

ADVANCED DIVER MAGAZINE

ISSUE 29

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A dramatic scene set in a cave. A diver in full gear is visible in the background, illuminated by a bright light. In the foreground, a large hand wearing a red leather glove holds a lit fuse, which is about to explode. The background is a mix of red and yellow, suggesting a fire or explosion. The overall mood is one of tension and danger.

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Publisher's Notes

I find myself returning from another successful expedition—this time to Guatemala's Lake Atitlan where the ADM dive team discovered, documented, and recovered a multitude of pre-Columbian Mayan pottery. Of course, these precious ancient pieces were donated to the local museum so that future generations can learn about the Mayans, and how they lived and survived along the lakeshore.

ADM's free on-line publication, ADM E-Zine, continues to receive an impressive number of downloads from around the globe. We also want to welcome the many new subscribers and retail facilities for the hard copy publication that you are holding in your hand.

ADM Exploration Foundation is in the final stages of becoming a 501(c)3 not-for-profit organization that will be designed to support continued underwater exploration projects around the globe. Its ultimate goal is to help fund underwater explorations and assist with scientific research and continued education.

ADM On-Line is continuously expanding our web content. We are currently working on a number of web videos and educational materials for our viewers.

ADM has also added several new staff writers and photojournalists to our ever-growing staff of dive professionals who are dedicated to bringing our readers only the best photos and editorials. We wish to thank you for your continued support. It is your enthusiasm and interest that makes all this possible.

Curt Bowen
Publisher ADM



Publisher..... Curt Bowen
Co-Publisher..... Linda Bowen

Copy Editor..... Victoria Leigh
Chief Staff Writer..... John Rawlings
Chief Photojournalist..... Jeff Toorish
Web Master..... Jakub Rehacek
Kindergarden..... Savannah Bowen

ADM Staff Writers & Photographers

Mel Clark • Erik Foreman
Richard Harris • Jill Heinerth
Tom Isgar • Jim Rozzi
Tamara Thomsen

Writers • Photographers • Assistants

Keith Ambrose • Michael Barnette
Thaddius Bedford • Leigh Bishop
Jon Bojar • Joseph Dovala
John Falcone • Brett Hemphill
Dr. Thomas Iliffe • Richie Kohler
Jillian Morris • Wes Skiles
Sten Stockmann • Dr. Bruce Wienke

Editorial Contributors & Assistants

Jon Bojar • Jack & Karen Bowen • Andrew Bowie
Patterson & Debbie Cade • Rich & Doris Chupak
John DeBoeck • Joseph Dovala • Sheck Exley
Ken Fulghum • Erik Keck • Chris Lopez
Curt McNamee • BJ Nussbaum • Eric Osking
Grant Pearce • Jon Shrives • Joel Silverstein
Kim Smith • Josh Smith • Charlie Tulip • Terrence Tysall

Contact Information:

Write..... Advanced Diver Magazine
327 Snapdragon Loop
Bradenton, FL 34212 USA
Phone..... 941-748-3483 (DIVE)
E-Mail..... AdvDvrMag@gmail.com
C.Bowen..... CurtBowenADM@gmail.com

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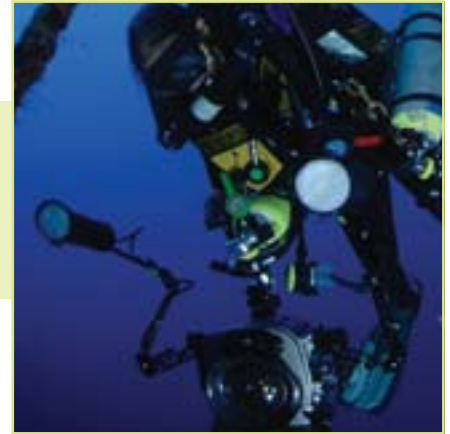
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Illuminated by massive underwater strobes, Dr. Thomas Iliffe, world-renowned cave biologist, searches for new forms of subterranean life as he descends into the four-mile-long lava caves of Lanzarote.

Photo by Jill Heinerth

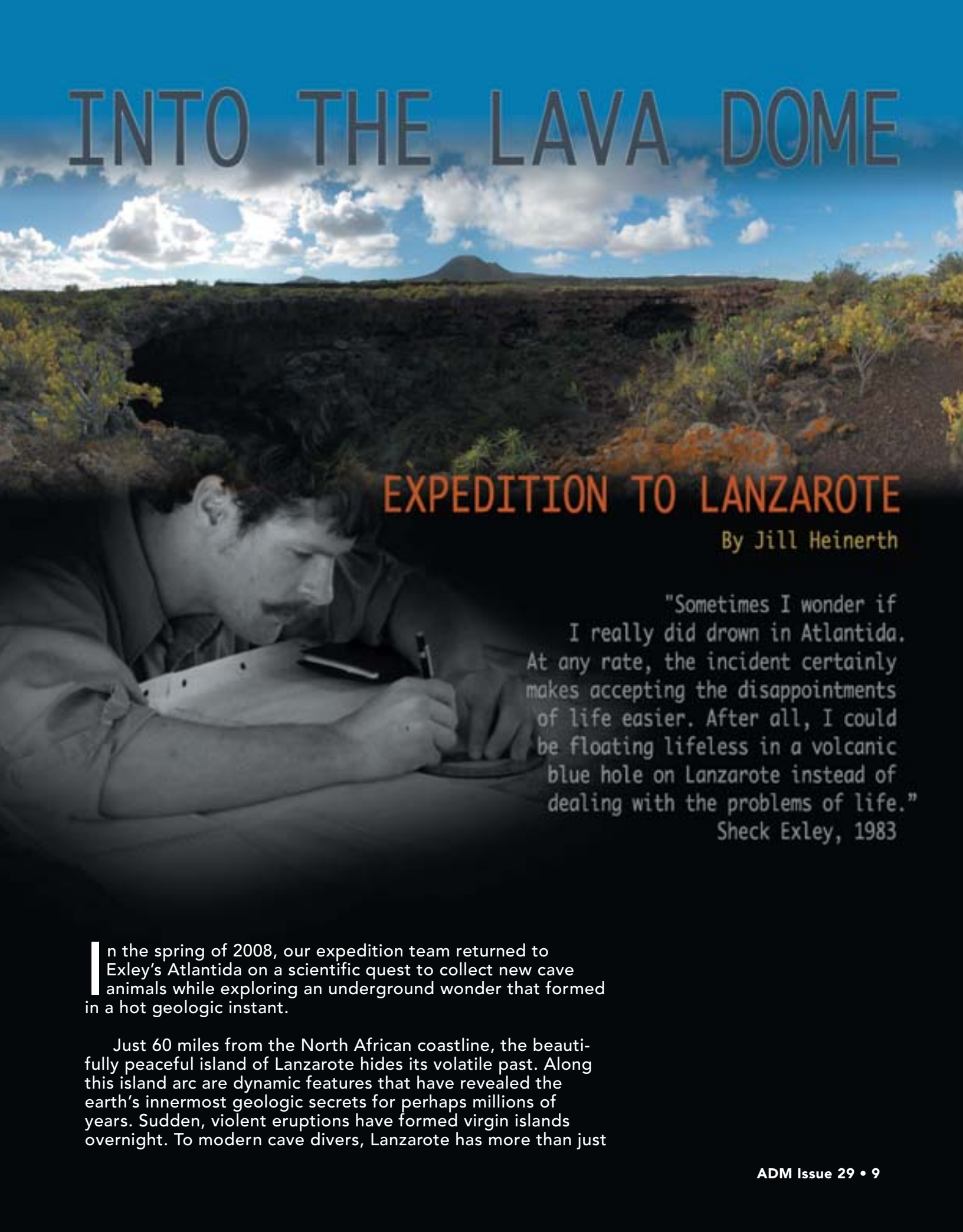




INTO THE LAVA DOME

EXPEDITION TO LANZAROTE

By Jill Heinerth



"Sometimes I wonder if I really did drown in Atlantida. At any rate, the incident certainly makes accepting the disappointments of life easier. After all, I could be floating lifeless in a volcanic blue hole on Lanzarote instead of dealing with the problems of life."
Sheck Exley, 1983

In the spring of 2008, our expedition team returned to Exley's Atlantida on a scientific quest to collect new cave animals while exploring an underground wonder that formed in a hot geologic instant.

Just 60 miles from the North African coastline, the beautifully peaceful island of Lanzarote hides its volatile past. Along this island arc are dynamic features that have revealed the earth's innermost geologic secrets for perhaps millions of years. Sudden, violent eruptions have formed virgin islands overnight. To modern cave divers, Lanzarote has more than just

The view across Jameo Chico,
home of the Blind Albino Crab,
Munidopsis Palimorpha.



a fiery history. Over a quarter century ago, this, the longest submerged lava tube in the world, almost claimed the life of cave diving pioneer Sheck Exley.

Our expedition leader, Dr. Tom Iliffe, vividly recalls the day in 1983 when Exley's dive partner Ken Fulghum aborted decompression to call for emergency air supplies. Fulghum and Exley had run out of gas twice on exit and were now down to desperate levels. With the nearest chamber in Madrid, Spain, it was no place to get bent.

In his biography, *Caverns Measureless to Man*, Exley recounts this calamitous dive when Fulghum experienced a complete air loss at over 4500 feet of penetration. While buddy breathing, they sprinted towards stage bottles more than one thousand feet away. "One last,

labored breath, then my air was completely gone," he wrote. Still short of the stage drop, the divers hurried for the tanks ahead, lungs in a hungry spasm, pumping for air. With the second depot at 1550 feet, they would run out of air again. Dizzy from carbon dioxide build-up, the duo somehow managed another suffocating sprint to the final tanks. Despite snagging the guideline, they kept their composure and arrived at decompression within sight of the surface.

Not wishing to bring up ghosts of the past, Dr. Iliffe planned a completely different approach to exploring Atlantida in 2008. Using closed-circuit rebreathers, our team would be able to penetrate the cave with greater margins of safety while minimizing our affect on the environment that unique stygobitic cave animals depend on.

"The first time I came to this cave, some twenty-five years ago, we used conventional open circuit scuba, where every time a diver exhales, all their exhaled gas is lost as bubbles. Now we are using a more modern technology. We are using computer controlled close-circuit rebreathers. This greatly lessens our impact on the cave ... there are no bubbles and no polluting oxygen. We are not adding additional oxygen to an oxygen poor environment and we are preserving the character of the ecosystem in which the animals depend," Iliffe explains.

The cave system associated with Atlantida Tunnel formed a mere three to four thousand years ago during the great eruptions of the Corona Volcano. A massive explosion carpeted lava down the slopes of the mountain. As the surface of the lava cooled and solidified, a thundering torrent of mol-

Artist Cesar Manrique has morphed Jameos del Agua into a stunning show cave, where tourists quietly walk in reverence of the environment.





Top: Multi-colored algae paints the walls in the entry pool. Middle: Jim Rozzi, Terrence Tysall and Tom Iliffe prepare to dive. Lower: Just beyond the restaurant tables, we descended loose rock to reach the entry to Atlantida Tunnel.

ten magma continued to pour through the core of the flow - a virtual subterranean fire hose of lava. Meeting the ocean, a massive explosion vaporized seawater in its path as the hot tributary plunged below the surface. The final result was a tunnel almost four miles long that extends from the base of the volcano, down the side of the island to the coastline, before continuing an additional mile under the sea floor. From its vast size, unparalleled grandeur and enduring mysteries, it is easy to see why this final submarine section of the lava tube became known as the tunnel to Atlantis.

Several collapses on the lower slopes of the Monte Corona volcano provide entrances to the cave system - including a mile of passage opened as two separate tourist destinations. We accessed many other wild portions of the cave with basic dry caving and sump diving techniques.

Diving in Atlantida Tunnel is only possible through rare scientific permits, but it is not because of the challenges of entry. In fact, after walking through a show cave complete with a swimming pool, restaurants and concert hall, we arrive at our dive site. Carrying our gear, we parade past tourists standing at the bar, weave between diners and sightseers and climb over a railing in the restaurant to get to the water.

At this stunningly beautiful location, the Lanzarote-born artist Cesar Manrique has magically blended the stark volcanic landscape and blue water of the cave with artistic features including an extensive museum on vulcanology. A natural auditorium space can seat 600 and is renowned for its excellent acoustics. The overall beauty of the surroundings is filled with gentle, new age music inspiring visitors to whisper as they walk reverently through the cathedral-like spaces beside the Jameo Chico Lagoon. Dotting the black volcanic rock like twinkling stars, blind albino crabs (*Munidopsis polymorpha*) are found in this lagoon and nowhere else on earth.

The walls of the entry pool to Atlantida are covered with exotic and colorful algae that are fed by the mix of artificial lights and the fluctuating tidal flows in the cave. Festive bands of gold, green and cyan algae are brightly contrasted with stark maroon and black lava rock beneath. Once submerged, one is struck by the sheer size of the cave passage often soaring to over 50 feet in height. The gin clear water offers visibility far in excess of 200 feet.

Swimming with Tom down the passage on the first dive, I was stunned by the sheer scale and fascinated by what appeared to be a white deposit of silt on the rocks. Finally curious enough to touch the silt, I discovered that what I thought was sediment was in fact a sort of submarine cement, coating the horizontal surfaces of the rock. There was almost no silt to disturb in the cave.

Accustomed to diving in limestone caves formed over hundreds of thousands of years, I was now diving in a cave that was formed in an instant! The contrast is sobering. Dripping formations were born from molten rock. Scours from rapidly flowing lava etched the walls in distinct layers. In places, undulating lava waves peeled off the wall, frozen in time.

While Tom and I enjoyed our first look at the cave, team members Jim Rozzi and Terrence Tysall worked tirelessly arranging fill logistics. Oxygen was scarce and expensive at \$400 for a k-bottle. Luckily, we had



Top: Jim Rozzi using the booster at the make-shift fill station at our condo in Arrieta. Lower: Jim completes last minute checks on his Megalodon closed-circuit rebreather.



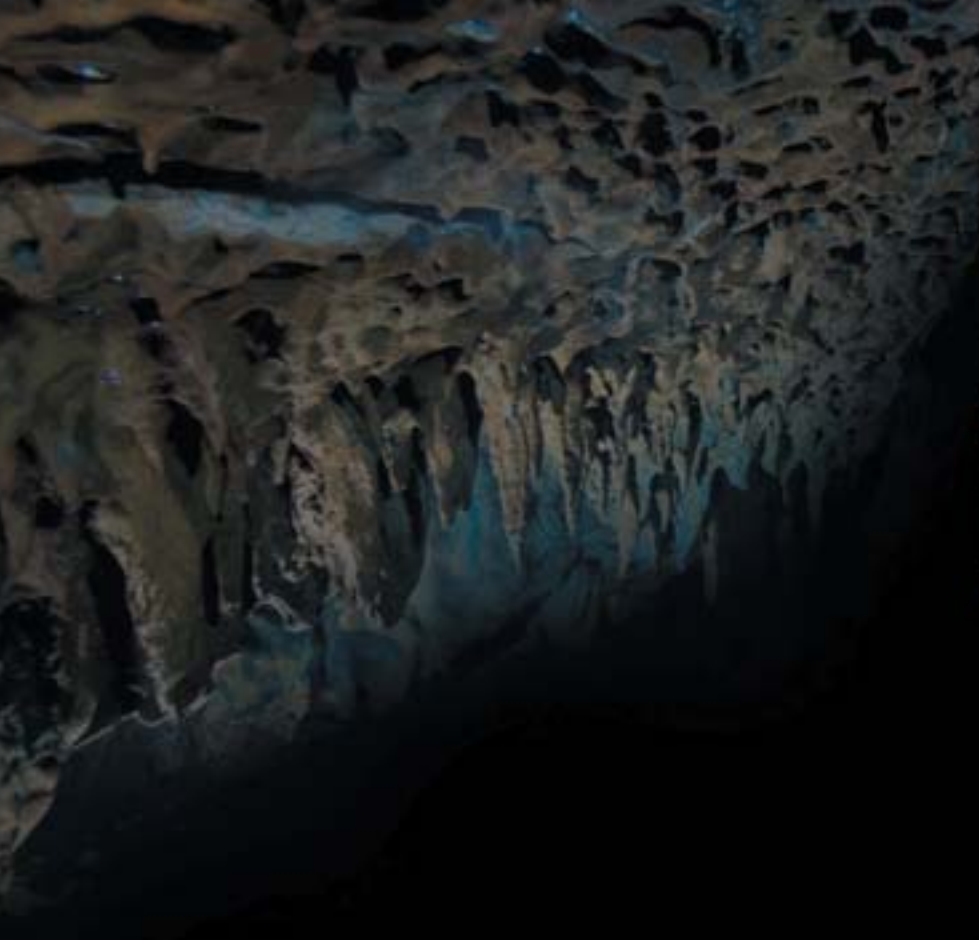


Atlantida Tunnel is located in the north of Lanzarote and was formed by the eruptions of the Corona Volcano about three to four thousand years ago. Tom Iliffe dives a Megalodon rebreather as a matter of conservation, leaving the water chemistry minimally affected by our presence.

a small KISS Baby Booster enabling us to use every bit of precious gas. But, as Jim and Terrence collected bail-out tanks and drive gas at local dive shops, we realized that lack of available equipment and short-fused deadlines would thwart our plans for deep helium dives. With only two weeks of diving activities, we could not safely set-up and de-rig the cave for mixed gas dives, as well as complete the mission's scientific objectives of collecting animals and water chemistry data.

On the second day, our team reached a unique landscape approximately 2300 feet inside the cave. While swimming through vast dark tunnels, something white in the distance began to take shape. As we closed ranks, I realized we were approaching an edifice known as Sand Mountain. A small opening in the ceiling of the cave has allowed tiny grains of sand from the ocean floor to drop into the cave and form a monument over 50 feet high. This enormous slope was dotted with urchin spines, small shells and even tiny animals. Biological specimens from this location were closely examined and found to contain new species and a number of new records from this unusual habitat.





Top: Terrence Tysall gears up in his Prism rebreather. Below: The author perches on the edge of the volcanic crater of Monte Corona. Photo Jim Rozzi.

But the animals we most wanted to find were those associated with the greatest scientific mystery. Biologists Pedro Oromi and Stefan Konemann, hoped Tom would retrieve samples of an elusive crustacean that had been first collected here twenty-five years earlier. This rare and much sought-after remipede may be an example of the oldest living fossil on the planet. Having remained essentially stable in its form for some hundreds of millions of years, these creatures may reveal vital clues about evolution and survival of life on our planet.

I was fascinated by the fact that these exceptionally ancient creatures are living in a very young cave, one significantly younger than their ancestral past, indicating that they migrated from an adjacent, but much older location. Although we could not answer questions about where these animals came from, we knew that closely related remipedes from the same genus inhabit caves on the opposite side of the Atlantic suggesting an origin during the breakup of the continents in the ancient Tethys Sea. Remipedes have been collected in caves in the Bahamas, the Yucatan, Cuba, the Dominican Republic and even remote parts of Western Australia.



