

ADVANCED DIVER MAGAZINE

ISSUE 21 / 2005

- Good Luck Comes in Threes
- Jetsam Baby Gas Booster
- Queen of Nassau Wreck
- Bermuda High
- USS Curb Wreck
- Dive Rite O₂ptima Rebreather
- ADM Featured Photographer
Jill Heinerth
- Newfoundland's Diving Diversity
- Ouroboros Closed Circuit Rebreather
- The Walls of Quadra Island
- HIJMS Amagiri Wreck
- Buford Sink & Little Gator Siphon
- SS Metropole Wreck
- Shipwrecks of Crimea
Ukraine Black Sea Expedition
- The Helmet Wreck / Palau
- Doorway to Bloody Bay Wall
Little Cayman

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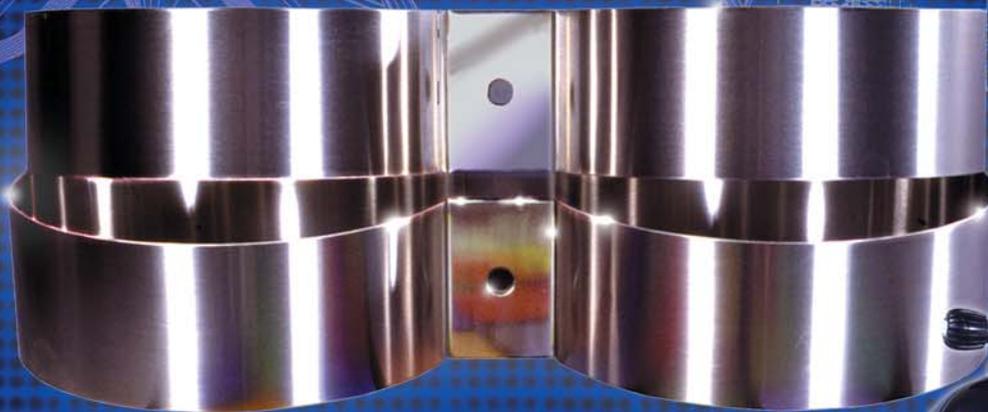
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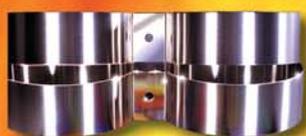


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Fig.1

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Fig.2



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TABLE OF CONTENTS

- 8** Good Luck Comes in Threes
SS Coolidge, Tui Tuata & Kathleen
by Richard Harris
- 14** Baby Gas Booster
by Gordon Smith and Curt Bowen
- 18** Queen of Nassau Wreck
by Curt Bowen
- 21** Bermuda High
by Jill Heinerth
- 26** USS Curb Wreck
by Curt Bowen
- 31** Dive Rite O₂ptima Rebreather
by Jeff Gourley and Curt Bowen
- 36** ADM Featured Photographer
Jill Heinerth
- 40** Newfoundland's Diving Diversity
by Bernie Chowdhury
- 45** Ouroboros Closed Circuit Rebreather
by Leigh Bishop
- 51** The Walls of Quadra Island
by John Rawlings
- 55** HIJMS Amagiri Wreck
by Kevin Denlay
- 60** Buford Sink & Little Gator Siphon
by Curt Bowen
- 64** SS Metropole Wreck
by Jeff Moore, David Trotter, and Mickey Trotter
- 70** Shipwrecks of Crimea
Ukraine Black Sea Expedition
by Leigh Bishop
- 75** The Helmet Wreck
by Jim Rozzi
- 78** Doorway to Bloody Bay Wall
by John Rawlings



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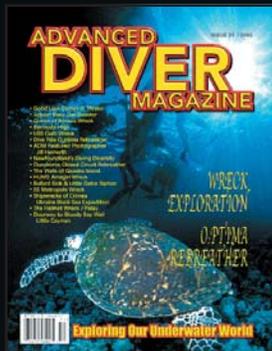
Publisher's Notes

Getting out there and capturing that one great photograph can make the difference between a successful expedition, and a not-so-colorful editorial. On many occasions, I find myself stuffed in some small inhospitable hole, or clinging to the side of a wreck trying to capture that one shot. Thank God for digital cameras, instant preview, a two-gigabyte memory card, and a bullet-proof Aquatica housing!

One of the most difficult tasks I have here at ADM is gathering good editorial from around the globe that I feel ADM readers will be happy with. Then taking all this information, photos, and illustrations and presenting them in a unique format -- all the time trying to be different from your run-of-the-mill magazine. A magazine that I would be happy to receive in my own mail box, or purchase off the news stand. The staff of ADM and I appreciate all the divers from around the globe who have taken the time, and done the hard work and research to submit their own editorial. Keep up the good work.

ADM has many additional ideas for the upcoming year, including a much-expanded web site with a video depot, instructor listings, calendar of events, etc. I am also planning to work on video productions, both for ADM readers and possibly television.

Curt Bowen
Publisher



Left:
ADM Cover Photo
by Leigh Bishop

Right:
Unable to dive while flying
Apache Attack Helicopters
over Bagdad, Chief
Warrant Officer 2 Joe
Walker takes some time
out of his busy schedule to
catch up on reading his
favorite magazine.



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GOOD LUCK COMES IN THREES

SS COOLIDGE • TUI TUATE • KATHLEEN

Text & Photography by: Richard "Harry" Harris

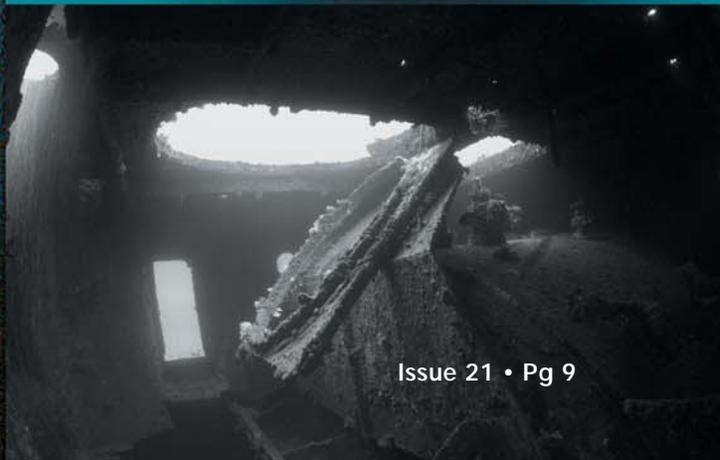
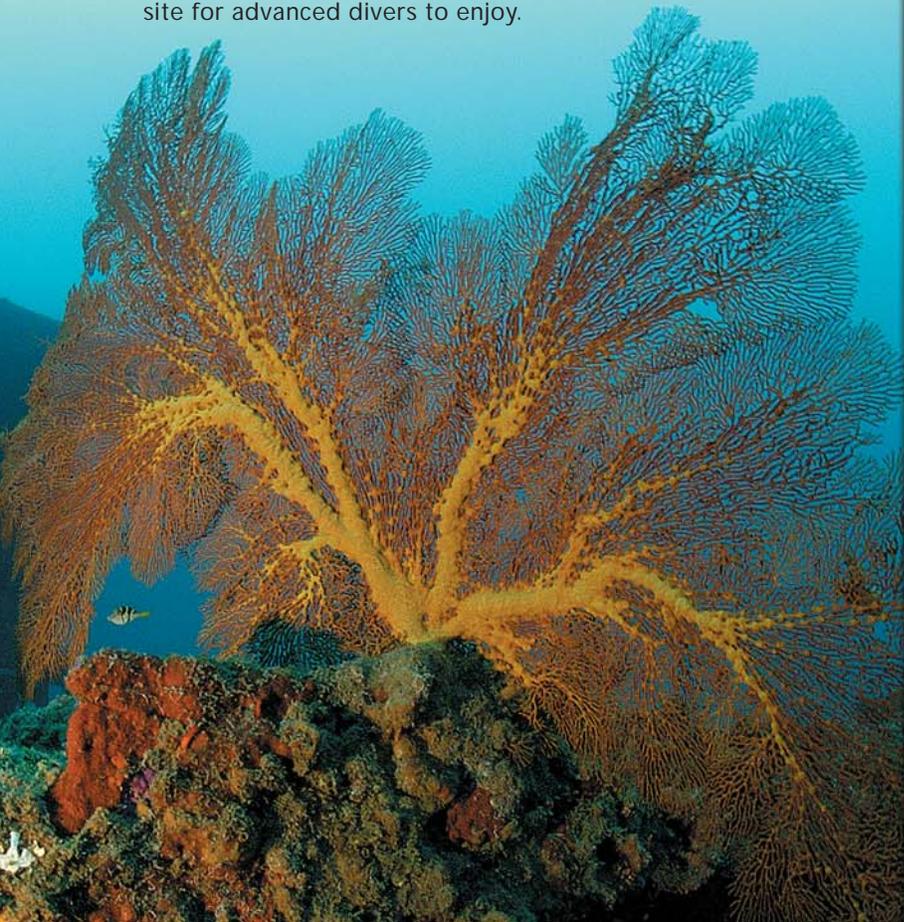
Ever had a week where everything just goes right? Well, it happened to me just last week here in Vanuatu. Three new and fascinating dives in quick succession, all in areas or sites well known to me. The first was on the magnificent SS Coolidge, the second on another historic wreck nearby called the Tui Tuata, the third on the wreck of the lost coastal trader Kathleen near Port Vila. Read on to see how events unfolded...

