated, but only after the boarding crew had been invited to share a glass of beer, and a barrel of beer had been sent to the rest of *E-19*'s crew! All to no avail. *Nicomedia* suffered the same fate as the other four vessels. The crew managed to reach shore in their lifeboats.

alongside.

For an hour they looted *Germania* and, after placing their explosives, went out to sea again. Time: 1:00 pm.

SS Gutrune

Immediately Cromie sighted a new target, the SS *Gutrune*, an impressive combined cargo and passenger steamer of 3039 tons, heading for Germany with iron ore. *E-19* intercepted her, and once again, the crew were asked to leave their vessel, to be picked up by a passing Swedish ship. *Gutrune* was sunk by opening the bottom valves. Only an hour had passed.

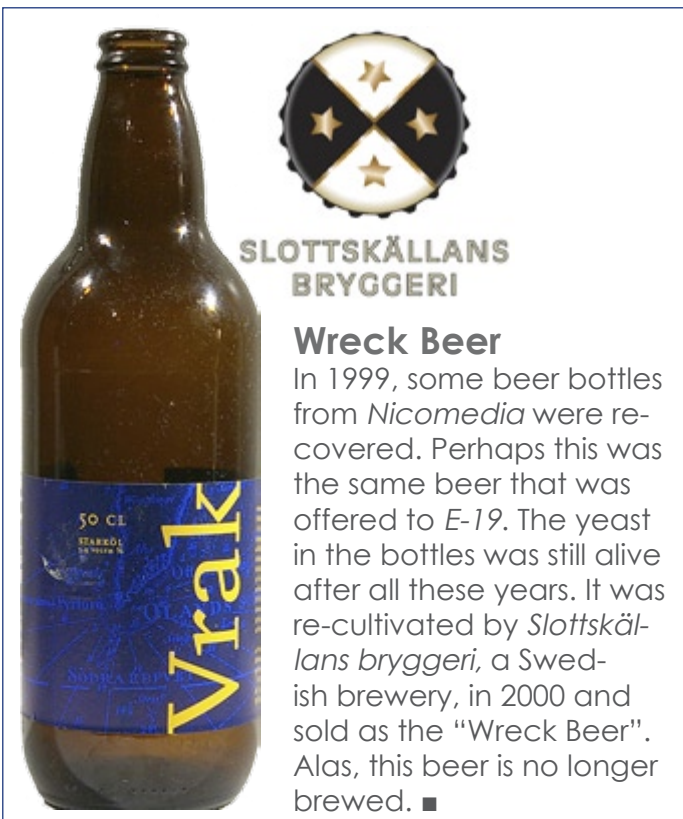
SS Director Reppenhagen

While checking the nationality of another ship that turned out to be Swedish, *E-19* sighted a fourth German ship, the 1683-ton SS *Director Reppenhagen*, laden with iron ore. The by-now familiar pro-

Still drinkable

The beer story doesn't end there. When diver Stefan Fransson found cases of the beer on *Nicomedia*, he found that it

E-19 had managed to destroy five German ships in one day, without using torpedoes and without anyone getting hurt!



was still drinkable! The idea arose to extract the yeast organisms and brew the same beer again. It was a success, and the special "wreck beer" went on sale in Sweden.

Made the Front Pages

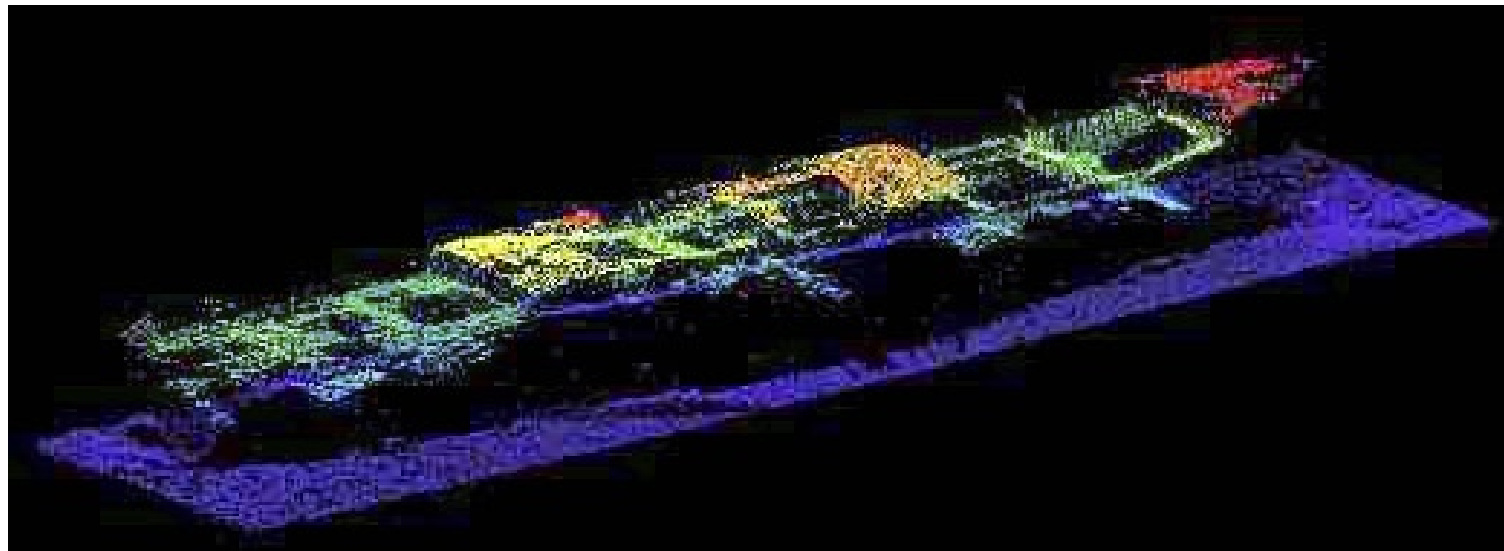
The English submarine *E-19* had managed to destroy five German ships in one day, without using torpedoes and without anyone getting hurt. The sinkings made the front pages in the local papers. But because they were all foreign vessels in international waters, they were never put in any registers in Sweden and not noticed by wreck-searchers.

Forgotten until 1982

The wrecks were forgotten until 1982, when divers, Torleif Nilsson and Sten Lindgren, were tipped off by a fisherman about a big object on the sea-floor south of



Getting ready to dive the *E-19* (above and bottom right)



Scan of SS *Nicomedia*. Leaving Oland, you can reach *Nicomedia* in an hour

Oland. They found a wreck and a bell with the name *Nicomedia*. That name gave up the story.

Their research also gave the approximate positions of the other wrecks. With more help from fishermen, they were able to locate all four, with *Director Reppenhagen* and *Walter Leonard* found on the same day.

First class wreck dives

The wrecks are first-class dive sites and attract divers from all over Sweden. Leaving Oland, you can reach *Nicomedia* in an

hour. Built in 1901, 4391 tons and 117m long, its deck is at 25m, making it the shallowest of the wrecks. The hull is completely intact, and a visit to the engine room is a must. It has a complete workshop with lots of tools and a nice engine telegraph on the wall. May it continue to rest in peace.

The most beautiful and romantic of the wrecks is the *Gutrune*, 97m long. When visibility is 20m, as it often is in May and June and sometimes even in July, when the pictures here were

taken, it is heaven for the wreck photographer. It all depends on the time and the extent of the plankton bloom, which in turn depends on light and water temperature. The midships building is only a shell, though standing upright. The sunrays passing through it create a beautiful light show.

On the *Director Reppenhagen*, 80m long and lying in 35m, the most remarkable sight is Captain Spiegel's cabin. All the wood is in good shape, with intact panels and furniture. Until last year, there

was even a nice intact porcelain stove, though this has, sadly, now collapsed.

The *Walter Leonard* is more eroded than the other wrecks, but the stern is beautifully intact, with the big spare steering wheel nicely draped in algae. It is the only wheel remaining on the four wrecks.

End of E-19 and Cromie

The bloodless massacre off Oland marked the end of Cromie's luck in the Baltic. *E-19* and the other British submarines continued to operate from Russian bases in the Baltic, but without any more big victories. The *E-19* was scuttled outside Helsinki in April 1918 to avoid it falling into German hands.

Francis Cromie ended his days as a marine attaché in Petrograd. He was shot on 31 August 1918 when Bolsheviks attacked the English embassy. ■

HONOURED BY STRANGERS

The Life of Captain Francis Cromie CB DSO RN - 1882-1918

ROY BAINTON

The Life of Captain Francis Cromie CB DSO RN, 1882-1918 is available from Amazon

Captain Francis Cromie, a submarine commander at the age of 24, forged a successful career attacking German shipping in the Baltic Sea in 1915, despite the hazardous nature of the climate and the ferocity of the German navy. During his three years in the Baltic, he became fluent in Russian and was decorated three times by the czar of Russia. He also received the Distinguished Service Order. His murder in the British embassy in 1918 came as a shock and has retained a tragic mystery until now. The author's extensive research has revealed the circumstances surrounding Cromie's murder and exposed facts about his complex character and his relationships with the Russians and the British Establishment. ■



Gotland & Öland

Gotland and Öland, the two large islands outside Sweden's east coast, are both exclusive destinations of unique scenic beauty and rare atmosphere, popular among Swedish holiday-makers but less known by international tourists. Both islands are among Sweden's oldest settlements, with some of the country's oldest and most fascinating historical sights.

One of many beaches of Öland

Located south of Gotland, Öland is a long, narrow island with endless flat plains and long white beaches. It is reached by the town of Kalmar via the long Öland bridge. In the summer time, Öland is busy with holiday-makers, so a

visitor who wants to experience the rare atmosphere and beautiful light and landscapes typical of the island is recommended to visit in spring or autumn, when nature is at its most beautiful, and peace, quiet and poetry rules.

World Heritage Site

In the south of the island is the peerless Alvaret, or limestone plateau, included on Unesco's World Heritage List for its unique nature values, with a large number of rare orchids, plants and species. The Långe Erik lighthouse and the Ottenby bird station on the southern cape is a favourite destination for ornithologists from all around Sweden and Europe. In the cozy and picturesque town of Borgholm, and also in other places around the island, there are several attractive hotels and restaurants that are also open in the off-season. ■

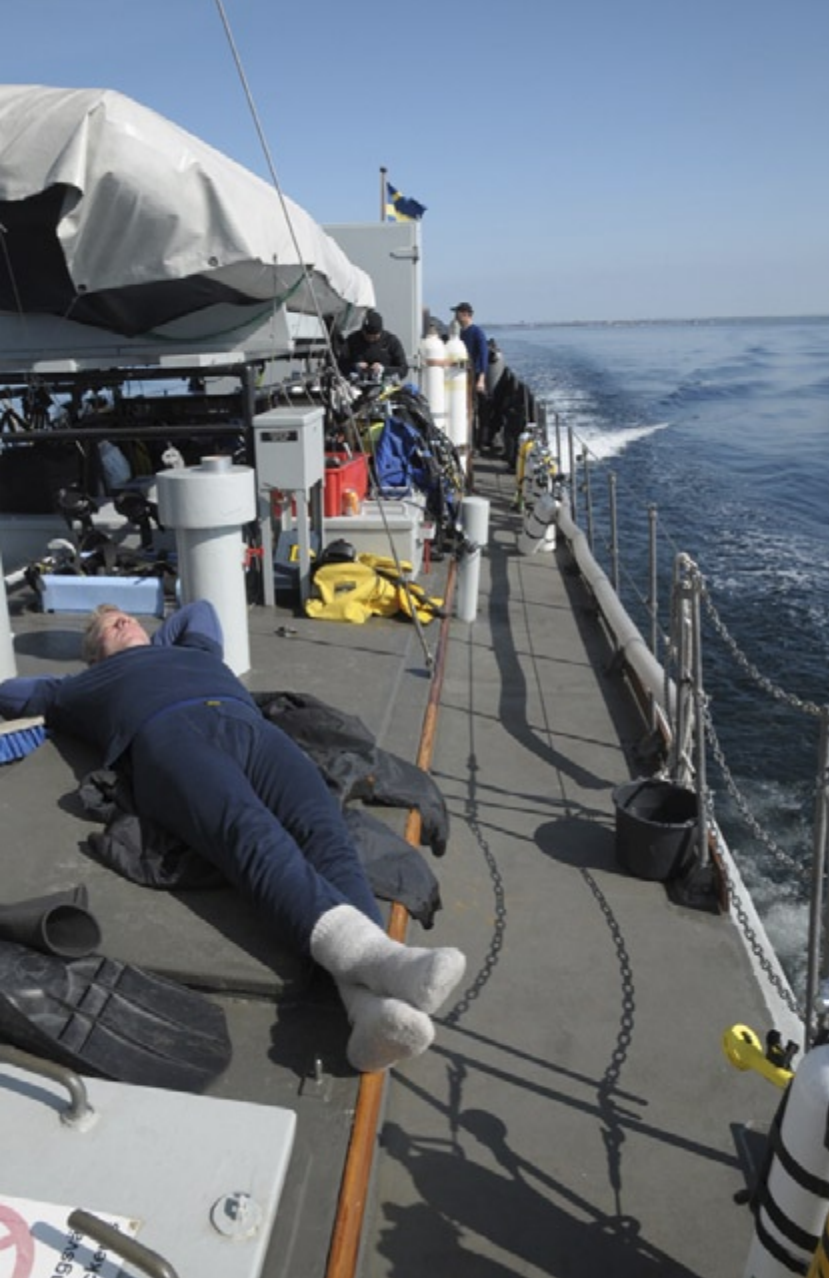
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Slow days on M24—you dive, you rest

Liveaboard

Dive a selection of the best wrecks in Sweden, in style and comfort aboard the former minesweeper, *M24*.

Text by Fredrik Isakson
Photos by Stefan Hogeborn

I am about to embark the “Big M”, which is moored in the small port of Sandhamn—a small settlement in the peripheral part of the Stockholm Archipelago. I find only a few boats left in the small port but once bustling harbour. Fishing is a dying industry, and there is little the small local dive tourism industry can do to remedy that despite the fantastic diving in this region, which is exactly what I am here for. Ahead of us lies some of the best wreck diving Sweden can offer.

No crowds

The Big M allows no more than nine guests, so there is never a crowd. As always on a liveaboard you get close to your fellow traveler-divers within no time. You quickly fall into a routine. Two dives a day. A proper lunch with recipes taken directly from the military's own cook book, which basically means a good old-fashioned Swedish home-cooked meal that'll fill you right up.

Lilly

First, we dive the *Lilly*, a wreck sitting upright at 30m, which went down in 1925. She is 48 meters long, and the most prominent sight as you reach her is the large open cargo hold. Close to it are the remains of a bilge pump that worked so hard to prevent the sinking. Visibility is good, and there is practically no current, so it's just about having fun. *Lilly* is a pleasant acquaintance. She has a beautiful skylight, many exciting holes and openings well-suited for simple penetration, if you have the proper training.

On a windy day

Half way through the trip, the wind increases to a point where we have to seek shelter. We leave Öland and head for Oskarshamn on the mainland and end up in the middle of a Harbour Festival. Loud music, dancing on the streets and happy, drunk people all around. During the night, the wind increases further, so we decide to stay in port and join the party, as the sea is too rough for safe diving.

Malmöhus

Since we are on the inside of Öland, we intend to make an attempt to dive a paddle steamer, the *Malmöhus*. The visibility can be pretty

mediocre between the mainland and Öland, but the wreck is supposedly worth the attempt. She went down on her maiden trip, on 12 January 1882, for a pretty dumb reason, which was easily prevent-

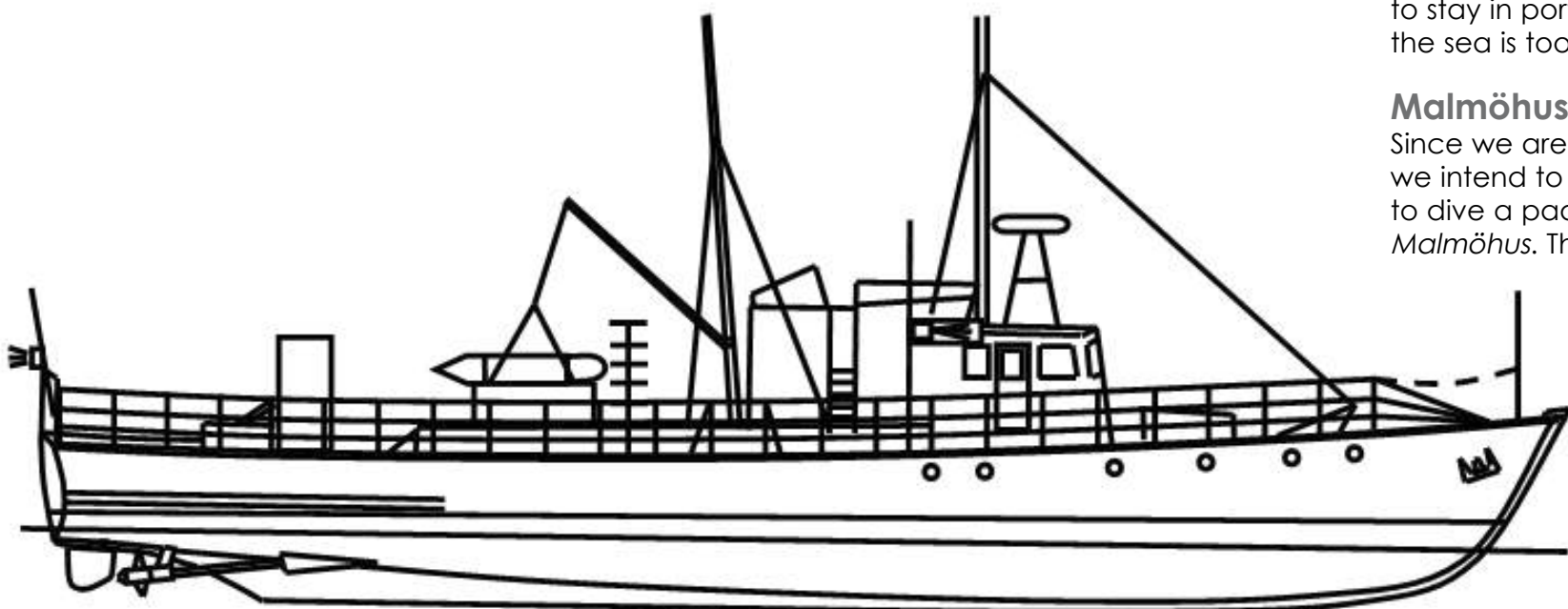


The majestic bow of the *Nicomedia*

able. The front salon was still in the process of being decorated, and to let the paint dry, the painters left two transverse bulkheads open. They locked the door to the salon to prevent guests from wandering in by mistake. It was windy, and water made it into the salon, which kept on taking on water. And the rest is history...

Down to 20 meters the visibility is

okay, but from there on it deteriorates with the water turning milky. As we land amidships, the viz is down to half a meter at best. The light from our lamps disappears into the fog, and we have to resort to finding our way around by touch. Needless to say, we still get lost, so we decide to abort the dive. We shoot off our safety sausage and commence our ascent.





Diver Christopher Zell having a beautiful day on the M24; The stern of the *Nicomedia*

Skriner

We had better luck on the following wrecks. On the *Skriner*, my main lamp failed, and I continued diving with my back-up light as the main source. But light reaches down from the surface and into the darkness of the deep, so I actually get a really cool overview of the wreck even though we are 28 meters below.

The bowsprit sticks out from the wooden wreck, it has some gorgeous wooden details carved on the stem. On deck, I spot a prism, used to spread light in the ship. A unique sight, that's usually one of the first things taken from an old wooden ship.

Humber

Another wreck, *Humber*, is one of the most beautiful wrecks I have visited. The visibility is crystal clear, and I could see the entire ship before me when I reached 25m. I found the compass, it was covered with silt, and when I brushed it off, I could still see the details. The cargo is still intact, the hold contains scrap metal.

As I looked up, I saw the chimneys majestic profile stretch toward the surface. I didn't want to leave. On the ascend line, I catch myself smiling. That evening, as I lay in bed, I think about the dive. This is how diving should be, always—just perfect conditions, and an incredibly beautiful wreck.

Klockvraket

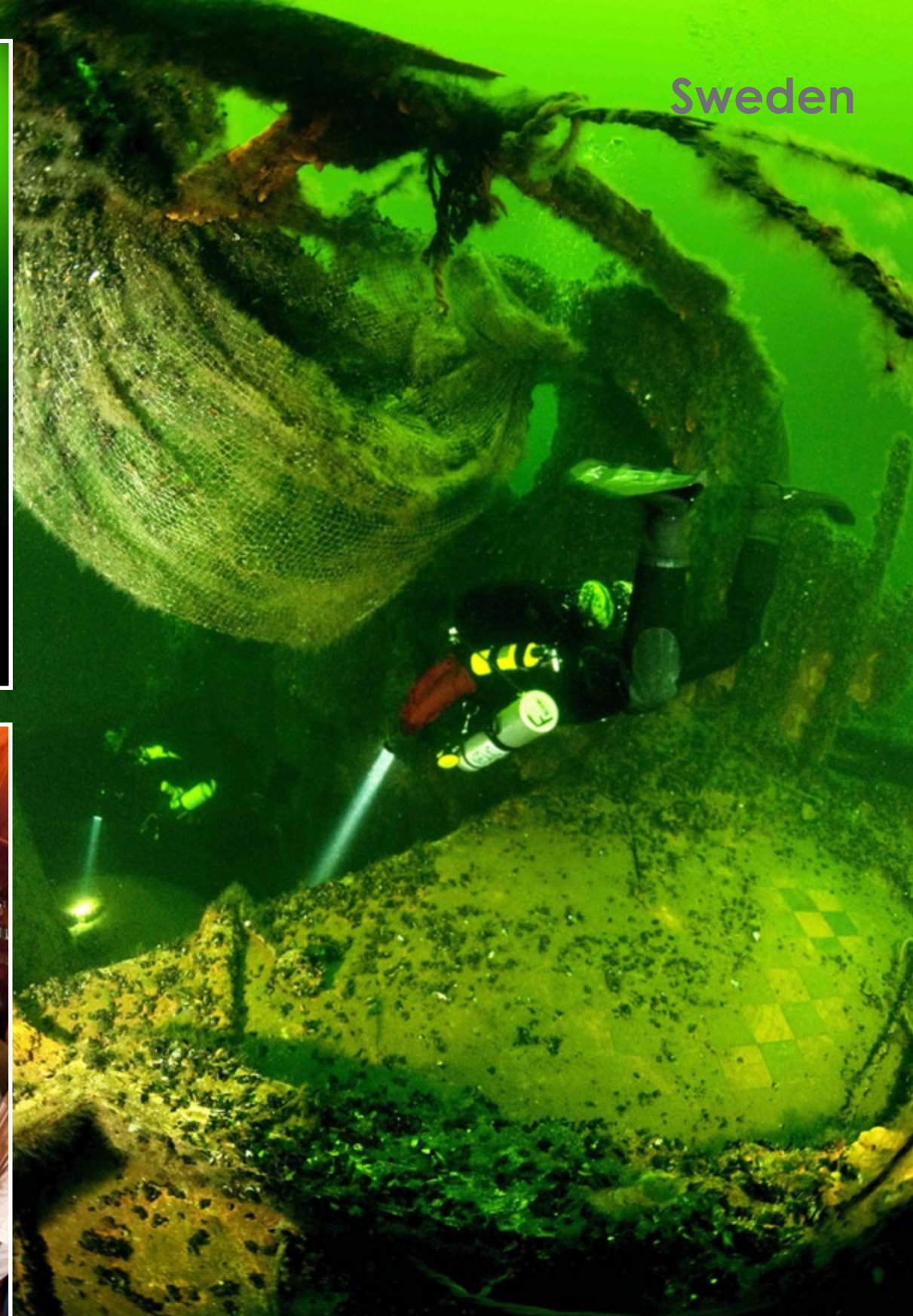
Another memorable dive is *Klockvraket*, a wreck full of bottles and porcelain. Some of the bottles are still sealed. This is an old ship and in a bit of a mess. What's so interesting about this wreck is how one can see the entire dive site due to the incredible visibility.

Accept the weather

Diving around Öland is fantastic but also somewhat temperamental with weather conditions that may put a halt to diving for a day or three. But for what you might see, it is worth the trip. For more information, visit: www.m24.nu ■



On board, dive stories about previous adventures are told, you're logging your dives and chilling between dives. There is lots of laughter. Stress is relieved, and your day-to-day problems melt away. You are among your peers and all is good



Sweden

Divers heading down towards the machine room, into the bowels of the *Nicomedia*

As I looked up, I saw the chimneys majestic profile stretch toward the surface. I didn't want to leave. On the ascend line, I catch myself smiling. That evening, as I lay in bed, I think about the dive. This is how diving should be, always—just perfect conditions, and an incredibly beautiful wreck.

Wrecks of Åland

Sail Ship Mecca



Text by Fredrik Isakson
Underwater photos by Stefan Hogeborn

The Åland archipelago as seen from a ferry (below); At a depth of 50 meters, one will find the steering wheel of the *Hindenburg* (left)



When other nations began replacing their sailing ships and investing in steamships, the islanders of Åland went in the opposite direction. They bought old sailing ships cheap and kept them sailing, transporting cargo from port to port. In many ways, they were inferior to the steamships, but the windjammers carried lots of sails and were still fast in windy conditions and had no expenses for fuel. Some of them didn't even have engines. Needless to say, they were fighting a battle they were ultimately deemed to lose, but for a little while longer, the majestic sailing ships kept sailing.