Top: Thomas Iliffe, Terrence Tysall and Tom Iliffe light up the interior of one of the dry jameos. Top inset: Terrence Tysall squeezes through a breakdown pile. Middle inset: The hike to the crater rim begins at a significant distance from the volcano. Lower inset: Team members explore the edge of the caldera of Monte Corona.



The highlight of our expedition came with the successful collection of several remipede specimens that appear to represent an entirely undocumented species.

Despite the success of the expedition's efforts to collect keystone animals, many questions remain. Where do these stygobitic animals come from? Do they live in deep ocean habitats or in tiny spaces within the matrix of mid ocean ridges and seamounts? Did they simply ride around the globe on ancient drifting continental rafts? Is their rarity an indication of changing water conditions or a testament to perfection in evolutionary form?

Stygobitic cave animals have a unique survival strategy. Living in subaquatic darkness, these creatures developed improved senses of smell, taste and vibration detection. Eyes and pigment, and other unused anatomical features gradually disappeared. These animals are often endemic to a single, remote site, adapting to its particular environment and very scarce food sources.

Dr. Iliffe sums it up best. "Many of these animals are basically missing links in helping us to understand the origins of life in the oceans and generally the origins of life on Earth. They are totally new forms of life than is already known from anywhere else on the planet. The animals here provide us with a glimpse of what the Earth was like many, many millions of years ago."



The island of Lanzarote seems to be singled out in terms of natural beauty and oddities. From top down: El Golfo is a small sea water lake inside a volcanic crater. The island of Graciosa from El Mirador. Timanfaya National Park. Dramatic landscape near El Golfo. Background: Tom Iliffe explores a "galerias" used to mine water horizontally from inside the volcano.



Unlike divers, these adaptable creatures somehow thrive in low levels of oxygen. And unlike most people encountering a potentially fatal reality, Sheck Exley and Ken Fulghum adapted to their situation, retaining composure during one of the most spectacular emergency exits in cave diving history.

The scientific results of our team's extraordinary research will benefit biologists for decades.



I however, am not a scientist. Swimming through the depths of this lava tube, tracing the fin kicks of Exley and Fulghum, I am keenly aware and grateful for what I am. I am an explorer.

More of Jill Heinerth's photos can be found on her website at www.IntothePlanet.com. She also hosts an interactive multi-media online resource www.RebreatherPro.com which carries video and audio content as well as articles about what's hot in the world of rebreather diving.



From top: Tom Iliffe makes the climb up Sand Mountain. Departing Sand Mountain. Iliffe squeezes through a restriction from the upper level of the cave to the lower tunnel. Bottom: The Relic Sand Mountain in the upper level of the cave was one of the few locations where we encountered silt.

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Safeguarding the Coral Reefs of Cayos Cochinos, Honduras

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Text by Jon Shrides
Photography by Curt Bowen

First charted by Christopher Columbus in 1502, the idyllic Los Cayos Cochinos Islands lie nestled between the Caribbean coast of mainland Honduras and the more commonly visited Bay Islands. The warm waters around this archipelago are home to one of the few actively managed marine reserves in this region. Stretching from the Yucatan down through Belize, Guatemala, and on to Honduras, is a network of coral reefs that form the second largest barrier reef in the world: the Mesoamerican Barrier Reef System. The Honduran Marine National Monument Cayos Cochinos forms an essential part of the 'string of pearls' – the name given to the handful of marine reserves that have been formed to protect the sparkling diversity of corals and fish found along this trans-national reef.

Photo: Social Feather
Duster worms (*Bispira brunnea*) are just part of the myriad of invertebrate life that can be found on the coral reefs of the Marine Protected Area, Los Cayos Cochinos, Honduras.



The protected reefs of Los Cayos Cochinos reserve help conserve and bolster fish stocks within the region. This allows divers to enjoy colourful sights such as this Queen Angelfish (*Holacanthus ciliaris*), seen darting through a gap in the reef.

As most well know, the majority of the world's coral reefs are under threat of extinction from human activities. The opportunity to conserve, understand, and monitor such an important reef is what has drawn Biosphere Expeditions to the Los Cayos Cochinos region.

Biosphere Expeditions is an international non-profit conservation organisation that takes teams of volunteers to work on wildlife research projects around the world. Originally founded in 1999, Biosphere runs several international projects around the globe. Expedition team members do not need any previous experience; they come from all backgrounds and join on one-week or two-week expeditions to work alongside scientists collecting data for research and conservation. These projects are aimed at those who want to 'do something' with their vacations. There is an increasing market for those who want to go back home not with just a good tan, but also able to say they actively took part in conservation and research.

Biosphere's various projects also present a spectrum of experiences, wildlife, and challenges. Some projects require a high level of fitness for activities such as high-altitude tracking of snow leopards in the mountains of the Altai Republic. Other projects have a lower fitness requirement, such as the boat surveys of whales and dolphins in the Azores. The level of home comforts available can also vary, from field camps based in tents, such as those tracking jaguar in Peru or Brazil, to the comparatively luxurious game lodges of the chamois, wolf, and bear project in Slovakia. The project in Honduras is right down the middle, with a moderate fitness level required for diving surveys. Although housed in comfortable cabins, Biosphere Expeditions rates the accommodation as 'rustic' with no running water or flushing toilets. This is still an expedition, after all!

The focus of Biosphere Expeditions research in Los Cayos Cochinos is surveying the fringing reefs around the two main islands and the thirteen smaller sandy keys. Biosphere first

started surveying these reefs in 2006; and by using the same methodology and returning to the same sites each year, they provide a basis for continued monitoring of reef health within the marine park. Expedition team members join the project for two weeks, and all must be a minimum of PADI Open Water or equivalent. The expedition staff consists of an Expedition Leader, a Team Scientist and a Dive Instructor, all of whom participate in training team members for the first few days of the expedition. Training consists of lectures, DVD presentations, and practice runs. Of particular popularity with the team members each year is the outstanding DVD created by the Reef Check organization, which is followed by a mock, dry land dive survey conducted on the local beach, featuring the highly dangerous duct tape barracuda!

The objective of all this is to transform the volunteers from recreational divers into science divers. For many, the use of survey tapes, slates, SMBs, and other unusual equipment underwater comes as a new experience. Dealing with task loading is an important part of the training, and safety is paramount. Divers have to work hard to collect data whilst handling equipment – one section of the survey work requires divers to dive head-down whilst looking under rocks for invertebrates and also collecting data on the general state of the reef. With so much to think about at once, it's possible for divers to forget basic aspects of dive safety, such as checking air on the SPG. For this reason, the training is thorough and there are always two PADI professionals in the water with the teams during surveys.

Top right: Expedition team members need to maintain good buoyancy to be able to assess the reef whilst handling a variety of underwater equipment.

Middle Right: Fish and Corals aren't the only interesting wildlife in Cayos Cochinos. The Islands are also home to a rare species of endemic Spiny Tailed Iguana; *Ctenosaura Melanosterna* (pictured), and the elusive Pink Boa Constrictor (not pictured!).

Inset: For two weeks at a time, team members call this beach home. Boat survey dives depart from this, the island's only dock, up to three times a day.





The survey protocol that the Biosphere teams use is called 'Reef Check.' Since 1997, the Reef Check survey method has been used in dive sites around the world, giving the first ever global assessment of coral reefs and their associated fisheries. The unique feature of Reef Check is the ability to recruit and use regular, non-specialist divers. The survey work focuses on indicator species, i.e. those that 'indicate' the state of the reef and the level of human impact upon it. For example, groupers are a popular commercial fish, and some reefs suffer from low populations due to over extraction. Likewise, banded coral shrimp are popular in the aquarium trade, and hard coral percentage cover of a reef can help to explain the status of one dive site's ecology versus another. This allows useful between-site comparisons; for example, whether one site suffers more fishing pressure than another. The use of a standardised methodology also allows this data to be collated by Reef Check, and compared across regions, the wider Caribbean, and even globally. The established pedigree of Reef Check, availability of high quality multi-media teaching materials, and ease of introducing divers to diving science, makes it an ideal survey program for Biosphere Expedition's work in Los Cayos Cochinos.

But it's not all work, work, work on the expedition. The diving schedule does allow time for the team members to get out and enjoy some of the fascinating wildlife in the region, be it above or below the water. On their day off, team members can venture deeper into the island's steep jungle, in hopes of catching a glimpse of the rare pink boa constrictor, found only in Cayos Cochinos. It's not uncommon to find some of the indigenous black-chested iguanas strutting about the research base during the day, followed by the eerie large ghost crabs scuttling in and out of their burrows at night.



Top Photo: One of the many small inhabited islands in the Cayos Cochinos Marine Preserve.

Top Left: There is much for the keen macro photographer, such as these stunning and delicate Blue Bell Tunicates (*Clavelina puerto-secensis*).
Left: Night divers are treated to the elegant meanderings of a Giant Basket Star (*Astrophyton muricatum*).

Below Left: A night dive reveals many very interesting animals normally not seen during the day. This large Basket Star curls up into a tight ball during the day, but at night spreads out its multiple appendages to gather food.

Underwater, the team experienced colourful acrobatics by reef squid, a close encounter with hawksbill turtles, stumbled across a sleepy nurse shark, tucked away under a sandy ledge of reef, and had a flyby from an inquisitive eagle ray. On a night dive, with their torches briefly switched off, the team experienced bioluminescence, their movements exciting the glowing plankton in the water, whilst elegant and delicate basket stars, roamed slowly over the reef, wafting their giant fern-like arms in an attempt to catch a tasty night time snack.

Back on dry land, the team have the evenings free to input data from the day's diving into the expedition's computer. Some evenings have lectures scheduled for those who are interested in learning a little more reef ecology from the marine biologists who are on hand. However, some nights are free to just sit back, enjoy the warm Caribbean breeze, the clear starry sky, sip some rum, and watch the eagle rays swoop past the local dock to hunt out small fish that have been attracted by the light.

Currently, the Reef Check monitoring project in Los Cayos Cochinos is the only diving project offered up by Biosphere Expeditions, who will be running expeditions to Los Cayos Cochinos in March 2009. There are also plans to set up a similar reef monitoring project in Oman in the near future. The proximity to the coastal town of La Ceiba allows relatively easy travel arrangements, which in turn provides a good opportunity to travel up to the beautiful Mayan temple ruins of Copan before flying home from the city of San Pedro Sula. Currently, dive tourism is very limited in Cayos Cochinos, certainly in comparison to the diving of Roatan and Utila. This expedition allows members a unique way to not only dive and experience the reefs of this marine reserve, but to get directly involved in research and reef conservation, whilst learning diving science at first hand.

www.biosphereexpeditions.org

Top right: Divers use long lengths of PVC plumbing tubing, in conjunction with a long fibreglass tape, to help measure width and length of survey areas for fish counts.

Bottom Right: Although divers concentrate on counting key species of fish, corals and other reef invertebrates, there is time to enjoy rare sights, such as this slightly sleepy Hawksbill Turtle (*Eretmochelys imbricata*).





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B-29 SUPER FORTRESS

Lake Mead National Recreation Area

**Text and Photography
by ADM Photojournalist Mel Clark**

Beyond the glitter of the Las Vegas strip where fortunes are won and lost, lies a little lake that holds a piece of Cold War history that's been hidden for half a century. What started out as a stop over for GI's on the way to the West Coast grew to be one of the most exciting and controversial cities in the nation. Who would have thought it would become a technical diver's playground as well?

In the desert, not many people would really think of scuba diving, let alone diving on a WWII B-29 bomber called the "Super Fortress." But Lake Mead, just outside of Las Vegas, Nevada, has become quite a diver's paradise.

Lake Mead holds many sunken treasures for the adventure minded scuba diver, including a PBY Mariner, Wreck Alley, and the B-29 bomber. The lake has many great technical dives that could keep an avid diver content for days or even weeks. The "crown jewel," and the most fiercely protected dive site in the lake, is the B-29 S/N RB29A 45-21847.

WWII brought about a need for long-range bombing campaigns. Boeing was awarded a huge US Air Force contract to build the B-29 bomber, a long-range high-altitude heavy bomber. The two most well known B-29's are the Enola Gay and Bocks Car; they carried "Little Boy" and "Fat Man," the first two atomic bombs to be used in wartime. The devastation these two bombs brought about caused Japan to surrender, and so ended WWII (August 14th 1945).

The next few decades saw a realigning of world powers, and the start of the Cold War. On September 13th 1945, "Lake Mead's B-29," serial number 45-21847, was put into service. In 1947, that B-29 was stripped of her armaments and re-classified as a reconnaissance B-29 and moved into the Upper Atmosphere Research Project. The purpose of this project was to develop an intercontinental ballistic missile guidance system that used the sun for direction and positioning. Due to the threat and increasing tensions with Russia over the Cold War, Sun Tracker was developed and needed to be tested.

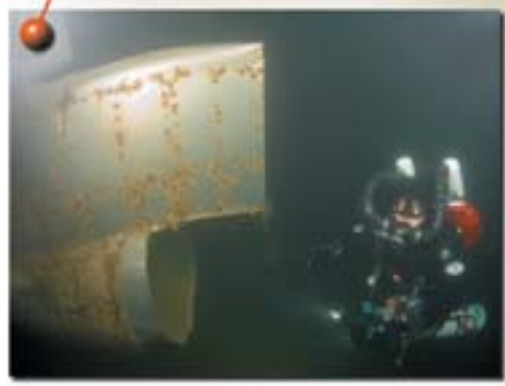
To test the accuracy of Sun Tracker, a plane capable of high altitude flight followed by a rapid low level flight was needed. The B-29 was the first mass-produced aircraft with a pressurized cockpit, which was what was needed for such testing. The other appealing feature of the B-29 for this test was that after WWII there were many surplus B-29's available.

Sidescan sonar outlines the unmistakable shape of the B-29 Super Fortress on Lake Mead's contoured lake bed. Lake levels that have dropped over 100 feet during the last decade have brought the historic aircraft almost within reach of recreational divers.



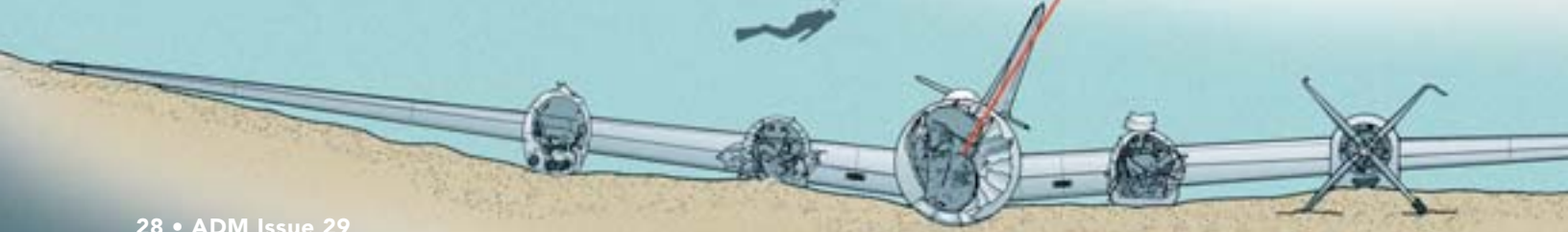
RB-29A SUPERFORTRESS

Lake Mead National Recreation Area



Survey by
James E. Bradford
Matthew A. Russell
David L. Conlin
Brett T. Seymour

National Park Service
Submerged Resources
June 2003





Primary Function: Bomber
 Contractor: Boeing
 Crew: 10 crew
 Unit Cost: \$639,000
 Powerplant: Four 2,200 HP engines
 Length: 99 feet
 Wingspan: 141 feet 3 inches
 Height: 27 feet 9 inches
 Weight Empty: 69,610 lb
 Weight Max: 105,000 pounds

Speed: 365 mph
 Ceiling: 31,850 feet
 Range: 5,830 miles
 Armament: Eight .50-cal. machine guns
 Two .50-cal. machine guns
 One 20mm cannon in tail
 20,000 lbs. of bombs.
 Number Built: 3,970

Lake Mead was chosen as a testing area due to its remote location, availability of the sun, and because it was relatively unobstructed by obstacles, an important feature for low level flying — with the exception of the lake, of course! The only distraction may have been Frank Sinatra at the Tropicana that week!

On July 21, 1948, the B-29 plummeted from high altitude down to as close to the lake as possible. Unfortunately, Captain Robert M. Madison lost his depth perception and plowed the huge plane into the lake at 230 mph. The impact tore off all but one of the engines and sent the plane skipping along the lake surface. When she eventually stopped, she began to take on water and started to sink. Fortunately, all of the crew was able to escape into life rafts and wait for rescue. And so ends the history lesson. Let's go diving!

Viva, Las Vegas! Here we are, but not for the standard tourist reasons. Most folks go to "Sin City" to gamble, get married, or participate in various other activities, so flying with hundreds of pounds of scuba gear will get you a second look by the airlines and our friends at TSA. Between the airlines seeing an opportunity to make more money with overweight baggage, and your average TSA agent, the technical scuba diver has an interesting day ahead of him. Flying is always a challenging compromise and battle of wits.

Our expedition to Vegas for diving was the last week of December. Joel Silverstein from Tech Diving Limited invited us down to experience the B-29. This was to be a down-and-dirty end-of-year look at the B-29 and some other technical sites in Lake Mead. We finally arrived late that night at our two-star hotel by Hoover Dam. The wind was really howling. I went to bed hoping that it would subside over night. Of course, I was not so lucky and the wind was still going strong the next morning.

We arrived at the boat ramp inside the Lake Mead National Recreation Area, and started preparing our gear. We were all diving closed circuit rebreathers. Curt and Joel were using KISS Classics, and Erik and I were using COPIS Megalodons. We decided on a mix of 10/50 as we were also going to dive some of the deeper wrecks in Wreck Alley after the B-29. Joel was overjoyed to dive such a high helium mix. While I was eagerly putting my gear aboard, I could see in John and Joel's eyes that this day might be a wash; but, like troupers, we headed out of the harbor to take a look. The waves were four to five feet, which is more than we wanted to fight for an hour's ride out to the B-29. Not to mention that things can change fast, and for the worse I am told.

Up to this point in my diving career, I have never been blown out of a dive; so I'm having a hard time realizing that I might not get to dive in the lake today.



The bent propeller wings on engine #1 show the force of the impact onto Lake Mead's water surface. Joel Silverstein, rebreather diver and dive permit holder, pauses for a photo beside this massive engine.



Above: Ripped from the plane during the crash, a lone oxygen cylinder that was used for high altitude flights sits on the muddy lake floor.



Right: Tucked tight and warm in his drysuit, Joel Silverstein's KISS classic rebreather provides the optimal gas mix, optimizing his required decompression — a small payment to visit such a unique and historical dive location.