The week started with one of my frequent trips to Espiritu Santo to dive the famous wreck of the SS Coolidge. (As most readers will be aware, the Coolidge was a luxury American passenger ship that was converted for wartime use. On her approach to Luganville in 1944, she sank after striking two "friendly" mines.) Living in the small capital of Port Vila, I have been



fortunate to travel north to dive this wreck many times over the last 18 months. Barry Holland, the manager of Aquamarine in Luganville on Santo, is a fellow tech diver who has helped me explore the wreck on many occasions. He had some exciting news for me on my arrival. The letters of the ship's name and home port were now visible on the stern starting at around 60m, and he was keen to take me down to photograph them! It seems an Australian diver, Andy Andrews, had earlier discovered the letters, and news of the exciting find was now spreading! How the letters had gone unnoticed for so many years since the sinking of the great ship in 1944 was anyone's guess. Photos of the stern in Peter Stone's book "The Lady and the President," taken whilst the ship sank, show no evidence of the letters. Perhaps they were covered or otherwise disguised in an attempt to obscure the ship's identity during the war? Anyway, they were on view now, and I couldn't wait to see them.

A quick trip to the general store for three wire brushes, then Barry, Kevin Green (another well known local diver) and I set off for the dive. Barry and Kevin would perform the dive on open circuit trimix, whilst I was diving my KISS CCR. The dive involves a 200m surface swim out to a midships mooring, followed by a diagonal descent down to the stern area. The Coolidge lies on her port side; as you approach the stern, the naked starboard prop shaft comes into view — the prop having been salvaged many years earlier. Over the stern rail, the 30cm high letters "President Coolidge" become apparent. Underneath in smaller letters, the home port of "San Francisco" could just be made out. For the next 10 minutes, at depths between about 62 and 68m, we scrubbed the letters with the wire brushes. To allow time for the dust to settle, we swam off to inspect the wrecked lifeboat and some other debris on the sand behind the ship, then came back to take the photos shown here. Well worth the effort, I believe! I'm sure you will agree, this adds yet another attraction to a world-class wreck site for advanced divers to enjoy.





That same afternoon came exciting new dive number two! The wreck of the Tui Tuata, a tug used by Ian Lockley during the salvage of 650 tons of bunker oil from the Coolidge in the 70's, was scuttled in the western end of the Second Channel in about 1990. She started life in the 1940's in an Aberdeen shipyard as the Empire Shirley, 105 feet long and 232 tons. She underwent a number of name changes, becoming the Tapuhi (1947-1973), then the Tui Tuwate, and finally the Tui Tuata. The wreck has significant historical importance as she was also involved in the rescue of over 170 of 733 passengers in the New Zealand Wahine ferry disaster in 1968. She was scuttled by the owner (Clement Griffith) in a secret spot because he believed the wreck was too cramped and dangerous for divers. However, some persistent detective work and searching by Kevin Green of Aquamarine uncovered its location in 46m. He has taken only two or three groups of divers to her since, so I felt very privileged to dive her with Barry and Kev. The dive site is current prone and subject to poor visibility, but on this occasion luck was on our side and we spent 30 minutes exploring this small but unique piece of history. Sitting alone on the sand, a deep trough is carved around her that bears witness to the strong currents that sweep past. Bat fish, large pelagics, and numerous reef fish stand guard over her forlorn structure. My time ran out before any serious penetration of the wreck could be performed, but there appear to be some good areas for exploration near the stern. Trevor Jackson from Australia is one of the lucky few to have dived the Tui, and his photos taken last year show the ship with its funnel in place. That is now gone, presumably fallen victim to the tides, leaving a large hole in its place that gives access to the boiler.

The next few days were spent diving the Coolidge, and I thought things couldn't get much better. Riding high on the excitement of the great diving in Santo, on my arrival home in Vila I called a friend to see whether he felt like a dive. We decided to have another look for the lost wreck of the coastal trader Kathleen. The

Kathleen was scuttled as a dive site near Hideaway Island for tourist divers. In 1987, the full fury of cyclone Uma was unleashed on Port Vila causing massive destruction, in the process washing the poor Kathleen off the top of the reef into deeper water. For a few years she was dived by locals in 40-50m, but after another big storm she disappeared into even deeper water. Since then a couple of divers have claimed that they have caught glimpses of her (including the ubiquitous Kevin Green!), but her exact location was unknown. I had previously dived to 90m searching the steep seaward side of the reef in the mistaken belief that this was where she lay. On this occasion, we searched in a radial pattern with the boat's sounder on the landward side of the reef. At 70m, a small blip registered. Taking a compass bearing from the top of the reef, my buddy Dale and I started our search. On the downward slope, we picked up the debris trail from the wreck and followed it down to the sand at just over 70m. No wreck. We decided to swing left initially in the direction the trail seemed to be heading as it petered out. No wreck. With five minutes bottom time left, we swam to the right until in the distance I picked up a vague shadow...initially thinking my eyes were playing tricks on me. But gradually the shadow solidified into a small wreck sitting upright on the sand, prop in situ, and a large cargo hatch lying next to her. We could not have been more excited if we had found the Titanic or a galleon full of treasure...that is the thrill of even such a minor discovery! With two minutes to spare, I swam part of the wreck blazing away with my camera, and then started the ascent and deco — already planning my return to this pretty little wreck. We returned the very next weekend and captured the images shown here.

Three great dives, all new to me, but all in my backyard and right under my nose. Part of the thrill of diving is never quite knowing what lies around the corner. What a great sport!

To see more of Harry's photos see www.divedoc.net



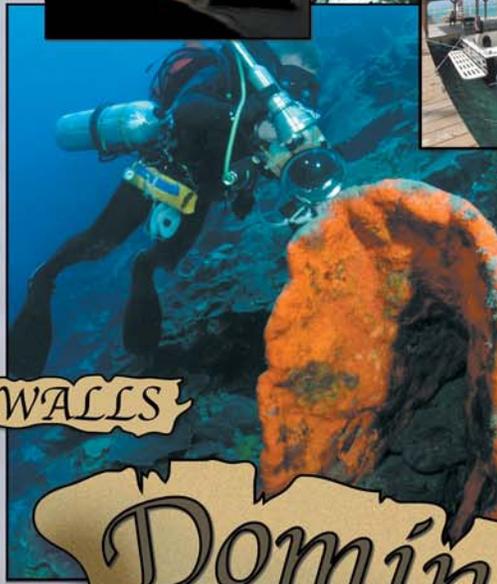
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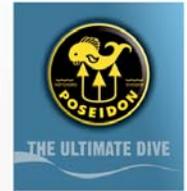
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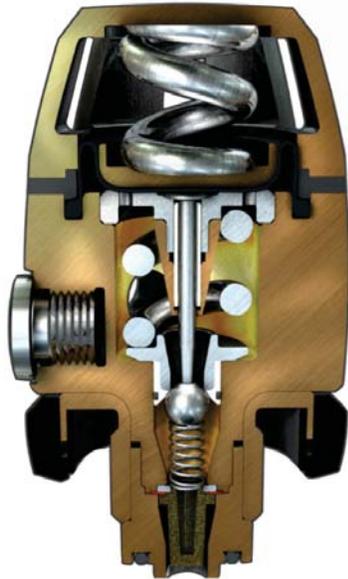
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BABY GAS BOOSTER

By Gordon Smith & Curt Bowen

The most complex and expensive dilemma in remote dive exploration is the capability to fill scuba cylinders on location. Generating the substantial amounts of breathing gas needed for technical diving operations while on site is almost impossible without a cascade of bank cylinders and a large portable compressor.

Even though rebreathers require about 1/15th the amount of gas volume, they still require the capability to compress gas to desired higher pressures. To solve the problem of the higher pressures needed, restrictions for weight and space during travel, and the limited amounts of oxygen and helium in remote world locations, Gordon Smith of Jetsam Technologies has designed a miniature gas booster.

Cleverly called the Baby Booster, Gordon's design is intended for the rebreather enthusiast only. This small, lightweight, and portable unit is the perfect answer for mixing and filling small rebreather cylinders anyplace on the planet.

What is a gas booster?

A gas booster takes gas from a lower pressure cylinder, transfers it into a second cylinder, and raises it to a higher pressure. A booster can be driven electrically with hydraulic pressure, or, in the case of the Baby Booster, by compressed air. Using compressed air is probably the least efficient method of powering a booster; but, in some cases, it is the most convenient. Remember the pictures of some of the major cave expeditions? The ones that showed the trailer full of K bottles? Those bottles were not intended for dive gas, but to drive a gas booster. The problem with an air-powered booster is that the drive gas consumption goes up logarithmically as the supply pressure decreases and the fill pressure increases.