The islanders are proud of their heritage, so there are still many beautiful tall ships sailing the waters around Åland. On any given day, you will find unique sailing ships above and below the surface. A good starting point for a journey back in maritime history is the Åland Maritime Museum and the museum's sail ship, *Pommern*.

Diving

Going with the locals does not only make for an obvious choice in a good guide, in Åland, it is also a requirement, according to the strict regulations for diving.

Åland consists of some 300 habitable islands and some 12,000 smaller islands, cliffs and rocks. The landscape is pristine, practically untouched and has a raw beauty to it. This is a small self-governed community with only 27,000 Swedish speaking citizen in a region of Finland. Due to its strategic location, many of the Baltic trade routes pass the islands both in the past and today. Navigation in these waters has always been difficult. In the near vicinity of Åland, there are at least 500 known wrecks.



Aerial photo of Åland by Hannu Vallas

Diver Jonas Pavletic looks at the ship's bell of the *Hindenburg*



Another fantastic detail on the *Belliver*, which was found during the discovery of S2 by project leader Björn Rosenlöf

Lundqvist recommends two specific wreck dives: "Start with *Plus*, a really large sailing ship, a magnificent three-masted windjammer that went down in 1933. It is 75 meters long and standing at a slope with the stern at 17 meters and the stem at 32 meters with a 30-degree angle. The masts reach for the surface and all but a few details are intact. A few items from the wreck can be found at the museum, but everything else is still there. The steamer *Belliver* is also a great wreck."

The No-Touch Law

The fine condition of the wrecks is down to Åland's unique law regarding shipwrecks which dictates that nothing is to be touched. Thanks to the strict enforcement of this no-touch law, most wrecks around Åland are



Sweden

You may look but not touch



One of many details on the pristine *Belliver*

Ville Lundqvist is the owner of dive center, Oceanic Tech Åland, which is licensed to take divers to the wrecks. When asked why divers should come to Åland to dive, Lundqvist said:

"It is one of the very few places on Earth where you can find wrecks with all wooden details intact and where all its artifacts remain onboard. It's a time capsule of a past that you will have the opportunity to visit. Around Åland, there are more than 600 known shipwrecks, not all of which have been located yet.

"We organize dive trips, and we visit about 30 different wrecks today. Most of the wrecks are from between the 19th and 20th centuries. We've got sailing ships, steamers and modern ships, but you won't find many warships. Several Russian submarines have sunk in the area, but unfortunately, it's prohibited to visit them, because they are declared war graves."



Many beautiful tall ships are still sailing the waters around Åland

far more interesting than wrecks elsewhere.

The legislation, which dates back to 1974, states it is unlawful to collect any artefacts or tamper with the wrecks. To ensure that the divers abide by the law, divers can't dive on their own but must go with dive operators who are required to obtain a license to dive in waters that belong to Åland. No penetrations of wrecks are allowed either. There are only a few certified dive centers allowed to arrange diving on the wrecks.

Some wrecks are limited in terms of how many visits a year the centers can do. For example, only 12 visits per year are allowed at the icebreaker, *Hindenburg*. All these rules might seem annoying, but it gives Åland some unique wreck diving features. In addition, the absence of trawling in the area means no fishing nets have destroyed the wrecks.

Radar enforced

"The license is given to local dive centers, like mine, so they may bring divers out to the dive sites", Lundqvist explained. "The coast

guard controls all the waters by radar, and they check the diving boats. This law has been respected during the last 35 years. It means that, more or less, everything is still down on the wrecks."

Plus

Plus, a three-masted windjammer, was on its way from London to its home harbor on Åland, Mariehamn, when it ran into bad weather and poor visibility. The captain signaled for a pilot but received no assistance and decided to continue to Mariehamn nonetheless. He could hardly see ahead through the dense fog, and just 100 meters from shore, the vessel rammed a shoal, which ripped out the bottom. She went down in a matter of seconds taking 12 men with her. Only four survived.

There are so many interesting details on the *Plus*, but do check out the stem with its violin-like figurehead. The masts still have all the rigging details, and the skylights gives you a chance to peek inside.

Dive depth is 17-32 meters.

The *Pommern Mariehamn*. Photo by Annica Jensson



Beliver

Lundqvist described the wreck of the *Belliver* as "a fairly new steamer found in 2009". Lundqvist added, "She is 60m long, and she is unbelievable! She stands on the bottom 30 meters down, and she looks

like she is still sailing. All the details such as ship bells, compasses, telegraphs are still there, on deck."

Hindenburg

The *Hindenburg* served as an icebreaker for the German Navy, and



Skinny-dipping off the coast of Åland, a favorite local past-time. Photo by Daniel Eriksson

Sweden



Diver Tor Jörgensborg documents the findings on one of the first dives on the *Belliver*

Even sailors have to take a dump





was changed to *Frock*, and as any naval history buff knows, changing a ship's name means bad luck, indeed. In this case, it came in the shape of a close encounter with a German submarine.

Since Åland was a part of the Russian Grand Duchy at that time, and the German captain found the *Helge/Frock* carrying cargo for the Russian military, he decided to sink it with explosives and without further ado, she was sent to the seabed 51 meters below. The wreck is 61 meters long and has a beam of 8.5 meter.

"This is a really good wreck, and an excellent technical dive. She is in very good shape." Lundqvist explained. "You can really feel how time has stood still. On the wreck, you'll artifacts still in place, as if the ship sank yesterday, such as ship bells, wheels, telegraphs and many more items," he said.



A ship's watch on the *Helge*

some cruisers used her to shield them from mines. The arrangement worked out good for the cruisers but *Hindenburg* hit a mine, which blew a big hole in the bow, and she went under, taking three of the crew with her.

Now she is a beautiful wreck, 51m long with a beam of 13m. The wreck is full of details, brass all over, porcelain, engine telegraphs and a huge prop. The bottom is at 47m and average diving depth is around 40m. It is a bit on the deep side for sport divers but is a commendable dive. If you are a tech diver, use helium, so you remember what you see. It is also cold and dark, and while Åland generally has excellent visibility, it is not always the case. So be prepared, plan accordingly, and dive within your limits. The Baltic is not like the tropics.

Helge

Another beautiful wreck is the *Helge*, an old wooden sailing steamer from the 1869. She had three masts; the early steamers were constructed so they could also make use of the wind. Just a month before she sank, her name

Sweden

Other wrecks

The wrecks lie in the depth range of 10 -120m. All the wrecks have all their wooden details intact and are in very good condition, so it is like diving in a maritime museum.

Lundqvist said, "We have a team of enthusiasts who search for wrecks. In August 2009, we made our last search before the winter, following a tip from a local fisher. In only two hours, we picked up three new wrecks on our sidescan sonar! This was amazing and out of the ordinary, as we sometimes spend whole days without finding anything.

"The wrecks are lying on depths between 85-120 meter. We have identified one of the wrecks as the lost steamer, *Centric*. She was built in Glasgow in 1903 and struck a mine in 1915. Now, she is standing with the bow on the bottom at 106 meters and the stern at 85 meters. She is in very good condition. We are planning to do some more

documentation this season, as well as try to identify the other two wrecks," said Lundqvist.

There are so many reasons to dive in the waters around Åland, and the rest of the Baltic, not one of them having anything to do with fish. But expect one thing: after a trip here, any other wreck you visit might just feel like a pile of junk.

The editors wish to thank Ville Lundqvist, Oceanic Tech Åland and Divealand.com ■

In only two hours, we picked up three new wrecks on our sidescan sonar!

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The Lakes

Sweden



Freshwater crayfish, which is regarded as a local delicacy, may be fished during five weekends in August and September

A 90-year-old sewing machine from Husqvarna — goods from the wreck of the steamer, *Per Brahe*

the lack of shipworm and the low levels of oxygen at depth, which makes for a near perfect environment for those old wooden wrecks. The wreck sites include the steamer, *Per Brahe*, which sank in 1918 taking with it the famous Swedish painter and illustrator John Bauer and his family who all perished. The boat was salvaged, but to this day wreckage is still lying scattered on the seabed at 35m.

Some dive sites are a given to visit, such as the wrecks of *Ulrika*, *Måsen* (The Seagull), *Hajen* (The Shark) and *Kung Ring* (The Ring King). They are located at reasonable depths and in areas which make them suitable for most divers.



Vättern is Sweden's second largest lake. With merchant and passenger ships crossing it, there's bound to be a wreck or more throughout the years. The fresh water has kept them well preserved. The underwater landscape is dramatic, with steep walls, and divers ranging from beginner level to advanced can find something interesting here. Visibility is always good, but the very cold water preserving the wrecks in the lake also makes great demands on the divers and their equipment.

Text by Fredrik Isakson and Peter Andersson
Photos by Peter Andersson

The diving is mostly done on the East side and at the municipalities of Ödeshög and Motala. At Ödeshög, we find wall diving with big boulders lying on a number of ledges. These ledges are like a gigantic stairway down to 70m.

Most of the many well-preserved wooden wrecks that have been found in the lake are located in the vicinity of Motala—a little town on the eastern shore of Lake Vättern, which is regarded as the main centre of both the Göta Canal and the surrounding lake region.

The fine state of preservation is due to

Ebatus et; C. Mae
occhica edicient per

Life

The lake provides a pristine and stunning underwater environment. There is not an awful lot of fish life, but there are a lot of crayfish in the fall as well as pike, perch, salmon, char and trout.

Ready to rock and roll



Circumstances

Visibility in the lake is around 10m. Temperature is on the cool side, and at depth, is usually outright frigid. The lake is deep, and after two months of persistent icecover during the winter, it takes many weeks before the lake warms up again.

A deep freshwater lake is a little bit more demanding on regulators than the open sea, as the salt in seawater counteracts freezing to some extent. And with no salt present in the lakes, equipment failure might come sooner than later, which should be taken into consideration. Using a twin set of regulators is recommended.

Going diving

Accompanying me on my upcoming dive was my buddy, Alex Dawson, and our hosts, Peter Peltonen and Eva Lindahl, from the local dive store, Oxygene, located in the city of Hjo. They urged us to use an extra second stage. Alex declined the offer. He has done numerous ice dives with

his regulator rig without a problem. It was a decision that would come back to haunt him later.

We decided to start with *Hajen* (The Shark), a wreck not too far outside the port of Hjo. In the harbor, there was this hole-in-the-wall joint that sold smoked and fresh fish. Peter picked up some treats for us, and off we went.

Outside the protection of the harbor, the waves were high. The lake is known for its rapid changes in weather. One moment the surface may completely still and smooth, and an hour later, the lake is brimming with large, powerful waves. The lake is a long one. The waves build up along the length of it, with nothing to stop them from growing. Good seamanship is surely a requirement in these parts.

We reached our destination and made our way down the line to the wreck. The water was clear, blueish-green and icy cold.

Hajen was carrying a cargo of bricks and sunk deep into the silty bottom; only about one meter



Burbot (*Lota lota*) from the old french, *barbot*, is the only freshwater gadiform (cod-like) fish. It is most common in streams and lakes of North America and Europe above 40°N latitude. They are edible

of the hull reached up above the mud. The masts stuck up like toothpicks stretching for the surface. It was actually really pretty. Then Alex's regulator started free-flowing. Time to abort the dive and admit that the locals were right. Always heed the advice given by the locals.

Then Alex's regulator started free-flowing. Time to abort the dive and admit that the locals were right.

The *Greve Rosén* is a type of vessel that was typical for Lake Vättern in the late 1800's - early 1900's. Standing at 42m, it is relatively undived

Bronze Age site

That evening, we opted for a more protected site an archaeological site from the Bronze Age, starting at four meters below and located outside the city of Huskvarna. Part of it was still not excavated. Over the millenia, Vättern sort of "tipped", due to asymmetric land rise with water now covering what was once areas of dry land areas.

We dived on a stone structure surrounded by a bog. It was assumed that this was a gravesite, since human bones were discovered here. A number of weapons and other valuables were also found in the bog—several of them by divers.

There should be more finds from the Viking Age, as well as the Bronze Age, on this site. Just remember: anything found belongs to Sweden and is protected by law.

I saw submerged stumps of trees that grew on land 2,500 years ago, and I tried to picture life back then and how they made offerings to the gods right here. Crayfishes in abundance kept us company during the dives. Spring was on its way.

The weather had cleared up, and the late evening sun brightened my mood, and I remembered why I loved diving. Vättern has so much to offer. Tomorrow was another day, and we had many dives ahead of us. I had hardly seen anything yet. Maybe there was a wreck out there with my name on it, somewhere, some place. ■



Stump of a tree that grew on land 2,500 years ago

The author wishes to thank Ulf Långström, Ulf Kajhammar, Peter Peltonen, Eva Lindahl, Johanna Johansson, Håkan Petterson and all other helpful people he met.

Oxygene, Jönköping, where contributing photographer Peter Andersson is based, organizes trips several times a week and offers training from entry level to instructor as well as the full DSAT program from Tec 40 to Tec Trimix.



A talk with Carl Douglas

Deep Sea Productions

Text by Millis Keegan. Photos by Jonas Dahm.

The Baltic Sea may not boast great visibility, but it is famous for its many pristine wrecks, some of which are centuries old. Only a few will ever have the opportunity to experience these astounding time capsules, but through the book, *Shipwrecks of the Baltic*, you get a glimpse of one of the most well-kept secrets in the diving world: that in the Baltic Sea, you'll find the most spectacular wreck dive sites in the world.

The book, *Shipwrecks of the Baltic*, is the result of a project that has been in the works for five years. The main goals of the project were to find, dive and document ships lost in the Baltic Sea and to tell their stories.

It was quite an undertaking performed by Björn Hagberg, Jonas Dahm and Carl Douglas. Jonas and Carl worked to find wrecks—with the help of marine survey company MMT AB. Marine archaeologist

Björn researched and wrote the text. Carl and Jonas led a group of experienced divers who explored the wrecks, and Jonas took all of the underwater images.

The book was produced by Deep Sea Productions, a Swedish company that produces documentary films and now also books. As it happens, Carl is also a friend of mine, so naturally it falls upon me to talk to him about this book.



The artifacts found bear such strong evidence of long lost stories from the past. It is impossible not to be affected but what you see

MK: Now Carl, I think that this book is a true testament to the fact that sunken ships are time capsules with great stories to tell. That is, if you have the patience and the skills to find both the wrecks and the stories, of course. With that said, if you don't mind

me saying it, I also think the book is a true testament to you guys, and to your dedication. And speaking of dedication, is it true that you managed to find over a hundred wrecks over the course of five years?

CD: Yes. Of course, all of those wrecks are not as interesting as the ones you will see in the book, but we have found a lot of wrecks—and keep on finding them. The Baltic is such a treasure-trove of shipwrecks—many tens of thousands of them,



according to the more careful estimates, and most of them are incredibly well-preserved. The thing that strikes most visitors is the preserved wood. In the Baltic, we do not have shipworm, so basically all wood is preserved.

But once one starts to look into the stories behind the wrecks,

another aspect emerges—that is, to tell the stories so that those lost will not be forgotten. This has become very important to us—that these forgotten stories be told.

MK: Forgotten stories—there's your title for the next book! Be sure to

credit me for that. There are a lot of interesting post- and pre-war facts in the book tied in with the most amazing underwater images taken by Jonas Dahm. The pictures speak volumes about the tragic cost of that era, and I can honestly say that his images are spectacular! Who is this guy?

CD: I really think that his images are some of the best wreck photography ever. However, Jonas is a very private guy who prefers his images to speak for themselves.

MK: Right. Okay, we will leave it at that then. But I agree with you. Those are some world-class



images. The clarity is astonishing. How do you manage that in such a sensitive environment? I mean, one wrong move inside one of those wrecks, and the visibility will be gone for a decade, right? What is the most difficult part of photography under these conditions? Seriously, what is the secret?

CD: Obviously, the quality is the result of many factors. First, we need to find wrecks that are "photogenic" in an area of the sea where there is good visibility. Then, I have to say that Jonas' sheer ability as a diver is also very important. He goes everywhere inside wrecks. There is a reason you don't see very many good images of engine-rooms! But Jonas does it. On many of the images, another factor is also important, and that is teamwork—both for modelling and setting light. Since we have dived together now for about a decade, we know what we want to do. We talk a lot about what kind of images we like and how to create them. It's a very creative environment in the group.

I also think the environment we

Carl Douglas found his calling as an historian and cold water-diver, but he also has a soft side for warm water-diving

The team acknowledge that not all wrecks are as photogenic as the ones in the book, but that doesn't mean that they don't bring something significant to history and should be explored further

Sweden

The book is available in five languages



we have researched them for many years and really know the stories, such as the

Route of Death wrecks (the *Steuben*, *Goya* and *Wilhelm Gustloff*), the WWI cruiser, *Prinz Adalbert*, and the Soviet WWII submarines. Others are more anonymous in the greater scheme of things, but are nonetheless fascinating to explore and to try to figure out their story. Some are



Team member Jonas Dahm rigging up
dive in helps. The darkness in the surroundings helps create the mysterious feeling in the images. Furthermore, the lack of colour helps to focus attention to the overall shapes rather than the details. All this brings forward the wreck itself. This is an effect that we very much appreciate.

MK: And so you should. Enough buttering... I have a favourite wreck, Aachen,

and I have chosen the chapter based on that for our readers. Which chapter and what pictures are you most proud of and why?
CD: Difficult question. For me, there are so many feelings associated with the text and with every image. All the joy and all the hard work over the years. The images, in particular, bring it all back. The images from the *Aachen* are some of my favourites as well. It is a fantastic wreck to dive as well—and that's really my focus: the diving. Every dive on these wrecks is like crossing into another time.
Some wrecks have meaning because



It is like time stood still. You almost expect someone to walk into the room any minute



beautiful ships, some have wooden carvings, some have nice interiors, some have interesting engine-rooms, some have details that somehow capture our interest and others are just attractive for reasons we don't fully understand ourselves.

Still, some of these wrecks manage to surprise us. One of my favourite dives was our first dive on the *Steuben*, the summer after we found her. We were really charged up about diving this wreck, and to tell the story of the plight of her

passengers. However, nothing could have prepared us for the sight that we encountered on the seabed 75m/260 ft below. We had maybe 40m/130 ft visibility, so when we came down in front of the bridge, we saw the whole bow-area of this beautiful old liner resting on her port side. Very Titanic-like. There is a particular stillness about shipwrecks that often belies the violence behind their loss. Very true in this case. For me this was a magic moment.

MK: To do something of this magnitude requires a lot of resources and commitment. I am assuming everyone works on their own time, juggling a day job and maybe a family? The logistics alone must be a nightmare! What prompted you guys to do this project?

CD: Yes, this is a project that is all about passion. Certainly not logic. We had been diving together for a few years. I

guess we just wanted to take our diving to another level—to see whether we could. But it was also a gradual thing: we started diving, then we started looking for wrecks together, dove some more. Then, we brought in the guys from MMT and really started looking, dove some more, then we said, “Hmmm, this could be a book.”

This creative process, while doing something difficult and working together in a group, is really the key. We're not just

visiting the wrecks; we try to figure them out and try to get “inside” their stories. *MK: Thank you so much for your time, and I hope our readers will enjoy this glimpse into the depth and the history of the Baltic Sea as much as we do. The book is available in Russian, Finnish, Swedish, German and English. For the other language versions, contact DeepSea.se.* ■

TOP: No matter how prepared the divers are before the dive, the sights still amaze them



The sinking of the *Prinz Adalbert* made the headlines, telling the story of how only three of 675 crewmembers survived

Lithuania. When the torpedo struck, the reverberations of the resulting explosion made it sound as though the entire sea had split apart. The torpedo had struck the ship's magazine, and the vessel was torn in two. Parts large and small rained down from the sky, and an enormous pillar of smoke hundreds of metres high was the last of the vessel to be seen. Of 675 crewmembers, only three survived. The sinking of the *Prinz Adalbert* was the largest loss ever suffered by the German Baltic fleet at that point.

The freedom of movement of the neutral countries at sea had been respected at the beginning of the

chant marine suffered losses. To begin with, it was ships in the North Sea that were blown up in the dense minefields, but soon her ships in the Baltic would suffer losses as well. News reached Sweden in December 1914 that three Swedish ships, the *Everilda*, the *Luna* and the *Norra Sverige*, had been blown up by mines north of Åbo. The ships had tripped German mines, and 42 Swedish sailors were killed.

The continued laying of minefields was putting shipping increasingly at risk. Six months later the Swedish steamship *Hermodia* disappeared in the Sea of Åland, followed in rapid succession by the Dutch ship *Ceres* and the Danish vessel *Ely*. The conflict in the Baltic was

the alarm of the submarine commander, no attempt was made to ram her. The crews of the German ships were convinced that their colleague had sunk as a result of an



exploding mine and never detected the presence of the *E1*. These events were reported a few days later in the Swedish newspaper *Gotlands Allehanda*. Some of the wreckage had drifted ashore: doors and parts of the telegraph cabin, bedclothes, a mattress and a lifebuoy bearing the legend "Aachen-Bremen" – which made it possible to identify the ship.

A much greater catastrophe in human terms would occur when the British submarine *E8* sank the German armoured cruiser *Prinz Adalbert* off the coast of

war, but – as the war escalated – the rules were tightened and the threat-level increased. Only a few months after the outbreak of the war, the Swedish mer-

largely over the trade in Sweden's iron ore. Just as would be the case in the Second World War, Germany was dependent on deliveries of iron from

EXCERPT FROM CHAPTER 3 OF:
THE FIRST WORLD WAR
—NEW WEAPONS FOR A NEW AGE

Text by Björn Hagberg
Photos by Jonas Dahm

GERMAN SETBACKS

Both the German navy and its merchant marine lost many vessels early on. Some went down as a result of mines, while others were subject to submarine attacks.

On 30 July 1915, the captain of the British submarine *E1* sighted a convoy near the Latvian port of Libau. It consisted of three vessels that had been specially equipped by the Germans to

transport cargo while also serving as minesweepers. The submarine attacked the leading vessel and hit it with a torpedo. The cargo hold immediately filled with water, while the engine-room and the boiler also started to flood. Fifteen minutes later the ship had sunk.

Immediately after the attack, the submarine turned up toward the second vessel but was forced to dive too deep at the decisive moment for launching an attack, as the third boat was heading straight at the submarine in what seemed to be an obvious attempt to ram her. Regardless of the heavy seas, the two vessels remaining in the convoy managed to save all but five of the crew of the torpedoed vessel. Despite



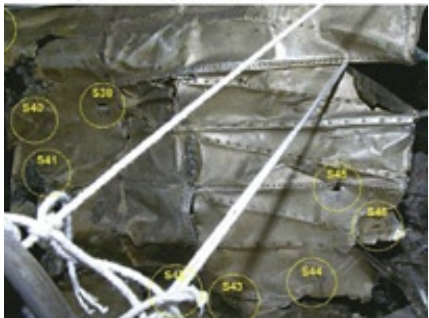
DC3 on a spy mission shot down during the cold war



On June 13, 1952, a Swedish military DC-3 carrying out signals intelligence gathering operations over the Baltic Sea for the Swedish National Defense Radio Establishment, disappeared over international waters east of the island of Gotland.

The USSR denied shooting down the DC-3, but a few days later, a life raft with Soviet shell shrapnel was found in the area. In 1956, while meeting with the Swedish Prime Minister Tage Erlander, Soviet leader Nikita Khrushchev admitted that the Soviet Union had shot down the the plane although that information was not released to the public at the time.

In 1991, the Soviet Air Force publicly acknowledged it had shot down the DC-3. The remains of the downed DC-3 were found by a Swedish company



in the summer of 2003. Inspection revealed bullet holes that proved the plane was shot down by a MiG-15 fighter. The exact time was also determined, as one of the clocks in the cockpit had stopped at 11:28:40 CET.

[Link to official Swedish report](#)

Submarine warfare in the Baltic was very successful and made a significant dent in the shipping of materials to the war-faring countries



Sweden. Protecting these vital imports became the main task of the German Baltic fleet.

War in the Baltic escalated with an expansion of submarine warfare and the ongoing laying of minefields. The Allies attempted to block all marine transports to and from Germany, which responded by increasing submarine attacks. The escalation of hostilities between the opposing blocs would pose an ever-greater threat to the shipping of the neutral countries.

THE ALBATROSS AFFAIR

The neutrality Gustav V, the Swedish king, had so solemnly guaranteed proved difficult to sustain. Violations became both more frequent and more difficult to overlook. The war would even be carried out on Swedish territory in the summer of 1915. This event has come to be known as the Albatross affair. A squadron of

German warships that had been laying mines in the Gulf of Finland had relayed its planned return route to its home base in Danzig. The telegram was intercepted by units of the Russian navy and the hunt was soon in full cry.

On the morning of 2 July, thick banks of fog were drifting across the Baltic. Onboard the German mine-cruiser *Albatross* all was peace and quiet. On the bridge Karl Bühler, the ship's second officer, had the watch and kept in constant touch with the other vessels in the German squadron. All of a sudden, he spotted a foreign vessel among the swirling

mists and the next moment all hell broke loose. A couple of hundred metres from the *Albatross*, two shells struck the water, and Bühler rapidly realised that they were surrounded by four hostile craft.