We are not talking the ocean here, so what the heck? We return to the dock and play the “hurry up and wait game” for the next three hours. The winds do not drop, and Joel finally calls it: the day is over and we will try again tomorrow. Now it is official. I have had my first dive scratched, and it was on Lake Mead. I’m starting to get an appreciation for the size and strength of this lake. Oh well, the day is still young and we are divers in Las Vegas, so off to the bar to toast to our defeat!

Attempt two. We decide to launch from Echo Bay Marina this morning, which is a few miles north of our first launch site. The B-29 is only about 20-30 minutes from here as compared to an hour or more from Lake Mead Marina. The winds are fairly light and we are cautiously optimistic. After loading we head out, this time to a completely different lake.

We make it to the B-29 site, and begin to suit up. Joel, Curt, Erik, and I jump in and begin our descent to the bottom. The B-29 just a few years back was on the bottom in over 240 feet of water; but today, because Lake Mead’s water level has dropped over 100 feet, the B-29 now sits in almost a recreational diver’s depth of 140 feet. The National Park Service has set up a permanent down line to the B-29 to protect her from carelessly dropped anchors or drop lines, and really went all out setting this up. Two 12,000-pound concrete blocks anchor the main down line that your surface support vessel is attached to. I guess they did not want their marker moving! To further protect the plane, you now

have an 87-foot swim to the next 1000-pound concrete block that is around 20 feet aft of the tail section. The theory on this long swim I am told is two-fold: one to get your buoyancy worked out before you get to the plane, and the second reason is to prevent anything that is accidentally dropped off the surface support boats from hitting the plane. The next line was from this cement block going to a copper stake that is right next to the tail section.

The first object a diver will get to see is the oxygen cylinder that lies just off the port tail section. This is my first stop on the tour. I grab a quick few pictures of Erik with the oxygen cylinder. Like most lake dives I have experienced, the lake bottom is very silty, and it is best not to even get close to it or the visibility will be ruined. Joel and I now head for the port #1 engine. Part of Joel’s job was to be a great buddy, but his main job was to be the lighting man with the two 50-watt HID lights from Salvo. These lights were like having our own hand-held sun with us! The number one engine is the only engine left on the plane and it makes for a great photo. The propeller is sitting almost squarely with two blades on the bottom and two blades pointing up. All the blades are bent pointing port (left). This is due to the engine running when it impacted the water. The hypothesized reason for the #1 engine surviving the impact while the other three were torn from their nacelles is due to the right bank of the aircraft on impact. If you get a chance to dive this B-29, I recommend getting a few shots here. The B-29 is covered in a

layer of silt. It almost looks like the plane is totally brown, but every now and then you can see a spot that has no silt with the original aluminum skin showing through. If you look closely at the upper prop blade, you can see some corrosion that almost looks like a rusticle.

We now swim to the cockpit, and the first thing I notice is the pilot's window that is pushed out where he must have escaped. The nose section sustained a large amount of damage and is now completely open allowing the diver to peer into the cockpit. There is a folded parachute, a crescent wrench, and a pair of pants lying undisturbed. It has been rumored that there is a \$100.00 bill in the pants. As this is a "do not touch wreck," we may never know whether this is a fact or just a tale.

Circling around the starboard side of the cockpit, you will see that the co-pilot's window is also pushed out. Looking inside, you will see another parachute lying next to the pilot's seat. We now ascend a bit to take a look at the Sun Tracker's dome. Unfortunately, as we are not allowed to touch the plane, we cannot clean off the dome, so all we see is a dome covered with silt, not too exciting. We continue past the radio antenna and tour down the starboard wing. Engines three and four are missing. The jagged remains of the engine nacelle and controls are all that is left.



Immersed in cool green water as he completes his required decompression time, Seattle diver Curt McNamee daydreams of the dive he just completed on the B-29 Super Fortress.

The nice thing about this wreck being in 140 feet is that you can spend a long time examining her. We head to the tail section. Joel, Erik, John, and Curt all take their turn at posing for a picture. The leading edge of vertical stabilizer is missing a chunk just like a bite was taken out of it. The joint between where the vertical stabilizer meets the fuselage is fractured and bent towards the port side of the plane. This damage is likely due to the plane's impact on the bottom that has an upward slope here. The rudder sustained some horizontal damage that looks like a can opener had peeled a layer back. Part of the B-29's serial numbers (45-21847) can be read on the rudder "5218." The fabric on top of the elevators has been punched through and is mostly torn. The damage looks like it is post-crash and likely caused by a diver carelessly putting lighting or other camera equipment down on them.

We were extremely fortunate to get to spend almost an hour on the wreck; but now it is time to return to the surface. First the swim back to the 12,000 lb blocks, then a 45-minute ascent.

Upon surfacing, the weather had become a bit windier and the waves were starting to build. John and Joel decide it is best to head in and call it a good day.

The B-29 is an incredible piece of history, relatively undisturbed and frozen in time in the 1940's. If you get an opportunity to dive this wreck, I would definitely suggest doing it.

The National Park Service (NPS) opened the B-29 to divers under very strict conditions in July 2007 for a six-month trial. Two companies were issued "commercial use authorization (CUA)" to have a finite number of dives on the B-29. Joel Silverstein the CEO of Scuba Training and Technology Incorporated (928-855-9400 e-mail: joel@techdivinglimited.com) was one of the companies. Joel has submitted his permit request to NPS again. At the time of writing this article, the requests are stuck in a bunch of red tape and typical bureaucratic delays. The purpose of only permitting controlled diving on this wreck was to preserve it for all Americans and others to enjoy for future generations to come. The NPS was pleased with the overall preservation of the site by the two CUA operations. It is really too bad that in a country where freedom is prized, we are being prevented from experiencing such a great piece of history. I want to thank Joel for his expertise on this site and for being a great dive buddy. I also want to thank John Fuller, our boat captain, for running a top-notch trip for us. And Salvo (www.salvodiving.com), who loaned our expedition the 50-watt HID lights, which were extremely valuable in getting all the great still and video images, thanks!

Charter and availability to visit the B-29 can be found on:

www.divetheb29.com

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[NOTE]

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Images of America FLORIDA'S SHIPWRECKS

The Sunshine State has a rich maritime history spanning more than five centuries. Tragically, part of that history includes thousands of ships that have met their fates in Florida waters. Potentially more than 5,000 shipwrecks reside off Florida's 1,200 miles of coastline, with hundreds more lost in the state's interior rivers. In and of itself, the Florida Keys archipelago, consisting of approximately 1,700 islands stretching 200 miles, is littered with the remains of close to 1,000 shipwrecks. *Florida's Shipwrecks* utilizes captivating images to illustrate dramatic stories of danger and peril at sea, introducing readers to a fascinating crosssection of Florida's shipwreck history.

<http://uwex.us/>

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www.fourthelement.ca



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VR Technology Limited are proud to announce a brand new VR3 model for 2008 armed with High Definition (HD) software giving enhanced screen visibility and some exciting new options as standard.

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Dive Rite O2ptima Carry On Bag

Meeting current carry-on requirements of most major airlines, this new bag allows rebreather divers to protect the critical components by carrying them on the plane.

The O2ptima Carry On Bag holds head, electronics, loop, regulators and counterlungs. The frame and cover can be thrown into checked luggage. Internal trays flip open to reveal various components to airport security without having to remove and potentially lose any parts.

Made from 1680 ballistic denier nylon with thick foam padding and extruded polyethylene stiffeners that protect components should the airline decide to check the bag.

Weighing in at only 25 lbs (11 kg) loaded and 5 lbs (2.25 kg) empty, the O2ptima Carry On Bag is 2 lbs (0.9 kg) lighter than other bags in its category.

www.diverite.com



KISS Classic and Sport Miflex Hose Up-grade



The Classic KISS & Sport KISS rebreathers are now shipped with the Miflex hose's. These tested and certified hoses are rated for air, air mix, nitrox and oxygen.

The Miflex hoses are extremely flexible and utilize standard scuba fittings.

Upgrade packages are available to all Classic and Sport KISS owners. Please contact KISS Rebreathers or your nearest dealer for details.

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DeepOutDoors has Gone Nuclear Cold Fusion is finally here!!!

This new LED lighting system is the first to surpass the performance of HID Dive Lighting. This 9 watt powerhouse is significantly brighter, smaller and more durable than any other 10 watt HID system.

Comes standard with wet-connect, charger and choice of two battery packs. The Lithium pack (pictured) is 7.2 volts and will provide 3.5 - 5 hours of burn time. The "Field-Pack" system takes 5 D cell alkaline with slightly less burn-times.

This LED light-head with proprietary reflector will provide the most efficient use of this new form of "cold" light to allow the diver to cut through just about any poor visibility conditions.

www.DeepOutDoors.com



An underwater photograph showing a diver in a channel. The water is clear and blue. On the left, there is a large, colorful kelp forest with yellow, orange, and red patches. The diver is in the center, wearing a dark wetsuit and a mask. The background shows the rocky bottom of the channel and more kelp.

British Columbia's Browning Pass

The World of "Clavella John"

**Article and Photos by
ADM Chief Photojournalist John Rawlings**

The drone of the boat engine assaults my ears as we head further north from our departure point at Port Hardy, just about as far as one can drive on Vancouver Island. Mounds of dive gear and cases of photo equipment are piled on the deck, and I hear excited conversation from within the cabin. A chill wind blows against my face as I peer ahead toward the entrance of a channel marked with rocks on either side, each completely encircled by mats of glistening brown Bull Kelp. Colossal fir trees hang out over the water's edge, their intense green seeming to stretch forever into the distance. A Black-tail Deer doe and fawn freeze on the shore of a tiny cove and stare as we pass by; the fawn's tail flicking this way and that in curiosity. From a barren tree limb, a Bald Eagle glares at us – the sound of our passage clearly an annoyance. Onboard, all eyes are on the water ahead, straining to detect any movement that might betray the passage of a pod of Orcas or a feeding Humpback Whale. Dozens of Rhinoceros Auklets putter about on the surface, the horn on their beaks marking their species. Churning past the rocks into the mouth of Browning Pass, surrounded by wilderness on all sides, we enter the world of "Clavella John." It's a moment that I cherish every time I experience it....

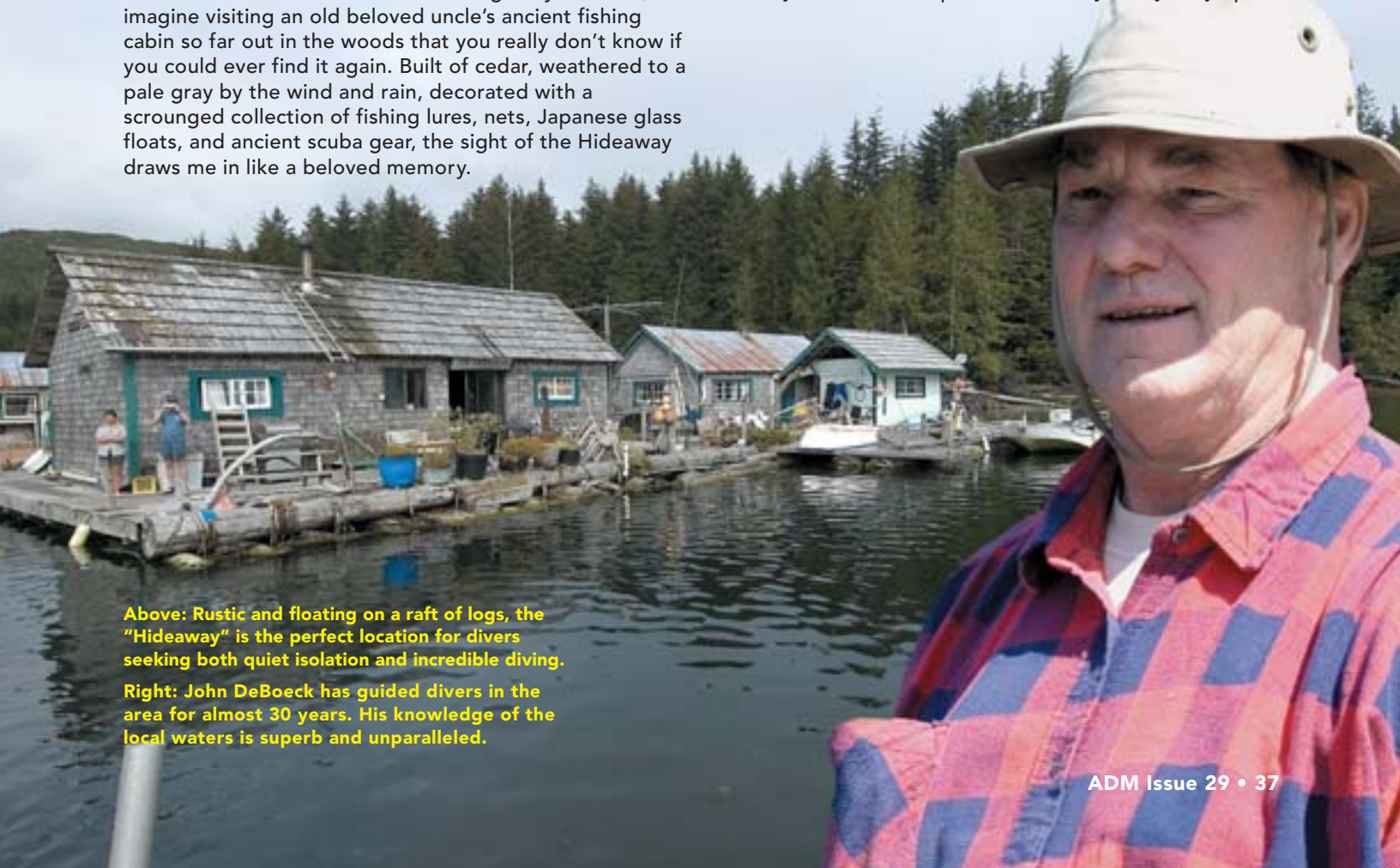
Above: With virtually every square inch of rock blooming with an astonishing quantity of colorful life, this photograph of Browning Wall displays the reason that it is one of the premier sites for cold-water diving in the world.

John DeBoeck, fondly (or infamously, depending on your personal viewpoint!) known as "Clavella John" to the Haida people, has been guiding trips into the area north of Port Hardy for over 27 years. John was one of the first to discover and record hundreds of dive sites in the region, and few, if any, can claim to know these waters better than he does. My father was a commercial salmon fisherman off the Olympic coast decades ago, and John reminds me of some of the "old salts" from those years...with a strong mischievous side and a wee bit of raconteur tossed into the mix for good measure. Everyone is completely enthralled within minutes of departing the wharf at Port Hardy as John regales us with tall tales of whales, wolves, and the demise of his long-lost love, MV Clavella, sunk at its moorings by a freak storm in 2003. The stories continue and time flies by as we churn past scenes of incredible beauty with nary a sign of mankind. Eventually, John turns the bow into the snug entrance of Clam Cove, a tiny inlet located on Nigei Island, and home of the aptly named "Hideaway."

Chugging down a narrow channel, we are greeted by a small horde of Harbor Seals that pause in their lightning-fast hunt for herring and gaze with cow-like eyes as we putter past. Yet another Bald Eagle glares down at us from a tree branch extending over the water as John turns to starboard and we catch our first glimpse of what will be our home-away-from-home for the next several days. The "Hideaway" is just that – a collection of rustic cabins built aboard a large raft of logs floating in the cove – a perfect hideaway from the constant noise and trauma of the outside world. To create an image in your mind, imagine visiting an old beloved uncle's ancient fishing cabin so far out in the woods that you really don't know if you could ever find it again. Built of cedar, weathered to a pale gray by the wind and rain, decorated with a scrounged collection of fishing lures, nets, Japanese glass floats, and ancient scuba gear, the sight of the Hideaway draws me in like a beloved memory.

No phone, no television, no internet connection, heated by wood stove, no power except when the generator is running, the Hideaway isn't exactly what most people think of when they think of a dive vacation destination. It does, however, have a distinct advantage over all the swank dive resorts clustered around the equator – it is on the very doorstep of Browning Pass, well known for some of the absolute finest cold-water diving on the planet. Current-swept and within proximity of the Northern Pacific, Browning Pass is an incredibly rich marine environment attracting divers from around the world. Here a diver can see and photograph gorgeous and colorful sights rivaling anything to be found on Earth. The Pacific Northwest is home to thousands of species of invertebrates, marine fishes, and a variety of marine mammals – the majority of this diverse range of species can be found in the waters surrounding Browning Pass. It is this wide diversity coupled with the natural beauty of the overall environment and often spectacular visibility that have given the area its remarkable reputation.

Things are rather "laid-back" at the Hideaway. There are no schedules other than those dictated by the tides. Diving is done at slack, and the dive sites are selected based on the vagaries of the weather. If the wind is howling, the waves jumping and the current is ripping...it's time to cozy up by the woodstove with a good book or tinker with your camera system. But when "things" are right, as they often are, at any time of the day you can expect to see John Deboeck wander nonchalantly over to the group with a mischievous glint in his eye, hands in his pockets, and say, "Anybody up



Above: Rustic and floating on a raft of logs, the "Hideaway" is the perfect location for divers seeking both quiet isolation and incredible diving.
Right: John DeBoeck has guided divers in the area for almost 30 years. His knowledge of the local waters is superb and unparalleled.



for a dive?" Those are words designed to ignite a flurry of "asses and elbows" as everyone leaps for their cameras, lights, and other paraphernalia and sprints toward the boat. Within a very short period of time, we are chugging away through the channel, salt spray teasing our happily grinning faces...usually not having a clue where John's taking us until we get there. I love it.

Divers that haven't been there often think of Browning Pass as a single dive site based on what they have read. They are wrong – there are multiple incredible sites within the Pass and still more in the surrounding areas. Those within the Pass are generally wall dives – each covered with such an absolutely enormous carpet of life that the famous wall dives of the Caribbean seem to pale in comparison. Joining me on this trip are my friends Josh Smith, BJ Nussbaum, Erin Keck, and Chris Lopez. This is their first trip to Browning Pass and anticipation levels have been profound, to say the least. Remembering back to my first time here, I know that they will experience a sense of awe that they will remember vividly for years to come. Most of the group will be diving with open-circuit, with Josh and me on our closed-circuit rebreathers. Though fantastic diving is available year-round, we have selected mid-April, the dates specially chosen for the best expected visibility.

Above: Members of the ADM team explore 7-Tree Island, one of many astonishingly colorful sites within Browning Pass itself.

Right: A brightly colored "Orange-Peel" Nudibranch glides over a cluster of soft coral. The invertebrate life in Browning Pass is both incredibly diverse and stunningly colorful.