Gas flow configuration of the Jetsam Baby Gas Booster

- A. The gas to be boosted enters the booster from the supply tank. Supply gas can be any gas or mixture of gases, such as air, nitrox, oxygen, helium, heli-air, trimix, or argon. The Baby Booster will continue to compress gas from the supply cylinder until it drops below 500 psi.
- B. The drive gas, which should be set to 147 psi (10 bar), (normally air from a scuba cylinder) is used to compress the supply gas and transfer it to the fill cylinder. The booster will continue to operate as long as adequate pressure is maintained.
- C. Due to the surface area difference between the cylinder's pistons (23:1), the drive gas can raise the pressure of the fill tank to 3000 psi/210 bar.
- D. The ending result is higher pressures obtained of desired breathing gas without the need for gas or electric powered compressors. This allows the diver to fill small rebreather or pony cylinders almost anywhere on the planet.

Designed for the traveling rebreather diver, the Baby Booster is not recommended for filling anything larger than a 30 cubic foot cylinder. If you wish to fill a set of doubles and vacuum your helium banks, the Baby Booster is not the right tool. For these purposes, it would be best to use a much larger Haskel or Masterline booster.

One of the more difficult questions to answer is how long it will take for the Baby Booster to fill a cylinder. If the tank to be filled is a steel "13" cu. ft. at 2300 psi, and the supply cylinder is a K bottle at 2400 psi, the answer would be "not long at all." In fact, you probably wouldn't even have to turn on the booster. Change the situation to adding 500 psi of helium to bring your double 121's up to 3000 psi, and your helium tank has only 400 psi in it. The answer then is "just slightly less than infinity." While you are at it, you'd better order a bunch more drive gas cylinders because the drive gas consumption is at its maximum when the fill cylinder approaches its final pressure. This is unrelated to how much gas it pumps with each stroke.

The time to fill a cylinder depends on many factors:

- What is the cylinder size and beginning pressure of the supply tank?

The higher the supply tank pressure, the faster the booster will transfer gas. As gas is removed from the supply tank, its pressure is falling. The larger the tank, the slower the rate of pressure drops.

- What is the cylinder size and beginning pressure of the fill tank?

Are you trying to fill a small 13 cu. ft. cylinder starting at 0 psi, or a 30 cu. ft. cylinder starting at 2000 psi?

Jetsam Baby Booster Fill Time Chart			
	Fill Target (psi)		
	2400	3000	3200
500	27.75	66	-
1000	7.5	14.75	19.25
1100	6.5	12.25	16.25
1200	5.25	10.5	14
1300	4.5	9.25	12.25
1400	4	8	10.75
1500	3.25	7.25	9.75
1600	2.75	6.25	8.5
1700	2.25	5.5	7.75
1800	2	5	7.25
1900	1.5	4.5	6.25
2000	1.25	4	5.5
2100	1	3.25	3.25
2200	0.5	3	3
2300	0.25	2.5	2.5
2400	0	2.25	2.25

Fill times for a 13 cu.ft. cylinder, from an 80 cu.ft cylinder based on controlled conditions with a new booster. (after tanks are equalized)

- What is the gas being transferred?

Argon pumps faster than air; air pumps faster than helium. Oxygen, nitrogen, and air all pump at about the same rate, while pumping helium is the slowest and produces the most heat.

- What is the temperature?

Both the ambient temperature and the temperature of the booster are important. The greater the difference between the supply and fill pressures, the more heat will be generated by the booster. The hotter the booster gets, the less efficiently it pumps. The chart shows typical fill times at various starting pressures using an aluminum 80 cu. ft. (12L) as the supply tank and a 13 cu. ft. (2L) as the fill cylinder.

There are two pressure ratios involved with pneumatic boosters. One pressure ratio is the theoretical area between the drive cylinder and the boost cylinder. On the Baby Booster, this is 23:1. At the maximum drive gas pressure of 10 bar (147 psi), the outlet pressure should reach 230 bar (3381 psi). In reality, there is some leakage, seal friction, and gas compressibility to take into account so that the maximum will be in the 210-220 bar range (3087-3234 psi). The second ratio is the difference between the supply gas pressure and the maximum outlet pressure. The Baby Booster is rated for 5:1 for most gases, and 3:1 for helium due to the greater compressibility of this gas.

The Baby Booster is so small that even tiny leaks in the system will seriously reduce its efficiency. A slightly damaged o-ring on the fill whip can leak gas at a higher rate than the booster can pump. Also, minor contamination on the reed valves can cause internal leakage that can prevent the booster from pumping.

The operation of any booster has some inherent risks, especially when pumping oxygen. Anyone using a booster should have completed an approved course on gas blending, and should be aware of these risks.

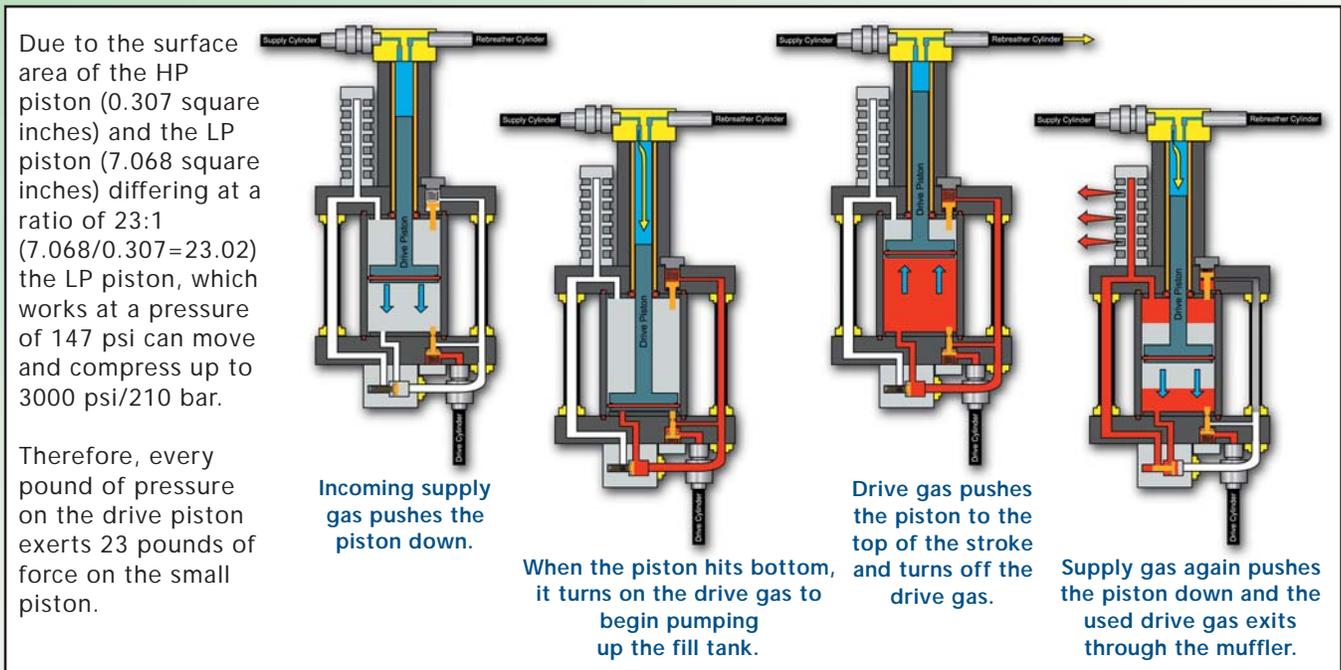
Some basic assumptions should be made about the gas boosting circuit, and the first one will probably surprise you. The system is contaminated, and is not "oxygen clean." "Oxygen clean" and its cousin "oxygen compatible" are two of the most misunderstood phrases in diving. Oxygen compatible depends on the temperature, pressure, duration, and desired result. Gasoline is oxygen compatible, if you are trying to start a fire.

An item can be oxygen clean for a brief period, but once put into service it should always be considered to be contaminated to some degree. (For more information see ADM, issue 10, Oxygen Clean by Bart Bjorkman.)

The most likely points of ignition when using a booster are the supply and fill whips attached to the booster. Opening either of the tank valves too quickly can easily generate enough heat to cause ignition. If the fill whips have quick connect fittings or other restrictions, the risk of ignition is increased.

A rebreather and Baby Booster is a great combination for expanding your diving possibilities. The ability to top up your oxygen and diluent tanks quickly between dives, and do it anywhere you have access to Scuba tanks as a drive gas source, opens up almost limitless dive options. The old set of doubles sitting in your garage collecting dust now makes a perfect gas bank.