The *Albatross* made for the island of Gotland at top speed in an attempt to seek the safety of Swedish waters. The other German ships chose a different tack in the hope of luring the

attackers into following them, away from their poorly armed and slower comrade. But their Russian attackers decided to follow the *Albatross* instead. Four fast and heavy Russian armoured cruisers against one mine-laying cruiser – the outcome could not be in doubt. The Russians bom-

barded the *Albatross*, one shot after the other lacerating the German vessel. Some three thousand shells were fired, and no one believed that the boat could remain afloat. Water poured in through two huge holes, one in the stern and one on the port side. Listing ever more





violently, the *Albatross* could overturn at any moment.

Early that morning the ship managed nevertheless to reach the Eastern coast of Gotland and sought shelter behind the little island of Östergarnsholm. Her Russian persecutors, however, refused to give up and continued to bombard her. The lighthouse staff on the little outcrop was forced to flee in haste as the shells flew over their building. The *Albatross* could no longer manoeuvre, and she was taking in a great deal of water. The commander finally gave the order to use the last dregs of power in the steam engine to drive the boat up on to the beach. The shooting stopped for good then, and the Russian vessels quickly left the area.

With a German mine-boat now strand-

ed on the beaches of Gotland, the local population flocked to see it. They were confronted by dreadful scenes. Dead and wounded men lay everywhere, although the worst sight was of shocked and bloodstained sailors wandering around the ship that had been shot to pieces. That same evening, 26 crewmen were buried in the cemetery on Östergarn. The Swedish government made a forceful protest to its Russian counterpart. An apology came by return of post and an explanation that has become legend in Swedish-Russian relations – errors in navigation were the cause of the violation of



Stuck in time

The symbolism found in Jonas Dahm's compositions is stunning

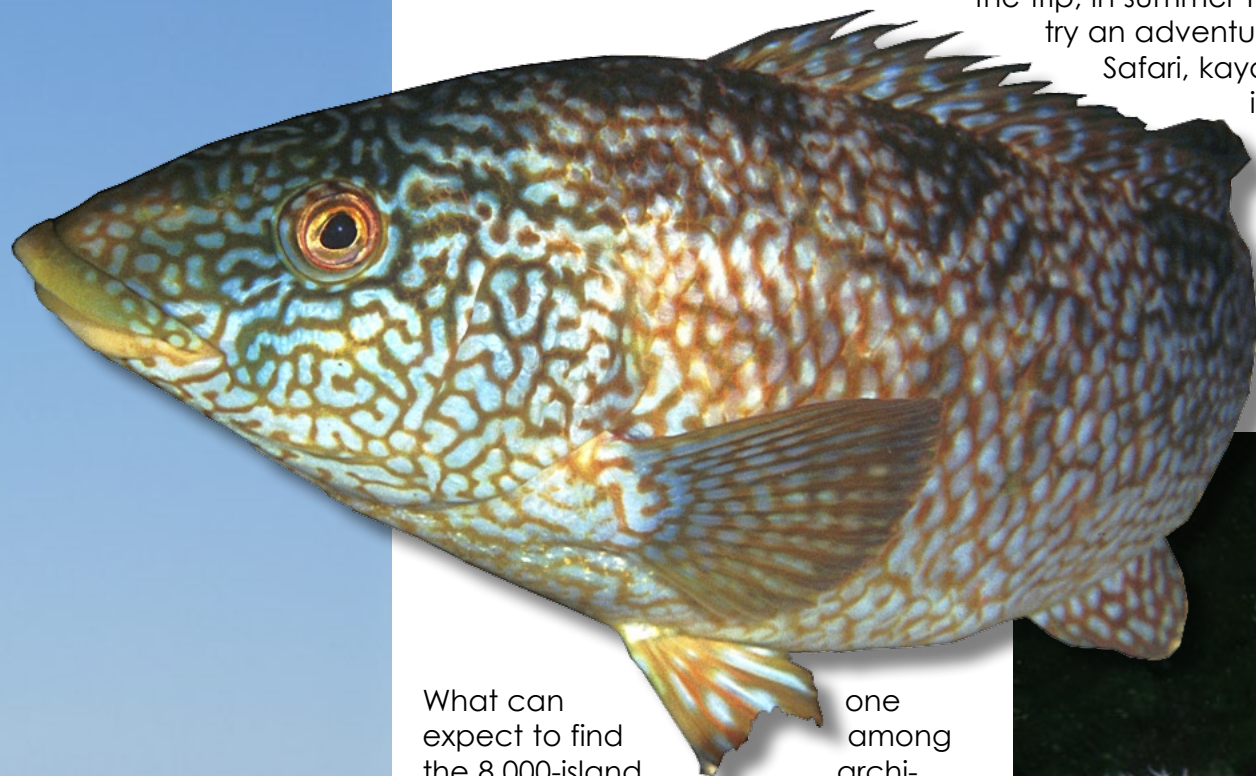
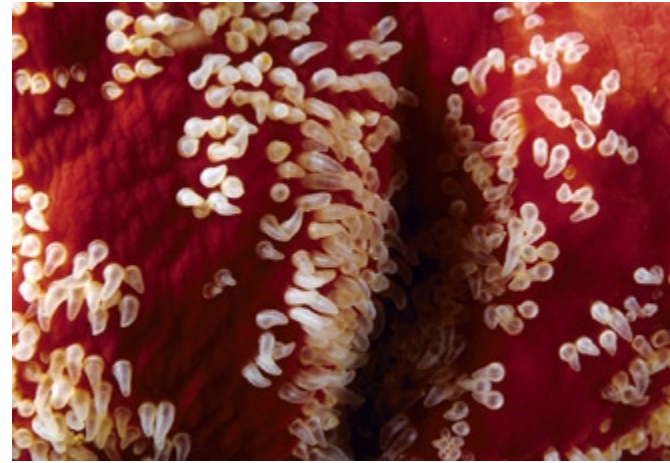
Swedish waters.

The war would not in fact come any closer than this, but vessels continued to be lost and the difficulties faced by the ships of the neutral countries would only get worse. The war at sea became more brutal, with the hostile countries only occasionally respecting ships designated as neutral while the minefields continued to expand.

Sweden managed to remain outside the war and her neutrality was preserved, despite further violations. But this was neutrality understood in the most generous sense of the term. Sweden continued to deliver iron ore to the Germans and timber to the British during the entire war,

both of which were vital to the continuation of hostilities. At the same time, this trade was a source

of income for Sweden where many people earned huge sums from the war. Despite the vessels that had been sunk, the iron ore transports had to be preserved at all costs, since they were far too profitable to stop. Those who had to pay the price would end up at the bottom of the Baltic Sea." ■



The West Coast is a very popular destination among those divers who have no regard for the wrecks and sparse marine life of the Baltic Sea. And the contrast stands out—the West Coast is teeming with life.

Text by Millis Keegan
Photos by Stein Johnsen

the trip, in summer time in particular, or try an adventure or two, like a Seal Safari, kayaking or island hopping in the archipelago, or maybe some lobster fishing.

Summer time means hanging out and partying with the Swedes in eclectic hole-in-the-wall restaurants

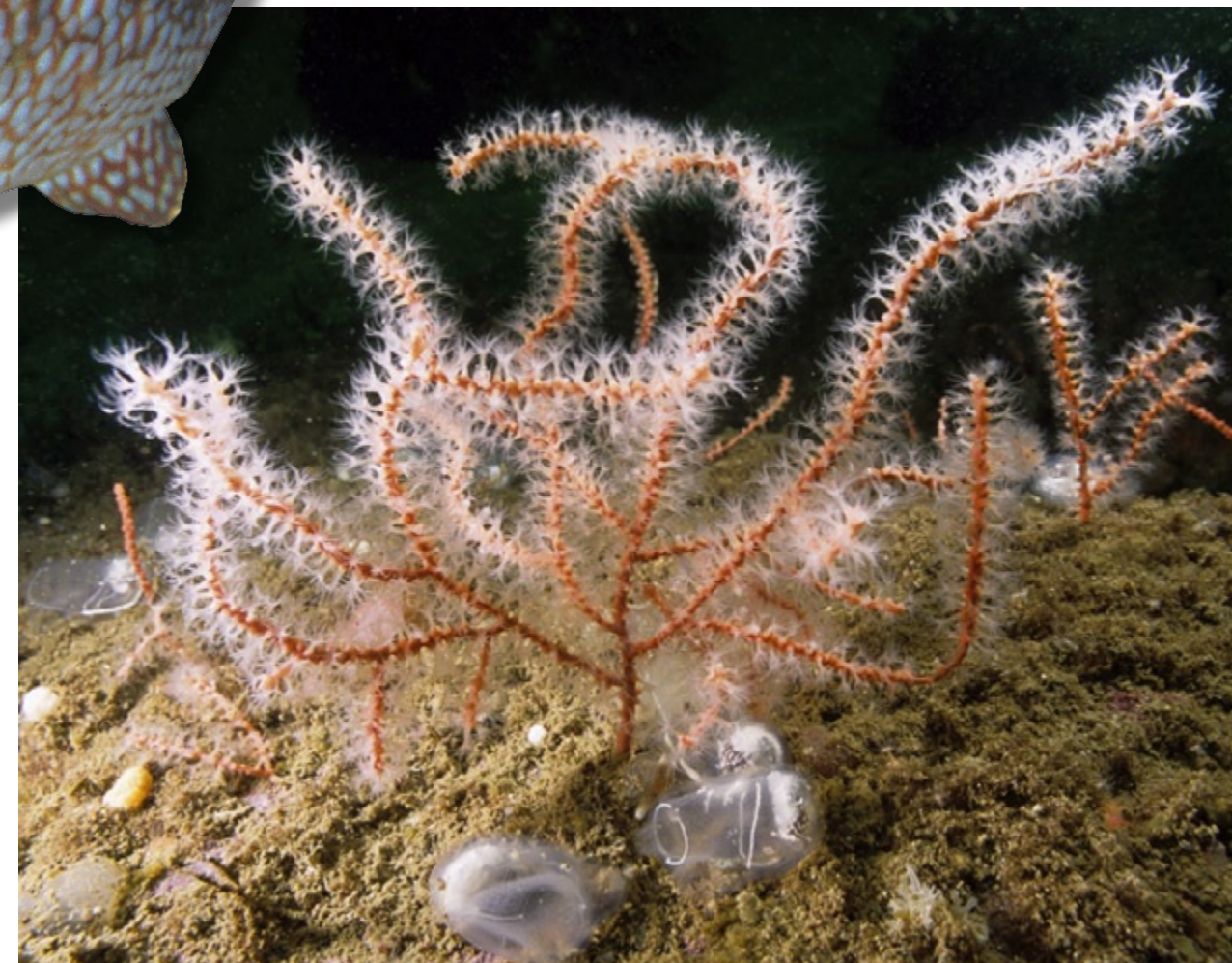
along the bridges down by the docks, eating tasty crab, shrimp and lobsters, drinking lots of beer, eating more great sea food and singing silly songs. Swedes love to sing silly songs when they've had a few.

The further north you go, the more diverse diving you get. There are lots of small picturesque coastal villages

What can one expect to find among the 8,000-island archipelago and the fiords is a rocky underwater landscape with seaweed swaying in crevices, lobster, variety of crabs, variety of sea anemones, starfishes, cod, coalfish, mackerel, flatfish and eel. One can also find jellyfish, Dead Man's Hand, some sharks—if you are lucky and in the right place at the right time. The same goes for octopus. The variety is there.

There is more to the West Coast than diving. The landscape alone is worth

CLOCKWISE FROM TOP LEFT: Mouth of anemone; Arms of anemone; Detail of soft corals; Wolf eel; Delicate fronds of soft coral with tunicates; Grouper (inset); Serene scene on the West Coast of Sweden



The West Coast Västskusten



Traditional little red huts dot the coastline of the West Coast of Sweden

ecologically unique fiord of Gullmarn. Diving tourism as well as a High School teaching special programs in marine biology has developed in this area of very beautiful red granite cliffs. Learn more about what you can expect to find in the fiord by visiting Havets Hus, "the House of the Ocean". www.havetshus.lysekil.se

Kungshamn/Smögen

For after-dive activity in Smögen, the one and only place to hang out in is on the Smögen Bridge. One end starts at the fish hall and runs a kilometer long on the south side of the old fishing dock, but don't expect any early fish auctions any more. That is done by Internet these

days. Walk along the bridge, shop, eat, drink and chill. That's what you do here.

Väderöarna

Direct translation of its name is "The Weather Islands", which is an appropriate name. The islands are located in the outer band of the archipelago and quite exposed to the weather. They are a very popular must-dive site. The islands are home to a large seal colony. The seals sometimes spend time playing pecka-boo with divers.

The Koster Fjord/Kosterhavet Marine National Park

A coldwater coral reef was found not too long ago in the Koster Fjord. The



and towns where you can dive and enjoy life. Marstrand, Lysekil, Kungshamn/Smögen, Tanumstrand, Grebbestad and Strömstad are all great places to find a dive center. Pick your location or three. Every place has it's own charm. The reason is because the Gulf Stream makes a little turn here and hit a little bit of Sweden. The mixing of cold and warm water creates excellent conditions for any marine life. Don't miss Väderöarna; It is often said to as having the best diving the West Coast can offer.

Lysekil

Is a very small, but interesting, community that has grown around the

MATHIAS CORVALLO



Diver inspects large anemone on rocky landscape under the waves (above); Sea pens sway in the current (left)



Electric blue flashes from the patterned scales of a cuckoo wrasse (*Labrus bimaculatus*); Close-ups of anemones (right and below center)

We found this fantastic video of Kosterhavet Marine National Park by Knut Bergsten, including Väderöarna. Scroll down to "Missing Summer" at: www.explorewestsweden.com

Kullen, South Sweden

The best dive site for marine life in the south is Kullen. Kullen is a very distinct peninsula with a rocky, craggy shore that continues under water. Currents bring nutrients to the marine life that thrives here, particularly during summer and autumn. Expect to find shore

Sweden



deepwater coral *Lophelia pertusa* was a remarkable find, which earned the fjord the status of becoming Sweden's first Marine National Park. Well, that, plus there are 200 unique species

found only in this area, such as the firework anemone *Pachycerianthus multiplicatus*, the pink shrimp *Pandalus borealis*, the sea cucumber *Parastichopus*



tremulus, the northern stone crab *Lithodes maja*, and a couple of rare sharks (Velvet Belly Shark and Greenland Shark). More information on Kosterhavet.se.

crabs, hermit crabs, jellyfish, dead mans hand, lots of flounders, and on a good day, sea trout, cod, mullets and more. ■

Close-up of a scallop with its many eyes

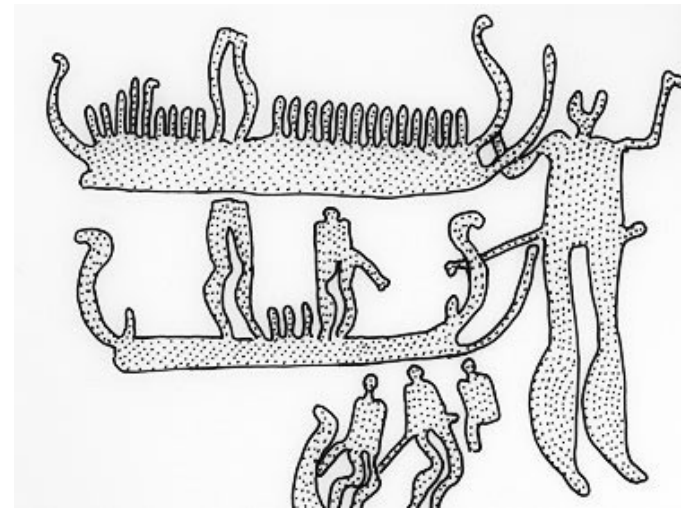
Kayaking can be enjoyed on the West Coast after a good day of diving



fact file

Sweden

SOURCE: CIA.GOV WORLD FACTBOOK
SCUBA-DOC.COM



LEFT: Hallistningar symbols are pre-runic symbols found in rock carvings in Sweden.

RIGHT: Location of Sweden on global map
FAR RIGHT: Map of Sweden



from agriculture. Sweden sustained economic



History During the 17th century, Sweden was a military power. However, for two centuries, the nation has not been involved in any wars. Sweden managed to preserve armed neutrality during both World Wars. In the 1990s, Sweden's long-successful economic formula of a capitalist system interlarded with substantial welfare elements was challenged by high unemployment and economic downturns in 2000-02 and 2009. Over the past several years, fiscal discipline has allowed the country to get through economic fluctuations. In 1995, Sweden joined the EU, but its people rejected the introduction of the euro in a 2003 referendum. Government: constitutional monarchy. Capital: Stockholm.

Geography Sweden is located in Northern Europe and borders the Baltic Sea, the Gulf of Bothnia, Kattegat and Skagerrak, and lays between Finland and Norway. Terrain is composed mostly of flat or gently rolling lowlands with

mountains in the west. Lowest point: reclaimed bay of Lake Hammarsjön, near Kristianstad -2.4m. Highest point: Kebnekaise 2,111m. Coastline: 3,218 km. Note: Sweden has a strategic location along Danish Straits linking Baltic and North Seas.

Climate is temperate in the south with cold, cloudy winters and cool, partly cloudy summers. Sweden has subarctic climate in the north. Natural hazards: ice floes in the surrounding waters, particularly in the Gulf of Bothnia, which can interfere with maritime traffic.

Environmental issues Acid rain damages soils and lakes and pollution is a problem in the North Sea and the Baltic Sea. Sweden is party to agreements including: Air Pollution-Nitrogen Oxides, Air Pollution-Persistent Organic Pollutants, Air Pollution-Sulfur 85, Air Pollution-Sulfur 94, Air Pollution-Volatile Organic Compounds, Antarctic-

Environmental Protocol, Antarctic-Marine Living Resources, Antarctic Treaty, Biodiversity, Climate Change, Climate Change-Kyoto Protocol, Desertification, Endangered Species, Environmental Modification, Hazardous Wastes, Law of the Sea, Marine Dumping, Ozone Layer Protection, Ship Pollution, Tropical Timber 83, Tropical Timber 94, Wetlands, Whaling.

Population 9,059,651 (July 2009 est.) Ethnic groups: indigenous population: Swedes; Finnish and Sami minorities; foreign-born or first-generation immigrants including Finns, Yugoslavs, Danes, Norwegians, Greeks, Turks. Religions: Lutheran 87%, other religions including Roman Catholic, Orthodox, Baptist, Muslim, Jewish, and Buddhist 13%. Internet users: 8.1 million (2008)

Language Swedish, small numbers speak Sami- and Finnish

Currency Swedish kronor (SEK)

Exchange rates:
1EUR=9.62SEK;
1USD=7.21SEK;
1GBP=11.05SEK;
1AUD=6.65SEK;
1SGD=5.26SEK

Economy Under a mixed system of high-tech capitalism and comprehensive welfare benefits, Sweden has achieved an enviable standard of living, aided by peace and neutrality for all of the 20th century. The nation benefits from a modern distribution system and excellent external and internal communications as well as a skilled labor force. In September 2003, Swedish citizens rejected entry into the euro system due to concern about the impact of the move on sovereignty and the economy, which leans heavily on foreign trade in primarily timber, hydropower, and iron ore. Ninety percent of industrial output is produced by privately owned firms half of which are from the engineering sector. Only one percent of GDP and employment comes

growth, encouraged by strong exports and increased domestic demand, until 2008. A reform program aimed at increasing employment, reducing welfare dependence, and streamlining the state's role in the economy was implemented by the government. Even with robust finances and underlying fundamentals, the Swedish economy fell into recession in late 2008 with growth continuing to slow with the global economic downturn. Industry: iron, steel, precision equipment, wood pulp, paper products, processed foods, motor vehicles. Agriculture: barley, wheat, sugar beets, meat, milk. Natural resources: iron ore, copper, lead, zinc, gold, silver, tungsten, uranium, arsenic, feldspar, timber, hydro-power.

Hyperbaric Chamber
Karolinska sjukhuset (Stockholm)
08-517 700 00
Karlskrona lasarett 0455-731000

Websites
Sweden Tourism
www.visitsweden.com/sweden

Panaramic view from the peak of the highest mountain in Sweden, Kebnekaise





Edited by Peter Symes

Several new species of orca

One of the newly designated species preys on seals in the Antarctic while another eats fish

Tissue samples from 139 killer whales collected from around the world confirm a theory scientists have had for years. Orcas, commonly known as killer whales comprise several different and distinct species.

Specialization in diet and hunting tactics along with differences in markings led marine biologists to suppose that they might be looking at different orca species instead of a single population. One of the newly designated species preys on seals in the Antarctic while another eats fish, said Phillip Morin of the US National Oceanic and Atmospheric Administration's (NOAA) South-west Fisheries Science Centre in La Jolla, California, who led the research.

DNA
His team sequenced the DNA from the whales' mitochondria, a part of the cell that holds just a portion of the DNA. Mitochondrial DNA is passed down with very few changes from mother to offspring. New sequencing methods finally made it possible to do so, Dr Morin said in a statement.

"The genetic make-up of mitochondria in killer whales, like other cetaceans, changes very little over time, which makes it difficult to detect any differentiation in recently evolved species without looking at the entire genome," he said. "But by using a relatively new method called highly parallel sequencing to map the entire genome of the cell's mito-

chondria from a worldwide sample of killer whales, we were able to see clear differences among the species." The team looked at orcas living in seven ecological niches around the world identifying each group as an ecotype.

At least three species

On the basis of ecotype behavior and the new DNA data, the two Antarctic orca groups that eat seals and fish should be recognized as distinct species, as should the North Pacific transients, Dr. Morin's group concluded in a report published this month by Genome Research. The other ecotypes should be regarded as subspecies pending further data, they said.



Related studies led by Andy Foote from the University of Aberdeen, show that there are two distinct species of killer whales in the waters around Britain. Samples were taken from 62 killer whale skeletons kept at sites including the Natural History Museum in London and the National Museum of Scotland

Some skeletons were hundreds of years old while other samples died in 2008. The length of each whale and whether their teeth had been worn down were also noted in the study. In the wild, killer whales that eat herring and mackerel display the tooth wear while those that are thought to eat marine mam-

mals, such as small dolphins and whales, had virtually no tooth wear. NOAA has designated a population of killer whales that lives in the Pacific off the coast of Washington state as endangered.