Rolling off the side of the skiff for our first dive, the North Wall, I pause briefly to watch my companions as we slowly sink down into the emerald-green water along the sheer face of the colossal wall. Anticipating their initial shock, I grin as I watch their reactions. Their eyes are huge as they realize just how great the visibility is compared to our waters further south. Diving with my Classic KISS CCR, I can clearly hear their whoops and cries of amazement as our descent continues and the bright colors become increasingly apparent. Huge clusters of glowing red and pink soft corals protrude from the wall, billowing outward like massive balls of cotton candy. Interspersed between these bright splotches of red and pink are hundreds of white and orange Plumose Anemones softly waving in the current, and brightly colored sponges of all shapes and sizes. We find ourselves torn between pulling back from the wall to see its total grandeur and hugging it closely to watch the intricate details of life growing or scurrying across it. It is on dives such as this that one truly experiences the startling variety of the invertebrate world – glowing white and yellow Basket Stars perch atop the fuzzy pink soft corals, their coil-like arms twisting into bizarre shapes like something from the movie *Alien*. Huge Puget shapes like something from the movie *Alien*. Huge Puget Sound king crabs cluster on ledges, their newly molted shells glowing with brilliant fluorescent orange, yellow, and sapphire-blue; bunches of hermit crabs scurry in all directions, making the wall appear to move. Breaking the surface at the end of the dive, the first sounds I hear are euphoric shouts and laughter from the open-circuit group. It's just day one of the trip, and their expectations have already been exceeded. John calmly leans back next to his outboard and gives us a knowing grin.



Right: A Harbor Seal pauses in its quest for fish to steal a quick peek at the author. Marine mammals are common in the area, ranging from playful sea otters to several species of whales.

Above Right: A "Decorated Warbonnet", named for the feather-like crest on its head, peers at the camera lens from its hiding place on a wall covered with anemones and soft corals.



For the rest of the week each dive brings with it its own personality. The sites flow by in wave after wave of color...Eagle Rock...7-Tree Island...Rock of Life...Browning Wall – each one startlingly unique. It seems as though each site is “color-coded,” with one being primarily orange, another primarily white, and still others primarily red or yellow. It is as though each spot has been “painted” with various species of encrusting sponge as a means of marking it differently from the others. To the delight of macro photographers, many different and unique species of nudibranchs are found here, among them a huge species known as the “Orange-Peel” nudibranch, *Tochuina tetraquerta*. Looking exactly like a gigantic orange peel, this species can frequently be seen gliding over bright red and pink stalks of soft corals, giving photographers opportunities for amazingly colorful shots with stunning contrast.

In addition to the invertebrates, fish species abound and divers can frequently find themselves beneath a cloud of Black rockfish, playing “hide-n-seek” with a yellow-striped China rockfish, or face-to-face with a huge toothy lingcod hanging out on a ledge. A vast array of sculpins can be found here, with one small species, the Scalyhead sculpin, *Artedius harringtoni*, being particularly plentiful. Scalyheads can assume the colors of their surroundings and thus often appear to be different species. One of my absolutely favorite fish is the Decorated Warbonnet, *Chirolophis decoratus* – a beautifully colorful small fish with an elongated body, the Decorated Warbonnet takes its name from a feather-like crest beginning at its forehead and extending upward and partially down its back. Solitary and reclusive, this beautiful and amazing fish can often be found staring


back at divers from small cracks and crevices on a wall dive or wedged between barnacles, sponges, or corals.

The dive I shall remember most from this trip was Browning Wall. We had over 100 feet of perfect visibility and the sun shown down through the emerald water - its rays literally danced and glistened on the amazing colors of the wall below. It rivaled absolutely anything that I have seen in the Caribbean or the Pacific, and it was only because of the sting of the cold water on my cheeks that I recalled where I was. Ascending from deeper water on our CCRs, Josh and I paused for a deep stop at 75 FSW. I looked upward to get my bearings and to locate the rest of our team. To my amazement, I could see not only the team at their stop at 15 FSW, but also the dive boat on the surface...a scene considered typical at many tropical destinations, but rare as hen’s teeth in the cold waters of the Pacific Northwest. Savoring the sight, I realized the moment was yet another incredible memory filed away in my mind from the world of “Clavella John.”

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A Basket Star, *Gorgonocephalus eucnemus*, extends its tendrill-like arms to collect plankton from the passing current. Common in the area, Basket Stars can be found singularly or in large groups, making for incredible photographs.

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Wreck of the **MEXICAN PRIDE** *Gulf of Mexico*

Text and photography by
ADM Publisher Curt Bowen



Florida's Gulf Coast boasts some of the finest white sandy beaches in the world. Millions of tourists stroll these beautiful stretches each year. But the sand does not end just off shore, it continues westward in some places for over a hundred miles. Below the water's surface, there is a massive sand desert that contains few rocky outcroppings for fish to live and seek cover from natural predators. Massive structures such as large wrecks and natural sinkholes in the Gulf of Mexico are few and far between.

Photo: Scuba Quest
dive manager John
Falcone documents
the bow section of the
Mexican Pride wreck.

For the last hundred years, man has helped to provide such shelter by adding a multitude of artificial reef structures such as concrete pilings, bridge rubble, barges, ships, and even decommissioned military tanks. When discovered, fish flock to these structures in numbers so thick that they sometimes block out the sun's rays. Millions of small cigar minnows create a moving blanket of life as they shift together in an underwater ballet. Larger fish such as snapper and grouper tuck under and inside every crack and crevice while behemoth rough-skinned jewfish dominate the food chain, only to be challenged by an occasional passing shark or dolphin.

Due to the long distances from shore, many of these massive structures are rarely visited. One of the more popular wrecks off the shores of Tampa Bay is that of the Mexican Pride. The Pride, as locals call it, is a 200-foot-long bulk-products barge that once transported phosphate out of Tampa Bay. In the 1970's, the ship fell victim to mismanagement and subsequently was neglected to the point of no return. The vessel was towed off shore for about 35 miles and, with a single explosive charge in her bow, sent to the bottom of the Gulf.

Today, the *Pride* sits upright in 130 feet of water as she continues to deteriorate from the never-ending effects of salt water eroding her metal structures. Her bow and stern sections still stand tall, but her center has collapsed into an unrecognizable pile of rusted steel beams and metal sheathing.

Artifacts are not the treasure that divers seek on the *Pride*. Divers come to immerse themselves in the immense schools of fish, and to get a chance to swim along with a multitude of VW Bug-sized jewfish that inhabit the wreckage. The stern of the *Pride* contained the crew's



KISS CCR instructor Warren Stincer swims through the marine-encrusted rudder section of the *Pride*.

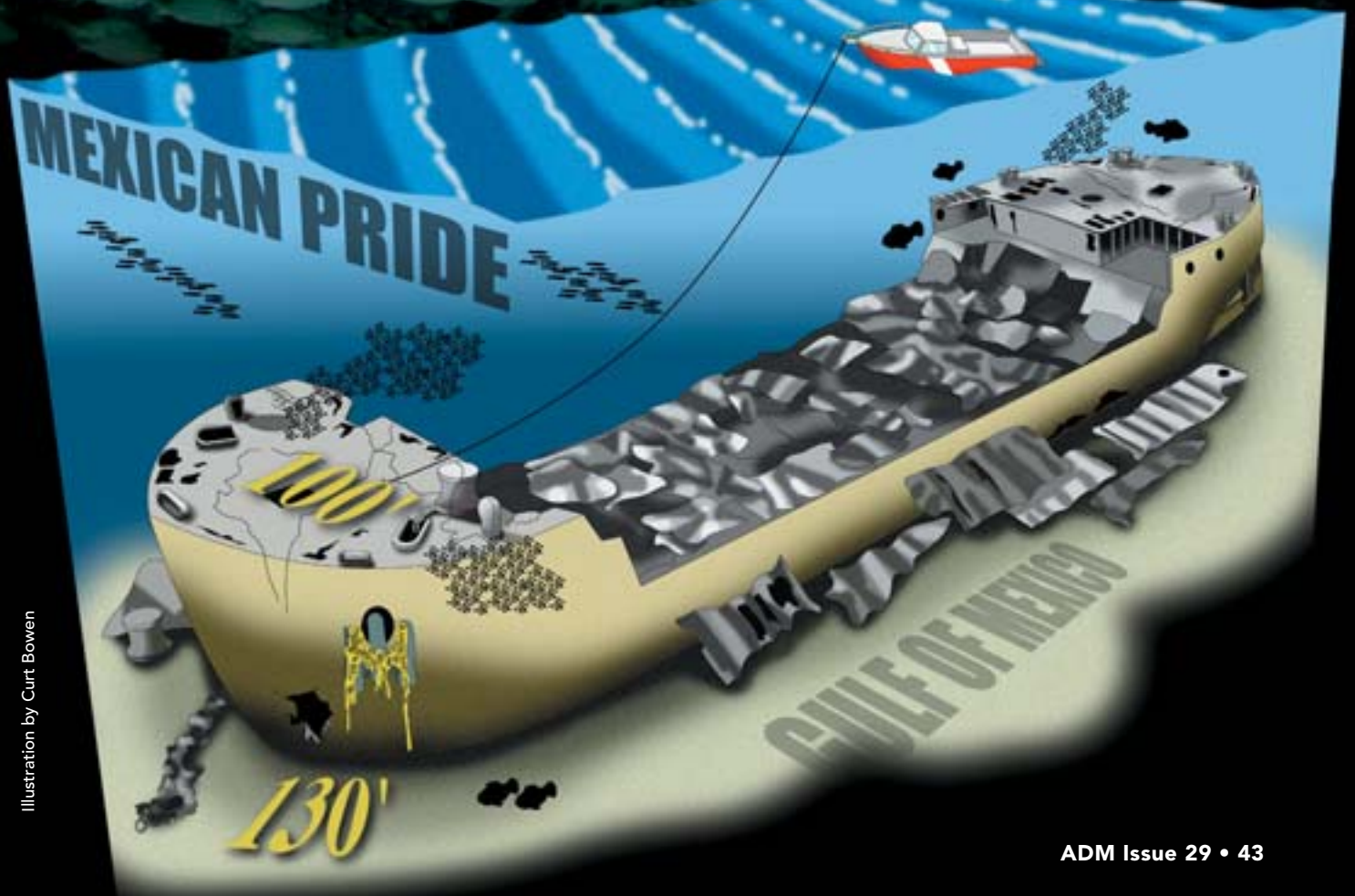
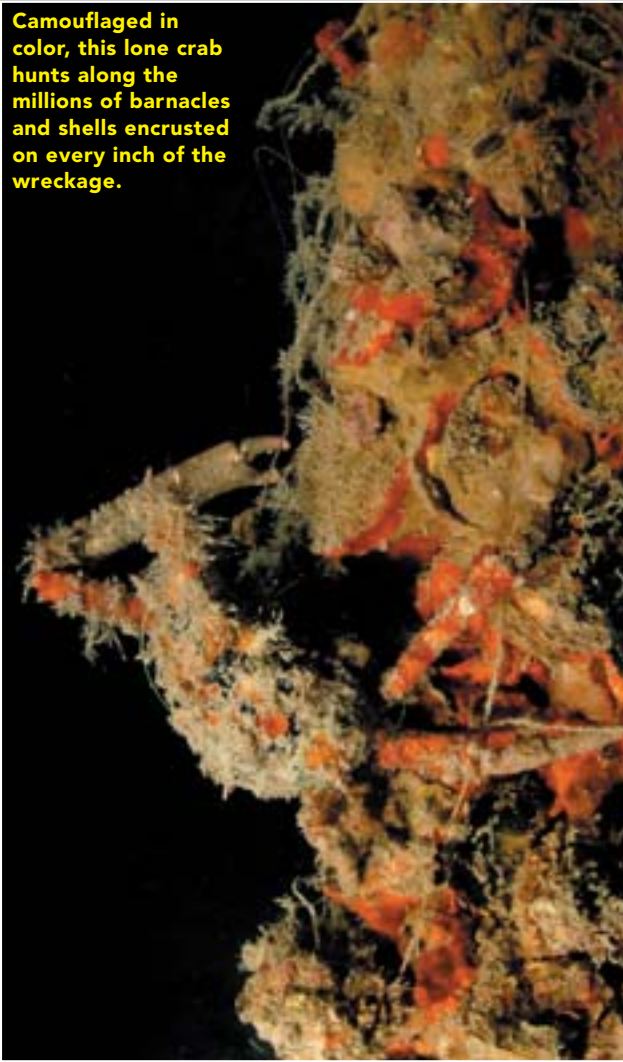


Illustration by Curt Bowen

Camouflaged in color, this lone crab hunts along the millions of barnacles and shells encrusted on every inch of the wreckage.



quarters, galley, and heads. These days the giant fish have taken over this section and renamed it the Jewfish Condo. Care should be taken when entering into the lower decks of the stern section: three or four five-hundred-pound fish do not like to share a crowded space with one misplaced diver blocking the only exit.

The long boat ride to the *Pride* provides enough time for the divers to get acquainted, prepare their dive equipment, and, depending on the speed of the vessel, take a long nap. During the early summer months, the Gulf of Mexico is somewhat predictable for calm weather so seas are normally tolerable.

The *Pride* contains no mooring buoys, thus dive and fishing vessels are required to anchor into the wreckage or drift fish across the structure. As you will see when you swim around the *Pride*, many of these misplaced anchors stay while the previous owners whimper back to shore leaving their unwanted sacrifice for the fish. If you need a new anchor for your boat, many times it's good pickings — bring along a 100-pound lift bag.

Besides the enormous numbers of fish swarming the wreckage, macro photographers can locate a vast amount of small critters to keep themselves entertained. Every inch of the wreckage is thickly coated with barnacles, shells, small fish, crabs, and fish hooks; bring a line cutter and gloves.

If you're seeking a dive full of life and adventure, the wreck of the *Mexican Pride* is an oasis filled with surprises.

For dive charters to the *Pride* visit
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Three, 400-pound Jew Fish (Goliath Grouper) seek refuge from divers inside the upper stern decks of the *Pride*.

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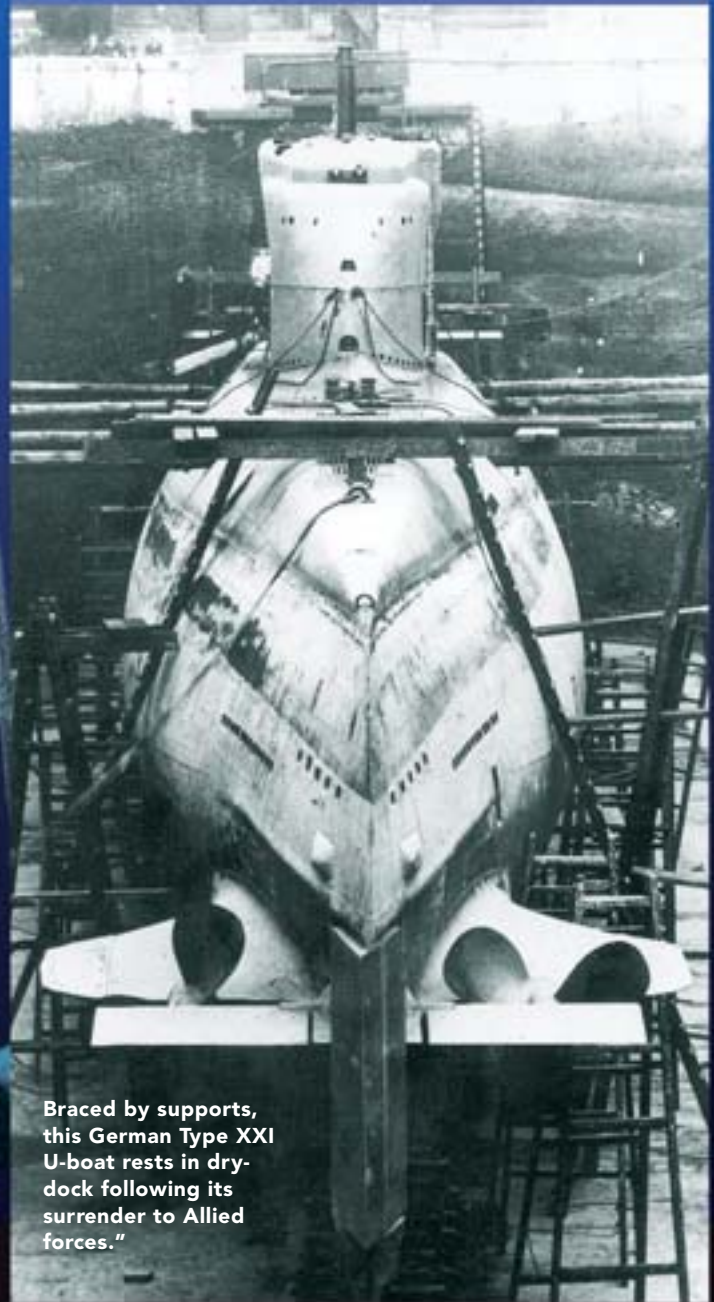
U-2513

THE FIRST TRUE MODERN SUBMARINE


By Michael C. Barnette

Following Hitler's defiance of the Treaty of Versailles in 1935, Germany implemented a brisk and aggressive remilitarization program. However, rather than pursuing new technology and taking the time to produce a modern submarine force, Germany initially opted for quantity over quality. To expedite the rebuilding, the proven U-boat designs from World War I were hastily modified to manufacture the conventional Type VII and IX U-boats. Initially, the U-boats scored numerous victories. Yet, by 1942, the "Happy Time" enjoyed by U-boat crews earlier in the Atlantic had all but vanished. Convoy protection, improved sonar detection, and Allied air cover inflicted heavy casualties on the *Unterseebootwaffe*. The conventional U-boats were simply too slow and could not stay submerged long enough to avoid being rapidly sent to the bottom by the Allies.

Following a November 1942 meeting aimed at rectifying the disturbing trend of U-boat losses, two engineers proposed a simple solution: increase the submarine's battery supply. By increasing a submarine's battery supply, speed and endurance could be improved. Currently, the conventional Type VIIC U-boat could travel at six knots for approximately 45 minutes or two knots for approximately 20-30 hours, before surfacing to recharge the batteries with her air-breathing diesel engines. By doubling the battery supply in a secondary hull, the new *elektroboote* could maintain a speed of 18 knots for 90 minutes or five knots for 60 hours. The design of the new Type XXI electroboat was completed in July 1943, with a planned delivery time of the first vessels expected by the end of 1944.



Braced by supports, this German Type XXI U-boat rests in dry-dock following its surrender to Allied forces."



While speed and endurance were the two most critical improvements in the Type XXI design, other technological advances were also incorporated into the new submarine. Currently, when a conventional U-boat found abundant targets to attack, she was limited to the amount of torpedoes she could fire before retreating and having to manually reload her tubes. This was especially critical considering that the Type VIIC and IX U-boats had to surface to gain access to additional torpedoes carried between their inner pressure and outer hydrodynamic hulls, which left them fairly vulnerable to attack. The Type XXI addressed this shortcoming by possessing six bow tubes and a semi-automatic hydraulic loading system that could fill all of the bow tubes in approximately 20 minutes. The electroboats also utilized radar, radar detection, and a new sonar device. The *Gruppenhorchgerät* sonar array, which utilized 48 receivers in a housing mounted below the bow, was capable of detecting a target as far away as five miles and at a cruising speed of 11 knots, though there were initial problems with interference and streamlining. Improvements were also made that allowed the Type XXI to keep her depth more accurately, a constant problem on conventional submarines. Additionally, the crew was treated to the presence of a deep freezer, which kept food from quickly spoiling on their long sojourns across the Atlantic. Furthermore, it is important to note that the Type XXI U-boat was the first production submarine to also abandon deck-mounted guns in favor of improved streamlining, a characteristic that was eventually adopted by all other submarine navies. The *elektroboote* was truly the first modern submarine.