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Versatility

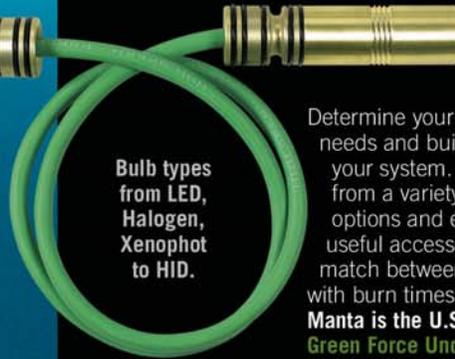


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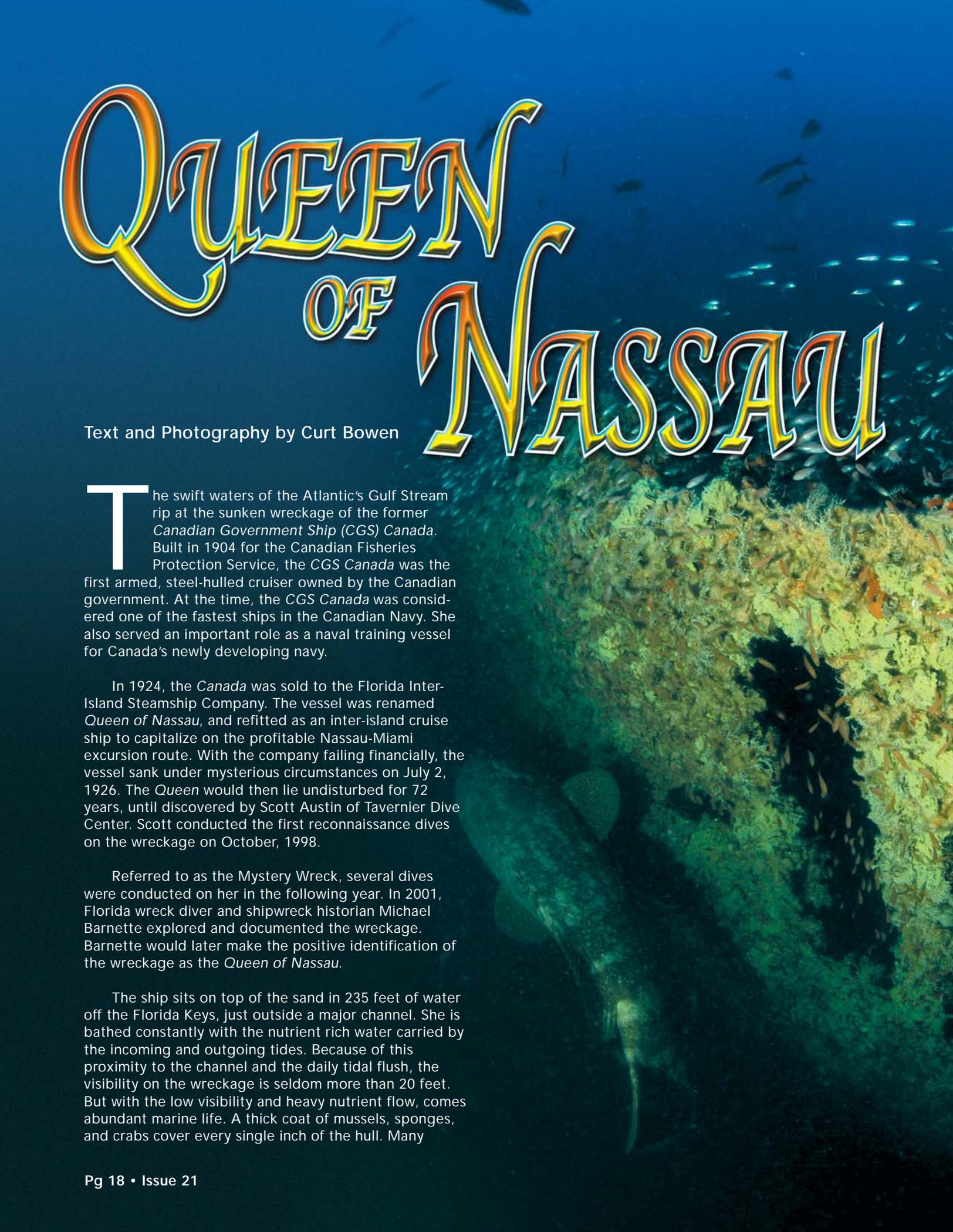
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An underwater photograph of a shipwreck, the Queen of Nassau, resting on a sandy seabed. The wreck is heavily encrusted with coral and other marine life. The water is clear and blue, with many small fish swimming around. The title 'QUEEN OF NASSAU' is written in a large, stylized, yellow and orange font with a white outline, positioned at the top of the page.

QUEEN OF NASSAU

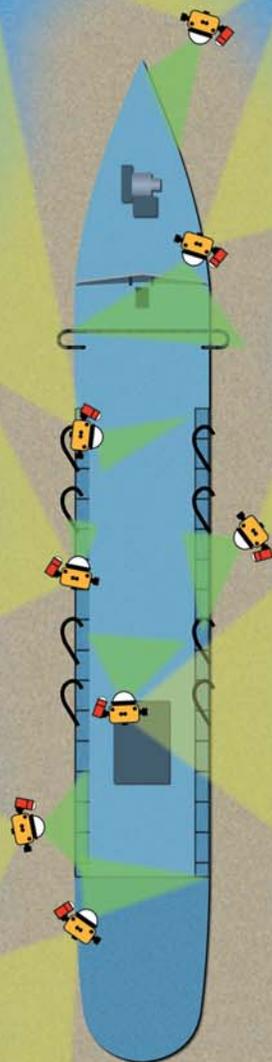
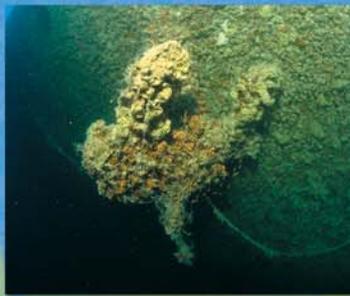
Text and Photography by Curt Bowen

The swift waters of the Atlantic's Gulf Stream rip at the sunken wreckage of the former *Canadian Government Ship (CGS) Canada*. Built in 1904 for the Canadian Fisheries Protection Service, the *CGS Canada* was the first armed, steel-hulled cruiser owned by the Canadian government. At the time, the *CGS Canada* was considered one of the fastest ships in the Canadian Navy. She also served an important role as a naval training vessel for Canada's newly developing navy.

In 1924, the *Canada* was sold to the Florida Inter-Island Steamship Company. The vessel was renamed *Queen of Nassau*, and refitted as an inter-island cruise ship to capitalize on the profitable Nassau-Miami excursion route. With the company failing financially, the vessel sank under mysterious circumstances on July 2, 1926. The *Queen* would then lie undisturbed for 72 years, until discovered by Scott Austin of Tavernier Dive Center. Scott conducted the first reconnaissance dives on the wreckage on October, 1998.

Referred to as the Mystery Wreck, several dives were conducted on her in the following year. In 2001, Florida wreck diver and shipwreck historian Michael Barnette explored and documented the wreckage. Barnette would later make the positive identification of the wreckage as the *Queen of Nassau*.

The ship sits on top of the sand in 235 feet of water off the Florida Keys, just outside a major channel. She is bathed constantly with the nutrient rich water carried by the incoming and outgoing tides. Because of this proximity to the channel and the daily tidal flush, the visibility on the wreckage is seldom more than 20 feet. But with the low visibility and heavy nutrient flow, comes abundant marine life. A thick coat of mussels, sponges, and crabs cover every single inch of the hull. Many



larger predator fish such as Goliath Grouper, sharks, and Jacks now make this small oasis in the sand their home. Multitudes of small fish envelop the structure, giving the distinctly eerie impression that the ship itself is waving below your fins.

Over time, the layers of encrustation have become so thick that most of the details of the ship's structure have long since been lost. The bow winch appears as a giant block of thriving mussel shells and sponges, while all the framework of the upper deck seems to have melded together into one solid mass. All the prospective artifacts scattered across the decks during the sinking are now entombed in a two-foot thick layer of living shells and sifted sands.

Gaining access to this wreck can be extremely difficult due to the strong currents. However, there is a method of wreck diving that can be used when pulling yourself down an anchor line would be extremely difficult or impossible due to strong currents. Known as "bombing the wreck," it consists of maneuvering the dive vessel directly up current of the wreckage. All divers line up on the dive deck, completely prepared and ready to bail out the back of the dive vessel once the captain gives the "Dive-Dive-Dive" command. Like paratroopers exiting an airplane, the divers rapidly maneuver off the dive vessel and plummet as quickly as possible towards the sea floor. If all goes as planned, the current will pull the dive team into the wreckage where they can tuck themselves behind the structure and out of the main current.



Above: Megalodon CCR diver Jim Rozzi looks down at wreck explorer Scott Austin, who wishes he were wearing a Meg and not open circuit.

Bottom Left: A 400 pound Goliath Grouper (Jewfish) hides within the marine life encrusted wreckage.

One of the team members descends with a small grappling hook connected by rope to a large float ball on the surface. Once on the wreck, the diver attaches the grappling hook onto the wreckage. At the conclusion of the dive, all team members assemble at the grappling hook, and begin their ascent up the line. Once all team members are accounted for, the hook is pulled free of the wreckage and tied backwards into the ascending rope. The whole team can then drift with the current in comfort while the surface vessel follows the float.

If a diver misses the planned target, then that diver is required to head for the surface; and, if needed because of decompression obligations, shoot a marker buoy for the surface vessel to follow. Once on the surface, the dive vessel will recover the diver and return to the wreck site.