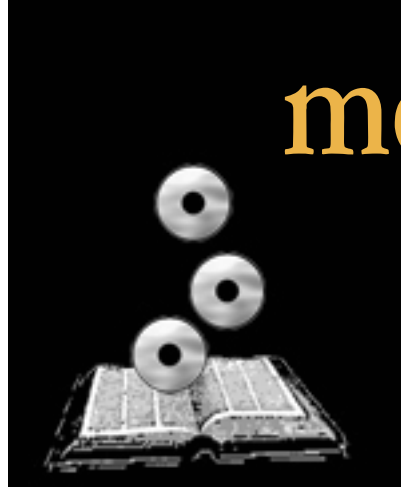
In Association with Olympus Dive Center
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Morehead City, North Carolina. August 6-8 2010 Elasmodiver.com/sharkfest.htm

Dying Struggles of the Spermoceti Whale. Image Date 1837

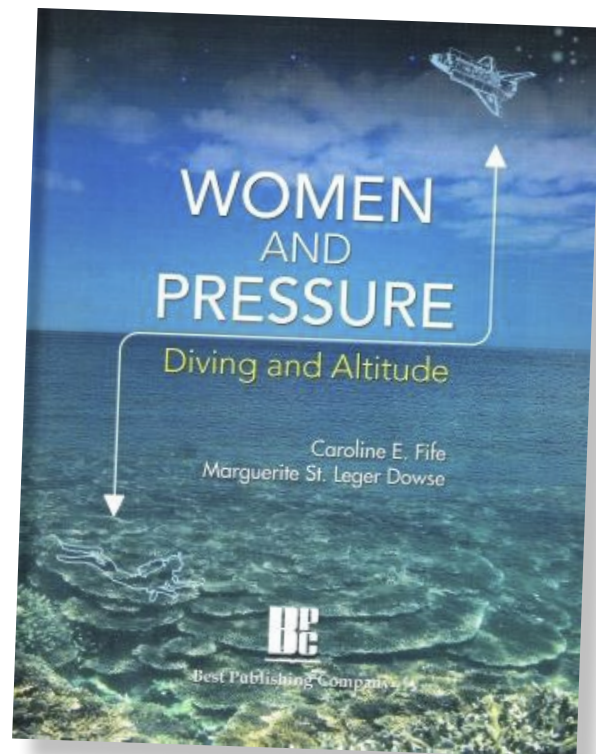




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Dive into the gender gap

Readers with interests in the scientific aspects of diving have a must-get book to put on their shelves in *Women and Pressure: Diving and Altitude* from Best Publishing Company. In the 400-page hardcover, Caroline E. Fife and Marguerite St. Leger Dowse assemble articles on the similarities and differences between men and women working in hyperbaric conditions. It grew out of a 1986 Undersea and Hyperbaric Medicine Workshop chaired by Fife's husband William, who died in 2008 and to whom the authors dedicated their work. Its 27 chapters are divided into sections on decompression illness, human factors and the workplace. Chapters are articles written by scientists with expertise in their various fields such as

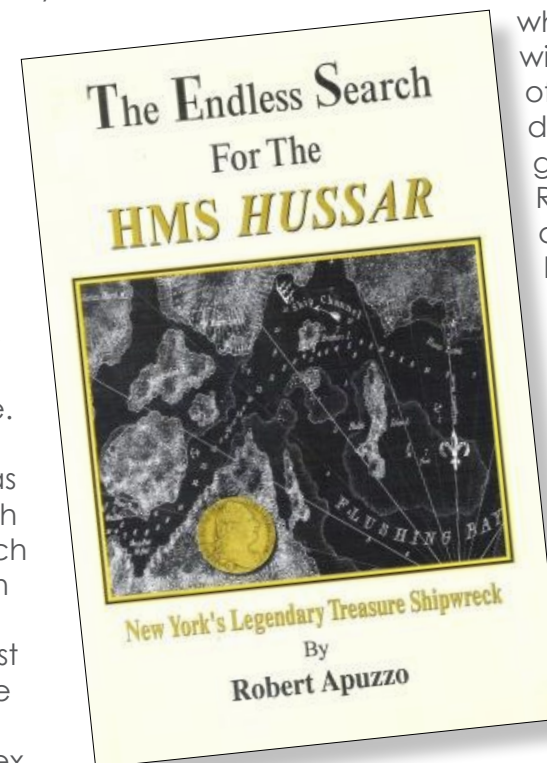
pathology of DCI, physiology of cold-water diving, health standards, combat pilots or underwater archeology. Each author supports the findings with data from studies, often presented in tables and graphs, and heavily footnoted sources of information. Many end with a summary or a list of key points that identify what is known, and often more intriguing, what has yet to be learned about the topic. Profiles of pioneering women and a comprehensive index that eases cross-referencing topics close the book. Fife is a consultant to NASA's Johnson Space Center Neutral Buoyancy Lab and an advisor for Divers Alert Network. St. Leger Dowse is a mainstay in England's Diving Diseases Research Center and is the only person to twice receive British Sub Aqua Club's Duke of Edinburgh prize. ISBN: 978-1-930536-54-8. www.bestpub.com

Read an unsolved mystery

Robert Apuzzo has provided a real service for historians, wreck divers and media junkies by pulling together *The Endless Search for the HMS Hussar*, a 154-page soft cover from R&L Publishing. The British Revolutionary War ship sank on 23 November 1780, after striking a rock in a current-raked narrow

stretch of water known as Hell's Gate, where New York's East River connects with Long Island Sound. It carried scores of shackled American prisoners to their deaths and, rumor holds, a fortune in gold and silver to pay British troops in Rhode Island. Apuzzo, an amateur archeologist and a New York history buff, collected articles dating from 1780 through 1985 from local newspapers and magazines about the *Hussar*, its wreck and many of the attempts to find the ship to salvage its rumored treasure. The articles provide glimpses of the people and society in their day. Since they're reprinted verbatim, the articles also show fluctuations in spelling and phrasing that occurred as the King's English evolved into an American language in the United States. Woodcuts and historic black and white photos illustrate the text. The gear images

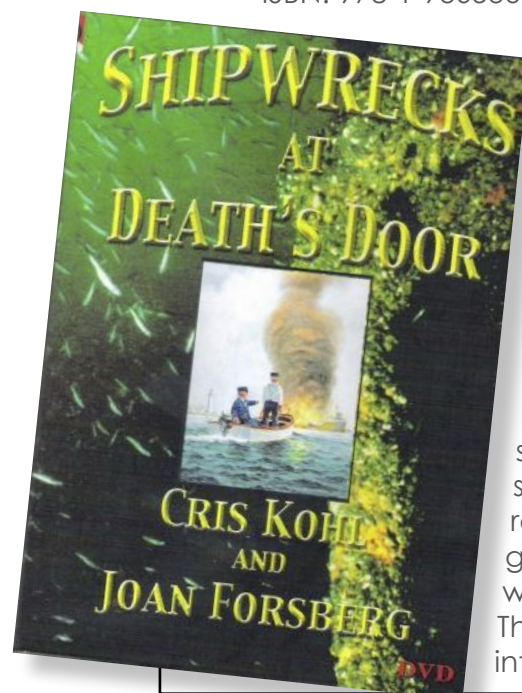
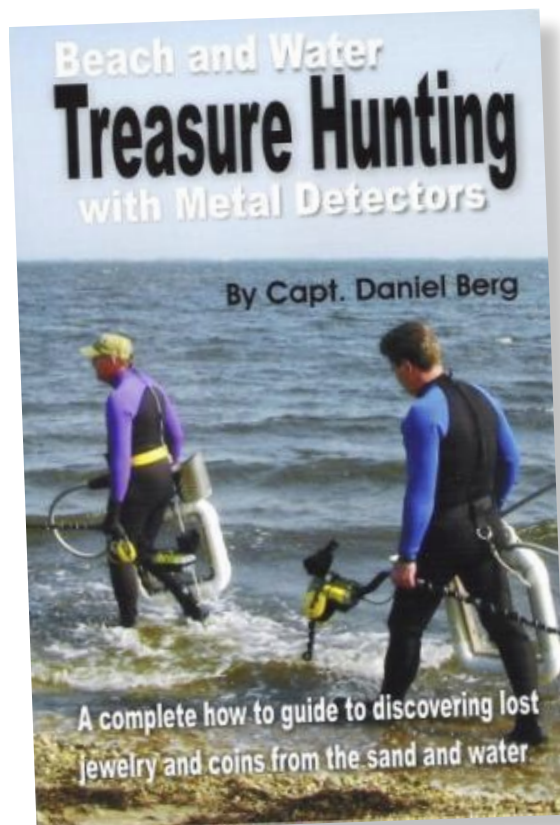
especially instill an appreciation for modern scuba kits. Despite attempts by hundreds of amateur and commercial salvors, no one has yet to find the jackpot if indeed there is one, so the final chapter of this mystery has yet to be written. ISBN: 978-0-9629913-2-5. E-mail the author at ERi101@aol.com.



A book to treasure

Captain Daniel Berg has developed a handy guide to help divers and non-divers find more fun and valuables in and around the water. *Beach and Water Treasure Hunting With Metal Detectors* from Berg's Aqua Explorers publications is a slim soft cover. Yet, its 68 pages cover anything a neophyte needs to know to get started looking for treasures at beaches and at depth. It starts with descriptions of the various detectors' features, explaining which are useful where. He then suggests techniques that could improve the odds of returning from an outing with valuables instead of bottle caps and very historic pop-top aluminum can openers. The book is illustrated throughout with gem-studded

rings, coins that are hundreds of years old and other artifacts, many recovered by his hunting buddy and fellow diver Mike McMeekin. The only thing lacking is an index, but it's hardly needed because of the good organization of the chapters. This is the most recent in a line of diving books that are available in many dive shops or on-line as eBooks or PDF downloads. ISBN: 978-0-557-14768-7 www.aquaexplorers.com



Relax to a view of Death's Door

Thanks to Great Lakes historians, Cris Kohl and Joan Forsberg, wreck divers can get a sense of visiting Lake Michigan's best sites by popping *Shipwrecks at Death's Door* into the DVD player. The 45-minute video draws its name from the series of islands and shoals interspersed with deep water that form passages into Green Bay, Wisconsin, USA. Opening shots from the deck of a ferry making way in rough seas through a snowy late-fall gale give viewers a sense of the fury captains face when the inland freshwater ocean turns ugly. Threading their vessels through the passages into the relative calm of Green Bay offered

their only chance for survival. Many didn't make it and now make the region a prime destination for diving. About one-third of the time is spent underwater with images by the authors as well as Kim Brungraber, a local diver and author. Kohl and Forsberg alternate narrating the video adding variety to the presentation, which is so packed with facts and anecdotes that it must be viewed several times to catch its content. Their stories of the ships and the people who sailed them add warmth to the tragedies that happened on cold seas. They also call attention to the many museums, pubs and quaint towns to visit during surface intervals. The DVD is a companion to their newly released book of the same title, which will be reviewed in an upcoming Book Log column. No ISBN. www.seawolfcommunications.com



tech talk

Wetsuits *Hot or not?* *How far have we come?* anno 2010

Today's modern wetsuit embodies technology that benefits divers with an abundant choice of options to fit most any size and shape of diver, and any style of diving activities from mild tropical to very cold water.

Text by Wayne Fenior

Waterproof's new W1 suits are a good example of how far contemporary wetsuit design has come



Birth of the wetsuit

Would you consider building your own wetsuit straight from raw materials? It hasn't been that long back in diving history when this option was widely utilized by divers trying either to save a little cash, or to get a closer custom fit. The materials and patterns were available from several dive suppliers. Fortunately, the choices now are better than ever for choosing your next perfect wetsuit.

Today's modern wetsuit embodies technology that benefits divers with an abundant choice of options to fit most any size and shape of diver, and any style of diving activities from mild tropical to reasonably cold water.

Wetsuits have long been one of the distin-

guishing marks of the scuba diver, along with our other gear like tanks, masks, and fins. But even as we've seen remarkable development over the 50-plus years of our sport, the underlying principles remain the same when considering the modern wetsuit: it must isolate and insulate.

The materials have evolved dramatically over time along with numerous styles and options available to the diver. But still the principle remains that if a suit fits poorly, even though constructed of the warmest and latest high tech materials, the diver will still get cold because of water flush (constantly needing to re-heat the water entering or sloshing around in the suit). The suit that is meant to provide protection from the elements is allowing the elements to flood in next to the diver's skin with every twist and turn of the body and fin kick.

Poly... erh!?

Polychloroprene, invented by DuPont scientists in 1930 and originally called Duprene, was the first mass produced synthetic rubber; and eventually branded as Neoprene.

In its raw unmodified form, its characteristics and insulating properties are very similar to rubber—the same substance earliest wetsuits were constructed from. By foaming the base polymer with nitrogen gas bubbles, the insulation properties greatly improve. Since the early 1970's, what we now know as neoprene has completely replaced rubber for the suits we wear today.

**Would you believe
AQUAQUIPMENT
have a better way**

Simple-to-follow assembly instructions enable the novice to produce a professional-looking wet suit first time—easily.

The extensive range of AQUAQUIPMENT low-cost kits is designed and produced to meet the need for a wet suit at a cost that all can afford.

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Flashback to 1971 and magazine advertisements of the day. Building your own wetsuit straight from raw materials was commonplace among divers trying either to save a little cash, or to get a closer custom fit

WATERPROOF



Full stretch

New materials in the last few years have given the diver the benefit of "full stretch" neoprene suits, which have spandex added to the material that is able to more closely fit the diver's body. But a possible liability of these new "super stretch suits" is the temptation for the manufacturer to utilize the materials as a quick fix for poor design. Remember also that as a suit needs to stretch to fit over problem fit areas, the insulation properties become less effective, as the suit becomes thinner. Another potentially dangerous problem that can occur as a diver squishes him- or herself into a suit that is just a bit tight is increased resistance effort in breathing underwater, as the wetsuit constricts the diver's potential lung volume (remember your first instructor taught you to breathe slightly slower and deeper underwater from a regulator).



Stretch panel on a modern suit



Wetsuits



Whenever diving in the ocean, I always recommend my students wear full suits for their protection benefits from scrapes and things that may sting if they get careless.

James Bond in *Thunderball* (1965) made wetsuits look hot... or not?

The lightweights

At the lightest end, one and two millimeter suits are available for the warmest tropical waters, and shorties (short sleeves and shorts), for the most tepid conditions. These lightweight suits are effective above 27°C (80°F). Whenever diving in the ocean, I always recommend my students wear full suits for their protection benefits from scrapes and things that may sting if they get careless.

If you will be in the water for extended periods, or if your activity level is going to be low, opt for the heavier suit. Where and when thermoclines are possible, opt for the heavier suit! Even in my native sunny Florida on the same dive site the same day, a dramatic difference



If you will be in the water for extended periods or if your activity level is going to be low, opt for the heavier suit

from morning to afternoon can be seen because of a thermocline that moved over the area. For safety sake, the diver should opt for more insulation, as you can always vent or flush the suit.

Mediums

Medium weight wetsuits are generally constructed with five millimeters of neoprene. Options for your style of diving include two-piece suits with farmer John/Jane bottoms and jacket style uppers that combine to give you two layers of insulation on your torso, in addition to the now traditional one piece suits.

The 7mm

For cold water below 21°C (70°F), 7mm neoprene will be necessary for all but the most active divers. It is in this category of suits where the manufacturers have the most opportunity for innovation. In addition to one-piece suits, be sure to

One or two pieces? Advertisement for Collins & Chambers from October 1969



tech talk

Warm enough?



For the sake of both safety and comfort, the diver should opt for more insulation, as one can always vent or flush the suit.

explore your options with two-piece suits and extra thermal insulation layering.

For the coldest temperatures, explore the semi-dry suits, which only allow a small quantity of water to enter the suit. Do your homework and shop well for this purchase, with your priority of properly fitting suit as your ultimate goal.

The usual evolution

Most divers enjoying our sport today go through a metamorphosis in their thinking and shopping patterns from when they select their original exposure suit to when they vow to never again make the mistake of "buying the cheapest to save money". But the diver who has learned the cold lesson that a quality suit does indeed make a difference in how comfortable they will be underwater, still may not know the questions to ask when choosing their next suit. This article will help you know what to look for along with the proper questions to ask your local dive retailer, as you prepare to shop for that new suit!

Ask the diveshop

Is this a company specializing in wetsuits? There is more to this question than the apparent answer. Most (if not all) major suppliers

SCUBAPRO

"Semidry!?"



SEACSUB

Semi-dry is a bit of a euphemism for "less-wet". These suits come with snugly-fitting seals at the wrists, neck and ankles, the purpose of which is to prevent water from leaving the suit as the wearer moves around. This does not mean that the suit is water-tight. The wearer does indeed get wet in a semi-dry suit, but the water that enters is soon warmed up and does not leave the suit readily, so the wearer remains warm. Any residual water circulation past the seals still causes heat loss. But semi-dry suits are cheap and simple compared to dry suits. These suits are usually also made from thicker grades of Neoprene.

of gear have branded suits to go along with their masks, fins, and regulators, and the lion's share of divers are proud to wear a wetsuit emblazoned with their favorite manufacturer's logo. But problems begin when divers are forced to choose between only four common sizes frequently offered (small, medium, large and XL in women's or men's). Remember, functionally, the suit isolates and insulates. If the isolation fails because of improper fitting, nearly no amount of insulation will occur as water continues to pour fresh into the suit.

What sizes are offered?

You may be lucky enough to fit

FOURTH ELEMENT

Wetsuits

into one of the four main offered sizes, but chances are that your body type may require more specialization. The premier companies offering exposure solutions will typically offer more options for the close fit (up to 20 or more different sizes). This increases the chance that you will get "your custom tailored fit" without the need to offer a custom built suit in your size (less wait for your size and a substantial savings in cost to the diver).

What are the layering options? You can expect to extend your diving season with optional vests, hoods, hooded vests, and even step-in hooded vests. If the suit fits properly, the option of additional layering will insulate the water trapped in the suit from external cooling.

Warranty?

Typically, the companies specializing in wetsuits will have longer warranties on materials and workmanship.



What is the construction of the suit?

Usually, a heavier suit will be glued and stitched to prevent water from entering the construction seams. Lighter suits (i.e. 1-3mm) are stitched on-

What about the kids?

Great care needs to be taken to assure that the same guidelines utilized for adults are afforded even more attention when outfitting children for scuba diving and other water sports. With close fit being the ultimate goal, remember that our little people will lose critical body heat even faster than adults, and if your water babies are typical, having extreme fun in the water will prevent them from looking for an exit long after most adults have reached their cold threshold. Be prepared to try multiple manufacturers' suits, looking for proper fit with no loose bagging along with the proper seals found on adult suits. The investment will keep your kids happier and safer as they enjoy the sport.



IG-COMPANY

ly—fine for tropical diving, but a problem whenever your diving day requires long periods in the water.

Is the suit anatomically correct versus a flat pattern?

The companies devoted to specializing in

A neutrally buoyant suit = less lead

Fourth Element's Thermocline neutrally buoyant system represented an evolution in thermal protection, using state of the art materials to maximize performance without compromising on comfort. The Thermocline neutrally buoyant wetsuit system is comprised of the long-sleeved top and the "explorer" and offers the equivalent protection of a 3mm wetsuit but weighing less than 1kg (2.2 lbs). Thermocline also provides a real solution for people who suffer from neoprene allergies by eliminating contact between the skin and the wetsuit.





Wetsuits

exposure suits offer their large variety of sizes based on an anatomical three-dimensional fit. When the suit fits correctly, there is very little (if any) slack areas where body mass fails to fill out the suit. These slack areas invite larger quantities of water to collect and slosh around in the suit, drawing more body heat and energy from the diver.

See your local retailer

It seems easy enough and tempting just to surf the internet hunting for the best price and the nicest looking suit. What the diver is missing out on is the expertise gained typically over many years as a dive professional. Your

retailer should ask you revealing questions that will help to find the right suit for your expected style of diving.

What type of diving are you buying the suit for?

The once in a lifetime trip to the Galapagos is no place for a 3mm wetsuit.

Which brands have you worn previously, and were there any challenges with fit, flush or seepage?

Sizing charts from manufacturers

Do your homework and shop well for this purchase, with your priority of properly fitting suit as your ultimate goal.

Is the suit three-dimensional or just made up of flat panels?

Slack areas invite larger quantities of water to collect and slosh around in the suit, drawing more body heat and energy from the diver.

Reflective linings

Australian manufacturer Radiator led the way in developing multilayered wetsuits. The Radiator suits combines four layers one of which is a reflective titanium coating that acts as a highly efficient barrier to the outside cold. www.radiator.net

PETER SYMES

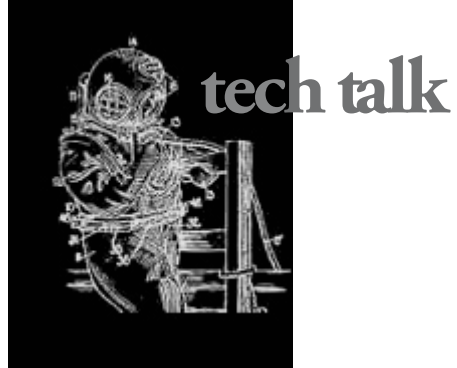
“To understand a man, walk a mile in his shoes”
Native American Proverb

To understand a revolution in dive boot comfort and performance, walk a mile in ours.



fourth element footwear





tech talk

Sun and salt takes it toll. Rinse well while your are out and hang to dry in a cool, airy and shaded place when you get home

helpful for finding your best fitting size, but they are only a guideline. Your retailer should help you in the fitting process to insure that your new wetsuit will fit well, so that you can stay warm.

Care

Neoprene will eventually fail as the material breaks down and nitrogen bubbles in the materials are crushed, broken and diminished. Rinsing your suit in fresh water after usage and drying out of the sun will keep the suit newer for a longer period of time.

I have certain associates that are in the water nearly every day with students, and they regularly will run their wetsuits through the washing machine on the gentle cycle with cold water and a mild detergent. Suit life is greatly extended by this practice, they have reported. Wetsuits should then be stored hanging loose to prevent crushing of the neoprene, in a dry cool place guarded from sunlight.

Wetsuit hygiene

A topic typically untouched by a lot of instructors is wetsuit hygiene, or more specifically the sound advice of not urinating in your wetsuit. A lot of divers will argue the point, but remember one of the functions of the suit is to isolate. As a good parent, I hope you wouldn't let your child sit for hours in a wet diaper, and it goes without saying, that I have seen what appears to be diaper rash on a few divers in my day. The practice of more and more dive centers today is the option not to rent wetsuits because of health issues. For those still wishing to rent, the vehicle rental practice is certainly worth considering: "An accident is as good as a sale." ■

As a good parent, I hope you wouldn't let your child sit for hours in a wet diaper, and it goes without saying, that I have seen what appears to be diaper rash on a few divers in my day.



PETER SYMES

Stats from our survey

Some interesting facts about your fellow divers wetsuit usage:

- What percentage of your dives in the past two years were made without a wetsuit?

Only 3% answering said none, with an overwhelming 52% answering 90-100% of the time.

- What are the water temperatures in which you conduct most of your dives?

Above 25°C/77°F for 30% of the majority, then diminishing with the water temp colder.

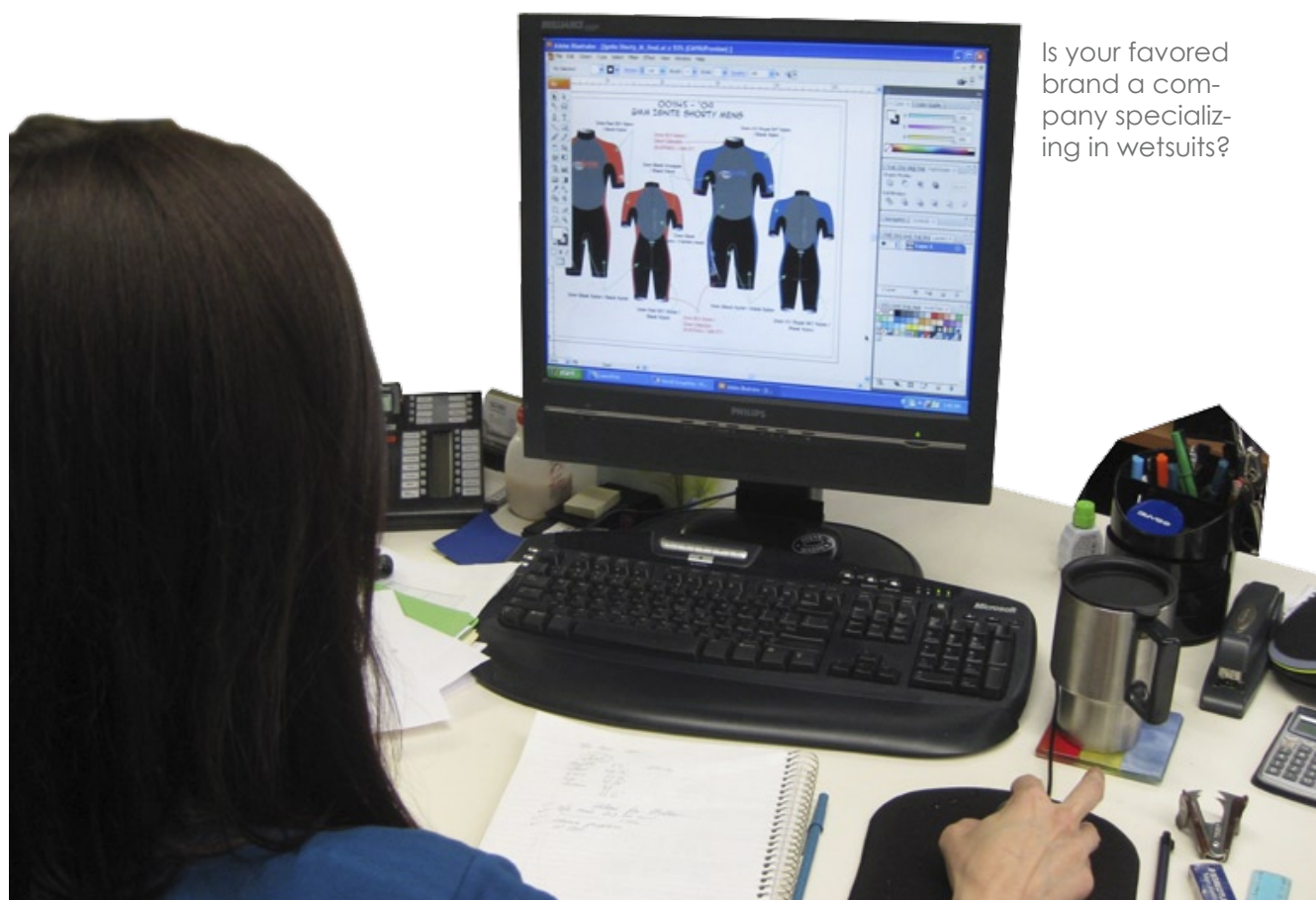
Many thanks to everyone who participated in our online survey and helped us prepare this article.

- What pieces of thermal protection do you own?

The highest percentage was the 3mm one-piece suit, with 61% of the respondents owning this suit. In second place was the 3mm shorty at 45%, and the least popular was the 5mm two-piece.

- What are the most and least important criteria you use in choosing a suit?

35% responded that price was most important; 25% said that their instructors opinion was least important; 26% said a friend's opinion was least important. Fit was overwhelmingly the strongest criteria for choosing a suit by 79% of the respondents. ■



Is your favored brand a company specializing in wetsuits?



The latest & coolest

Some of the

Some two months prior to going to press, we wrote all known manufacturers of wetsuits asking them to supply us with information and images on the latest models. Some did, others didn't

SeacSub SkinFlex

"300% stretch," boasts the Italian manufacturer. In a dynamic and continually changing world, here is the new frontier of wetsuits: "Hyper Flex" Neoprene with a new generation, ultra-elastic lining that stretches up to 300% and the water-resistant Silver Seal Titex zipper that allows high performance plus great fit and comfort.