Above: The U-2513 rests on the sandy sea floor lying hard over on her starboard side. Explorer Richie Kohler hovers over the port side fixed stabilizer surface located just forward of the large three-bladed screw.

Right Page Top: President Harry Truman (in the light suit and hat) disembarks U-2513 after his historic dive off Key West in 1946.

Right Page 2nd Down: The U-3060 in the final stages of construction at the Deschimag AG Weser yard following an Allied air attack. Note the GHG sonar housing below the bow.

Right Page 3rd Down: Shipyard workers install the massive starboard diesel engine in section 3 of a Type XXI U-boat.

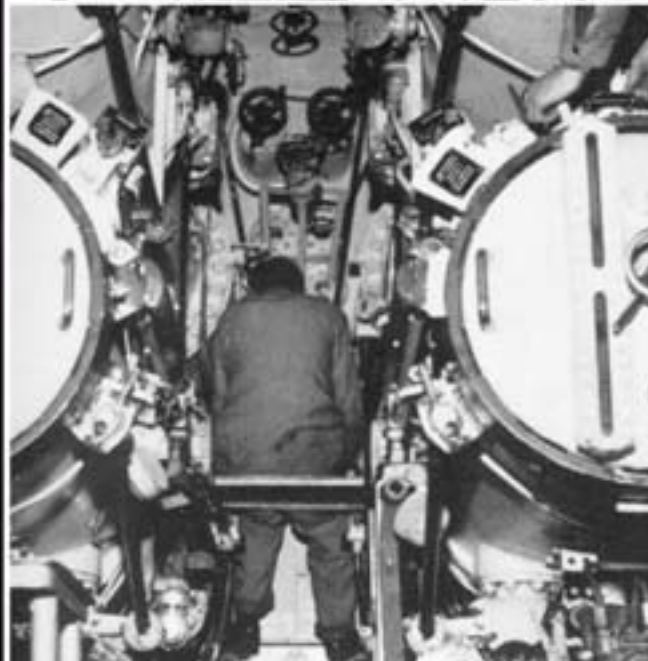
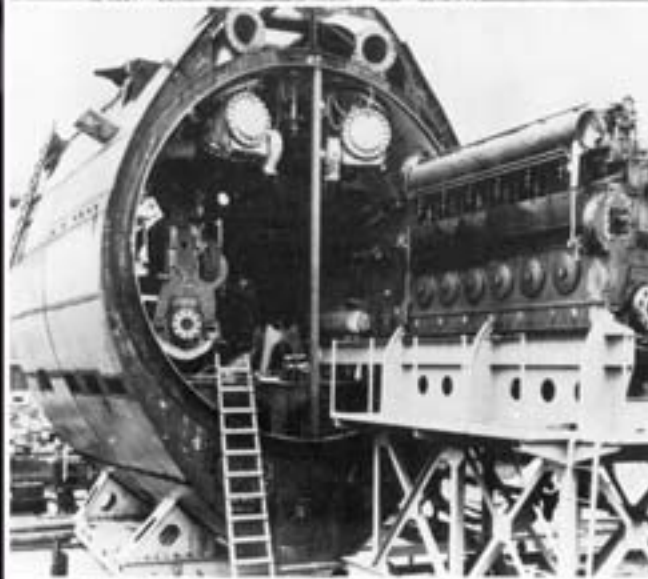
Right Page Bottom: A view of the forward torpedo room in the U-2518 after the war. An operator is perched in between the middle two tubes and in front of the adjustor device for *Lagenunabhängiger* torpedoes.

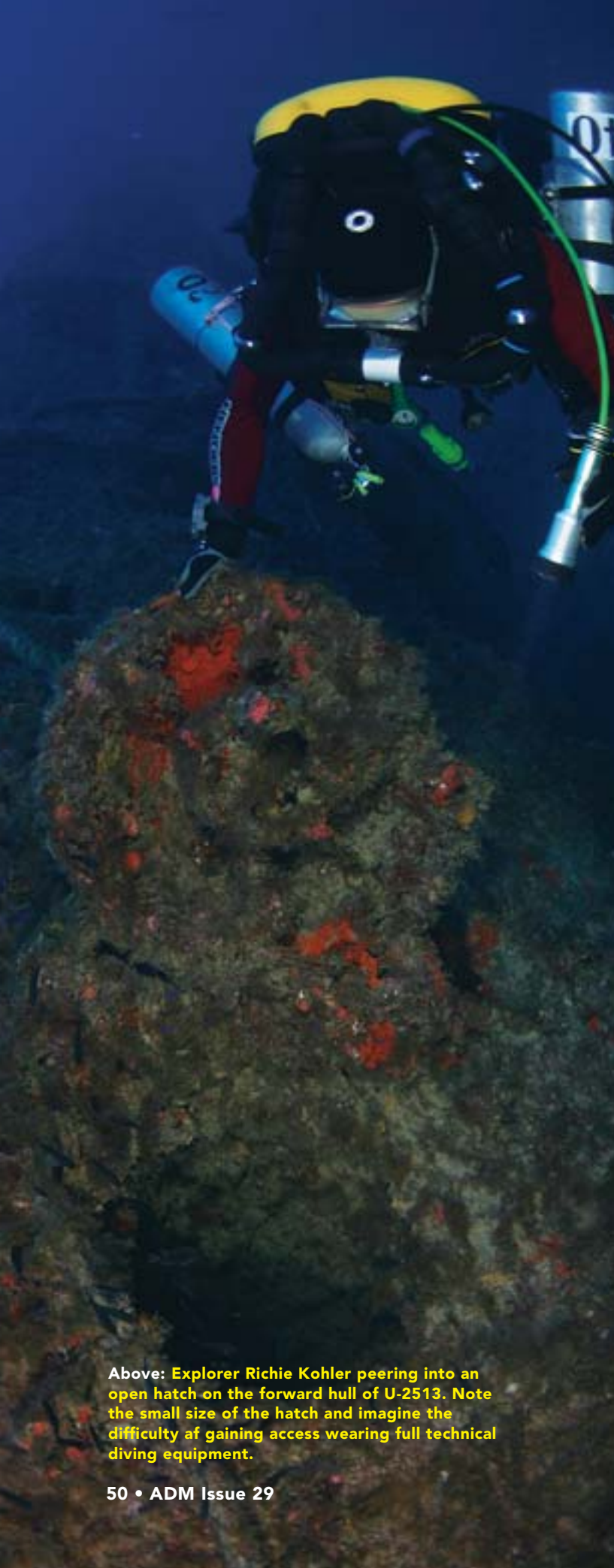
The *U-2513* was built in late 1944 at the Blohm and Voss shipyard in Hamburg, Germany. The Type XXI program implemented a fairly efficient modular construction process. Each electroboat was constructed from eight separate sections, allowing the vessels to be completed in approximately six months, including only 50 days on the rails. While other Type XXI U-boats suffered delays due to Allied bombings, it is unclear if the *U-2513* suffered any damage during its construction. In March 1945, the *U-2513* sailed from Kiel, Germany to Norway under the command of *Fregattenkapitän* Erich Topp, former commander of the *U-552*.

Unfortunately for the German war effort, the Type XXI U-boats were introduced too late in the war to make a difference. Only 119 electroboats were commissioned, and fewer still were actually war-ready. Before making any war cruises, the *U-2513* was surrendered to the Allies in May 1945. The *U-2513* was initially taken to the British naval base at Lisahally, Ireland. There, along with 62 other German submarines, the *U-2513* and her crew awaited their fate. At the same time, a special detachment of approximately 200 U.S. submariners called the Rainbow Division was formed to learn the technology of the U-boats and sail some of them back to the United States. Thirty-eight officers and men departed New London, Connecticut, and arrived in Northern Ireland to take over the *U-2513*. They spent about a month learning the Type XXI systems and controls, a process that was complicated by the fact that the U.S. sailors had to learn German along the way. After everything was checked out and drills were successfully conducted pier-side, the *U-2513* went to sea for more trials. Comfortable with the U-boat's operation and performance, the crew of the *U-2513*, part of the "Forgotten Submarine Bastards of Ireland", departed Lisahally with the *U-3008* and sailed for the United States in August 1945. Also onboard were eight of the original German crew of the *U-2513*.

The U-boats cruised on the surface for the majority of their initial trip to Newfoundland, though a couple of trim dives were made. Just before arriving in Newfoundland, the *U-3008* flooded her stern and had to be towed in. The two Type XXI U-boats then sailed for New London, Connecticut, and finally to the Portsmouth Navy yard in New Hampshire, where the *U-2513* was commissioned into the U.S. Navy as the U.S.S. *EX U-2513*. During the three month stay at Portsmouth, the *U-2513*, now called the *TATAO* (Things Are Tough All Over) by her crew, spent most of the time in the yard for inspection and overhaul. After her time in the yard, the submarine operated out of New London, conducting numerous tests.

In April 1946, the *U-2513* sailed for Key West, Florida. In November, President Harry Truman boarded the U-boat and participated in a cruise to 450 feet. This cruise would represent only the second time a President of the United States would travel underwater in a submarine, the first occurring on August 23, 1905, when President Theodore Roosevelt made a series of short dives onboard the archaic torpedo boat, U.S.S. *Plunger*. The log of President Truman's November 17-23 vacation to Key West even mentioned the many technological advances of the German U-boat, such as the advanced snorkel design that allowed the boat to stay submerged for extended periods of time. After breakfast was served on the boat, the *U-2513* commenced diving operations at 9:30 a.m. on November 21. After descending to 450 feet for a minute or two, the *U-2513* ascended to periscope depth by 10:00 a.m. However, during this time, the port engine room flooded, which resulted in copious amounts of smoke to creep through the aft portions of the sub. Fortunately, the situation was addressed and the *U-2513* safely surfaced at 10:15 a.m. The trip earned President Truman





a card signed by the *U-2513*'s commanding officer, Lieutenant Commander James Burr Casler, which certified that Truman was now an "Honorable Member of the Ancient Order of Deep Dunkers."

John Cunningham was one of the few fortunate sailors to have the unique experience of sailing aboard the former German U-boat while she served in the U.S. Navy. He reported to duty in early 1949 to find the submarine already "Americanized," in that many of the German instructions and labels mounted on equipment had been swapped out for English versions. Having also served on the U.S.S. *Diablo* (SS-479), his recollection of the submarine illustrated the vast improvements of the Type XXI design over its American counterparts. Built about the same time, the *Diablo* was bigger, slower, and not as well armed. It was not until around 1950 that the U.S. Navy had an equivalent design of her own.

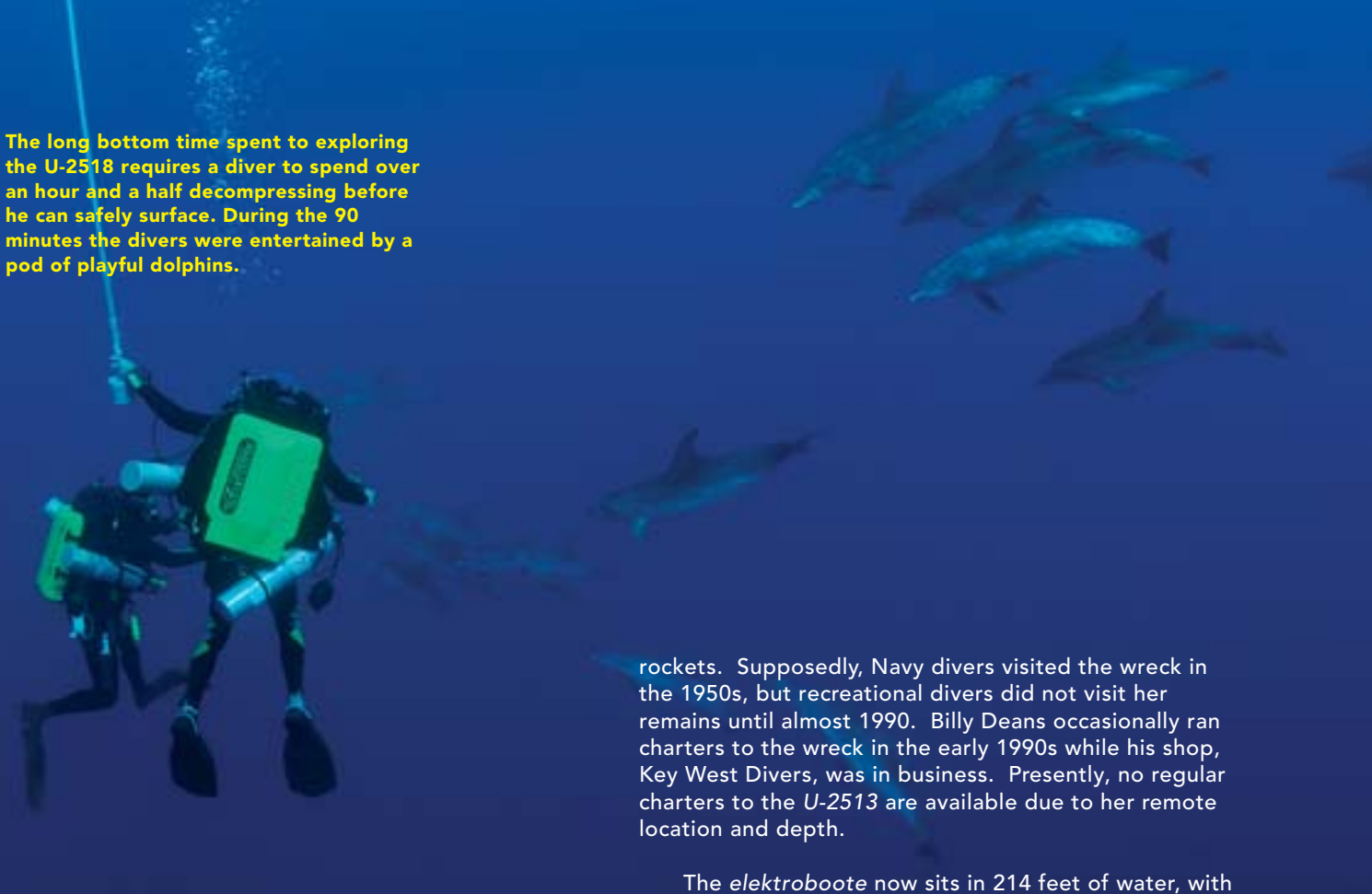
By mid-1949, even with a cracked pressure hull that prevented the submarine from descending past 400 feet, Cunningham came to appreciate the advanced design and engineering of the submarine. Interestingly, he noted the extraordinary hull paint on the U-boat, which seemed to hold up extremely well as compared to the hull paint on other U.S. Navy vessels. Typically, period fleet boats were scraped and painted about every three months to prevent rusting. However, by 1949, the U-boat was still wearing her original hull paint. When ordered to scrape the hull, the crew found the task extremely difficult, as the paint would simply not come off. After extensive work, the paint came off one scratch at a time. Underneath, the metal was bright and shiny, just as it may have appeared when built in 1944. However, after being repainted with standard Navy hull treatment, she was rusting within a few months.

During his short stay on the U.S.S. *EX U-2513*, one event in particular stood out in Cunningham's mind. During operational tests, the submarine experienced a "hot run" of one of her torpedoes. Instead of leaving the torpedo tube, as any well-mannered torpedo is apt to do, this torpedo chose to stay put and run in the tube. At the time, most of the young and inexperienced crew did not know what was amiss. Fortunately, one of the crew in the torpedo room was a veteran submariner who served in World War II. When the commanding officer strolled forward to determine what was going on, obviously oblivious to the impending danger of an armed weapon in the torpedo tube, the crewman screamed to him: "Get your [expletive deleted] ass back to the Control Room and put a down angle on this boat and get rid of this torpedo!" Fortunately, the officer heeded the enlisted man's advice and averted a potential disaster.

After three years of service in the U.S. Navy, the *U-2513* was towed northwest of the Dry Tortugas to be used as a target. On October 7, 1951, the destroyer U.S.S. *Robert A. Owens* sent the Type XXI U-boat to the bottom following several salvos of anti-submarine

Above: Explorer Richie Kohler peering into an open hatch on the forward hull of U-2513. Note the small size of the hatch and imagine the difficulty of gaining access wearing full technical diving equipment.

The long bottom time spent to exploring the U-2518 requires a diver to spend over an hour and a half decompressing before he can safely surface. During the 90 minutes the divers were entertained by a pod of playful dolphins.



rockets. Supposedly, Navy divers visited the wreck in the 1950s, but recreational divers did not visit her remains until almost 1990. Billy Deans occasionally ran charters to the wreck in the early 1990s while his shop, Key West Divers, was in business. Presently, no regular charters to the U-2513 are available due to her remote location and depth.

The *elektroboote* now sits in 214 feet of water, with damage both fore and aft of the conning tower. Part of her sail lies in the sand off to the starboard side, with hedgehogs (anti-submarine weapons) residing along the port side. The U-boat sits with an almost 60 degree list to starboard. Numerous valves and pipes are visible running along the pressure hull as the majority of the hydrodynamic outer hull has deteriorated. Heading aft, divers can observe massive damage to the hull just forward of the engine room. At the extreme stern, both screws are visible nestled amongst the large diving planes and rudders. Forward of the conning tower, a large hole on the port side allows access to the forward torpedo room. Proceeding forward, divers can pass equipment that has tumbled across the interior. A ladder to an open deck hatch lies under a coat of rust and silt. The torpedo tube doors are easily visible, and the perimeter of the room is adorned with numerous placards, gauges, and hand wheels. The forward conning tower hatch is open but, due to the tight fit, there is no diver access. For those that have the diving experience and are willing to make the journey, the wreck of the U-2513 presents a unique opportunity to inspect one of the few remaining examples of a Type XXI U-boat, the first true modern submarine.

*Michael C. Barnette is the founder and director of the Association of Underwater Explorers (<http://uwex.us>), a coalition of divers dedicated to the research, exploration, documentation, and preservation of submerged cultural resources. Employed as a marine ecologist with the National Oceanic and Atmospheric Administration, he has published two books: *Florida Shipwrecks and Shipwrecks of the Sunshine State: Florida's Submerged History*.*



Close-up view of the circular radio direction finder aerial on the conning tower of the U-2513.

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The Blue Duck and a Two-Bob Watch

PEARSE RESURGENCE

I dreamt that I dwelt in marble halls....
I had riches too great to count.