To schedule a dive on the *Queen of Nassau* or other Upper Keys wrecks, contact Tavernier Dive Center

Ph: 1-800-787-9797

www.tavernierdivecenter.com



Bermuda High

Text and Photography by Jill Heinerth

His name is Mictacea - actually it's *Mictocaris halope*. He lives in Bermuda, and nowhere else on the planet. In fact, he has been found in only five of more than 150 known caves of Bermuda. And within those caves, he inhabits only deeper waters in the most remote parts. It's like living in one room of your home and never venturing to the rest of the house, let alone outside to the rest of the world.

Mictacea and its discoverer - Tom Iliffe, are what brought Wes Skiles, Nate Skiles, and me to Bermuda. Tom is an icon in the world of cave biology, and Mictacea is one of his most significant finds.

Mictacea has been described as a new order of Crustacea within the animal kingdom. That's the equivalent of being aware of mammals, and then suddenly discovering a new group like marsupials that had never been known before.



Photo by Nate Skiles



Although Tom is not a Bermuda native, his heart is tied to protecting this place he called home for over a decade. Protecting animals like *Mictacea* means protecting the home in which they live. And that home, the vast underground water resources of the island, is critical to the survival and prosperity of many of Bermuda's finest treasures – the world's northernmost coral reefs, turquoise waters and the stunning environment that attracts thousands of tourists every year.

To understand *Mictacea*, one has to look far back in the Earth's history. *Mictacea* is a living fossil that appears to have remained little changed for untold millions of years. Its name, *Mictocaris* (literally meaning mixed or

blended shrimp) refers to the unique mixture of characteristics individually present in other crustaceans, but not in this combination. Thus, *Mictacea* is a missing link that helps us understand the evolution of crustaceans. But that's where the mystery gets really interesting. All known caves of Bermuda stood high above the ocean as recently as 13,000 to 18,000 years ago, during the Ice Ages when massive amounts of the world's waters were locked up in ice. The higher sea levels of today have flooded the caves, allowing us to swim through the stunning speleothems that were formed when the caves were dry. So where did *Mictacea* live at those times when all Bermuda caves were dry and air-filled?

Bermuda's shoreline is peppered with caves (below). Satellite photos (above), compiled by the Bermuda Zoological Society, reveal the extent of Bermuda's ancient platform.



Bermuda's limestone cap, where the caves are located, extends down to about 100 feet below present sea level. The island is perched on top of an extinct mid-ocean volcano that emerged from the depths more than 30 million years ago. None of Bermuda's caves have been explored below that limestone cap, and Iliffe wonders whether he will find life inhabiting the volcanic strata that make up the bulk of the Bermuda seamount.

During the last Ice Age, the land area of Bermuda would have been about 20 times larger than the peak of the atoll we see today. And on those ancient shorelines, now situated 300 feet below the ocean's surface, Tom intends to seek out relic caves that may yield answers to the mystery of where creatures like Mictacea could have lived. It has been proposed that some of Bermuda's cave creatures may have reached the island via the Gulf Stream, while others may still be hiding secretly on submerged seamounts in the Atlantic or in the cracks in deep sea rocks along the Mid-Atlantic Ridge. But scientists wonder about the connective path they have traveled through history. How and when did groundwater begin to dissolve away caves on the larger submerged platform? Did volcanic lava tube caves exist on early Bermuda? Will such caves still be visible or will they be covered by coral and other encrustations? Did Mictacea migrate from somewhere else, or does he still live deep in the ocean's depths?

Cave diving in Bermuda is not easy. Most of the over 150 cave entrances lie on private land. There are no rental cars on the island, and support for technical diving is in its infancy. But that did not stop Tom from pursuing his life's passion. He arrived in Bermuda expecting to study beach tar for the Bermuda Biological Station. But thanks to his mentor, Dr. Wolfgang Sterrer, his focus was diverted to document the unique biology found in Bermuda caves. Now that work has climaxed with his focus on educating the public about their underground resources, and protecting those resources for the future.

In order to accomplish this, Iliffe helped form the Bermuda Cave and Karst Information System (BeCKIS), a multidisciplinary research program coordinated through the Bermuda Biodiversity Project of the Bermuda Aquarium, Museum & Zoo. The goal of BeCKIS is to increase public awareness of Bermuda's caves, to identify negative impacts on these resources, and to promote the scientific study of Bermuda's caves and the unique animals that inhabit them. In addition to Iliffe, BeCKIS includes noted scientists and students from Bermuda, the US, England, Australia, Norway, Denmark, and other nations.



Cathedral Cave (below) is located on the grounds of the Grotto Bay Beach Resort in Hamilton Parish. The dominant feature in Cathedral Cave is the large, deep lake which is sometimes used as a swimming hole by hotel guests. The cave is tidally influenced, and possibly connected underwater to neighboring Prospero's (Island Cave) cave, where tourists enjoy special events in an underground bar and discotheque.

Church Cave (above) contains the largest underground lake in Bermuda. The magical beauty of this cave was first discovered by sailors from the Challenger Expedition in the 1870s. There are at least eleven cave species that are endemic to the cave lakes of this area including copepods, isopods, an ostracod, amphipod, shrimp, and polychaete.



Bermuda is the planet's biodiversity hotspot for underwater caves. Per unit area, it boasts more cave critters (84 species) than anywhere else on earth. Yet those unusual creatures are poised in a delicate balance. Threats to Bermuda's caves and groundwater include limestone quarries, construction projects, deep well injection of waste water, and leakage of cesspits. Currently, 25 of Bermuda's cave species are internationally recognized as critically endangered. Assuming conditions remain the same as they are now, this level of threat equates to a 50% chance of extinction in the next ten years.

Iliffe is not willing to stand by and watch that happen. He hopes that through education, cooperative programs with developers, and new protective policies, that Mictacea and his friends will be around for a long time. As an indicator species showing us the health and stability of water resources, we'd better hope he's successful.



Above: Dr. Tom Iliffe and Dr. Wolfgang Sterrer examine samples of Mictacea at the offices of the Bermuda Aquarium and Bermuda Zoological Society. The team of Skiles, Heinerth, and Iliffe retrieved the crustaceans from Deep Blue Cave earlier in the day

Below: Wes Skiles diving offshore in Bermuda documenting the inevitable links between the health of cave environments and the health of local coral reefs.



USS CURB

Text and Photography by Curt Bowen

Key West is a busy and active vacation spot for tourists and divers alike. Crowded bars and restaurants, shops, and plenty of leisure-time pursuits keep the surface town bustling. The Keys also have plenty to offer divers who don't wish to stay on the surface—at least, not all the time! There are numerous wrecks and dive sites to interest all skill levels.

Some are well known, and are visited almost as often as any favorite topside bar or dive shop; however, there are some wrecks still off the beaten path, hidden or just difficult enough to keep the majority of tourists away. One such seldom-visited wreck is the *USS Curb*. An incredible wreck full of color, abundant marine life such as jewfish, snapper, grouper, and many others, the *Curb* is just a short boat trip from Key West. But with the sea floor at 185 feet, and the main decks between 130 and 160 feet, the tourist dive charter boats tend to keep far away.

History

The *USS Curb* was built in Napa, California, by the Basalt Rock Company, and was commissioned as a Diver Class salvage boat for towing and salvage work in the Atlantic during World War II. After the war, she was decommissioned and loaned to a commercial salvage firm belonging to the Merritt-Chapman & Scott Corporation. For more than 30 years, she would continue her primary job as a cable layer and salvage vessel.

On November 23, 1983, the 214-foot long *Curb* was purposely sunk off of Key



West to serve as an artificial reef. She was placed in deeper water, and originally intended as a haven for fish as well as a structure for sport fishermen. Since the introduction of technical diving practices, the *Curb* has been considered one of the best technical dives that Key West has to offer.

Diving the wreck from bow to stern

No mooring buoys mark the wreckage, so using a typical bottom finder, GPS, and then a grappling anchor hook into the wreckage works well. Currents can vary greatly on this wreck, from undiveable to none at all, depending on the Gulf Stream and the tides. Once on the wreck, a dozen or more very large and inquisitive Jewfish act as greeters and pre-boarding inspection teams. Sitting upright on the *Curb's* bow (left page photo) is a winch lover's dream. Three massive winches from the ship's former work as a cable layer are now heavily encrusted with colorful marine life. Schools of Cigar Minnows and small baitfish dance along the winches, and the inquisitive giant Jewfish circle just out of reach, maintaining their careful consideration of the boarding party. If



they ever figure out that they could easily chase away these strange intruders, then wreck diving would come to a screeching halt!

Penetration into the ship's quarters is easy, but most interiors are covered with a buildup of nasty fine silt because the *Curb* lies close to a shipping channel that carries a tremendous sediment load from Key West Harbor. The visibility is reduced considerably by exhaled bubbles and each misplaced fin kick. Just aft of the bow is the lower crew quarters, and the upper pilothouse. All of the artifacts in the pilothouse, such as the ship's wheel, telegraph, and compass, have long since been removed.