Outer lining: Hyper Flex
 Inner lining: Fine Plush
 Zipper: Super Seal Titex
 Wrists and ankles: Glide Skin Hood:
 Integrated in the vest and with the "Air Draining" system
seacsub.com



Scubapro Everflex

Scubapro's advanced, extra-comfortable EverFlex line has been stylishly redesigned for an even better fit and freedom. The new EverFlex neoprene steamers are now in a pre-formed dimensional shape, so it fits and moves more naturally with your body and delivers unparalleled comfort, stretch and flexibility. Scubapro also added heliospan lining in the torso area of the steamers, for added protection and insulation. EverFlex provides excellent fit for a wide range of people. If you are tired of the struggle to get into your suit, EverFlex is for you.

www.scubapro.com



Camaro Seamless Pronomic

Camaro's seamless suit is hailed as a world's first thanks to a patented seamless bonding technology. The Hydronomic Series is the first Seamless generation and has been completely redesigned. The seamless bonding technology used with highly flexible material has created a suit with a high degree of comfort and freedom of movement.

The suit comes with a double collar, a release-zip and a G-Lock Zipper at the back. The 7 and 5mm suits are equipped with double cuffs and zips on arms and legs. The 3mm version is equipped water flap on arms and legs for warm water.

camaro.at



Bare Elastek

The Bare Elastek 5mm is a double glued full-stretch suit with high-end features and anatomically correct pattern for three-dimensional fit throughout. Features a heavy-duty, color coordinated, G-lock back zipper with stainless steel slider, skin-to-skin internal sealing zipper flap and embossed inner elbow flex panels.

barescubadiving.com



Fourth Element Proteus

Ideal for use in temperate to warm waters, this versatile dive wetsuit can also be combined with the Short John wetsuit extending its use into cooler conditions. With superstretch neoprene on the arms and legs where mobility is required and thermocore compression resistant neoprene on the body core panels, the 5mm Proteus offers outstanding thermal protection and comfort with excellent ease of movement. Available in 3mm, 5mm and 7mm. fourthelement.com



IQ Comfort-flex

The Smoothskin is laminated on one side and has a closed rubber surface on the other side. The smooth surface seals well with the skin and prevents the intrusion of water. An additional zipper at the collar provides additional wearing comfort. Under water, the throat is usually stretched due to the lying position, so the collar of wetsuits is tailored more tightly as to avoid water intruding. But on the surface, with a more natural position of the head, the collar feels restricting. This is where the neck zipper comes in; Open the zipper and breathe more easily.

iq-company.com



Cressi Lontra

New version of the Lontra wetsuit, made entirely from 7mm Ultraspan neoprene, which is exceptionally supple and soft. It is lined with Helioflex, a material that has excellent thermal characteristics. Produced in two versions: one for men (Lontra Man) and one for women (Lontra Lady), this is a modular wetsuit that includes an all-in-one jacket and hood, which can be purchased separately. www.cressi.com



Waterproof W2

W2 is Waterproof's new back-zip wetsuit. After all the excitement created by the W1 front-zip suit, the W2 had to exceed this suit, so the task set for the design team was challenging. The result, W2 available in two versions—5mm and 7mm—surpassed expectations. W2 features include anatomical gender-specific design, comfort front neck zipper, inner plush lining and a moulded rubber kneepad featuring a "hinge" effect. For further W2 suit and W2 icevest features and product information, please visit: www.waterproof.eu

“The thing with diving is that it can really bite you, and I soon discovered I wanted to share this new world with as many people as possible. The obvious answer for me was to start making underwater films, so I stole a friend’s camera for a couple of weeks, one which had been used by Cousteau on some of his underwater documentaries, and off I went.”



Mike Valentine

Underwater Cinematographer

You wonder, sometimes, how things link up. For example, how is a scuba diving suit connected to the likes of household names such as *Dr Who*, *Casino Royale*, *Trainspotting*, *Star Wars Episode I: The Phantom Menace*, *Basic Instinct II*, *Atonement* and the latest Ridley Scott/Russell Crowe epic, *Robin Hood*? Whilst on paper there’s not an obvious association, I know I’ll find the answer waiting for me in a small Chelsea café. A large gregarious Welshman, fizzing with energy, is talking in an animated fashion on a mobile. He is the renowned and much respected underwater cinematographer, Mike Valentine.

Interview by Roz Lund
Photos courtesy of Mike Valentine

It’s been more than 20 years since film director, Nicolas Roeg, gave Mike Valentine his first break filming Oliver Reed and Amanda Donohoe in *Castaway*. “I was in the Seychelles for almost two months, shooting and directing all the underwater sequences from a script that contained only two lines of description. The result was more than six minutes of screen time, something I still feel lucky to have achieved at that time” Valentine grinned. This achievement was remarkable because Valentine had just given up his “safe” day job as a senior sound technician with the BBC to work as a freelance underwater cameraman.

“I found it ironic that my first professional job was in the Seychelles, because this was where I first experienced scuba. In 1977, during a holiday there, I noticed a sign saying ‘Visit the Underwater World

for US\$20’. It was the best 20 bucks I have ever spent. I was instantly hooked. So, as soon as I got back to the UK, I joined the United London Hospital Diving Group—a local BSAC (British Sub Aqua Club)—and learnt to dive. The thing with diving is that it can really bite you, and I soon discovered I wanted to share this new world with as many people as possible. The obvious answer for me was to start making underwater films, so I stole a friend’s camera for a couple of weeks, one which had been used by Cousteau on some of his underwater documentaries, and off I went.”

Eventually, armed with *Silent World*, Valentine knocked on the door of BBC Acquisitions and showed them his 6.5 minute Red Sea mini epic. After shooting another ten films, he was given an offer he couldn’t refuse, to take his underwater expertise to the Seychelles to work on *Castaway*.

“Diving is an incredible sport, and

profile

something that I dearly love. When it comes to work, the diving I do is completely different. I've often noticed that recreational divers think that they can get into the film or television industry because they dive. It's not quite that simple.

"Diving is just the means of getting to work. I dive whilst other people catch a train. It's what

you do when you get to work that counts. In this day and age, it's never been easier for someone to pick up a video camera and shoot underwater and call themselves a director of photography or a camera operator," said Valentine. (A director of photography, or cinematographer, is the chief of the camera and lighting crews on a film, and therefore

responsible for achieving the artistic and technical decisions related to the image).

What matters

"At the end of the day, whilst you can use technology to help achieve an improbable shot, the one thing you can't buy, skip or fast forward, is experience. This is such an important thing, and

Diving is just the means of getting to work. I dive whilst other people catch a train. It's what you do when you get to work that counts.

good production teams know and appreciate that in the long run—having experienced personnel will save them money. It's not uncommon for me to have a meeting with the producer during pre-production and for them to remark that, "We've storyboarded the sequence, but we don't know how to shoot it, and we don't think it will work.

"Therefore, experience is an invaluable tool in my job. I not only have to work out how we will physically achieve the image desired, I have other major considerations, too, such as ensuring we stay within budget and timescales, logistics, and most importantly, actor and crew safety. After working on over 80 features, I can still say that every day we go to work is still fun, because I feel that we are still unlocking the door of the underwater world and sharing its beauty with as many people as possible," said Valentine.

"We"

"I say 'we' and I do mean, We. I could not achieve what I do on my own. I am part of a very strong team, and it's the only way we could do what we do successfully. You've watched us work, Roz, and observed that not all of our team scuba dives. Instead, we're split between top-



We're now working with Ridley Scott on his version of the Robin Hood story starring Russell Crowe



side and underwater. As you know, on the surface is Françoise, the underwater co-ordinator. Her job is mentally stressful, as she has to deliver the shot list. This means that she will talk through and rehearse every single shot with the whole crew before it happens—the topside crew, me, the artist(s),

"At the end of the day whilst you can use technology to help achieve an improbable shot, the one thing you can't buy, skip or fast forward, is experience."

the cable wrangler and the safety divers. It's imperative for a safe and successful shoot that everyone is relaxed, understands, and is happy, mentally and physically, with what is about to take place. When you look back at some of the more complicated sequences we've filmed, such as Daniel Craig and





Eva Green in the lift, which fills with water as the Venetian house sinks in *Casino Royale*, you can see why having a strong underwater co-ordinator is key.

"Sat alongside Françoise is the first assistant cameraman/focus puller, and next to him, the second assistant cameraman/clapper loader. And again, they are also crucial personnel. When you consider that the resulting footage will be blown up many times to become an enormous

image on a cinema screen, you can understand why so many people are involved in the camera department. Effectively, I point and shoot the image, whilst the first assistant cameraman ensures that the image is always sharp by remotely controlling the lens focus. Can you imagine if it's a tiny bit out of focus on a monitor, just how ghastly it will look on a huge screen at the Odeon Leicester Square? Then the second assistant camera-



Two of the 80 films on which Valentine has worked (left). Valentine in action on set (below)

When you consider that the resulting footage will be blown up many times to become an enormous image on a cinema screen, you can understand why so many people are involved in the camera department.

man is responsible for loading the film in the magazine, noting down what lenses were used, how many takes, etc, whilst working to the instruction of the first assistant cameraman. And then, the camera itself costs several thousand pounds, so you need both the first assistant cameraman and the second assistant cameraman to work together closely and ensure that all runs smoothly topside,

and that the housing is well-sealed, so that it does not flood.

"Meanwhile, underwater, I have a safety/cable wrangler diver with me monitoring my air and ensuring that I don't get tied up in cable, whilst every actor involved in the sequence has their own personal safety diver. Hence, you can see why I say 'we'. We've a solid team ethic where everyone understands and respects each other's position, and we all watch each other's backs," said Valentine.

Long days

"The film industry has traditionally long days, so that you get the most of the light. Consequently, a typical day for us will be to arrive at the

Mike Valentine

studio, or on location, at 7:30 am, in time for breakfast. Prep starts at 8:00 am, and we are in the water by 9:00 am. Four hours later, we will climb out for lunch. Then, at 2:00 pm, we are back in the water until 6 or 7:00 pm. So, diving for a living is not only mentally demanding, it's physically demanding, too," said Valentine.

Believe me, the producer doesn't come around to ask if the dive team and I are warm enough.

Shooting Robin Hood

"We're now working with Ridley Scott on his version of the *Robin Hood* story starring Russell Crowe. Obviously, at my age, I want to be as warm as possible, so decent suits and

thermal underwear are high on the list for my team and I. When you are working on a big budget feature, believe me,





Mike Valentine hangs out with a few extras on the movie set

confidence. Normally, the artists we work with have very little experience, so we need to train them for the shoot. A good example of this was Keira Knightley and *Atonement*. In one of the sequences we filmed, she had to hang in front of a blue screen for about four hours. Although she was a bit nervous at the beginning to be underwa-

After working on over 80 features, I can still say that every day we go to work is still fun, because I feel that we are still unlocking the door of the underwater world and sharing it's beauty with as many people as possible.



ter, the temperature really built her confidence, and she relaxed, which made for a successful shoot for all. "Instilling confidence and trust in an artist is vital. We were brought in to shoot a complicated sequence with Nicole Kidman in *The Hours*. The idea was that her head was stuck inside a tree root, and of course, her hair was terribly tangled up. We got her 'comfortable' and then added Fuller's Earth to the water until we had about three feet of visibility. She then held her breath for 15 seconds, as I slowly tracked the camera into her face. The result was amazing. At first, you see nothing. Then, it's like a painting revealing layers, and finally, you see Nicole 'dead' underwater. "She climbed out after the take and

our job properly. We'd put an actor into a very challenging and potentially dangerous situation, and very safely achieved a realistic shot that the audience truly believed and embraced.

"I really get a kick out of achieving a shot where the audience never even considers any of the problems associated in getting it," said Valentine. ■

the producer doesn't come around to ask if the dive team and I are warm enough—it just doesn't happen. So, we all need to be responsible for our own hydration, safety, fitness and stamina. None of us can just climb out of the water after an hour, because we've had enough, or we're cold, and it's not uncommon for us to be in the water for eight hours. You see, we're in the water longer than anyone else concerned with the feature. We're first in because we need to get the shot lined up. After that, we're filming the actors. Then, in between acting takes, we could also be filming anything from model ships to explosions and checking how shots look. As a result, we're always the last out of the water as well. Getting cold is not an option.

"I guess part of being the most effective 'we' also means having the best and latest equipment (in test) at our disposal. Consequently, we don't dive

any old piece of equipment. Having the right kit, which we know will consistently perform—so we can forget about it and get on with our job—is important to us," said Valentine.

Warm water

"It does make a change to film outdoors, because most of the filming I do these days is at Pinewood at the purpose built underwater stage. Ironically, this tank brings its own set of problems, because this time, we're working in very warm water of approximately 30°C/90°F. When you are filming babies through to Sharon Stone, keeping them at 30°C keeps them confident to work underwater," said Valentine.

Instilling confidence

It's funny, temperature not only has an impact on breathing rates, dexterity and one's ability to think and act effectively, it also greatly influences

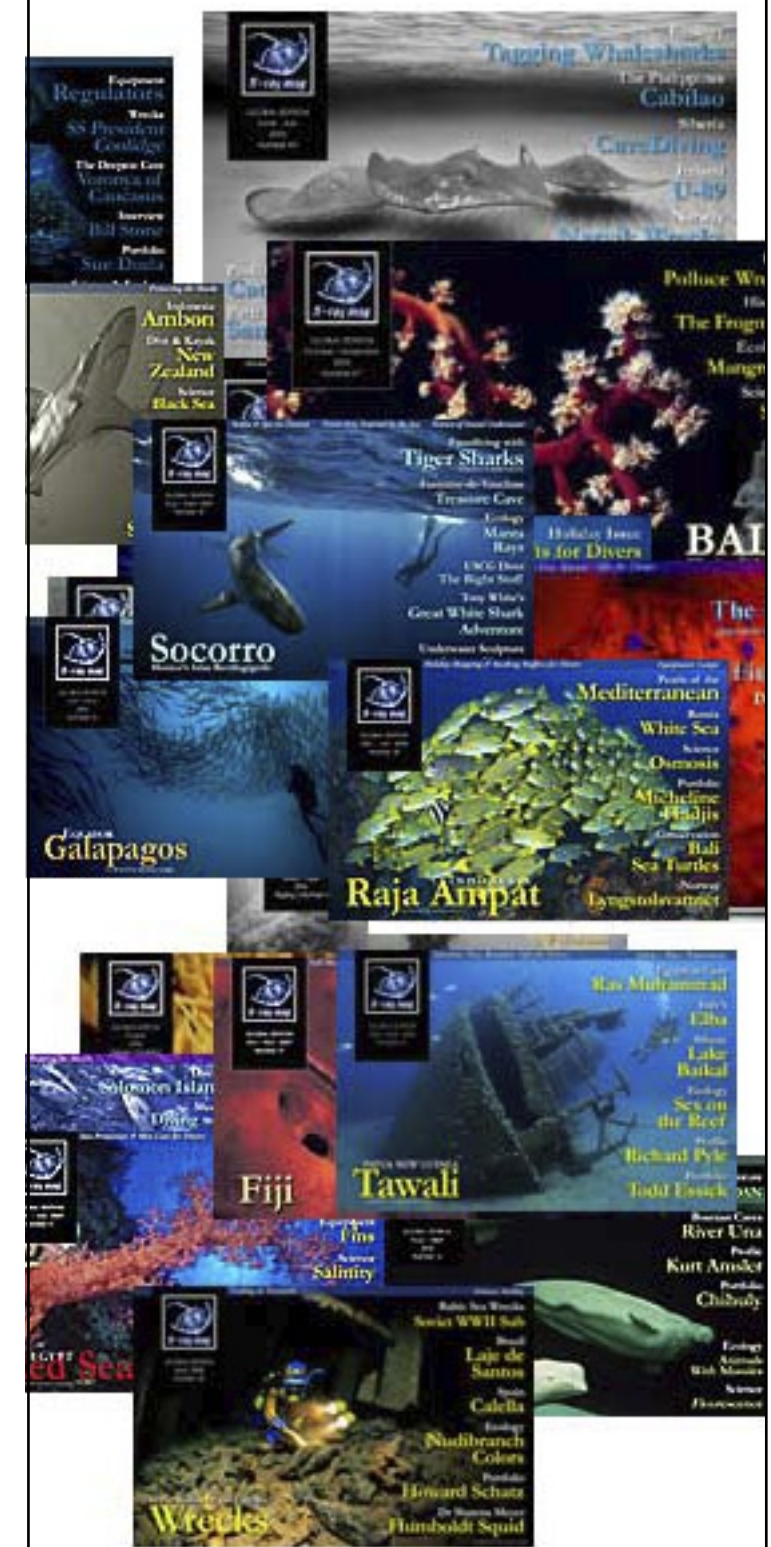
ter, the temperature really built her confidence, and she relaxed, which made for a successful shoot for all.

"Instilling confidence and trust in an artist is vital. We were brought in to shoot a complicated sequence with Nicole Kidman in *The Hours*. The idea was that her head was stuck inside a tree root, and of course, her hair was terribly tangled up. We got her 'comfortable' and then added Fuller's Earth to the water until we had about three feet of visibility. She then held her breath for 15 seconds, as I slowly tracked the camera into her face. The result was amazing. At first, you see nothing. Then, it's like a painting revealing layers, and finally, you see Nicole 'dead' underwater.

"She climbed out after the take and

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Spinies are curious and playful. After materializing from the emerald haze, they quite often zip from one diver to the next, like lost puppies sniffing at the heels of strangers.

— Andy Murch



Spiny Dogfish

and politicians

Text and photos by Andy Murch



Dogfish



rather special. By counting the lines on their dorsal spines (a bit like counting tree rings), scientists have calculated that they are extremely long-lived sharks, possibly reaching the ripe old age of 70. They also hold the record for the longest gestation of

clocks leave them extremely vulnerable to overfishing. Off the coast of Europe, where spines have been relentlessly fished to supply the demand for fish and chips, populations are at an all time low.

Conversely, in the Eastern Atlantic, catch limits that were introduced a decade ago have resulted in an upswing in dogfish numbers along the eastern seaboard. Their stocks have rebounded to the point where there are reports of marauding plagues of spiny dogfish destroying nets and depleting other fish and

any living vertebrate (up to a whopping two years), and they do not reach sexual maturity until their late teens or early twenties.

are invertebrate species that fishermen are trying to target. In an ideal world, big schools of dogfish should not be a problem. Historically, spines have always been abundant sharks. Veteran divers that were active in British Columbia back in the 70's and early 80's, relate tales of impenetrable clouds of dogfish tumbling over each other as they swept along the reefs in search of food. Their collective biomass would block out the sun, and their movements over the sea floor would generate a sand storm that reduced visibility to zero.

Unfortunately, their slow biological

You won't find Spiny dogfish on most shark diver's 'bucket lists'. In fact, the only time that your average diver will come into contact with a dogfish is when it is covered in batter, served with chips and bathed in an artery-constricting amount of salt and vinegar. It's ironic really, because as sharks go, these pint-sized predators are some of the most interesting sharks you're ever likely to bump into underwater.

Whale sharks for example, are interesting in a Goodyear Blimp kind of way, but they really don't do much other than swim monotonously forward, mouth agape, consuming copious amounts of plankton. If you've ever swum with one, you'll be familiar with their nonchalant stare and slowly weaving tail that quickly leaves you floundering in its wake.

Not so with spiny dogfishes. Spinies are curious and playful.

After materializing from the emerald haze, they quite often zip from one diver to the next, like lost puppies sniffing at the heels of strangers.

If you bring them a few tidbits, they'll be your friends for as long as the food supply lasts. If not, once they have sated their curiosity, they generally disappear back into the fog, but their vibrant personalities are guaranteed to leave an indelible impression

even after a very brief encounter.

Physiology

Spiny dogfish are physiologically

Population

Unfortunately, in the brave new world of the 21st century where practi-



cally all fish stocks have been depleted, the oceans may no longer be able to support dogfish in such large numbers.

The wholesale slaughter of larger shark species is a big part of the puzzle. Overfishing of apex predatory sharks has left spinies with few natural enemies that are capable of keeping their numbers in check.

With many fisheries hanging in the balance, more and more fishermen are expressing that western Atlantic dogfish stocks should be culled to take them out of the fight for food.

Last month, spiny

big blow to shark conservation in general, but regarding spinies, perhaps that was a good thing.

Solutions

The sensible course of action would

be for the European Community to impose a regional moratorium that would protect European dogfish stocks while allowing North American fishing fleets to keep operating. Hopefully, this will occur in the not

dogfish were among eight species of sharks that were put forward for inclusion in CITES Appendix II. A CITES listing would have given the endangered European spiny stocks a much needed respite from fishing pressure, but it would also have protected the rampant Western Atlantic populations.

Through a combination of questionable science and political maneuvering by wealthy fishing nations, all of the proposed species were rejected. It was a

too distant future.

Meanwhile, the coast of British Columbia is still one of the best places on the planet to encounter friendly spiny dogfish. Quadra Island—which has some of the most vibrant wall diving in the Pacific North West—is a particularly dogfishy place. During the summer months, it is fairly common for divers to be buzzed multiple times on a single dive. If you're not the type of diver that is scared off by 'non-tropical' conditions, give BC a try. A dive with a handful of spiny dogfish is an experience you'll not soon forget. ■





Text and photos by Barb Roy

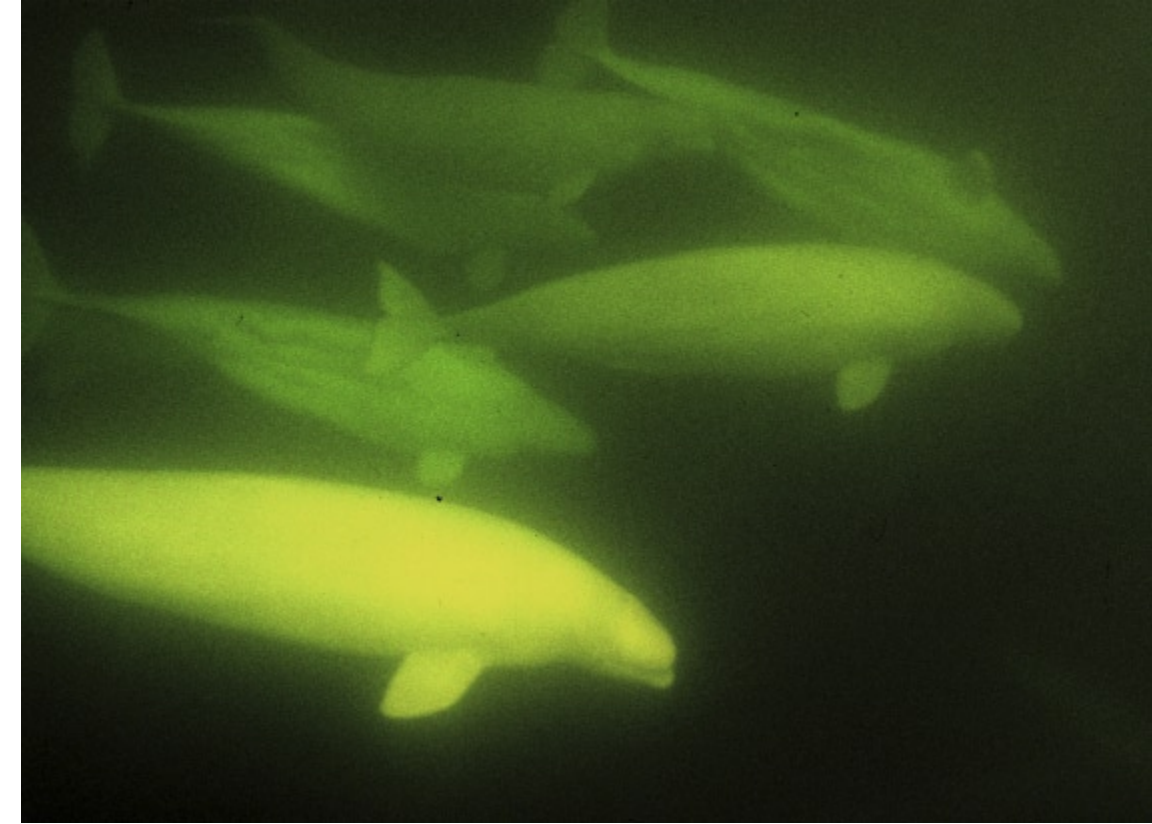
Churchill

Trekking Canada's Sub-Arctic Region in Manitoba



THIS PAGE: A wall of curious Beluga whales approaches the divers, glowing golden from the tannins in the water and showing white humps at the surface (above). PREVIOUS PAGE: View of Hudson Bay from town

The arctic air was crisp as I waited for my dive buddy, Rob Pritchett, to roll back into the water from the Zodiac. While in the water I made a quick scan of the shore and bay for polar bears, since they are excellent swimmers and predators to be wary of. A light breeze rippled across the smooth sub-arctic surface of Hudson Bay, sending an icy chill down my back. While listening to the soft tranquil hum of the zodiac's idling outboard, I noticed a pod of spouting belugas change their directional path and head towards us. Excitement embraced an already exhilarating moment, as I fumbled to locate my camera. Within seconds we were surrounded at the surface! Their white backs gleamed in a late afternoon sun, and the murky tannin from the nearby Churchill River caused the belugas to glow an eerie yellow underwater. The previous day, we were told by a whale-watching guide that they will only come close if you're snorkeling at the surface, but today we hoped for more by using scuba.