M. W. Balfe (1808-1870)

Text by Richard Harris

Photography by Richard Harris and Andrew Bowie

Twelve months ago, I joined Dave Apperley, Craig Howell, and Rick Stanton on the trip of a lifetime to explore the Pearse Resurgence in New Zealand's South Island. For the team, that trip was a great success with Rick Stanton pushing the cave to the new Australian and New Zealand record depth of -177m. But on a personal level, the adventure left me somewhat unfulfilled. My diving was plagued with problems: drysuit floods, a minor bout of DCS, and other equipment issues. So I resolved to return to the Pearse to dive, explore, and photograph the site to my satisfaction.

In February 2008, I finally left Australia again with two good mates — South Aussie cave divers Andrew Bowie and Grant Pearce. With the logistical nightmares of shipping hundreds of kilos of camping and diving gear overseas behind us, we arrived in Christchurch and stayed with friends whilst we sorted out the final details of a hire car and trailer, the decompression habitat, and provisions for ten days in the bush. Suddenly realizing that none of us had a wristwatch, we bought a complement of three team digital watches for fifteen dollars a piece! Top shelf! The eight-hour drive north to Nelson brought us to the door of local cavers "Oz" Patterson and Debbie Cade who fixed us up with the few items we had overlooked and gave

Photo: Cave explorer Grant Pearce, drops into the main tunnel of the Pearse Resurgence. The yellow surface supply oxygen line connected to the habitat can be seen on the right.

Inset: New Zealand's rare Blue Duck, and our good luck omen!





Above: There is only one easy way to get gear in and out of the Pearse and that is by helicopter and a cargo net. The Kiwi bush pilots are some of the best in the world.

us a bed for the night. These Kiwis are very hospitable! Then three days after arriving in the country, we finally flew into the Pearse Valley in Syd Deaker's trusty helo amid unseasonably heavy rain.

First impressions were of the resurgence in flood, and some very inclement weather. But on walking up to the cave opening I spotted the rare Blue Duck sitting in the entrance pool — locally recognized as a good omen! So I knew we'd be okay, and sure enough the weather soon improved and the water levels began to drop. Thus followed a period of perfect South Island weather, which held until our return to Australia.

The first task was to get the decompression habitat set up at 6m in the Nightmare Crescent, then to begin some familiarization dives, especially for Grant and Andrew who were new to the cave. The cold water (7 degrees C) and the dark granite walls of the cave make for an intimidating environment, and it takes a few days diving to feel "settled" in the site.

So we started by checking some of the original maps of the cave, adding some detail here and there, and doing some still photography and video. Soon Grant and I began staging cylinders further down the cave in anticipation of some deeper dives later in the week.



Deep cave explorer Richard Harris prepares for the 182m / 597' dive using a Mk 15.5 electronic CCR; and a load of tanks to stage in the cave.

Grant was still suffering from the cold a bit, and was trying some different equipment configurations, but gradually it was all coming together for him. As the only rebreather diver in the group, I began to push further into the resurgence while the other guys moved to a support role. Transfers in and out of the habitat became more streamlined and rehearsed, and we all developed a routine for the deeper dives.

The question of how deep I planned to go was never far from my mind. I felt that if all the buildup dives went faultlessly and I was coping with the cold, it was possible I would attempt to extend Rick Stanton's line from 177m. As the days rolled past and my deeper buildup dives of 95, 111, and 123m all went very smoothly, I started to entertain the possibility of a dive to the known limits of the cave. Finally, I decided on a dive to a maximum depth of 185m or fifteen minutes bottom time, whichever came first.

By the time the big day dawned, I had staged eight cylinders of gas in the cave in addition to the two I would carry with me, and the surface-supplied oxygen for the habitat. Using a diluent of trimix 6/85 (6% oxygen and 85% helium), I planned to get to the bottom of the main shaft at 110m by five minutes. This would give me ten minutes to scooter to the end of Rick Stanton's line and, if possible, explore beyond. By using a series of diluent flushes during ascent, I wanted to get back up to the habitat in the shortest possible time, and then do an extended stop on 100% oxygen at 6m in relative warmth and comfort. Hot soup and my underwater mp3 player should take care of the rest!

As I geared up in the entrance pool with Grant in the water assisting me, the Blue Duck was fishing for crustaceans in the stream just 10m away. Definitely a good sign! With final checks complete, I turned my X-scooter into the flowing water and powered down the Nightmare Crescent to the main shaft, the hard marble walls of the cave slipping quickly past. Everything felt good so I aimed straight downward, and well ahead of schedule arrived at the shaft's base at 110m. As I approached the "Needlebender," a squeeze developed in my right dry-glove which had been just below me holding the scooter. I pushed on further towards a rock where I could stop and relieve this minor annoyance. By then the squeeze had become so severe that my hand was fixed into a rock-like claw, and I couldn't flex my fingers at all. I ascended slightly to the ceiling and inflated my suit, the offending hand stretched up above me. But the seals were compressed so vigorously that no air would flow into the glove. I couldn't believe that such a seemingly minor issue might spell the end of the



Team diver Grant Pearce checks out the decompression habitat in the Nightmare Crescent at 6m / 30'.

dive! Suddenly, some air started to move past the seal into the glove and my hand was released from its iron prison. But over two minutes had been wasted, leaving me feeling somewhat flustered.

I decided to push on through the "Needlebender" and see how I felt by the time I reached the "Big Room." All seemed well by then. Breathing back under control, scooter-mounted lights burning brightly, and the rebreather maintaining set-point perfectly. I clicked the scooter's speed up a notch; and with the 6mm line laid by Apperley and Stanton running through my left hand, I continued my foray into this part of the cave I had never seen before. Down the "Brooklyn Exit" to 150m depth, then the less steep "M40" to over 170m. At thirteen minutes, I had reached my destination: the end of the surveyed cave.

Ahead of me, a tunnel continued at approximately 170m. Below me, a smaller hole with Rick's line leading into it tempted me down. At the end of Rick Stanton's final dive last year, he had been forced to turn due to the failure of his primary light. He had dropped the reel down this hole, but had been unable to follow it. Now, the line was doubling back on itself towards me in the light water flow. I dropped down the hole and entered virgin passage. Looking ahead, the tunnel marched on as big as ever. Behind me, the tunnel also disappeared. I

scooter slowly forward for 20m at a depth of 182m as my VR3 let me know my fifteen minutes was up.

Ahead the cave passage was starting to rise towards a crest. Over the crest?? Who knows! Perhaps the cave drops vertically again into the abyss! That question remains for the next adventurer to dive the mighty Pearse Resurgence!

Oh, and the two-bob watch? My \$15.00 supermarket chronometer tucked in my drysuit pocket happily counted down the hours until my safe return to the surface and a well-earned beer for the team!

Acknowledgements

The expedition would like to thank the following for their support or assistance: the Honeybone Family, Oz Patterson, Deb Cade and the NZSS, John Atkinson, Otter Drysuits, Seaoptics Adelaide, and BOC New Zealand.

Right: Deep cave explorer Richard Harris after his 182m / 597' deep dive...happy but weary!



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rEvo Instructors:

Mel Clark
scubagrunt@hotmail.com
Robin Jacoway
robin@waterranch.com
Joe Radomski
joeradomski@yahoo.com
Dave Sutton
DSutton@TrawlerExplorer.com
Greg Mossfeldt
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MYSTICAL FACES

ESCAPE FROM CAPTIVE PLACES

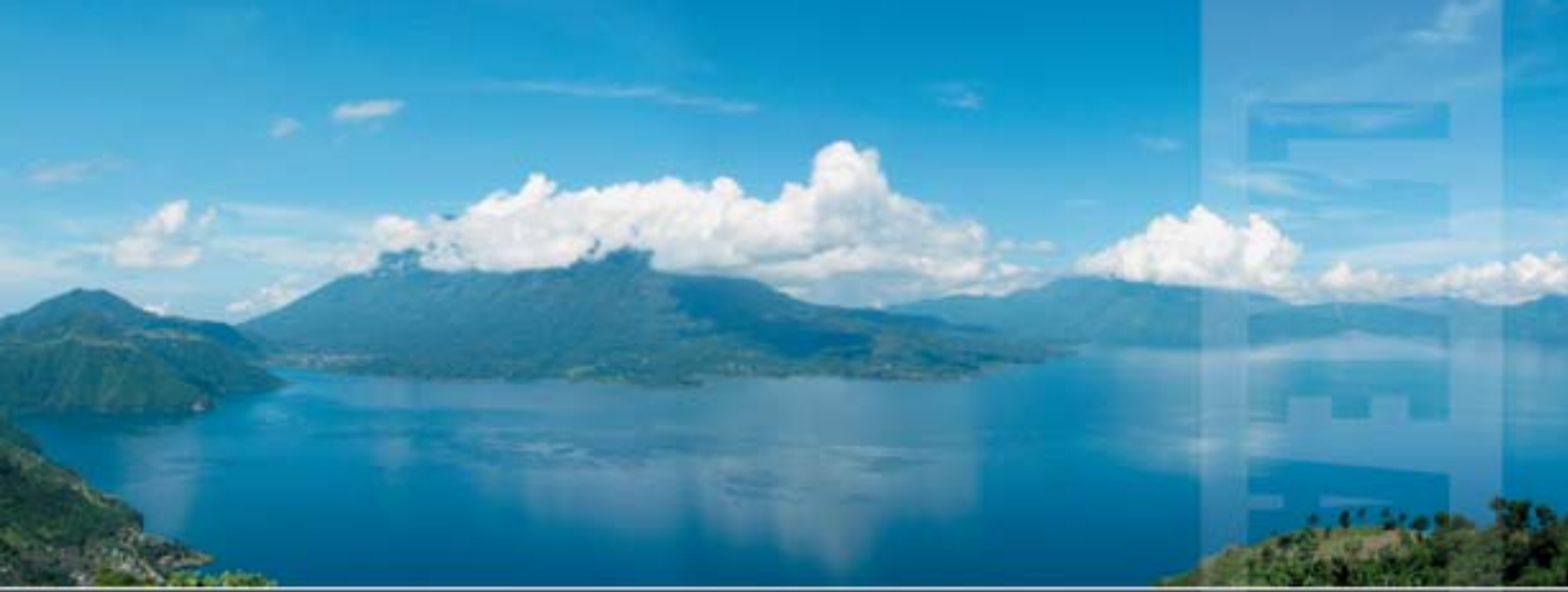
Text by Jeff Toorish
Photography by Curt Bowen and Jeff Toorish

Guatemala is a magical place, and probably the most magical part of this fascinating country is the Lake Atitlán region. Mayan culture is still influential in the area, in both dress and custom. Getting to Lake Atitlán is an adventure all by itself, especially with cases of gear, including rebreathers, a gas pump, scuba gear, video and still cameras, and other assorted pieces of equipment.

Lake Atitlán is a three-hour ride over breathtaking mountains from the airport in Guatemala City. Once at the lake, the primary mode of transportation is fiberglass boats powered by outboard motors. Loading and unloading gear several times, the ADM team eventually disembarked at La Iguana Perdida, our base of operations, run by Dave and Deedle Ratcliffe. (www.laiguanaperdida.com) The Iguana is worth the stay, if only for Dave's Saturday Night Concert.



Atitlán
(Mayan):
*The place
where the
rainbow gets
its colors*



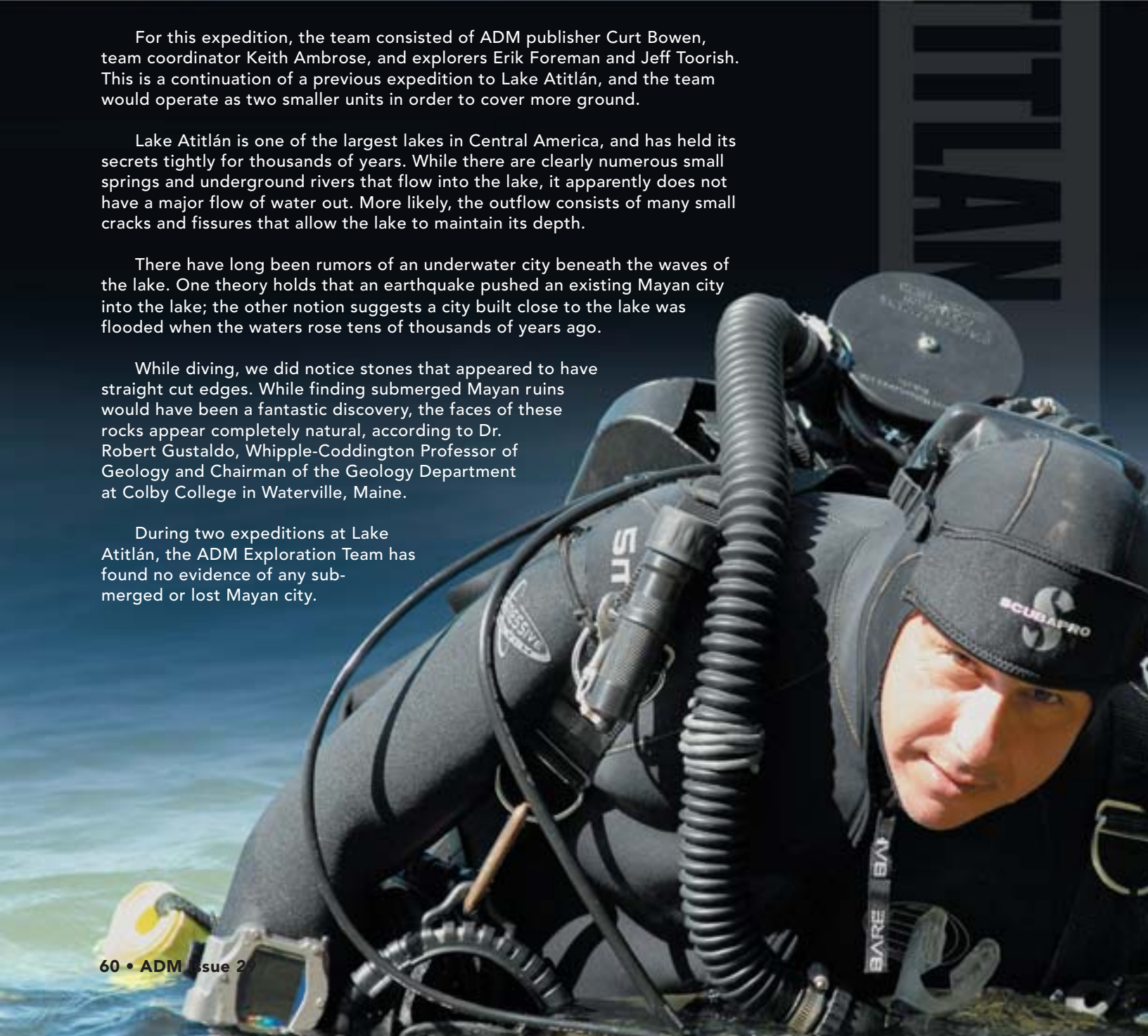
For this expedition, the team consisted of ADM publisher Curt Bowen, team coordinator Keith Ambrose, and explorers Erik Foreman and Jeff Toorish. This is a continuation of a previous expedition to Lake Atitlán, and the team would operate as two smaller units in order to cover more ground.

Lake Atitlán is one of the largest lakes in Central America, and has held its secrets tightly for thousands of years. While there are clearly numerous small springs and underground rivers that flow into the lake, it apparently does not have a major flow of water out. More likely, the outflow consists of many small cracks and fissures that allow the lake to maintain its depth.

There have long been rumors of an underwater city beneath the waves of the lake. One theory holds that an earthquake pushed an existing Mayan city into the lake; the other notion suggests a city built close to the lake was flooded when the waters rose tens of thousands of years ago.

While diving, we did notice stones that appeared to have straight cut edges. While finding submerged Mayan ruins would have been a fantastic discovery, the faces of these rocks appear completely natural, according to Dr. Robert Gustaldo, Whipple-Coddington Professor of Geology and Chairman of the Geology Department at Colby College in Waterville, Maine.

During two expeditions at Lake Atitlán, the ADM Exploration Team has found no evidence of any submerged or lost Mayan city.



Hearing The Gods Laugh In Your Face

Our objective for this expedition was to find relics from Mayan culture and return them to local authorities. Our previous expedition to Lake Atitlán had been primarily for reconnaissance purposes, but that trip yielded significant historical and archaeological finds. Armed with the knowledge gained from our prior expedition, we had high hopes for success this time around.

There is an ancient adage that says that the best way to hear the gods laugh is to announce your plans. This adage must have slipped our minds as we discussed how we intended to approach this mission.

Upon arriving, we learned of a tragedy that had occurred the day before. A fisherman was out at night in one of the Mayan canoes that are a staple for the indigenous people of the lake. In the dark, he was struck and killed by a motor skiff. Despite efforts by divers from around the lake, his body had not been found.

We agreed to help with the search and recovery, and spent the first day of diving searching in the vicinity of the accident. We subsequently returned to the area and continued searching.

While the recovery effort delayed our progress, we felt it was important to assist, especially after the first day when the fisherman's family specifically asked whether "the gringos" were coming back to search some more. As of this writing, his body has not been recovered. We had the difficult job of explaining to the man's family that because of the depth of the lake, his body may never surface.

We were also plagued by equipments snafus. It is important to note that much of our gear has been modified from the original manufacturer's specifications to accommodate exploration diving. For the most part, these problems were caused more by the changes we had made than any defects in the actual equipment. During the course of this expedition, repairs were necessary nearly every day.

Weather was also a factor with more rain than we had experienced in the past. The rain dramatically reduced visibility in the lake. Winds also seemed more active this year, kicking up a significant chop that limited our diving on several days.

Perhaps more ominously, the team was coming up dry day after day. This was a relatively short expedition. Because of travel restrictions we truly had only five diving days to complete our work.

Day one was strictly travel, from Miami to Guatemala City, then over the mountains by van to the lake. We met a boat on the dock at Panachel for the 25-minute boat ride to Santa Cruz and La Iguana Perdida.

Day two was a shake-out dive that we used to assist in the attempted recovery of the lost fisherman. That allowed us five days of actual exploration because we would have to drive back over the mountains on day six for a flight out early on day seven. It was a tight schedule, and our luck was not holding.

The first day of actual diving got off to a late start because we needed to modify one of our rebreathers. We were limited on tools, but fortunately the staff at ATI Divers at La Iguana Perdida was able to help. With the gear finally modified, we climbed aboard our boat, *Tornado*, captained by Domingo, and crewed, at times, by his son, Domingo Jr.



Day one of diving proved a bust. As the afternoon waves started to pick up, we decided to re-evaluate our plan of attack that evening to focus on other areas of the lake. But even using a sonar unit to help map the bottom along the shore and some of the inlets, things were looking bleak.

Face It – We Need Help

By day three, we were concerned that the expedition would be a failure, unlike part one of the effort a year ago when we had made finds from the beginning. This time, we came up literally empty handed. Coupled with continuous equipment problems and oddly unpredictable weather patterns, things were not looking good.