Beyond the main cabins is an upper work deck that supports another enormous winch and hoisting structure. At some point, some poor fisherman lost his net, and now it is stretched across the winch and upper structure.

Just past the upper work deck, there is a large lower working platform that was once used as the main salvage deck. Large



towing bits on the stern deck give clear evidence of her use as a tow and salvage ship.

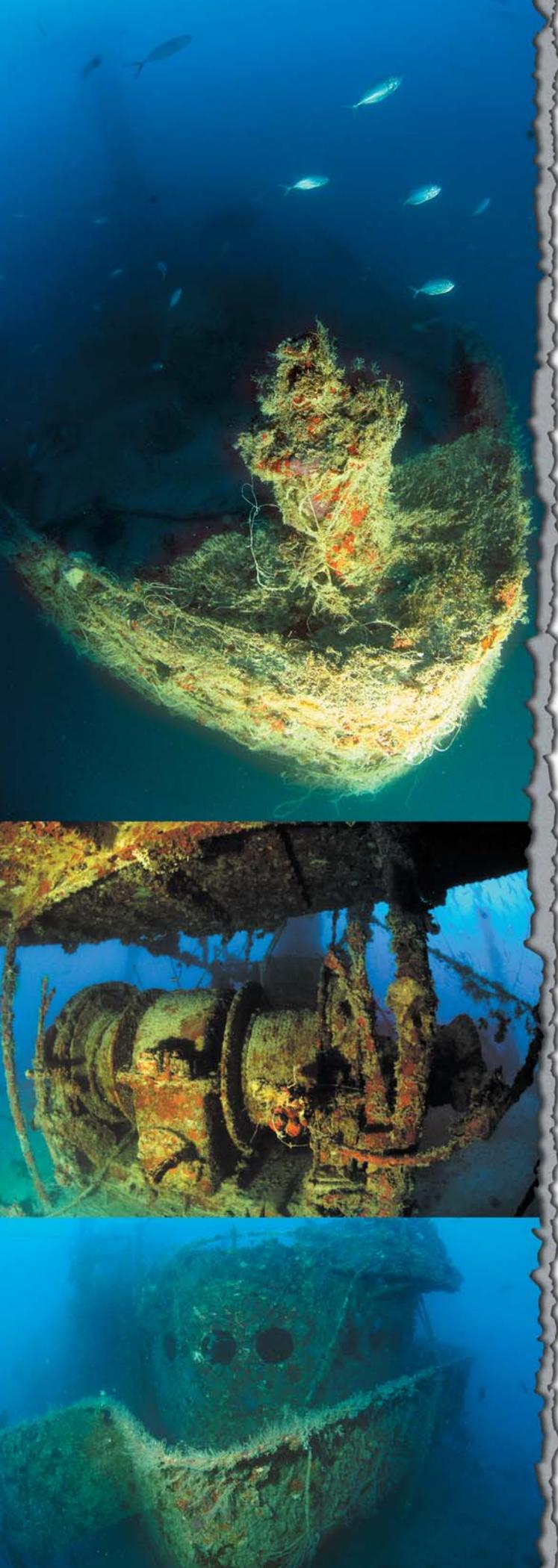
Since the *Curb* was sunk initially to serve as an artificial fishing reef, thousands of feet of monofilament line and fishing lures snag on every exposed inch of the wreckage. Caution must be taken in order to avoid becoming hooked or entwined in this invisible weave of fishing debris. It is advisable to have a sharp cutting tool handy...it will probably be needed.

The *USS Curb* offers both the apprentice and seasoned veteran technical diver an awesome and easily accessible wreck dive. Due to the somewhat shallow technical depths of 150 to 185 feet, the *Curb* also makes a perfect technical wreck-training dive.

Technical dive charters

Tavernier Dive Center
www.TavernierDiveCenter.com





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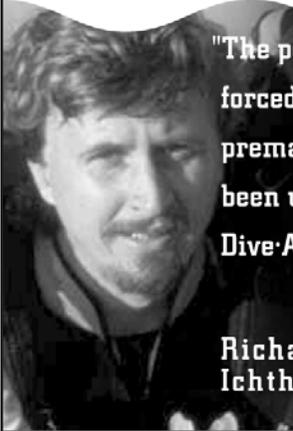
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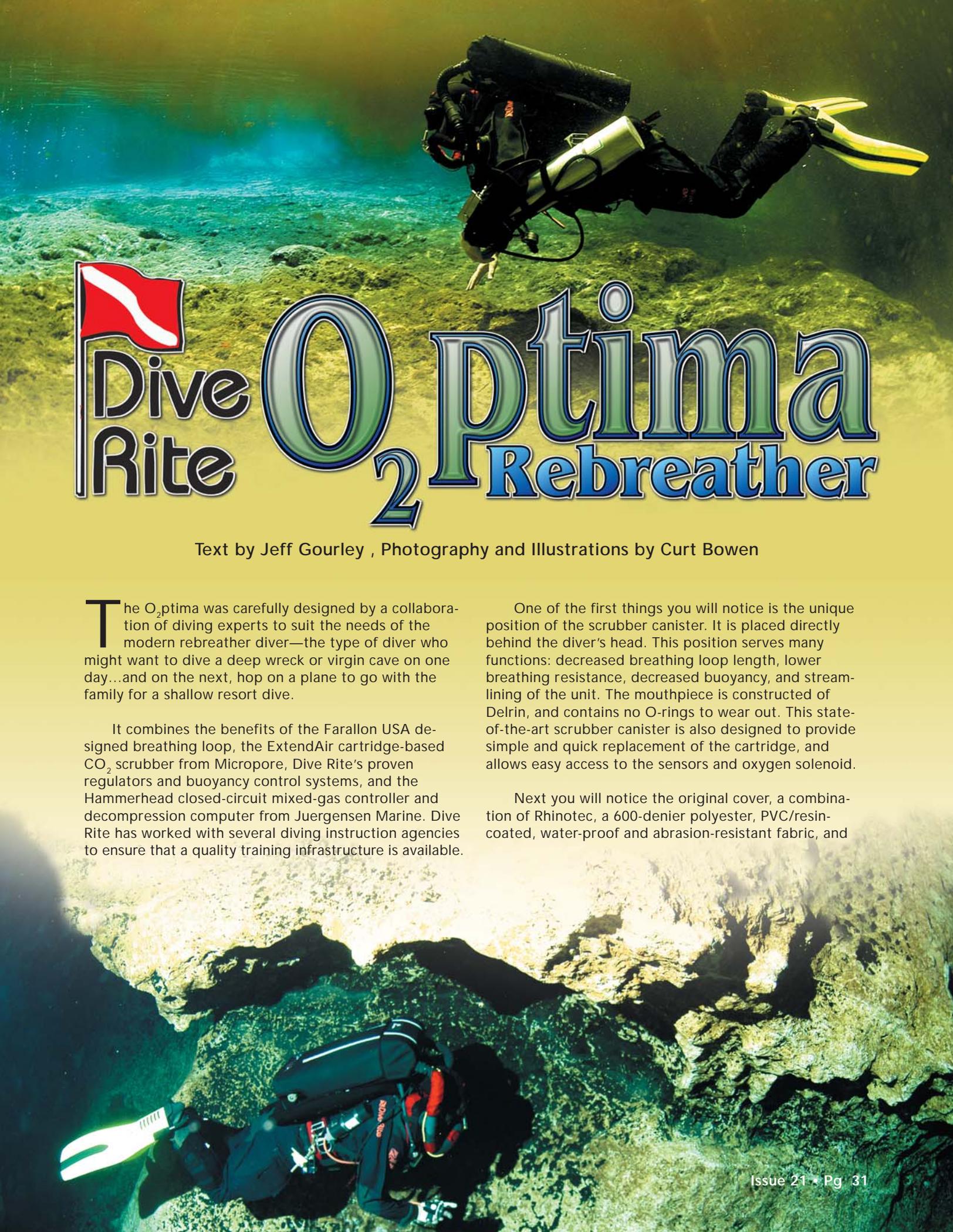
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O₂ptima Rebreather