Churchill

A sculpin fish sulks on the sea floor (left); Sea anemones are abundant along the coast (below)



At the surface, the rounded back of a Beluga can be seen half lit by the sun



Divers prepare to snorkel with the Belugas (left)

Tiny nudibranch can be found among fronds of sea flora (right)



Rob entered with a splash and we descended to 16 meters (55 feet) at the top of a flat pinnacle in Button Bay not far from the town of Churchill. Visibility gradually increased with depth, unlike the water temperature, which decreased to 2.7°C (37°F).

Life was indeed sparse in this harsh remote underwater wilderness, but the orange and yellow anemones, clusters of pink soft coral and several dozen decorator crabs seemed to be flourishing. Some sections were covered with dense patches of algae hiding invertebrate life, while others were bare and smooth with only a few sea stars. Hiding under a leaf of algae was a large armor-plated shrimp about the length of Rob's hand. I later learned it was probably a 'tank shrimp'.

As usual, I carried two cameras to document as much as possible. A high-pitched chatter of whistles and clicks seemed to tease us just out of sight. Doubting the Beluga would ever approach us underwater, I focused on obtaining macro images as quickly as possible, since my fingers were already growing numb after only 12 minutes of

bottom time! Some of my photographic subjects included a small nudibranch on an orange burrowing sea cucumber, more shrimp, a few sculpins and several amphipods, with the latter found in mid-water.

Just as my face was beginning to really feel the cold, Rob appeared in front of me and motioned to turn around. Not knowing what to expect, I slowly turned to discover a massive wall of belugas! Their accumulation was so great they filled our view.

Some were vertical in the water, others watched head-on and some slowly swam by. In awe, we watched motionless as about 30 came within six meters (20 feet) of us, then parted into two sections and swam in wide circles around us with the two groups going in opposite directions. They bobbed their flexible heads—their cervical vertebrae are not fused—and swayed their 3-5 meter- (10-15 foot-) long one-ton bodies. Light vibrations seemed to emanate from them as they curiously bounced sonar echolocation waves off us for a



better understanding of what we were. "Oh shisnic!" I muttered aloud through my regulator, realizing I hadn't fired off a single wide-angle shot. For ten minutes they swam around us, sometimes pausing just out of reach, maybe for a closer look. A baby, still gray in color, hovered close to mom and watched. I often later wondered if we might have been the objects of their study. Or...perhaps our unusual structure and sounds (tanks and bubbles) sparked an interest for them to learn more. Nonetheless, there we

calmly sat, turning into scuba popsicles, experiencing one hell-of-a unique encounter, not soon to be forgotten!

Churchill

This was one of my first dives in the remote township of Churchill, Manitoba, over ten years ago. I had hooked up with Rob, an RCMP officer stationed in Churchill, through our mutual friend, Ian Hall, who operated a dive charter business in Nanaimo, British Columbia. Rob provided me with the use of tanks, weights and a means to



CLOCKWISE: The flavor of rustic pioneer life distinguish local tourist shops like the Arctic Trading Company in Churchill; Wildflowers such as purple paintbrush decorate the fields in the spring/summer; Delicious local cuisine at the Lazy Bear Lodge; Sunset in the Canadian Sub-Arctic of Manitoba



get airfills at the local fire department.

There are mainly two ways for visitors to get to Churchill—fly or take VIA Rail, a two-day train ride from Winnipeg. Feeling adventurous I took the latter. Fortunately, I was also assigned a roomette or sleeping compartment on the train. If you are an underwater photographer, you will have an idea of how much luggage I was traveling with and how hard it is to separate a photographer from their equipment.

This tiny space was designed to accommodate only one, approximately 1.2x1.8 meters (4x6-feet) in size. Within this space was one cushioned chair next to an oversized window. A small toilet was located under the chair, and a tiny sink pulled down from the wall, complete with running water. The bed also pulled down covering the entire room. Showers and food service were in another train car. I must say though, the rhythm of the train was ever so soothing. Overall, quite the escapade!

Rob and I used a four-wheeler for the shore dives and rented a boat with a driver

for deeper dives, like the one described earlier. My lodging consisted of an inexpensive local bed and breakfast lodge where I had the opportunity to meet other travelers and back-packers from around the world. For transportation, I rented an old Ford pickup.

It was July then, and colorful wildflowers covered the countryside and scented the air with the fragrance of springtime. I must have spent hours in that old truck exploring one dead-end road after another. Churchill, however, was not without its challenges, and I'm not referring to the occasional polar bears one might encounter while out for an evening stroll after a meal of caribou stew. It's the mosquitoes.

When you have an environment such as Churchill, located on the western shore of Hudson Bay in a sub-arctic region, spring, summer and fall are limited to about ten weeks, thus creating an explosion of life! The same goes for the bugs. If I wanted to stop and photograph something—a beautiful sunset, a field of flowers or one of the 250



A sled dog sign tells it like it is...



Miss Piggy plane wreck (above); A local shows how to build a stone landmark called an *inukshuk* (left) — a tradition of the Arctic native peoples

species of migrating birds—I had to prepare my camera while in transit. When I arrived at the preferred site, I would park the truck (still running), quickly jump out to snap off as many images as possible during an average 30-second window before being inundated by the bugs. If more images were desired, I would simply run around the truck again for a 15-second window (bugs growing wiser to my tactics). Another sprint around the truck and I could often leap into the cab with minimal followers to later deal with.

Mosquito spray did help, but the little buggers seemed to know exactly to the second when the deterrent wore off. Even though the mosquitoes were a challenge, the journey was well worth the trip, especially to dive and see the belugas in such a natural setting.

Polar bears

Over the years, residents and business owners of Churchill have successfully survived by marketing their natural resources through ecotourism, utilizing almost every season.

Visitors arriving in late October and November are able to see polar bears from the safety of customized tour buses, as the bears await the return of the pack to continue with their hunting. Some bears tend to awake early, while others make their way back to the coast after being inland for some time. But if the bears arrive too early, they can pose a problem to unwary tourists.

I remember Rob telling me how he was part of a team who went out and rounded up bears that wandered too close to town. They would tranquilize them, put the bears into big round metal cages, and carry them off to the other side of the river away from town, or transport the bears (within the cage) by helicopter up to 20km (12.5 miles) north along the coast. He also said a few stubborn ones found their way back to town.

The bear patrol of today is still proficient in

keeping the town free of roving individuals and mothers with cubs. If you happen to see a dirty-white spot out in the tundra during July or August, or along the shore near the smooth boulders, there's a good chance it might be a polar bear—so keep in mind, they can eat you!

Arctic features

From November to March one can enjoy the brilliant colors of the Aurora Borealis dancing across the horizon. A milder version can also be seen during the summer, but not with the same grandeur. From late May



COUNTER-CLOCKWISE: Canon at Cape Mary Battery (above); Polar bear cages; Polar bear tour bus; Using an off-road vehicle to get around town is the locals' preferred mode of travel. BELOW: Location of Churchill on global map of North America





ANSGAR WALK / CREATIVE COMMONS



Churchill

LEFT TO RIGHT: Polar bears on Cape Churchill; A look-out with rifle watches for polar bears; Scene of the town of Churchill; Wild orchids can be found in the fields around town

POLAR BEAR POPULATION DECREASE: According to a report entitled, *Left Off the List*, published by the David Suzuki Foundation, a decline of 22 percent of the Western Hudson Bay polar bear population—the most studied population in the world—has occurred between 1987 and 2004. Scientists have drawn a significant correlation between global warming, the earlier break-up of sea ice, and the weaker condition (e.g. reduced fertility rates) of the Western Hudson Bay bears.

they had to offer. I also opted for flying in with Calm Air, shortening my trip by four days so I could do a stopover in Winnipeg on the way back.

Churchill still seemed to wear the look of an old northern frontier settlement, perhaps because it originally grew from a remote outpost in the late 1920's. Not much use for a rental vehicle any more because most of the tour companies now pick up their guests. Of the approximately 1000 year-round residents, four-wheelers are still the preferred mode of transportation, parked like cars everywhere. Some even fury navigators (dogs)!

Excursions

Unfortunately scuba diving is still not offered unless you pack in all your gear and my friend Rob was relocated. Visitors can however, participate in kayaking, whale watching and beluga snorkeling excursions.

The Lazy Bear is also preparing to offer inland fishing trips on the Churchill River along with wildlife sightseeing tours. After talking with Wally Daudrich, the owner, I gathered the Lazy Bear Lodge is willing to customize trips for just about any group. Their guides also seemed to go

out of their way in providing professional, knowledgeable tour guides.

Self-guided tours and interpretive talks are available through Parks Canada at the VIA Rail station and at Cape Mary National Historic Site, a stone battery originally constructed to provide additional protection for the settlement at the river's mouth. During both visits I found Cape Mary to be an excellent location for bird- and whale-watching!

During the latest trip, the guards posted with rifles on the walls were keeping an eye out for polar bears, rather than invading troops.

My first outing with Lazy Bear Lodge was a paddling trip on the river. The belugas came very close to the kayaks, and I'm sure the boats gave off a strange sensation when echolocation was used. Although a slight current pushed the kayaks around, rudders made it easy to maneuver. All around us, the belugas constantly spouted and released bubbles under the boats. Both adults and babies came close, their gleaming white and gray bodies standing out in the copper-coloured river water.

These majestic belugas will reach nearly six meters (18 feet) in length

and weigh up to 1,600 kilograms (3,500 pounds). They are very sociable and usually can be found in the Arctic and sub-Arctic waters above the 50th parallel. They love to play and have few natural predators (orca and polar bear).

Belugas are often called "sea canaries" because of their strange high-pitched whistles, clicking, chirping and other vocalizations. They are fond of this area for having their young and feeding on the river's rich run of capelin (small herring fish).

After playing with the belugas we ventured out on a land excursion to the wreckage site of *Miss Piggy*, a Curtis C-46 freight plane. The crash took place in 1979 while on approach to Churchill. Once again our guide brought along a bear deterrent (rifle). I brought my camera but never thought about shooting bears with anything else. During my previous trip, I visited the site with only a friend, who was probably a faster runner anyway.

The plane's engine currently sits next to one of the wings. Unfortunately time, the elements, and vandalism have taken their toll on the remains, leaving an empty shell sitting on huge moss and tundra covered boulders. Even the



View a short video clip of a curious Beluga whale mugging for the camera (click on the image below to watch)



Video shows divers snorkeling with a large group of Belugas (click on the image at left to watch); Prince of Wales Fort is being fully renovated (below)

useless at the surface. For video footage, I used a smaller housed camera (Cannon G7) in an Ikelite housing with no lights.

The water colouration was still affected by the river tannin causing it to have a murky yellow haze. Once again the belugas appeared to

must have looked like we were trolling for belugas, or maybe polar bears.

It wasn't long before a pod came to investigate. A few at first, but then more and more became curious. Soon, they were everywhere. The two in the water were making as much noise as the belugas. Not sure who was more excited...

Soon, it was my turn. I tried to enter without making any noise and found the surface temperature to be quite warm, maybe low 40's, compared to my scuba visit. With the sun shining and no wind on the horizon, it was turning out to be a great day, especially when the belugas came to check me out.

glow underwater.

It also seemed that they liked to position themselves directly under snorkelers just out of reach and turn their white undersides up to watch. Forty-five minutes passed like seconds, and not once did they make an aggressive move or seem afraid of us in any way. They just liked following the boat and probably laughing at the funny looking critters or "lures" being pulled behind it.

Topside attractions

Two other excursions not to miss when visiting Churchill are a visit to the Prince of Wales Fort National Historic Site and a trip out to the wreck of the *Ithaca*. The fort is located across the river from town. History states the fortress took the Hudson's Bay Company around 40 years to build, starting in 1731.

Currently, the Fort is undergoing massive renovations. Original iron cannons now lay on the ground in a row just outside the main entry, wait-

ing to be remounted on the walls.

The wreck of the *Ithaca* is a bit of a drive but fun to check out. In 1961, the cargo vessel was caught in a high wind-storm and washed ashore at Bird Cove. There it remained, sitting upright and exposed to the elements.

During my last visit, Rob and I walked out for closer examination, but at that time Rob was packing a big bear rifle. On this trip, the group decided not to tempt fate for a closer look at the rusting hulk.

On the way out to the *Ithaca*, you might get a chance to stop and visit a local dog musher's team. During the winter, some of the dogs are used for sled rides and others for racing. During our tour, the guide said he had heard stories from the caretakers who arrived to occasionally find the dogs playing with polar bears!

On the way back to town, our guide showed us where the Akjuit Aerospace was and the Churchill Northern Studies Centre. He also explained that the Churchill Research Range had 3,500 launches in its 28-year history through 1989.

instruments where the pilots once sat have disappeared.

After photographing the crash site, I began looking around for what flowers there might be and discovered some tiny orchids only a few millimeters high next to a puddle of water on one of the boulders. How easy it is to miss these rare delights.

Snorkeling with Belugas

Before my journey ended Wally took me and a couple of his new guides out to snorkel with the belugas. All equipment

was provided, including a quick douse of mosquito spray. Speaking of mosquitoes, and if you plan to travel with your own snorkel, the type that works best are the dry snorkels because the bugs can't be sucked in.

I'm not sure but I believe we were once again in Button Bay where Rob and I did one of our first boat dives with the belugas. The two guides donned their dry suits and snorkeling gear and entered the water. Wally had them hold onto a pole in the water, as he slowly pulled them with the boat. From a distance, it

Rather than holding onto the pole, I hooked my leg over it and was pulled backwards, keeping my hands free to work the camera controls. Strokes were



Churchill



LEFT TO RIGHT: Wreckage of the *MV Ithaca*; The staff of Winnipeg's Tall Grass Prairie Bread Company show off yummy baked goodies; Old St. Boniface City Hall in the French Quarter of Winnipeg. BOTTOM LEFT: St. Boniface Museum in the French Quarter of Winnipeg

Overall I found my journey to Churchill quite rewarding for the activities one can participate in. My stay at the Lazy Bear Lodge was first-rate, and I thought the rustic log construction fit right in. The diners in their restaurant were exceptional, especially the evening specials. Their daily breakfast buffets on the other hand could use more variety.

What to Bring

Summer visitors to Churchill might want to

pack some quality bug spray, sun block, a sun hat and mosquito netting, if one is planning any hikes. I brought my dive mask (prescription lenses) and my snorkel and fins.

Words of Wisdom

I did find out about condensation in my camera housing the hard way. With topside temperatures hovering between 21-26°C (70-80°F) on a sunny day and water temperatures between 0-4.4°C (32-40°F), condensation tends to build up on the dome port of the housing. To avoid this, I placed my housing (with camera inside) into a bin or bucket of cold ocean water while still at the dock, and covered it with a wet towel to keep it out of the sun.

Winnipeg Stopover

This is a city not to miss if you want the full Manitoba package. Whether you travel by air or rail, the cosmopolitan city of Winnipeg is where you will

depart from and return to for a trip to Churchill. As I mentioned earlier, I chose to fly into Churchill, so

I could enjoy a few days in Winnipeg to relax and explore some of the city's cultural diversity.

During my brief stint, I stayed at The Forks, a Natural Historic Site of Canada located at the junction of the Red and Assiniboine Rivers. This was once a meeting place where aboriginal tribes once met, dating back to over 3000 years. Today, it is a site filled with unique shops, restaurants, community events and self-guided tours.

Across the Esplanade Reil bridge is the French Quarter and home to St. Boniface, one of the oldest areas in Winnipeg. The other direction leads into downtown Winnipeg and the East Exchange District where the Manitoba Museum is located.

A new permanent exhibit is now open in the museum called *Ancient Seas*, creating an aquarium-like atmosphere with sound, video and multi-layered 3-D animation. This unique gaze back in time takes a look at prehistoric marine Manitoba, including Churchill when it was submerged under a tropical sea of

the Ordovician Period, 450 million years ago. www.manitobamuseum.ca

For more information about traveling to Winnipeg, visit the following links:

Tourism Winnipeg

www.destinationwinnipeg.ca

Tourisme Reil

www.tourismereil.com

Inn at the Forks

www.innforks.com

Churchill Travel Links

Churchill Chamber of Commerce

www.churchill.ca

Parks Canada

www.pc.gc.ca

Travel Manitoba

www.everythingchurchill.com

Via Rail

www.viarail.ca

Calm Air

www.calmair.com

Lazy Bear Lodge

www.lazybearlodge.com ■



VIA Rail train transports guests in style to Churchill from Winnipeg



Practice makes perfect; basic skills in technical diving can make it seem like one is learning to dive all over again, albeit better with more streamlined trim

Lessons from Technical Diving

Text and photos courtesy of Mark Powell

Diving is an activity that appeals to a huge selection of people, and within diving, there are almost as many ways to enjoy the sport as there are participants. During the 1990's scuba diving became a mass participation sport. The increase in holidays to exotic destinations, together with a growing commercialisation of diver training

agencies, combined to make it was possible for people to do a basic open water course in a few days during the annual summer holiday. Whole families could do an open water diving qualification, which allowed Mum, Dad and the kids to experience the wonders of the undersea world.

While the barriers to this underwater world were gradually being broken down, a small group of experienced divers were starting to push the limits of traditional recreational scuba diving. This movement, which has been christened 'technical diving', started off with just a few dedicated individuals. Over the last few years, this area has seen a huge increase in interest, and now a significant number of divers are moving towards technical diving. In this and subsequent articles, we will explore what is meant by technical diving, what is involved, the

risks that arise and how you can move towards this type of diving. For those who are not tempted to venture into this area of the sport, we will also discuss what lessons can be learnt from technical diving in order to improve normal recreational diving. This is similar to the way in which the majority of motorists will never come close to a Formula One Grand Prix car, but make use, in their own cars, of many of the innovations that have been developed by the Formula One teams.

In order to talk about technical diving, we should first try to define what is

meant by the phrase *technical diving*. This is not as easy as it might seem. There is no agreed definition of the phrase, and different people use it to mean different things.

One common definition is that technical diving is everything beyond recreational diving. This is a good starting point but does have a few problems. First of all, different organisations have different limits for what constitutes recreational diving. For example, some organisations do not allow decompression diving within the limits of recreational diving whilst

Technical dive instructor, Mark Powell, geared up for a technical dive



other organisations do. A second problem in defining technical diving as everything beyond recreational diving is that the dividing line between the two is not fixed. For example in the early 1980's, Nitrox was considered to be firmly in the technical diving area.

It was thought to be too risky for use by recreational divers. Yet over the last twenty years, Nitrox has become much more widely accepted, and today, when used correctly, is recognised as offering significant safety

benefits for all divers.

Another definition is that technical diving is the type of diving that is at the leading edge of the sport, or the type of diving that is carried out by the pioneers. This is another appealing definition but suffers from some of the same problems as the previous ones. Where do we draw the line between the leading edge and mainstream but adventurous diving?

So, we can see that a firm definition of what constitutes technical diving is difficult to pin down. Despite this, it is usually easy to recognise it when we see it. Furthermore, it is clear that there are certain aspects that we can use to identify technical rather than recreational diving.

Dives to depths greater than those found in recreational diving, or involving significantly longer dive times, are typical in the field of technical diving. Dives are undertaken to considerably greater depths than the recreational limit of 40m. Depths of 50m to 100m are not uncommon, with many dives greater than 100m or even 200m. This inevitably means that technical diving is decompression diving. However, not all decompression diving is necessarily technical diving, as some recreational agencies do allow limited decompression.

Deco time

In recreational diving, we often hear the term 'no-decompression dive'. In reality, there is no such thing, as all dives require decompression to some extent. It may be that during the ascent, sufficient

decompression occurs and no decompression stop is required, but we have still been decompressing during

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this ascent and will continue to decompress on the surface for a number of hours afterwards. This is why ascent rates and safety stops are essential, as they allow enough time to decompress during the ascent. So, rather than refer to a dive where we do not need

to make mandatory decompression stops as a 'no-deco' dive, we can more accurately refer to it as a no-stop dive. Once we exceed the no-stop time, we cannot ascend directly to the surface without risking decompression illness.

Decompression stops are carried out at certain depths to allow the excess nitrogen in the body to reduce to a level where it is safe to continue on to the surface. Effective buoyancy control and the ability to hold decompression stops accurately are essential before any diver considers carrying out decompression diving.

Oxygen tank and scooter are typical equipment used on technical dives



Technical Diving

Breathing mix

With longer decompression times, it is common for technical divers to carry more than one breathing mix. In addition to *back gas* carried in large cylinders mounted—not surprisingly—on their back, they will also carry one or more *deco gases*. These are rich nitrox mixes, which will speed up the decompression. This is known as *accelerated decompression* and can make a significant difference to the amount of



It's a good idea to get used to using twin tanks before you start a technical diving course

additional oxygen increases the risk of oxygen toxicity at depth.

For deeper dives a breathing mixture that reduces the levels of both nitrogen and oxygen is required. The only way to do this is to introduce a third gas, which will replace some of the oxygen and nitrogen. This gas must have limited side effects, as we don't want to reduce two problematic gases only to introduce a third. Helium is the only real option and is the gas of choice for technical divers. This combination of oxygen, nitrogen and helium is known as Trimix.

Why do we do it?

There are a number of reasons why people undertake technical diving. For me, the main reason is related to shipwreck exploration. Wrecks hold a unique fascination, and diving on a previously undiscovered wreck for the first time is a magical experience. In order to find undiscovered or rarely visited wrecks, divers often have to dive deeper than the recreational limits.

Another reason for venturing deeper is that wrecks at depth tend to be better preserved than wrecks in shallower water. The wave and storm action will quickly break up wrecks in shallow waters, and so the deeper we go, the more intact the wreck tends to be. So, for me, technical diving is a means to an end. If there was an endless supply of intact, undiscovered wrecks in 20m of water, then I would never have become involved in technical diving.

For others, there are different attractions to technical diving. In general, diving is not a competitive sport, but there are some people who want to dive deeper than anyone else, or to dive beyond some real or imagined depth limit. In the same way as climbers want to conquer a particular mountain peak "because it's there", there are divers who want to dive to a specific depth for the same reason. Similarly, there are divers who want to be the best in their field and who view technical diving as

Wrecks hold a unique fascination, and diving on a previously undiscovered wreck for the first time is a magical experience. In order to find undiscovered or rarely visited wrecks, divers often have to dive deeper than the recreational limits.

the pinnacle of scuba diving and a way to perfect their diving skills.

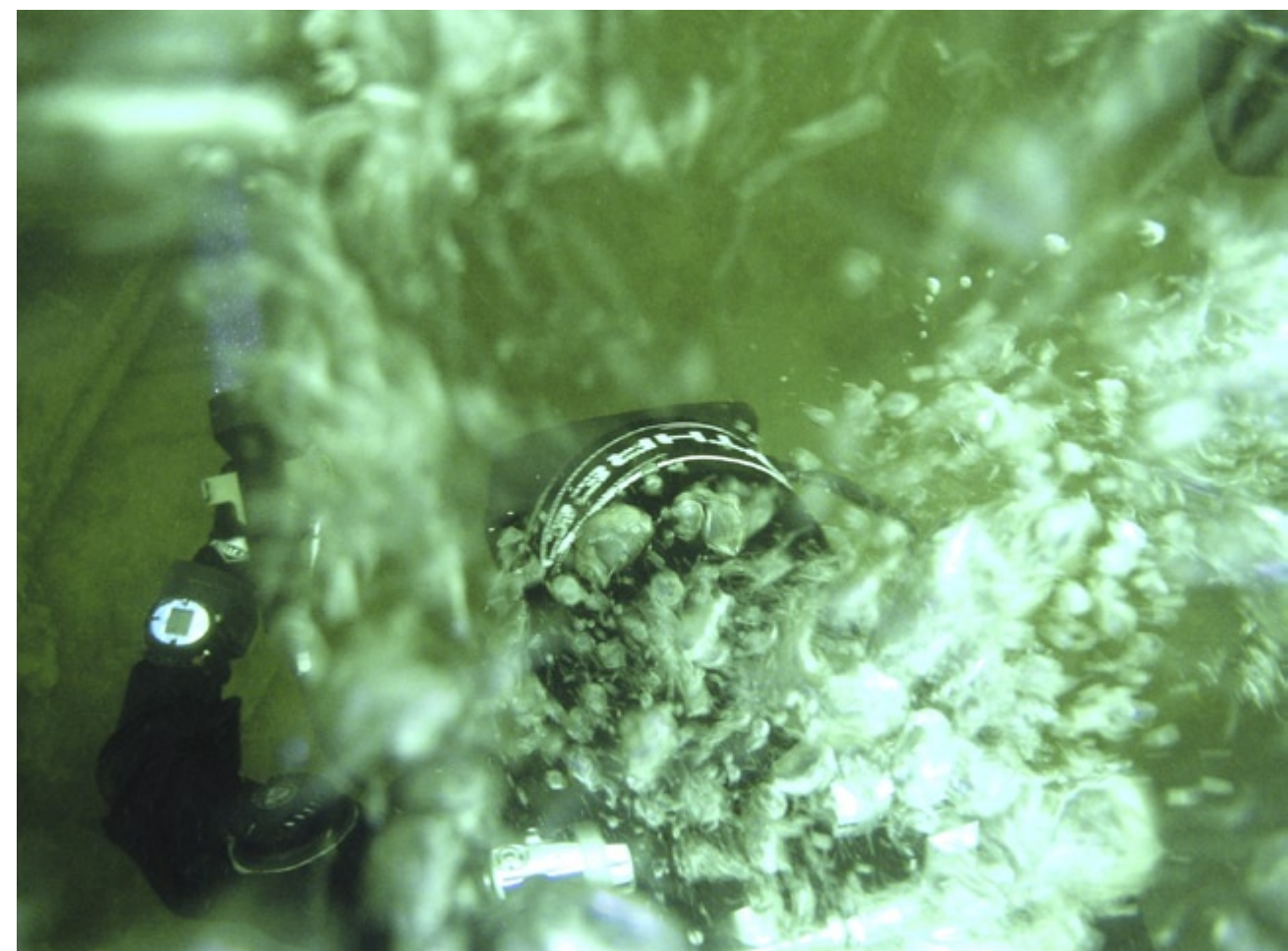
The Risks

Whatever the reason for starting down the technical diving path, it is important to recognise that any type of technical diving can potentially increase the risk of serious injury or death. Recreational diving is a very safe activity, and if we are going to increase the risks, then we should do it with our eyes open.