It was time to call in some serious help, and we went looking for the one guy who could turn things around for us. The problem was finding him. He could be anywhere, off drinking, smoking, and who knows what? Or he might be nowhere, preferring to hole up. It didn't matter; we had to look.

Our travels took us to Santiago Atitlán, the largest town on the lake where we would be most likely to find him: Maximón.

The Face of An Idol

Maximón is an idol; a combination of traditional Mayan deities, Catholic saints, and the legends of Spanish Conquistadors. He can be helpful, if paid the proper homage – along with some cigarettes and liquor. Or he can work against you, if you don't show the proper respect.

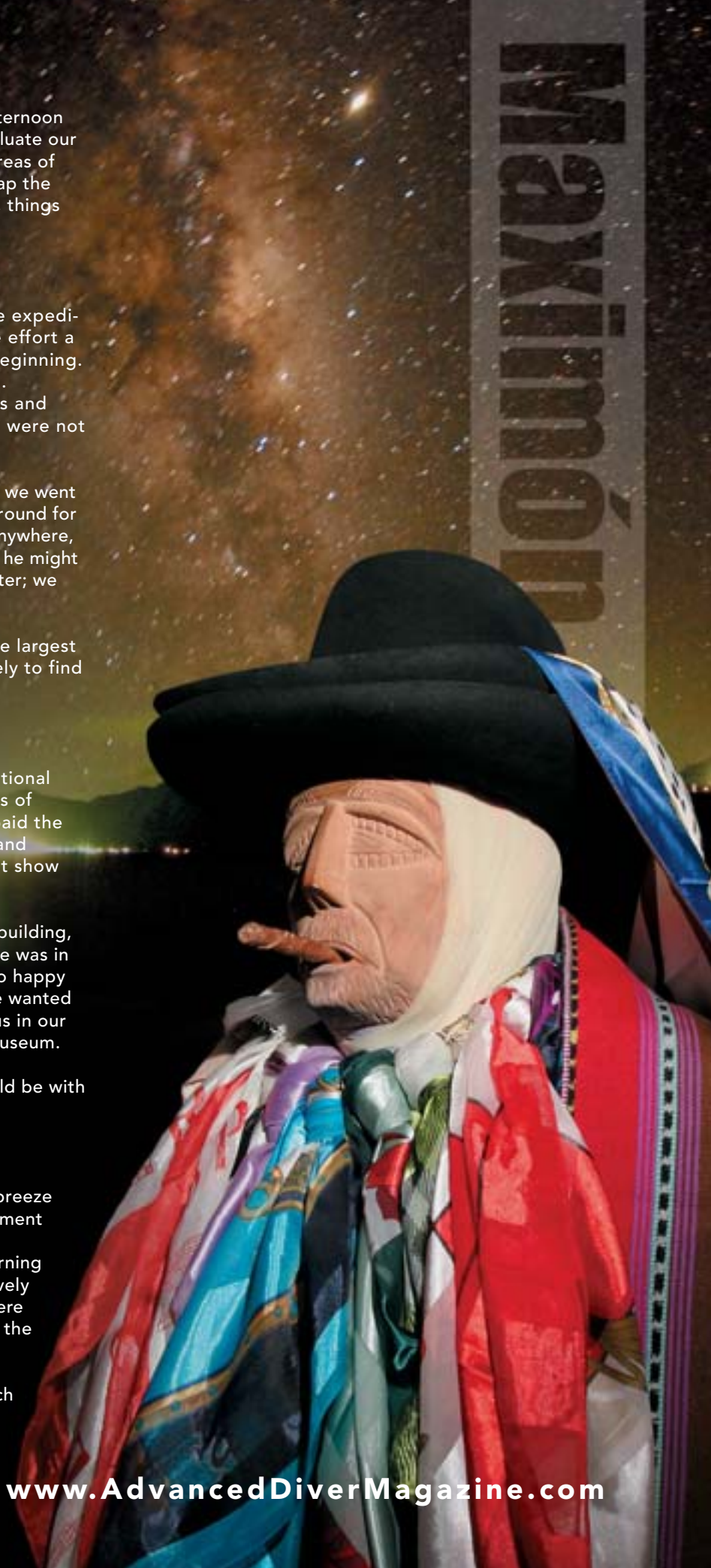
We tracked him down inside a ramshackle building, up a narrow alley off a rundown street. There he was in all his splendor and glory, and we were only too happy to pay the required tribute for an audience. We wanted the idol to bring us luck on the lake, and help us in our quest for Mayan relics for the local historical museum.

Now, we would see whether Maximón would be with us or against us!

Facing the New Day – Almost Our Last

Day four dawned with clear skies, a slight breeze and glass smooth water on the lake. Our equipment woes were at a bare minimum, and things were running on time for a change. After a short morning conference, we decided to head out to a relatively shallow area across from La Iguana Perdida where we would stage from the rocky shore or one of the docks nearby.

We continued to operate in two teams, each with one primary explorer and one photographer. Curt Bowen and Erik Foreman were team



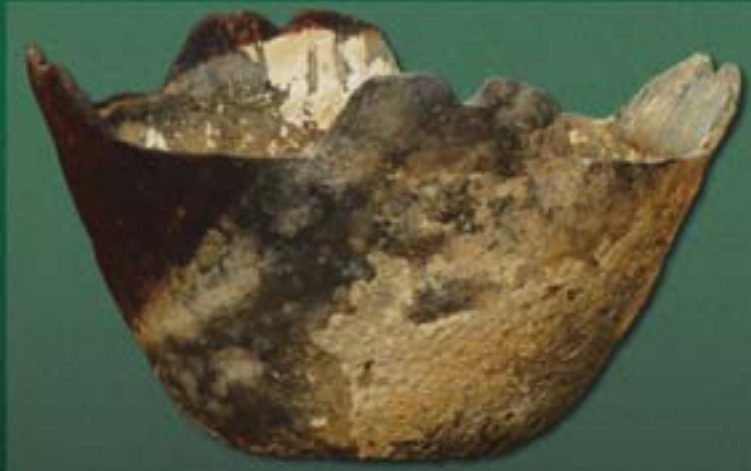
two; Keith Ambrose and Jeff Toorish were team one. Bowen and Toorish were carrying photography gear. Captain Domingo and the *Tornado* dropped team one off at a small beach where they suited up and silently slid into the oddly clear water. Then *Tornado* quietly motored about a kilometer away and dropped team two on a small stone dock.

Normally, the individual teams try to stay together for the entire dive. Both members of the team carry sufficient bailout gas in case of a problem with their closed circuit rebreathers. Each member also carries a reel and safety sausage, which can be used to mark the location of a found artifact or signal the boat.

But on this day, for whatever reason, both teams wound up separated. On team one, Ambrose and Toorish swam together for about fifteen minutes. Then while exploring a promising looking rock pile, they lost sight of each other at about 50 feet of depth. While Ambrose continued to search in one direction, Toorish followed the rocks down to about 110 feet and began to hunt.

While slowly scanning the murky, sloping bottom, Toorish's light skipped across the bottom of a large water jug. It was more than half buried and the bottom was shattered, but it was impressive, nonetheless. It was a find, the first significant one of the trip. The jug was filled with sand; but even after emptying, it was still heavy. Rather than risk a clumsy attempt at bringing it up, Toorish inflated a bag, and sent it to the surface to mark the site.

Once back on *Tornado*, team one quickly located the marker, and Ambrose "power snorkeled" down to retrieve the pot.





About a kilometer and a half away, team two was just coming out of the water, and they had also made significant finds, including entire bowls and shards with intricate designs. While the water jug was the largest piece, the most interesting and perhaps most significant was a partial bowl that was most likely used for ceremonial purposes.

The Face of Maya

The bowl shard with the face was unique, and nothing like it had showed up in our research. We had also toured local museums where we saw nothing even remotely similar. The piece most likely dates back between two and three thousand years. It shows what is clearly a depiction of a Mayan face from that time.

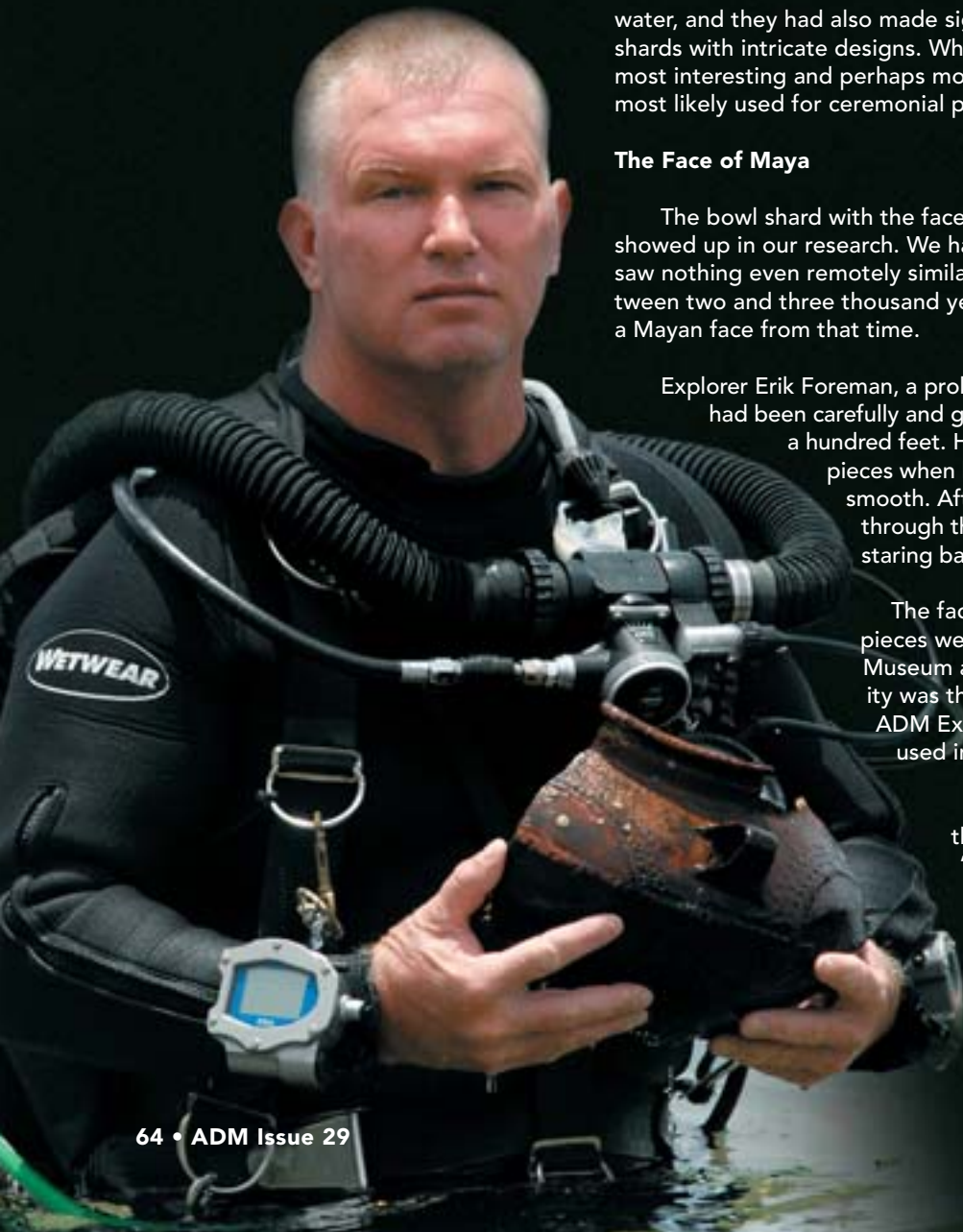
Explorer Erik Foreman, a prolific digger, found the shard buried in silt. He had been carefully and gently working through the soft silt at about a hundred feet. He had already collected several important pieces when his hand felt something rounded and smooth. After carefully extracting it, he moved it through the water to remove sediment and there, staring back at him, was a mystical face from the past.

The face relic, the water jug, and several other pieces were passed along to the local historical Museum at San Pedro. An official from the municipality was there to take custody, and informed the ADM Exploration Team that the pieces would be used in an exhibit at the municipal building.

The official also proudly invited ADM and the exploration team to return by saying, "You are always welcome here."

Plans are already underway for an ADM 2009 expedition along with a reconnaissance trip to possible new Guatemalan locations.

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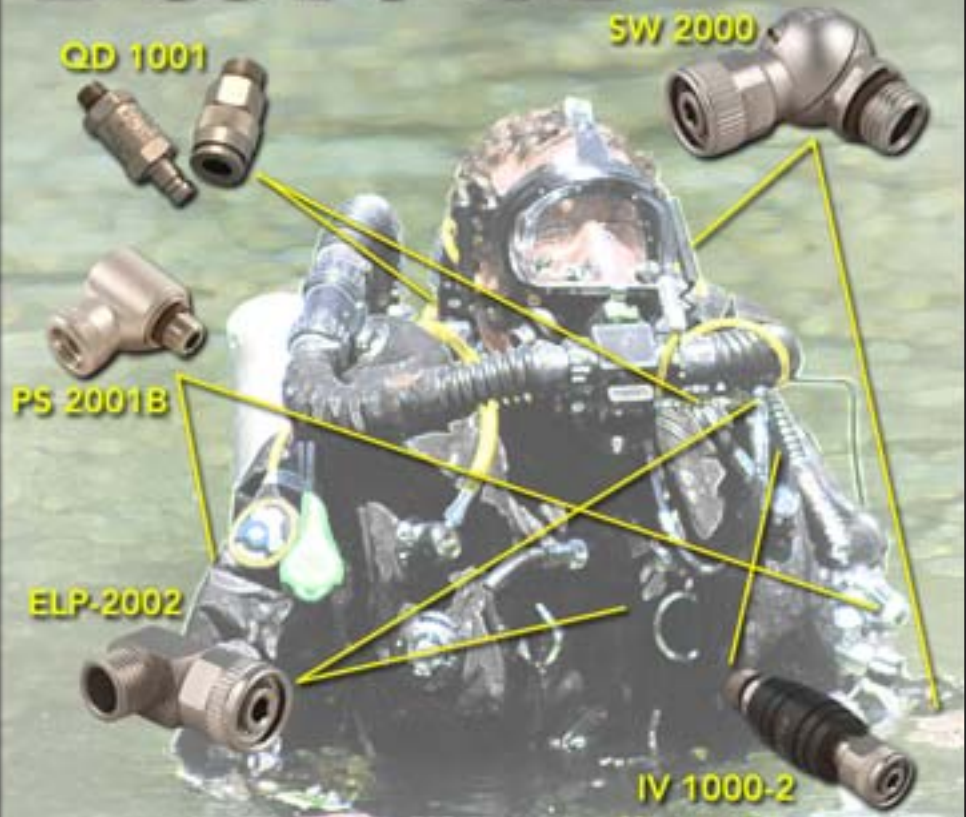
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FATHOMS
BELOW

Text and photography by Joseph C. Dovala

The sound was unmistakable...S-N-A-P! We had just reached 300 feet, and my breathing rate skyrocketed beyond even the ten-fold increase from being thirty stories underwater. I took a quick look and test fired my camera. Luckily, everything seemed to work and the ocean was still outside the housing. My camera in one piece, I calmed myself down and began to peer into the darkness. The dusky blue faded to black below my fins, but brilliant reds and yellows darted across the wall as our canister lights unleashed the true colors of the sponges and corals living in this twilight zone. Soon a very large barracuda, curious as to what all the commotion was about, joined us during our sojourn through his world. The amount of life at this depth is quite astonishing. Far below the surface, storm surges and large numbers of reckless humans have far less impact on sessile critters, so they get lots of time to grow big and stay healthy.

Unfortunately, time was definitely not on our side. Despite carrying nearly three hundred cubic feet of breathing gas, our visit here is measured in just a few minutes (a very strong argument for CCR's). There is little or no opportunity to set up a shot, and deviating from the very rigid dive plan is not an option except in an emergency. After nine minutes, we passed through a coral chute and began our slow ascent back to sunlight. Settling in at our first deep stop of 195 feet, I glanced down at the number "193" remaining on my four-gig CF card. I now had some seventy minutes of decompression to ponder this observation. Eight images! Two hours of dive planning and more than a few dollars in helium – if I'm lucky, one will be acceptable. To be sure, I can keep shooting until I'm clambering up the ladder with a hundred and eighty pounds of gear, but the dive objective and the bottom time were over in less than ten minutes.

Was it worth it? In the final analysis, I'd say yes - have to justify the \$180.00 gas bill somehow! Beyond the task of surviving, the challenge of capturing the image you want at these depths requires a healthy dose of familiarity with your photo system, confidence in your knowledge of the basics of shooting, and a bit of luck. Obviously, dive training, experience, and skills must also be up for the undertaking. Choice of photographic equipment is paramount to contributing to the success of shooting below recreational limits. Many manufacturers rate their products based not only on the engineering but also the degree of acceptable warranty risk. When you start asking around, you find out that most of the depth specifications are very conservative, as the development testing is



often considerably deeper than the recommended rating. Of course, as a consumer, one has to accept the risk that taking a piece of equipment substantially below its rated capacity could mean losing it. For example, I know of a fellow who takes a Nikonos V (rated to 165 feet) down well below 200 feet, and "most of the time" it comes back intact. When it doesn't, he either rebuilds it or retires it to the bookshelf. For me, I would not be willing to expend the energy required for this type of diving to have my camera system come up OK "most of the time." Keep in mind, though, that a piece of equipment may be rated for 330 feet, but it could still fail at 275 based on condition and maintenance.

Watching fish swim around inside your flooded housing is not the only way to be carrying a useless box on a dive. Often in deep situations, some of the features may not be functional or be difficult to utilize. At around 280 feet, during the dive in the opening paragraph, I was unable to use my shot preview button, as the housing spring was not strong enough to return it to the normal position due to the ambient pressure. However, this particular problem was more of an inconvenience, because I could just bracket like the ol' days (more on this later). Housing controls that are used frequently will probably degrade the fastest over time. The o-rings or springs on these buttons may not have the same capabilities as when they were new (sounds familiar doesn't it?), or their individual properties are not up to par. It is important that

critical controls such as shutter releases, film advances, focus knobs, etc., are designed in such a way as to minimize being deactivated by the effects of pressure. On many of the less expensive plastic housings, you can actually see control rods bending out of alignment with camera buttons when at or beyond their depth ranges.

If you've ever seen a good submarine war movie, you know water doesn't drip in through leaks at depth – it explodes in! O-ring maintenance is even more crucial when dealing with 150psi of water trying to get into a box with only about 15psi of air pushing out. The slightest nick, piece of dust, or hair, on the seals can provide a great entrance for a high-pressure stream of water. With today's sophisticated electronic cameras about a teaspoon of ocean is all you need to ruin your day. It takes even less to send a strobe into an electronic spasm of firings before fizzing out. Because the cameras have become more complex, so have the housings. Since most functions are available to the diver, it means there are a significant number of through-the-bulkhead buttons and levers. All of these must be made water-tight with o-rings, shaft glands, etc. As such, even with "recreational" use it is a good idea to follow recommended service intervals. Preventive maintenance becomes imperative when constantly taking the system to its limits. With saltwater damage, it rarely pays to have the camera repaired. It almost always requires another trip to your favorite photo shop for a new purchase.