Text by Jeff Gourley , Photography and Illustrations by Curt Bowen

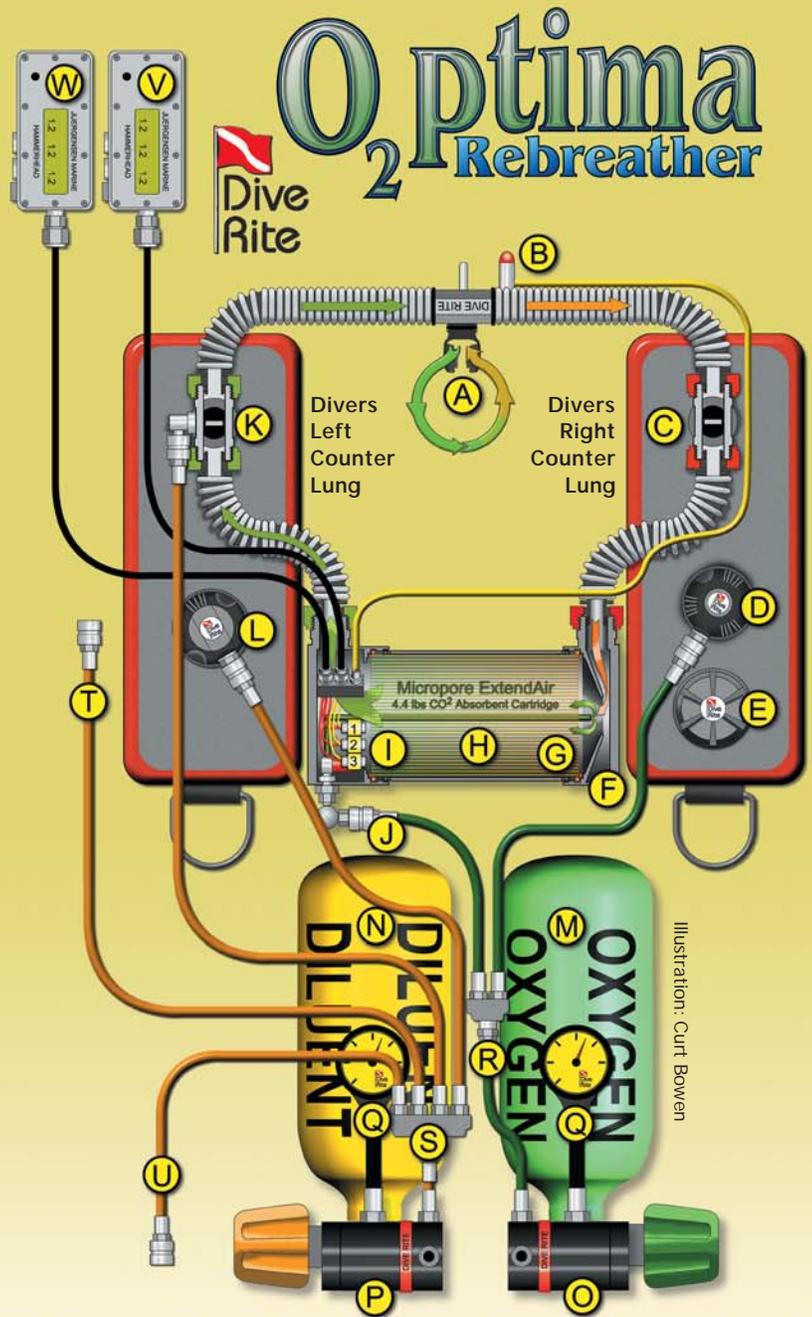
The O₂ptima was carefully designed by a collaboration of diving experts to suit the needs of the modern rebreather diver—the type of diver who might want to dive a deep wreck or virgin cave on one day...and on the next, hop on a plane to go with the family for a shallow resort dive.

It combines the benefits of the Farallon USA designed breathing loop, the ExtendAir cartridge-based CO₂ scrubber from Micropore, Dive Rite's proven regulators and buoyancy control systems, and the Hammerhead closed-circuit mixed-gas controller and decompression computer from Juergensen Marine. Dive Rite has worked with several diving instruction agencies to ensure that a quality training infrastructure is available.

One of the first things you will notice is the unique position of the scrubber canister. It is placed directly behind the diver's head. This position serves many functions: decreased breathing loop length, lower breathing resistance, decreased buoyancy, and streamlining of the unit. The mouthpiece is constructed of Delrin, and contains no O-rings to wear out. This state-of-the-art scrubber canister is also designed to provide simple and quick replacement of the cartridge, and allows easy access to the sensors and oxygen solenoid.

Next you will notice the original cover, a combination of Rhinotec, a 600-denier polyester, PVC/resin-coated, water-proof and abrasion-resistant fabric, and

- A DSV (Diver Supply Valve):** DSV contains two mushroom valves, which provide direction flow. Both mushroom valves are removable for maintenance and cleaning.
- B HUD (Heads Up Display):** Displays PO₂ information to the diver by a three color LED. Green, Yellow, and Red.
- C Right Shoulder Counter Lung:** Reinforced shell made from 1000 denier Cordura and RhinoTec materials. Size comes in twin six-liter bags.
- D Manual Oxygen Supply Valve:** Standard SiTech add valve.
- E OPV (Over pressurization Valve):** Standard SiTech OPV.
- F Water Trap in Canister:** Small funnel shaped water trap prevents small amounts of water from reaching the scrubber material.
- G Oxygen Injection Tube:** Oxygen injection tube supplies O₂ to the exhalation side of the scrubber canister to assist with proper gas blending.
- H Micropore ExtendAir Cartridge:** Easy to install, ExtendAir cartridges provide an easy, quick, no mess advantage over standard granular scrubbers.
- I Triple Oxygen Sensors:** Teledyne R22
- J Oxygen Inject Solenoid**
- K ADV (Auto Diluent Valve):** Located on the diver's left shoulder, the ADV provides diluent into the breathing loop upon descent as the air in the loop compresses.
- L Manual Diluent Valve:** Standard SiTech Valve
- M Oxygen Supply Cylinder:** Pressed Steel LP 27 cuft (2640)



Dive Rite O₂ptima Closed Circuit Rebreather Schematic (View as it appears on diver's back)



- N Diluent Supply Cylinder:** Pressed Steel LP 27 cuft (2640)
- O Oxygen 1st stage regulator:** Model type RG1208 ip 110psi - 2 Liters per minute flow rate
- P Diluent 1st stage regulator:** Model type RG1208 ip 140psi - 2 Liters per minute flow rate
- Q Pressure Gauge**
- R Double LP hose splitter:** Supplies the Oxygen Solenoid and manual oxygen ad valve
- S Quad LP Hose Block:** Supplies diluents to the Manual diluent Ad Valve, BCD inflator, Dry suit Inflator, and ADV
- T Low Pressure BCD Inflator Hose**
- U Low Pressure Dry suit Inflator Hose**
- V Secondary Electronic Display:** The Secondary Display functions as a fully redundant ppO2 Monitor (with independent power), and also serves to control the status of the DIVA. The Secondary Display also functions as a Depth/Timer in case the Primary should fail. There are two modes that the diver may choose for display on the DIVA - the "User Set-Point" Mode which displays a Green, Orange, or Red depending upon how near/far the set it from the Set-Point, and the "PPO2 Mode," where the actual ppO2 of each cell is displayed via flashing code to the Diver.
- W Primary Electronic Display:** Displays triple sensor PO2 information, current depth, bottom time, decompression obligations, Time To Surface calculation, and gas mixture chosen. Gradient factors on top of Buhlmann algorithm. New features to the Primary Display are the addition of a Total Dive Timer, which tracks the total number of hours logged on the unit (the famed "BS-O-Meter") and a Barometer with Temperature Display.



Cordura, reinforced with plastic in all areas likely to experience abrasion. The cover has D-rings for clipping accessories to it, and reflective stripes to provide good visibility in low light or silty conditions.

The independently front-mounted counterlungs are adjustable, so you can position them in the most effective configuration. Each lung is fitted with a Sitex swivel valve for manual addition of your gasses. The exhalation lung comes standard with a spin-valve, making the removal of any water trapped in the lung a cinch. The faces of the counterlungs are covered in Rhinotec—go ahead and squeeze through that restriction without fear of tearing a lung!

The O₂ptima's two-piece high-impact plastic case holds all the components of the systems securely in place; has a carry handle; stands upright for storage; and is light weight and collapsible—without the tanks, the entire unit can fit into carry-on luggage! The case comes ready to bolt onto your favorite Dive Rite buoyancy control system and go.

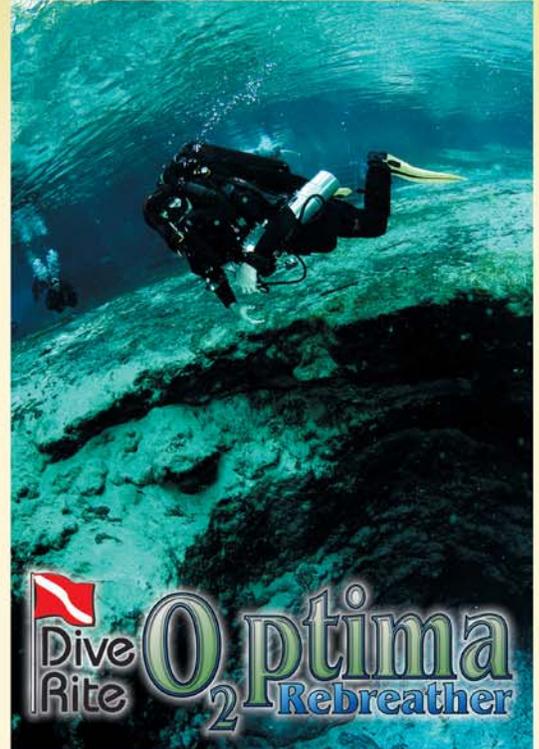
Both your diluent and oxygen gasses are delivered via the tried-and-true Dive Rite regulators, coupled with OP valve-equipped multi-port gas blocks. Two pressure gauges provide information for your gas tracking, and all necessary LPI hoses are provided. The oxygen components are clearly marked in green. Included as standard are two 27cu steel tanks that provide hours of gas as well as great buoyancy factors. The tanks are held in place with a simple Velcro band that will also accept smaller tanks, such as AL 13's, if you want to configure the unit to be lightweight.