Technical Diving

As we go deeper and stay longer, we increase our decompression obligation. In the event of a problem, we cannot simply ascend to the surface without risking decompression illness. Many divers would never consider cave diving, as the thought of not being able to ascend due to being in an overhead environment would be too much to deal with. Yet any diver who carries out a decompression dive introduces these same limitations, as the decompression obligation introduces what is known as a *virtual overhead*.

As we move further into the realm of technical diving, our assumptions about decompression illness start to become tested. If we are diving at 20 metres, then we know that millions of other divers have successfully dived in these depths. Whilst any dive will have a risk of decompression illness, we can be confident that the risk is very small. With deeper and longer decompression dives, we are



During deco stops at the end of a technical dive, divers switch to 100 percent oxygen

decompression time involved. For example, using EAN50 as a decompression gas can cut the decompression time required for a particular dive from 50 minutes to just 24 minutes.

Either air or nitrox is the gas of choice for the recreational diver. However, for technical divers, neither of these

choices is suitable for deep diving. The oxygen and nitrogen in both air and nitrox becomes toxic as the diver goes deeper; oxygen causes oxygen toxicity and nitrogen causes debilitating nitrogen narcosis. Nitrox reduces the amount of nitrogen in the breathing mixture but only by increasing the amount of oxygen. This



Technical diver taking notes in the deep

Obviously, this type of diving can only be undertaken with extensive training, experience and preparation. Divers should already have significant experience of recreational diving involving more than 100 dives before even considering technical diving. At this stage, they should find an experienced technical diving instructor who can give them the necessary training to move from recreational to technical diving.

In subsequent articles, we will look at some of the different equipment configurations used by technical divers. These stress the need for redundancy in essential equipment, familiarity with the use of all equipment, and streamlining to ensure everything is accessible, being overly cluttered.

We will also look at some of the additional training and skills that must be practiced and become second nature. We will look at the approaches to dive planning that are adopted in order to increase the safety of these dives. As we go through each of these areas, we will see that many of these changes can also be adopted by recreational divers to further increase the safety of their dives.

Mark Powell is one of the leading technical diving instructors. Powell has been diving since 1987 and instructing since 1994. He is a full time technical diving instructor for a number of the leading agencies and teaches all levels up to and including Advanced Trimix. Powell has led a number of expeditions to various parts of the world including the Middle East, Costa Rica, Malta and the Red Sea but is usually found diving the wrecks around the coast of the UK. ■

moving into an area where there is much less experience of decompression principles. We are, in effect, acting as guinea pigs for decompression research. There are so many aspects of decompression that are not fully understood, and the risks of suffering decompression illness when pushing this knowledge are correspondingly higher. Nitrogen narcosis, oxygen toxicity and a variety of other risks must also be considered when diving in these ranges.

The risks discussed above might lead you to think that anyone who undertakes any form of technical diving must be mad. This may be partly true, but it doesn't mean that technical divers are

happy to accept all of these increased risks.

In order to manage these risks, and reduce them to an acceptable level, we have to review how we carry out the dive. In many cases, the solutions are the same as those adopted by the recreational diver, but the emphasis placed on effectively carrying them out is much higher than for normal recreational dives. In other cases, different equipment, training, procedure and techniques are adopted in order to reduce the risks to an acceptable level. This is the reason why normal recreational diving equipment and training is not sufficient for technical diving.

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Technical Diving



Divers form a small trident star around the ascent line as they begin their journey to the surface



photo & video

Edited by
Peter Symes
& Scott Bennett

Ian Heslop coming to take a photograph of a turtle in the northern Red Sea. Specs: 20mm lens, ISO 100, Twin Sea&Sea YS110 flash, 1/125th second at F8

Text and photos by Lawson Wood

So, where do we start? And what type of camera do we buy? Should we go for the DSLR (Digital Single Lens Reflex)—basically a digital version of the old single lens reflex (SLR) camera where you compose your photograph through the lens of the camera—or should we go for a compact *point-and-shoot* camera, which has *live-view* screening.

DSLR cameras have interchangeable lenses, and all require a waterproof box, or housing, with suitable controls to use the camera to its full potential. (Actually, we NEVER, EVER use a digital camera to its full potential. Camera manufacturers should listen to what underwater photographers require and produce a relatively cheap, high resolution camera with very few controls and no extra bits, which will always remain consigned to the manual under, "Forget this bit. You are not clever enough.")

The other type of camera, which comes in two different versions, is the manufactured PHD cameras (Press Here Dummy). These are essentially *point-and-shoot* cameras with a large continuous viewing screen on the back, so you are actually composing your photograph by use of the *movie* screen. Most of these types of camera require a waterproof housing, and these are usually made specifically for the camera models by the camera manufacturers.

A few of these digital cameras are actually amphibious and do not require a waterproof housing. All of these types of point-and-shoot cameras also have the ability to shoot video directly onto the memory card. I have seen some amazing digital film



Digital Camera Choice

of animal behaviour captured, whilst I could only take a still photograph on my super-duper-state-of-the-art DSLR.

What to look for

DSLR's are produced by a large number of

manufacturers, and the relative models all have interchangeable lenses. Most will even be able to use your old lenses from your now obsolete film cameras. If you used Nikon in a previous life, then chances are that you will use the new Nikon DSLR's. The top of the range is the Nikon D3X with a 24.5

megapixel reproduction. Similarly, if you were a Canon or Olympus camera user, then chances are you will do so again in the future. The new Canon EOS-1 Ds Mk3 has a whopping 21 megapixel full-frame sensor and beats just about everything else hands-down.





photo & video



Sea&Sea YS-17 with DX-1200 Strobe



Sea&Sea DX-2G with YS-110a Strobe



Sea&Sea MDX-40D with Dual YS-110a Strobes and YS Converter

SEACAM
silver



cinema of dreams



www.seacam.com

Point-and-shoot cameras by Nikon, Canon, Olympus, Fuji, Casio, Sony, Kodak, Pentax, Sigma and just about everyone else in-between, all have a superb range of cameras with dedicated housings, and most have a high megapixel rating to ensure nice crisp images when they are reproduced.

Whilst the photograph of Ian and the turtle is in essence a *close-focus-wide-angle* photograph, I include it to illustrate the size of the DSLR and the housing, plus external flash and arm. The camera is undoubtedly set on auto-focus as my dive partner, Ian, has the camera extended at arm's length and angled in towards the turtle. By partly depressing the shutter release, he is able to *lock on* to the subject with his Canon camera, and by further pressing the shutter, he can take the photograph, thus firing the external flash whilst keeping everything in focus.

Advantages of DSLR

- Basically, what you see is what you get; you are able to compose your photograph *through the lens*.
- When the camera is switched on, it is instantly ready for use.
- There is no delay in taking the photograph.
- You can utilize interchangeable lenses to suit your photographic subject.
- You are able to follow action sequences with quick bursts of photos at around five or six frames per second.
- The battery life in DSLR's is very

efficient, as it shuts down unwanted processes between taking photographs, but is instantly available at the slightest press of the shutter button.

- They are able to utilize large capacity memory cards, and most have large megapixel rendition for ultra-sharp photography.

Disadvantages of DSLR

- Large and bulky
- Expensive
- Newer models continually coming on the market
- Expense of camera housings and ports to suit the variety of lenses
- Expense of additional flash system and connecting arms (more money!)
- Require additional lenses (even more money!)
- Once a lens choice has been made, it cannot be altered underwater.

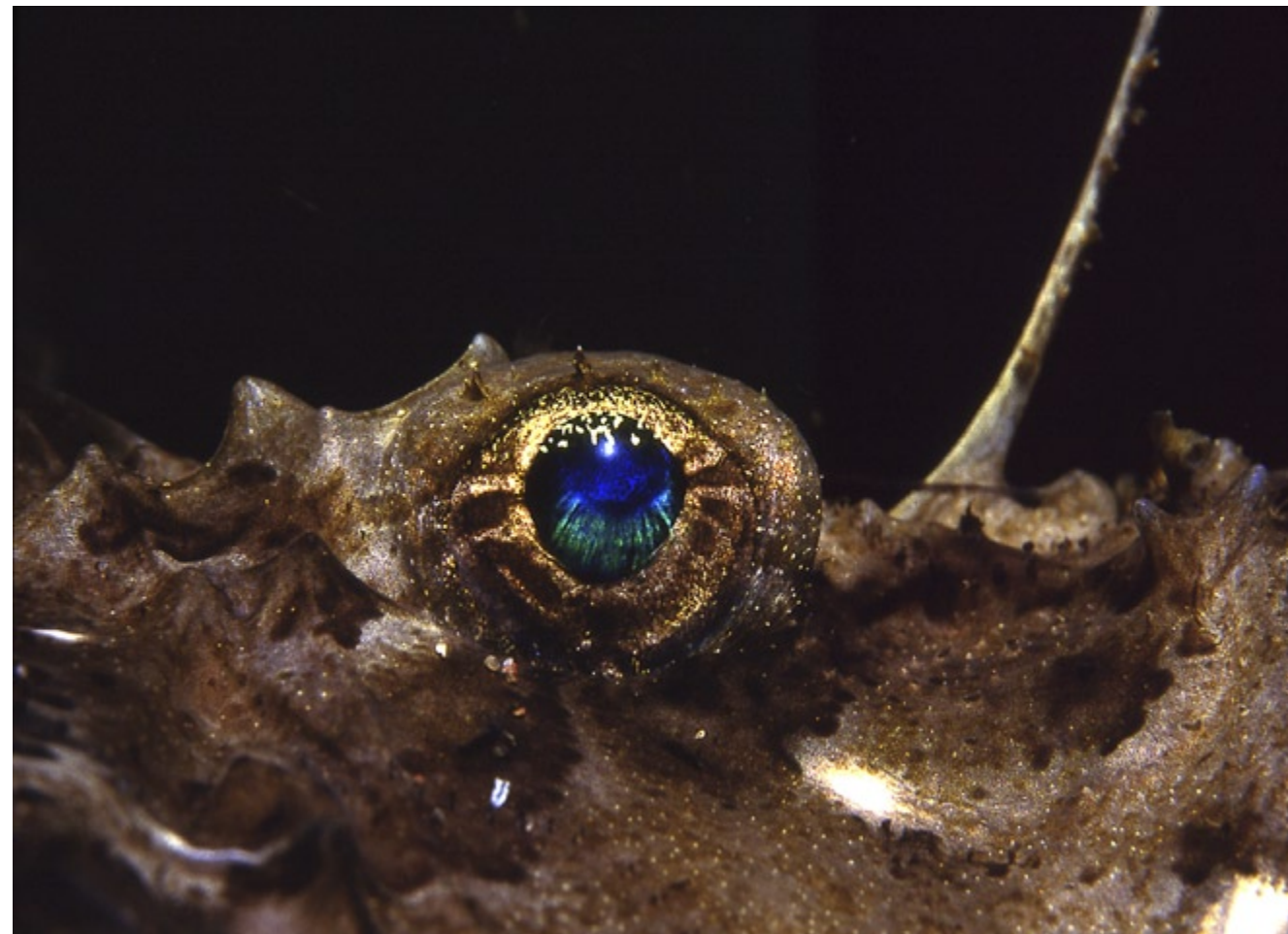
Advantages of the compact camera

- Small and compact
- Lightweight
- Some compact cameras are totally amphibious, thereby not requiring a waterproof housing.
- Relatively cheap compared to DSLR's
- Inexpensive camera housings, usually by the camera manufacturer

- Ability to add on supplementary lenses to the outside of the camera housing, therefore greatly increasing its capabilities
- Ability to add on external flash, which is fired as a *slave* from your in-camera flash
- Most compact cameras have the ability to record sound and record digital video directly onto the memory card.

Disadvantages of the compact camera

- The battery life of a compact camera is greatly reduced due to the *live-view* screen on the rear of the camera. Using the internal camera's flash also further reduces the battery life.
- Camera housings are usually not very robust, and care must be taken with the camera controls.



Specs: 105mm lens, 100asa, 1/125 second, single Sea&Sea YS180 flash at F.16





photo & video

Diver Reeta Tunney in a cavern in the northern Red Sea holding a Compact Camera. Specs: 10mm lens, ISO 100, Twin Sea&Sea YS110 flash, 1/80th second at F11. Note the size of the compact camera and waterproof housing that Reeta is holding



- Most do not accept external flash arrangements.
- There is a delay in the camera's performance whilst switching on.
- There is always a delay in taking the photograph, thereby perhaps missing *the action shot*, or point of the photograph.
- Some cameras do not offer the RAW feature for picture capture.

Which ever model you decide to invest in, you can be sure that it will already be out of date by the time you master its complexities. If you are already a

digital camera user, then it is much better to stick with what you have for now and learn your craft before spending the money, not just on newer and better models, but on all of the ancillary equipment that comes along with it. Big memory cameras also need big memory back-up, such as large memory cards, super-fast computer processing and terabytes of memory, to store your photographs safely.

For all you pseudo-professional photographers with your big mega-bucks DSLR camera and lens, plus housing, plus flash combo and arms, I would recom-

mend that you also carry a compact camera that is set to digital video, with the maximum size card available, simply because I have missed recording so many behavioural scenarios that would make David Attenborough weep, being unable to record the action with a still camera.

As always, versatility is the key. Being able to change from extreme close-up to wide-angle at the switch of a button, or turn of a dial, would be on everyone's list of *must-haves*. There are a number of zoom lenses that do increase your capabilities, but for the most part, once you have decided on the prime lens you are using for whatever type of photography you want, you are stuck with that lens for the entire dive.

What then happens is your wallet has a heart attack, and you buy a second more advanced super-duper-all-singing-and-dancing DSLR, and you take both of the cameras and housings and flash in at the same time. One camera fitted with a close-up lens, the other with wide-angle. Wow!! What just happened? Now, I need twice the memory on my

computer and hard drives and twice the amount of time to do any post production and captioning of my photographs!

Do I stick with the 105mm macro lens or should I carry another camera system with a 15mm wide angle lens and thereby take in the whole scene of the anglerfish and my dive buddy, Neil?

Lawson Wood was raised in the Scottish east coast fishing town of Eyemouth and spent his youth exploring the rock pools and shallow seas before learning to scuba dive at the tender age of 11. Over 44 years later, he has been fortunate to make his passion his career and has authored and co-authored over 45 books, mainly on our underwater world. Wood is a founding member of the Marine Conservation Society, founder of the first Marine Reserve at St. Abbs in Scotland, and made photographic history by becoming the first person to be a Fellow of the Royal Photographic Society and Fellow of the British Institute of Professional Photographers solely for underwater photography. ■

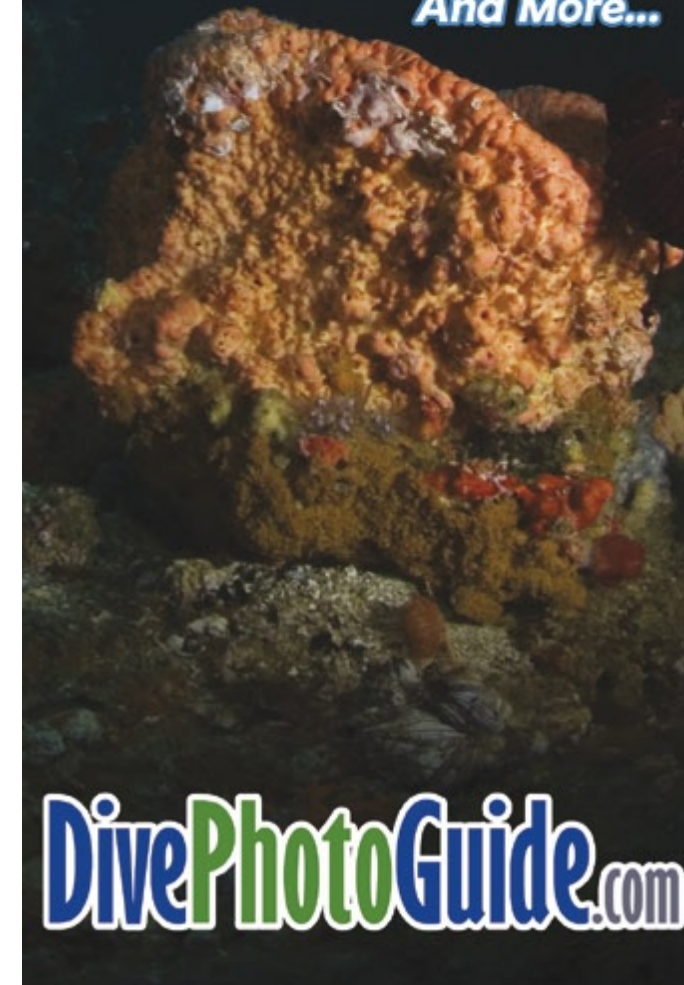


Diver Neil Finlayson with Anglerfish or Monkfish (*Lophius piscatorius*), St. Abbs, Scotland
Specs: 15mm lens, 100asa, 1/80th second, single Sea&Sea YS350 flash at F5.6

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Aquatica Dome

Aquatica introduces the BK-7 coated glass Mini Dome 100. The newest addition to Aquatica's burgeoning line of ports, the Mini Dome 100 is ideally suited for fisheye lenses such as the Nikon 10.5mm, Tokina 10-17mm and Sigma 10mm. Constructed from grounded BK-7 mineral glass, the Mini Dome 100 boasts a diameter of only 100mm (4 inches). Rated to a depth of 90m, the reduced frontal signature allows an extra close approach for close-up wide angle subjects, providing extra room to position strobes for that perfect shot. Optical anti-reflection and scratch-resistant coatings are included at no additional cost. Travelling underwater photographers will appreciate the lightweight and compact size, especially in these days of increased travel restrictions. Set for release in Spring 2010, the Mini Dome 100 will soon be made available for use with other housing brands. Suggested retail price: US\$699.00. For more information please contact: info@aquatica.ca

Ikelite

Ikelite has announced its housing for the Canon HF-20, HF-21 and HF-200 video cameras. Rated to a depth of 60m, Ikelite's robust polycarbonate design enables full view of the camcorder and control functions, with the camera's large LCD screen clearly visible through the housing back. The included UR/Pro Color Filter provides color correction in tropical blue water with available sunlight up to 80 feet (24 meters). An optional filter #6441.81 is also available to achieve more natural tones in green water settings. The housing port is threaded allowing the use of the optional #6420 Ikelite lens or 67mm threaded wide-angle and macro lenses available from other manufacturers. The base removes instantly with a unique toggle clamp for traveling or attaching of the optional Pro Video Lite 3 battery pack. The handle assembly detaches from the housing by removal of just two nuts for packing.

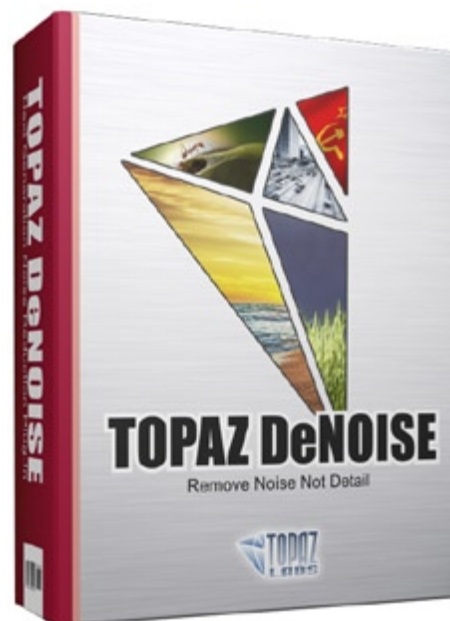


www.ikelite.com

Seahorn Snoot



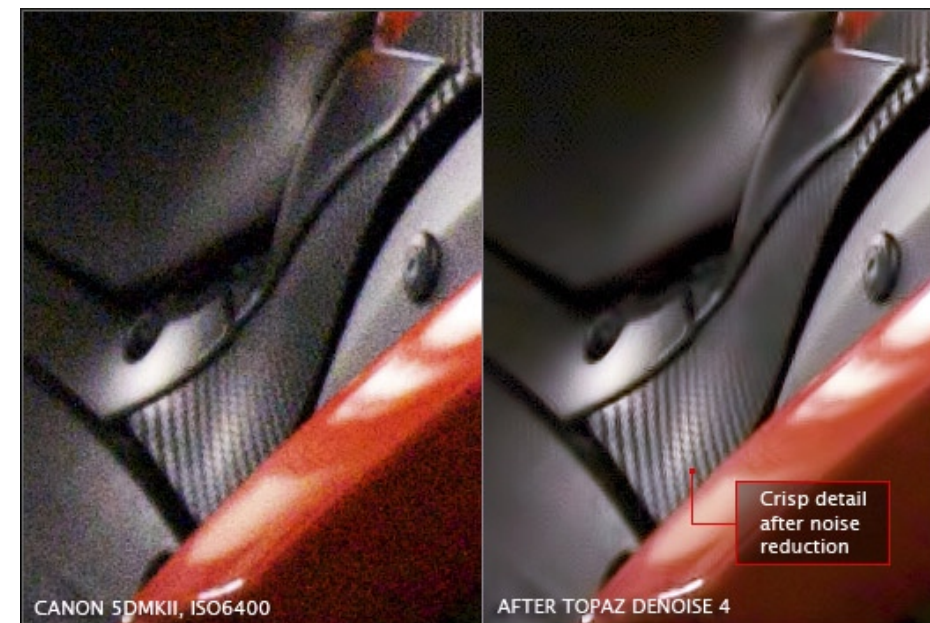
Constructed from aluminum and PVC, the Seahorn Snoot enables your favourite strobes to concentrate diffused light onto a small area. With a length of 14cm without attachments, the 35-degree angle beam opens up a new world of creative lighting possibilities for macro photography. In addition, three additional attachments are available: 15.5cm with honeycomb attachment (5.5cm opening for light), 21cm with macro attachment (2cm opening for light) and 29cm with super macro attachment (1.5cm opening for light). Weighing in at a mere 242 grams, the Seahorn Snoot is available for a wide range of strobes including Ikelite, Inon, Sea&Sea, Patima and 10bar. Cost: US\$60.00 plus shipping. For further information, visit: www.scubasympphony.com



Topaz Labs releases DeNoise 4

Topaz Labs announces "IntelliNoise," a new proprietary noise reduction technology that makes its product debut in the newly upgraded software program, Topaz DeNoise 4. IntelliNoise analyzes patterns in the entire image to discover underlying detail and to recover it in the final result. Inhouse tests have shown that up to four stops of noise can be eliminated while maintaining image detail and sharpness. Available as a plug-in, the software works with a variety of host programs including Photoshop, Aperture,

and Lightroom for Mac and Windows. Topaz DeNoise 4 with IntelliNoise is a free upgrade for existing DeNoise customers and retails for US\$79.99. For more information, visit: www.topazlabs.com/denoise



Crisp detail after noise reduction

CANON 5DMKII, ISO6400

AFTER TOPAZ DENOISE 4

Aquatica port adaptors

In a bid to attract potential customers, Aquatica has announced the addition of two new port adaptors, the first in a planned line of accessories to help future users migrate to the Aquatica system. The first accommodates the Subal older generation ports (type 3). As it fits inside the Aquatica bayonet, it does not add any extension, and all lenses normally associated with their ports can be used starting from the Nikon 10.5mm. The second will accept Sea & Sea NX generation ports. While adding a minimal amount of extension, it has been calculated to accommodate the popular Tokina 10-17mm without restriction. www.aquatica.ca



Unique Dive Site



Text and photos by Adam St.Gelais
www.atsphotographic.com

The Florida sun was warm and high overhead as I donned my fins and slipped below the surface with camera in hand. A juvenile Spotted Eagle ray

lazily glided away over the sand to avoid the impending intrusion of noisy bubbles and camera flashes. As I finned towards the shadows, I stopped to investigate a small male Rosy Razorfish in full breeding

colors flitting about frantically, as I intruded on his territory. So consumed by the dance of the Razorfish, I barely noticed the shifty dark mass in the distance making its way towards me. As I watched, the mass grew larger and more ominous as it drifted closer. I was still unable to discern what it was. Finally, the blob came into focus, and I was able to make out hundreds of wing tips and flashing white bellies writhing in the shallows.