Anyone who has tried to get a meaningful photograph below the surface knows that time is not the only hurdle to deal with. Lack of light and contrast under the waves is almost always an issue for the underwater photographer, and even more of a problem for the deep diver. A sufficiently powerful strobe, or strobes, is a must if you're going to unlock the colors and boost contrast. While there are some big powerful flashguns available, you must balance capabilities with size and complexity of the system. Available light shooting is always an option – you just have to keep the shutter open long enough. As on land, use of a tripod can help here. This can be very effective on shipwrecks, especially in monochrome (B&W). Of course, carrying and setting up the tripod eat into valuable bottom time, so it pays to practice in shallow water to get the bugs out.

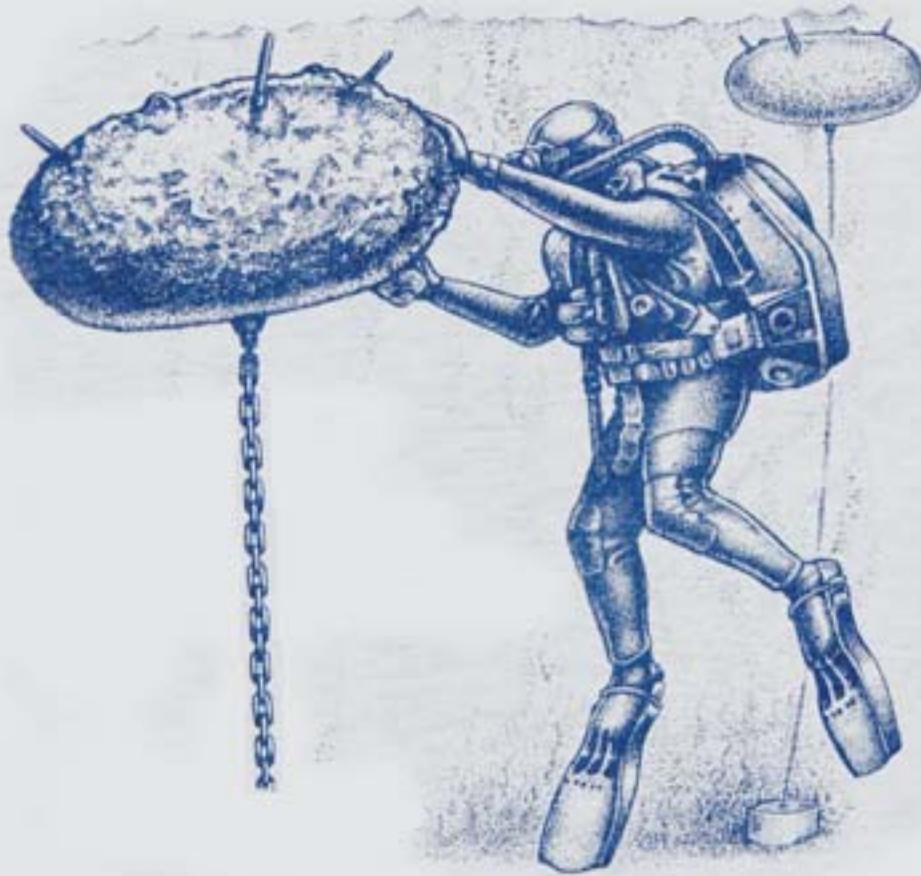
Since I've gone digital, I have been able to increase my number of keepers per dive. And by shooting in the "raw" format, I have more control of exposure and contrast than I ever could with transparency film. Also, with instant feedback I can make effective changes on site (providing the access control is working!). Due to the very limited time at depth, I usually just check gross exposure on the LCD. With more than two hundred raw images available on a four-gig card, I'm free to bracket all I want without worrying about running out of frames. Digital also allows ISO to be changed on the fly for as few or as many shots as you like. This is very handy when you want to change the "feel" of a shipwreck, for example, without committing the whole roll to a particular ASA rating. The new release of high ISO capable

cameras could be a real boon with this type of photography. That is not to say you can't produce fine images with film, for there are many superb photographs fashioned in just this manner. I am not attempting to debate film vs. digital either, but rather to illustrate my increased successes with deep-water shots by using digital tools.

Technical or extended range diving is not a trivial pursuit. It takes serious commitment in time, money, and training to do it productively and safely. It requires a very different approach to the dive than most people are used to with recreational scuba. Staying down a couple of extra minutes to get the shot, or dropping past dive plan depth limits to get under a subject, is not only hazardous to the individual attempting it but also puts the whole dive team in jeopardy. Like driving an automobile faster and faster, there is less time to handle an emergency and the ramifications expand exponentially the deeper one goes. Simply bailing out and doing a "free ascent" is never an option. Adding the additional task loading of a camera should be done in stages, with lots of practice in shallower water and full technical kit to get an idea of how to manage the whole package in a safe and efficient manner. Few people venture to these depths, and fewer still acquire photographs of the vistas they observe. For those willing to take the challenge and manage the increased risk, the rewards are many. Whether it is undersea scenics, large pelagic animals, or the mystery of a shipwreck, there are endless possibilities for the deep-water photographer to experiment with.



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Isla Gorgona

COLOMBIA

Adventure Diving for Advanced Divers

Text and Photography by ADM Photojournalist Tom Isgar

Cocos Islands, Malpelo Island, Isla Gorgona? All advanced divers know about Cocos – the long boat trip (300 miles), the hammerheads, who flee if you look at them, the success of rebreather divers in getting fantastic photos. A few advanced divers know about Malpelo the Colombian Island in the Pacific which is a shorter boat ride (200 miles) but reported to have as many hammerheads. But, few outside of Colombia, have heard of Isla Gorgona? Gorgona is South of Malpelo, near the same latitude as the Colombian and Peruvian boarder. It is reached by a flight to Gaupi from Cali and then a fast boat (one hour).

Gorgona became a National Park in 1984 to preserve the natural resources of both the underwater and land environments. Today the park has modern accommodations for 100 guests, while maintaining a steadfast stance toward preserving the natural environment. A bag is provided for guests to use to remove all of their non-biodegradable waste. But, there is wireless in the rooms.





The spacious modern rooms receive electricity from a hydro-electric system and the Park Director promises that by next year they will have mastered solar hot water for the modern shower. Three meals are provided in a large open air dining room. Even after a week, I found each meal attractive and tasty. However, some peanut butter would have hit the spot.

Gorgona Island is the site of a prison which existed for 20 years in the mid-1900's. There are some ruins which provide an interesting tour. There is a large classroom with local natural history exhibits. There are three main trails for hiking. The beach and a volleyball/ basketball court are the other attractions.

There are several indigenous lizards, some snakes, a few birds and wildflowers. One of the lizards, the Plumed Basilisk (*Basiliscus plumifrons*) is renowned for its ability to walk (run) on water for short distances. They are all around the park buildings.

There are also groups of White-faced Capuchin monkeys on the island. One group feeds on the palm berries near the dive shop. They had babies and were fairly aggressive but photographable.

I photographed lots of Blue-footed Boobies and Magnificent Frigatebirds from the dive boat.

In addition to the reported hammerheads the waters between the Island and mainland Colombia attract large dolphins (*Globicephalus melas* – also known as Long-Finned Pilot Whales) and Finback Whales between June and November. Whale watching is one of Gorgona's main attractions.

Diving is from a small open boat and the dive sites are a few minutes from the shop. The shop has some rental gear and lots of fresh water. They plan on having Nitrox available by the time you read this.



I did three dives a day and skipped an optional night dive. Diving was plagued by both silty water and currents. I was assured by the dive staff that the water clears up as we move out of winter into the summer. (I was there in early March.) Currents, however, are part of Gorgona diving. The currents, like those near Galapagos, are what provides the nutrients which attract the fish schools and the big predators. Even with the low visibility I saw sharks and turtles on nearly every dive and rays on most dives. They just weren't photographable. I was able to get great shots of smaller subjects by going slow and getting close.

Photography and fish watching are enhanced by the agreement with local fishermen 'not to fish within eight miles of the island.' One of the exciting aspects of Gorgona for Caribbean and Atlantic divers is that this is the Pacific and many of the species are the ones you would expect to see in Indonesia or Fiji, e.g., Moorish Idols, Longnose Hawkfish and Jewel morays.

Dive sites ranged from shallow sand slope to 100 foot plus walls. In all cases the coral was intact and very colorful. I saw some of the most brilliant underwater colors on these dives I have ever seen. With better visibility the colors would have been even more brilliant. Some of my favorite sites are described below.

Parguera (70 ft.) is a sandy rocky slope with lots of fish. There were several turtles and a barracuda school near the surface. I also saw several small schools of different species of jacks.

Remanso del Homo (60 ft.) is also a sloping wall with lots of coral heads. I saw the largest green eel I have ever seen at this sight. The shallows were teeming with fish.





Planchon (60 ft.) is in front of the lodge and has a small wreck as well as lots of tires (The site name.) There were lots of fish on the wreck including a small school of Moorish Idols. There was also a huge resident school of yellow snapper. The tires and rocks yielded a very cooperative octopus.

Plaza de Toros (Bullring) (100 ft.) is described by the dive guides as the place to see rays. At about 75 feet, crawling downward hand over hand on the rocks, I went around a large rock, discovered that I had been in the lee of the current and with camera gear in one hand and the other on a rock blew off the wall. Needless to say, I didn't see the rays but did make a safe ascent.

Aquario (40 ft.) as the name implies is a shallow dive loaded with fish. There were schools of juveniles of several species congregating around the small coral heads and rocks.

Piedra Mora (50 ft.) is a medium depth dive with lots of huge rocks. The rocks had partial covering of bright red fan coral which in turn was home to several Longnose Hawkfish. There were also several large Green Morays, a large Jewel Moray and at least two turtles being cleaned by angelfish.

We did three dives on the back of the Island but all were plagued by low visibility. However, this side of the island had hundreds of Blue Footed boobies sitting on the rocks so I made good use of the dive intervals doing bird photography.

I plan on going back in the summer when the visibility is better. Gorgona is loaded with reef fish and pelagic fish as well as turtles and rays. As noted above there are also several attractive photo subjects on the island.



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THE NEW

FORTY FATHOM GROTTO

**Text and Photography by
ADM Publisher Curt Bowen**

A couple of months ago, I was having dinner with a buddy of mine at Floyd's Diner, a local cave divers' hang out in High Springs, Florida, when the conversation of deep technical diver training came up.

The dilemma of good training locations with ample depth reared its ugly head once again. Florida has a multitude of decent training locations, but most have environmental concerns. For example, there are some that the access is often closed, others are located off shore where weather and boats play a significant role making them undependable. Too, there is the issue of a full cave environment — but your students are not cave certified.

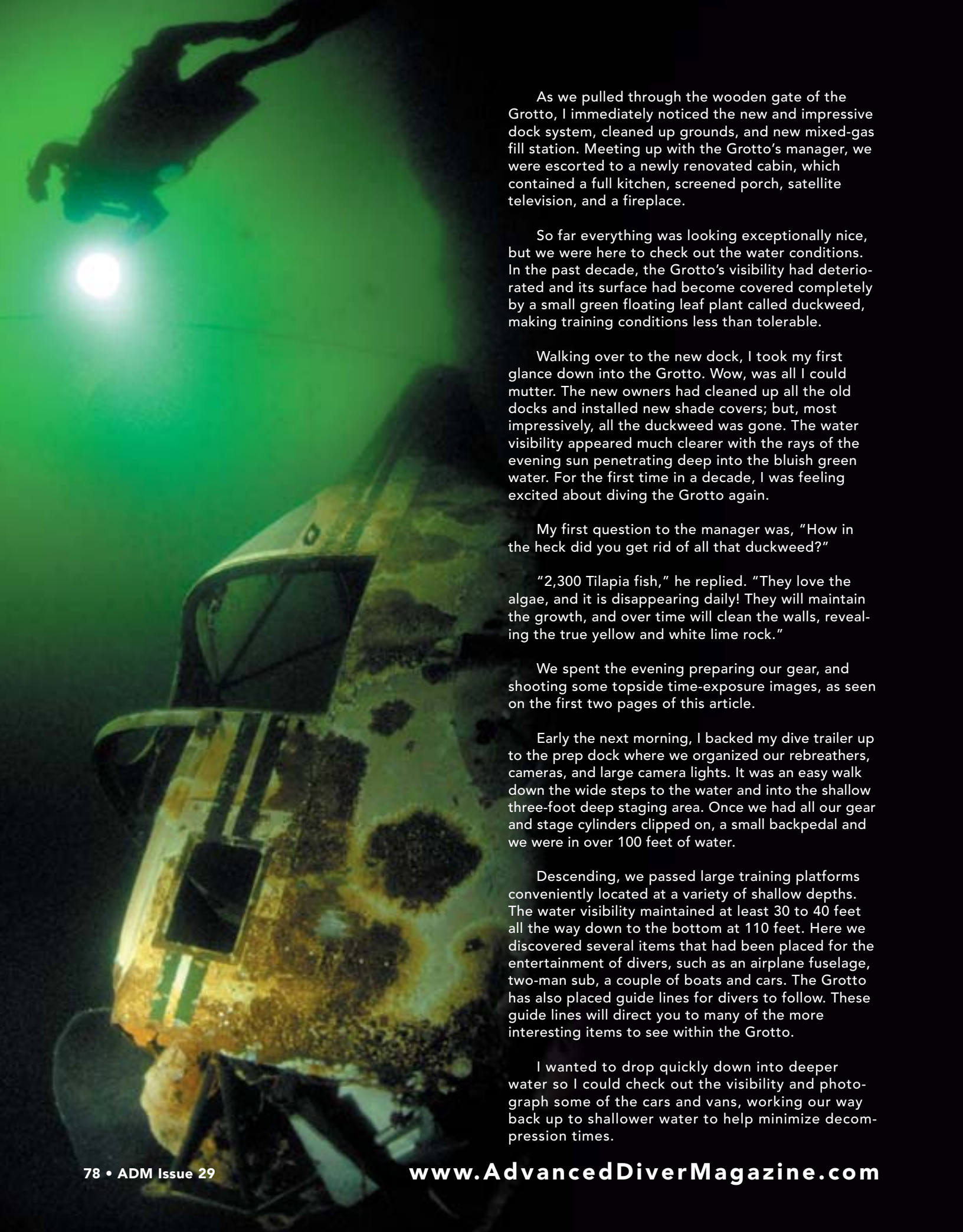
From across the room came the familiar voice of Bert Wilcher, Tampa Adventure Sports owner and NAUI technical instructor trainer, "Have you been to Forty Fathom Grotto lately?"

"No," I replied, "I haven't been there for at least eight years."

Bert went on to say that the previous owner, Hal Watts (or Mr. Scuba as he likes to be called), had leased out the Grotto along with all its buildings in the autumn of 2006 to a new company called the Commercial Diving Academy. Bert raved on for twenty minutes about all the new improvements they had done over the last year, and that it is once again an excellent location for technical diver training in a controlled environment.

With my curiosity heightened, I contacted the Commercial Diving Academy upon my return to the office, and made arrangements to visit and shoot photos at the new and improved Grotto.

Just fifteen minutes outside of Ocala, the Grotto is conveniently located in central Florida amidst rolling hills covered with ancient, picturesque oak trees. Joining me on the photo session was a good friend of mine, Eric Osking, and Warren Stincer, one of ADM's dive assistants.



As we pulled through the wooden gate of the Grotto, I immediately noticed the new and impressive dock system, cleaned up grounds, and new mixed-gas fill station. Meeting up with the Grotto's manager, we were escorted to a newly renovated cabin, which contained a full kitchen, screened porch, satellite television, and a fireplace.

So far everything was looking exceptionally nice, but we were here to check out the water conditions. In the past decade, the Grotto's visibility had deteriorated and its surface had become covered completely by a small green floating leaf plant called duckweed, making training conditions less than tolerable.

Walking over to the new dock, I took my first glance down into the Grotto. Wow, was all I could mutter. The new owners had cleaned up all the old docks and installed new shade covers; but, most impressively, all the duckweed was gone. The water visibility appeared much clearer with the rays of the evening sun penetrating deep into the bluish green water. For the first time in a decade, I was feeling excited about diving the Grotto again.

My first question to the manager was, "How in the heck did you get rid of all that duckweed?"

"2,300 Tilapia fish," he replied. "They love the algae, and it is disappearing daily! They will maintain the growth, and over time will clean the walls, revealing the true yellow and white lime rock."

We spent the evening preparing our gear, and shooting some topside time-exposure images, as seen on the first two pages of this article.

Early the next morning, I backed my dive trailer up to the prep dock where we organized our rebreathers, cameras, and large camera lights. It was an easy walk down the wide steps to the water and into the shallow three-foot deep staging area. Once we had all our gear and stage cylinders clipped on, a small backpedal and we were in over 100 feet of water.

Descending, we passed large training platforms conveniently located at a variety of shallow depths. The water visibility maintained at least 30 to 40 feet all the way down to the bottom at 110 feet. Here we discovered several items that had been placed for the entertainment of divers, such as an airplane fuselage, two-man sub, a couple of boats and cars. The Grotto has also placed guide lines for divers to follow. These guide lines will direct you to many of the more interesting items to see within the Grotto.

I wanted to drop quickly down into deeper water so I could check out the visibility and photograph some of the cars and vans, working our way back up to shallower water to help minimize decompression times.



At around 200 feet we encountered a deep-water muck layer that decreased the visibility to only a few feet. This is often caused by rainwater run-off making its way into the Grotto. Above this muck layer, the visibility maintained between 20 and 40 feet. More than enough to safely conduct controlled technical diver training. Of course, water visibility will vary from month to month, depending on the weather conditions.

So what are the plans for the NEW Forty Fathom Grotto?

According to the manager, they are in the process of completing more private classrooms, an economical bunkhouse, and recreational facilities such as a volleyball court, picnic area, additional parking, and much more.

The Commercial Diving Academy has also launched its own SCUBA Training Programs offering all levels of certification, including instructor training, technical, and rebreathers. They want to deliver the best training available, and have partnered with NAUI Worldwide to produce the finest training materials and maintain professionalism.

Upon exiting the gate, I was truly impressed by the countless hours of hard work, tens of thousands of dollars spent for remodeling, and true dive professionalism. If you have not been back to the Grotto in a long time, or have never been there, I would recommend dropping in and checking them out. Do a couple dives, and set it up to bring your students.

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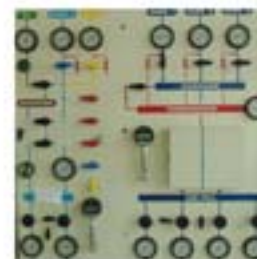
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