Blue Heron Bridge

Riviera Beach, Florida

A diver explores among the soft coral and sponge encrusted bridge pilings





TOP LEFT TO RIGHT: Hidden Crab—make sure you explore the abundant crevices. You never know what you might find; A sleeping Rainbow parrotfish photographed at night; Scrawled Tilefish and diver—an example of the habituation of fish to divers at the Blue Heron Bridge as a diver gets up close and personal to a Scrawled tilefish being cleaned by a juvenile angelfish; Spotted Moray eels are a common sight at the Blue Heron Bridge. LEFT: Location of Blue Heron Bridge, Riviera Beach, Florida on map of the United States' east coast. PREVIOUS PAGE: A school of Cownose rays in the shallows of the Blue Heron Bridge

A school of Cownose rays, oblivious to my presence, swirled around me in a full feeding frenzy. As the massive aggregation of rays moved on, I turned my attention—and new-found exuberance—back to the shadows.

When you mention Florida to an underwater photographer, visions that spring to mind tend to be those of beautiful reefs and haunting wrecks from Key West to Key Biscayne. This is for good reason. The Florida Keys could be argued to be the birthplace of underwater photography, and the ecosystems there have fostered the careers of some of the world's

underwater image pioneers. But to those in the know, there are plenty of photographic opportunities for photographic adventures in Florida well beyond the Keys, which are easy to get to, easy on your wallet, and just as exotic.

Case in point, the Blue Heron Bridge in Riviera Beach, Florida. Whether you are taking a camera beneath the surface for the first time, or you take two full SLR setups with you—in case you want to shoot macro and wide angle in the same dive—this is a place you need to experience.



Unexpected diversity

The Blue Heron Bridge is by no means a secret. Spanning the intracoastal waterway, the bridge shades an ecosystem



Unique Dive

Evil eye—a Scorpionfish (far left) lurks beneath the darkness of a new moon; A Scorpionfish (left) raises his poisonous dorsal spines as a warning to a nosey photographer and his bright lights; French Angelfish and Sergeants (below)

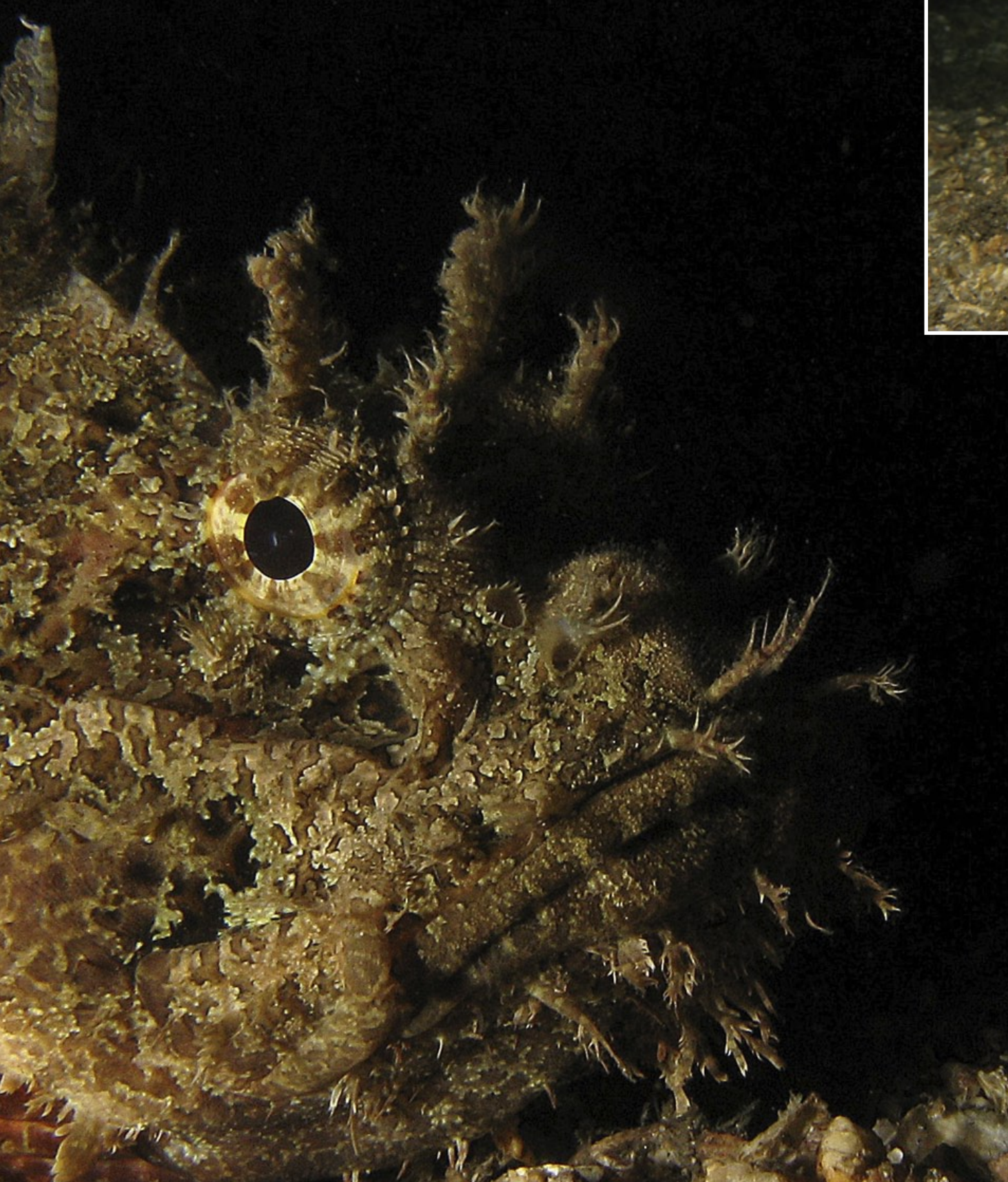
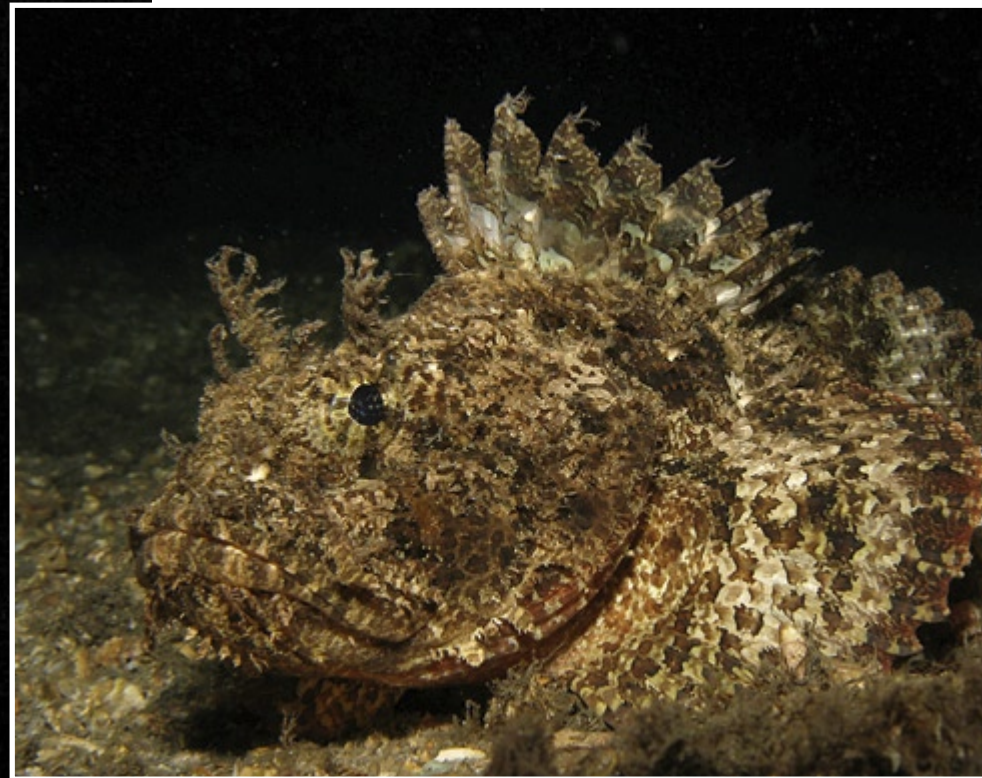
my face." The narrow window for us to slip below and explore this unique site opens up just one hour before high tide, as clear blue ocean water is forced in through the Lake Worth inlet, which sits just south of the bridge and washes beneath. Depending on the tide, visibility

that is one-of-a-kind—blending the tropical and the subtropical. It has attracted divers for decades. The bridge is un-divable for most of the day. Tidal currents are amplified through the narrow bridge passageways, and the visibility is classified as "I can't see my own hand in front of

can increase from tens of centimeters to tens of meters in a matter of minutes. The transformation is striking to say the least.

Not only does the bridge's proximity to the Lake Worth inlet make diving here possible, the pulsing tidal fluctuations that periodically inundate the bridge with water from the Atlantic also makes possible the incredible and unexpected diversity. Converging currents push in the planktonic larvae of a mixture of animals normally found on coral reefs and those from subtropical environments. Here, under the shelter of the bridge, they mingle and settle, adding to the establishment of a rare ecological hodgepodge of organisms. Where else can you see Arrow crabs and Horseshoe crabs in the same dive? Or Schools of Cownose rays, followed by a Manatee?

An Atlantic Spadefish swims in for a closer look





A large Arrow crab, possibly the most abundant crustacean found at the Blue Heron Bridge

Unique Dive

ing spring tides push the oceanic water further inshore. Parking is not allowed at night, however, and unidentified cars are ticketed. Luckily, this is easily remedied. Most local dive shops keep close tabs on the tides and often organize group night dives at the bridge that anyone is free to join. Just show up at the dive shop ahead of time, put your name and license plate on the list, and the dive shop will make sure you surface without a parking fine stuck to your windshield.

Getting the shot

From a photographer's point of view, it is hard to decide what to be prepared to shoot here. Subjects range from infinitesimally small nudi-

branches to the occasional blimp of a manatee cruising over head, but unless you're looking for pier type wide-angle shots, a macro lens will be your best bet. Just don't blame me when the manatee family shows up, and they won't fit in the frame.

One benefit to shooting under the bridge is that, for better or worse, animals here have become completely habituated to the presence of divers. While we could argue about the ecological ramifications of this all day, it does make getting the shot easier, even for those new to underwater photography. Normally skittish Angel and Spadefish practically swim up to greet you.

Under the Blue Heron Bridge, you never quite know what you will see. Which is why I keep going back. I have yet to be disappointed, and have taken some of my favorite photographs there.

What you need to know

Don't expect to just show up and dive at the Blue Heron Bridge. This dive requires a bit of research before hand. Make sure you check the tides ahead of time. Arrive 1.5 hours prior to high tide to allow time to assemble dive and camera gear, and then get wet a full hour before high tide. At

an hour before high tide, visibility will be good, but there will still be some current. For this reason, many divers will wait until 30 minutes before high tide to get in. If you don't mind a bit of current, getting in before everyone else is worth the extra fin kicks.

The deepest point is less than 7m, so it is more likely that your bottom time will be dictated by the tides and not your air. You will know it is time to get out when the visibility starts to decrease as the tide begins to go out. Generally, the visibility will drop before the current picks back up, so once you notice this, it is a good

idea to head back to shore before the current picks up too much, which can make your egress difficult.

Bring a light. Even at high noon on a sunny day, the lighting directly under the bridge may as well be the dead of night.

Speaking of night, diving the bridge after the sun goes down brings out a whole different group of animals and is well worth the effort especially on a full moon, as the accompany-

A Horseshoe crab attempts to bury itself in the sand to rest until nightfall when it will emerge again to scavenge for food



Lined seahorses (left) are uncommon in Florida waters, but this one seems right at home nestled among the hydroids and algae

Due to heavy usage and its location, trash is unfortunately a common feature at the Blue Heron Bridge. A small Spotted Moray eel (below) shows his teeth in disapproval



Besides the obvious angelfish greetings, make sure to keep an eye trained on things you wouldn't normally look at. Many of the rarest and most interesting inhabitants of the bridge like the Lined Seahorse—a rare sighting in Florida—are well camouflaged against the tangled mass of hydroids and algae. Further still, many photo-worthy and rare animals—like the Scotch Bonnet snail, which spends the daylight hours buried deep in the sand—emerge only under cover of darkness.

So, the next time you're vacationing in Florida, take a day away from the crowded, expensive charter boats and see what you can find in some places you wouldn't

expect to dive. I've seen some of the best reefs and wrecks that Florida has to offer, but if the tides are just right for a quick weekend dive with good promise for creating great images, you'll know where to find me.

Adam St. Gelais holds a Master's degree in marine biology, and the research that comes with it has made possible his foray into underwater photography. His current research focuses on the reproductive ecology of corals. His studies have taken him from Alaska to Dominica with camera in tow. You can see his photography and follow his travels at www.atsphotographic.com. ■

TAKE THE BAD WITH THE GOOD

While the Blue Heron Bridge is a popular dive site, it is also a public park that is popular with many other user groups. On the west side of the dive site is a heavily used fishing pier—be careful not to get caught, literally. Also, watch out for hooks and monofilament while diving and always take a knife or shears incase of entanglement. You will also see trash—a lot of it. I have seen it all under the bridge, from beer bottles and chicken bones (I hope) to an entire barnacle-encrusted bicycle. While it is disheartening to see, it can make for some compelling photographs. If you choose to dive towards the west side of the bridge, make sure to stay out of the channel as there can be heavy boat traffic. So, make the best of it, enjoy the dive, and always remember: Safety first! ■

This Scotch Bonnet snail hides buried in the sand during the day and emerges at night to forage the sand for food

Haiti Metal Art of the Sea



P O R T F O L I O





Detail of *La Mer*, Handcrafted Haitian Metal Art Wall Hanging, 24 inches. Price: US\$84.95
 PREVIOUS PAGE: *Out For A Swim*, Metal Steel Drum Turtle Wall Decor, 24x18 inches. Price: US\$69.95

Edited by Gunild Symes
 Photos courtesy of Mimi Namphy, Haitian Metal Art

In Haiti, folk artists create beautiful works of art from recycled materials, such as old steel drums, and transform them into enchanting pieces filled with intricate handwork, details which are inspired virtuosity in metal techniques as well as compelling expressions of Haitian folklore, culture and a close relationship with the sea. X-RAY MAG's Gunild Symes interviewed Mimi Namphy, gallery owner of Haitian Metal Art in Port au Prince, and found out more about these gifted artists and their struggle today to feed their families after the earthquake that hit Haiti in January 2010.

X-RAY MAG: Tell us about Haitian metal art, how it started, evolved and uses recycled materials.

HMA: This particular art form was born in Haiti in the early 1950's by a simple blacksmith, Georges Liataud. In his small shop, he made and repaired tools and created primitive metal crosses, for the graves in the Croix-des-Bouquets, Haiti cemetery. It was at the encouragement of an American teacher, DeWitt Peters, who in 1944 opened the Le Centre d'Art in Port-au-Prince that Georges Liataud expanded into the creation of decorative metal sculptures.

We have worked in the production and sales of handcrafted art in Haiti since 1982. These include hand painted metal wall art, stained glass sun catchers and jewelry boxes and the ethnic steel drum Haitian metal art.

The Haitian steel drum metal art is hand cut, with hammer and chisel, from a flattened, recycled 50-gallon steel drum. (The chisel is made from recycled steel truck springs.) The drum is initially set on fire to burn off paint and residue, then cut apart and flattened. The design is drawn on to the 34" x 72" piece of steel. The 24" tops and bottoms are also used for many of our round wall art designs. After completion of the design, it is finished with three coats of a clear rust preventative solution, making the piece suitable for indoor or outdoor use. More information and pictures can be found at: www.haitimetalart.com/About_Haitian_Metal_Art.html.

X-RAY MAG: Tell us a little about yourself and your unique gallery.

HMA: I am the mother of seven children. I studied folk art painting in the United States and Switzerland. I first came to Haiti in 1970 to help establish an orphanage. While here, I felt the need to help employ the Haitian people. After my children had "left the nest" in 1982, I moved to Haiti to work with some of my own designs to be painted on wood. This evolved into painting on recycled metal drums, a variety of brightly hand painted tropical wall hangings. I branched out into

working on many designs with steel drum artists who were creating the ethnic metal art.

X-RAY MAG: Tell us about your artists and workshop.

HMA: Each man resides in the small towns of Citi Soleil or Croix des Bouquet, which are adjoining Port au Prince, Haiti. Each new artist apprentices under a master metal artist, called a "boss metal", beginning with preparing the drums by burning and pounding out the drums into flat "canvases". After the apprentice has learned the skills of working the



The Depths of the Sea, Haitian Art Steel Drum Sculpture, 34 inches. Price: US\$159.95



Mermaid of the Sea, Handcrafted decorative Metal Wall Decor, Haitian steel drum art, 17x17 inches. Price: US\$42.95. "All mermaids inherit the sea's qualities. Just as the sea could be gentle and nurturing or violent and deadly, so can the mermaid. These are the same contradictory qualities that are seen in most mermaid legends, Tender, cruel, beautiful, loving, destroying." — HMA

days of the earthquake, we asked our artists to come back to work, using the safe areas of the workshop and the driveway to work. We supply all of our people two meals a day. Almost everyone of our people had their home damaged or destroyed, or members of their family killed or injured. Fortunately, none of our people were killed, and only one was injured. Pictures and a brief description our experience can be found at: http://www.haitimetalart.com/Haiti_Earthquake_News.html

X-RAY MAG: Tell us what needs your artists and operation still have in order to recover from the earthquake.

HMA: All of us need to rebuild. This can be made possible by orders for our handcrafted products. We are not looking for charity. We want to provide work for our artists. Due to the vast unemployment in Haiti, support of the artist's family (and his extended family) is very important to each artist. He is looked to, by his extended family, for the supply of food, medical care, housing and schooling for children. It is said that each employed person in Haiti has 15 to 20 people who are looking to him financially.

X-RAY MAG: How can readers help?

HMA: Place orders, so that we can provide employment for our artists.

X-RAY MAG: What role does ocean art play in Haitian society?

HMA: The mermaid figures in Haitian folklore date back to African beliefs and to reported sighting of mermaids by Christopher Columbus

Ocean Musical Combo, Metal Wall Hanging, Haitian Metal Sculpture, 17x34 inches. Price: US\$98.95



design into the metal, he may branch out into designs of his own. Naturally, the quality of the workmanship varies with each metal artist. We hold very high standards and do not work with anyone who cannot give us the quality we require.

We have a covered workshop that is situated among trees and is open on three sides to the fresh air. It is a very pleasant working environment for our artists. Some of our metal artists do their work here, and others do the work at their homes and bring the finished pieces into us for final inspection.

We do not sell locally in Haiti. All of our sales are to buyers throughout the world via our websites.

X-RAY MAG: Tell us how the recent earthquake affected your operations and how you are faring today.

HMA: Our private home was completely destroyed in the earthquake. This was one of the historic homes of Port au Prince. We have our workshop in the adjoining property. This was 50 percent destroyed. We have been working on rebuilding the workshop. Within three

Arctic Diving
Antarctica Expedition



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*Lobsters
Beneath the
Sea, Steel Drum
Art, Haitian
Metal Wall
Decor, 24x17
inches. Price:
US\$69.95*

forms of sea life are depicted in the art, as Haiti is an island of the Caribbean, surrounded by sea life.

X-RAY MAG: *I noticed a lot of musical influence in the mermaid and fish themes... can you tell us about that and how it ties in with Haitian culture?*

HMA: In Haitian culture, the mermaid depicts La Siren, the Vodou spirit who enchants sailors with the melodies of her trumpet or other musical instruments.

X-RAY MAG: *If you are a diver, please tell us about your favorite dive locations in Haiti.*

HMA: I am not a diver, but I do know that through the 1970's and 1980's, Haiti was quite popular with divers. The tourism industry has fallen off since then, therefore a drop in diving locations.

X-RAY MAG: *How can people order work from you and what is the turn-around time now after*



*Haitian Mermaid
Saxophonist, Steel
Drum Art Wall
Hanging, 24
inches. Price:
US\$84.95*

receipt of order. We air freight our orders from Haiti every two

weeks to Miami, where they clear customs. They are then shipped with Fed Ex Ground or the Post office to U.S. addresses or internationally.

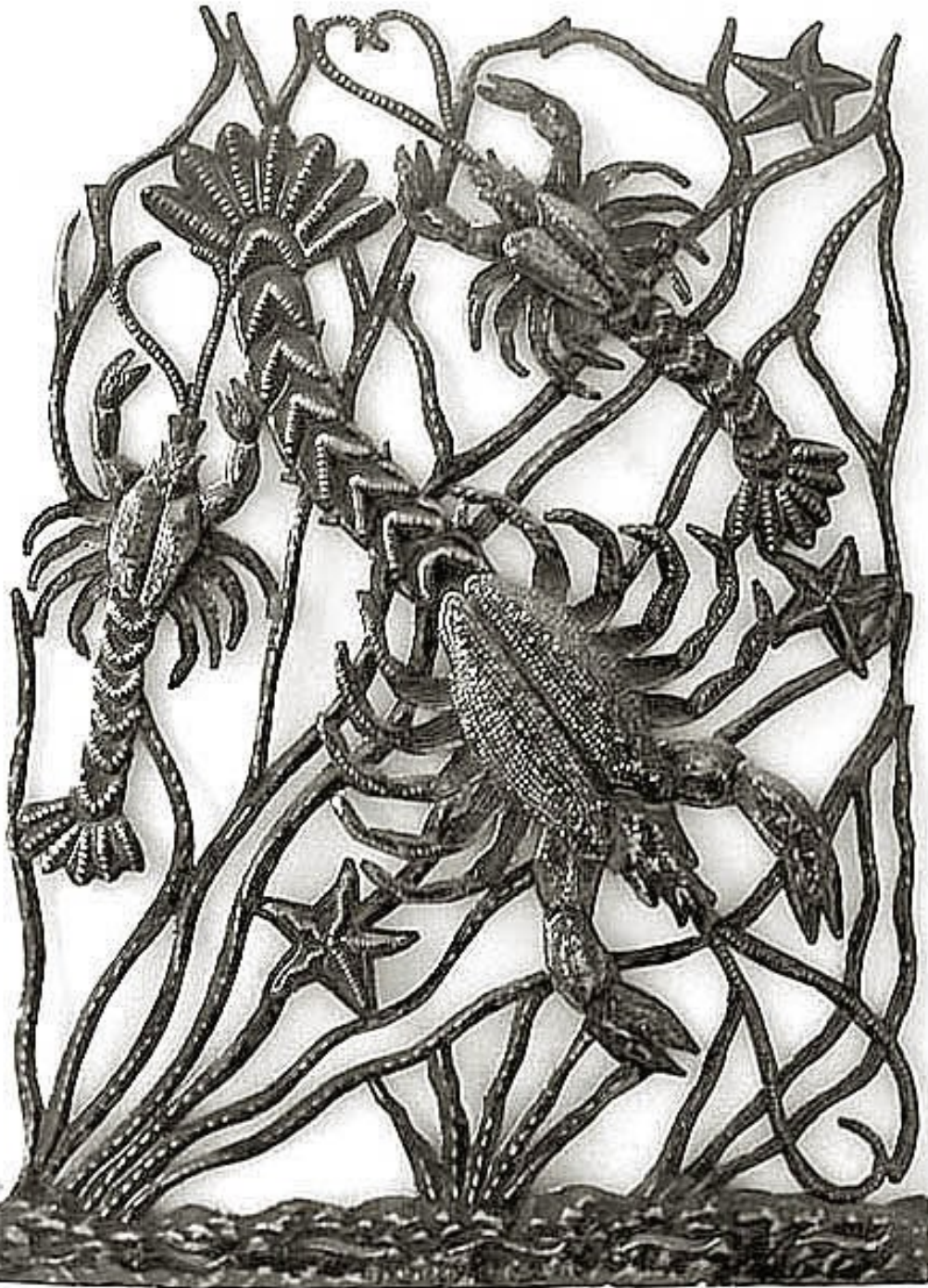
X-RAY MAG: *Anything else you would like our readers to know?*

HMA: I am an American, but it has been my desire for over 40 years to help the people of Haiti economically. After raising seven of my own children, I began living and working in the arts field in Haiti and am fulfilling that initial desire. ■

the earthquake?

HMA: We have two websites offering the natural steel drum Haitian metal art: **HaitiMetalArt.com** and **HaitiCheri.com**. We offer hand-painted metal tropical wall décor, hand-cut from recycled steel drums on **TropicDecor.com**, **TropicAccents.com** and **TheGiftSellers.com**. Our stained glass designs can be seen at **AccentonGlass.com**.

In most cases, we ship orders in one to two weeks after



off the coast of Haiti. (Experts believe that it was manatees that he had seen.) The Haitians believe that the mermaid protects them from the dangers of the sea and is a revered figure in Vodou worship. The mermaid (or la sirèn) is associated with the goddess Ezili, or Erzuli, who takes on several differ-

ent identities. She can be seen as a beautiful and engaging young woman. She can also be viewed as hideous and destructive, even dangerous. The mermaid is believed to either protect fishermen, swimmers, boaters and others on the water, or else causes them to drown.

It is only natural that other