Oxygen injection, PO₂ monitoring, and onboard decompression information are controlled by dual Juergensen Marine Version 7.0 Hammerhead electronics. This latest version of electronics is the most advanced available.

The handsets have aluminum bodies that are nickel plated (1.5 Mil) for corrosion resistance, and have been pressure tested to 600 feet. The piezo switches are just a dream to use. Touch them gently, and your screen magically changes. They are hermetically sealed, so depth has no effect on them. No more moving parts, no more springs to maintain, no more magnets to corrode. The Digital Pressure Transducer never needs calibration, and is capable of reading barometric pressure all the way out to deep space. Also included are temperature and barometric pressure displays, just in case you want to know what the weather is going to be like....

The O₂ptima utilizes a completely redundant secondary display to provide such necessary information as PO₂, Dive Time, Current Depth, Max Depth, and Temperature. The two handsets are truly independent; they do not share a brain or battery. The only shared components are the three O₂ sensors, but each is accessed individually by the handset. Because of this true redundancy, each handset must be O₂ calibrated independently.

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Jill Heinerth

ADM Featured Photographer

Few people know that my earliest memory in life is of almost drowning. From a cottage dock in my Canadian homeland, I slipped into the water, and floated face down - too young to right my tiny body. I recall looking at the rainbow hues reflected on the ripples of sand. It was beautiful. The only thing that broke the tranquility was the shrill cry of my mom as she snatched me from the chilly water. Apparently, I was laughing.

My poor mother has been subjected to many more frights over the years. The color drains from her face as she watches my underground exploits in movies, or reads in *National Geographic Magazine* about me diving inside of exploding Antarctic icebergs.

I've discovered that it is better to go on the expedition, and then expose her to the stories and photos after I return safely.

I now have my entire family perpetually on guard. My brother openly expresses his concern when he gets a particularly mushy letter from me. Is she going on an expedition? he asks my sister. I got a letter that sounds like a last will and testament again...?

But when I make my annual pilgrimage home, they are eager to hear about the projects, movies, and articles...always wondering what the baby of the family is up to now.



PSS Instructor
Dr. Marco Pivetta
dives with a
lionfish in
Sharm Al Sheikh,
Egypt

Brian Kakuk explores
Subway Cave, Exumas



Old Blue Eyes,
Grand Cayman



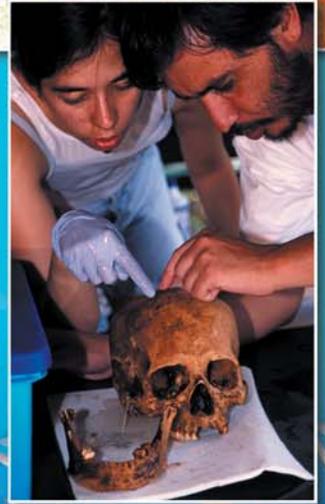
Susan Graham eyes a
large grouper,
Grand Cayman



Left: Luis Martinez
descends into a water
well in Homun, Mexico



Right: INAH Scientists
examine a skull
recovered from a
Yucatan Cenote



Below: Red Sea Splendor





Above: Kay Walten exploring Cenote of the Sun, Mexico

I was born with an explorer's gene. From my youngest days, I have enjoyed documenting my world, and bringing home stories to share. And that is the root of my passion: a mix of adventure with a heavy dose of creativity.

I received a Bachelor of Fine Arts degree from York University, but I was never truly happy unless I could mix my obsession for the outdoors with my artistic visions.

I have dabbled on both sides of the fence, owning a graphic design studio, teaching scuba, and pursuing an active life hiking, canoeing, and being in the water. But it is my filmmaking activities and creative partnership with Wes Skiles that fuels my energies today. It is a great gift to find an occupation in life that embraces and challenges your talents every day, and a rare opportunity

to do something that makes a difference for society. It's never easy creating the opportunities to make our own independent documentaries; but the reward of protecting a spring, or inspiring a school child, or exciting the next generation of adventurers is beyond words.

If my photos and films can give wings to someone's imagination, or better yet inspire them to chase their own dreams, then it makes it all that much more significant for me.

Jill Heinerth
Heinerth Productions Inc.
5989 NE County Road 340
High Springs, FL 32643
jillheinerth@mac.com

Below: Mary Sloan and dive partner Browning find magnificent life in the Florida Keys





- Above: Cis Lunar rebreather diver and explorer Paul Heinerth swims through an iceberg during the filming of the Wes Skiles production of *Ice Island*, Antarctic
- Top Right: Wes Skiles, producer of *Waters Journey* takes a moment to explore and document the St. Johns River
- Right: Two sport divers explore the fish filled caverns of John Pennekamp State Park, Florida Keys
- Below: Wes Skiles shooting his HD camera on a Bermuda Island wreck





NEWFOUNDLAND'S DIVING DIVERSITY

Text by Bernie Chowdhury

Photography by Kristin Briney, John Cogan, Marvin Gozum, Jerry Keenehan, Arch McNamara, Debbie Stanley, and Rick Stanley

Cold water divers seeking a new, interesting, up-and-coming locale for exciting underwater excursions, with the added lure of future exploration possibilities, would do well to consider Newfoundland's Conception Bay. Four intact iron ore freighters torpedoed during World War Two are currently the main attraction, and require a boat to gain access. Shore diving offers the chance to see whaling vessels from the 1960s. In nearby Trinity Bay, a shore dive gives access to entire whale skeletons discarded from a processing facility. Scallop and mussel gathering is possible, when diving with guides who possess the required license. Good visibility, lush marine growth, and a fair quantity of fish life - including some large cod, once the mainstay of the local economy - make Newfoundland an ideal destination for photographers and video buffs. Site diversity includes not only shipwrecks, but also icebergs, and chances to interact with larger marine life, including seals, dolphins, and even whales, depending on the time of year (see sidebar, "Travel Advisory"). Future possibilities for the cave certified include exploration of an extensive abandoned underwater iron-ore mine complex, though this site is not yet available for diving.

Rick and Debbie Stanley are the co-owner of Conception Bay's Ocean Quest Resort and Ocean Quest Charters. He says, "Many folks come here and compare our diving with British Columbia a number of years ago.

We're still off the beaten path." Evidence of that statement is easily seen above water. The Canadian province of Newfoundland (pronounced NEWFIN-land) and Labrador (NL) offers visitors the chance to see vast tracts of largely unspoiled wilderness and its inhabitants. For example, when heading to dive sites, car drivers should beware of moose, caribou, and bear that may wander across the road or highway. Distractions from above include bald eagles that soar in their search for food.

IRONIC HISTORY

Bell Island had six mines producing a fairly high-grade iron ore that was used in steel production. A lot of this ore was purchased by Germany in the 1930s, during their feverish rearmament prior to World War Two. The four freighters torpedoed off Bell Island may well have been sunk by German U-boats assembled from steel derived from the Island's ore.

The freighters were sunk in 1942 by two U-boats. Commander Rolf Ruggenburt surfaced *U-513* in Conception Bay's Wabana Harbor, on the morning of September 5th, 1942. He spotted *S.S. Saganaga*, *S.S. Lord Strathcona*, and *PLM 27* at anchor off Lance Cove, but not before his U-boat was seen and fired upon by the freighter *Evelyn B*. The German submarine was damaged, but still fit to fight. Ruggenburt ordered two torpedoes launched against the



S.S. Saganaga, which subsequently went down with 29 men; 14 other men survived. During the battle, *S.S. Lord Strathcona* tried to get underway, and actually rammed *U-513*, damaging the sub's conning tower. Again, the feisty Ruggenburt ordered two torpedoes launched immediately after his ship had been attacked. And again the U-boat triumphed. All of *S.S. Lord Strathcona's* crew was able to make it off their sinking ship and survive.

The *PLM 27* did not come under attack of *U-513* at all, and survived September's melee; however, the freighter was not so lucky only two months later. On November 4th, 1942, the *PLM 27* and the *S.S. Rose Castle* were both sunk by *U-518*, under Commander Friedrich Wismann. The French vessel lost 12 crewmen, while 38 survived. *S.S. Rose Castle* lost 28 men, while 15 crew members were able to make it safely back to shore.

SOMETHING COMPLETELY DIFFERENT

While the four Bell Island wrecks will likely be the highlight for any diver visiting Conception Bay, an easy day off in the middle of the week to frolic in shallower water may be well advised after long, deep dives on the freighters. The whale bone shore dive just outside the city limits of Dildo will not only prove interesting, but the drive there undoubtedly will be filled with wise-cracks and catchy slogans capitalizing on the town's name. Toward that end, a visit to Dildo itself and to one of its tourist shops could land the visitor with sweatshirts, t-shirts, and hats bearing eye-catching phrases.

The whale bones themselves are scattered along the bottom at about 70 feet/21 meters depth. An incredibly vast number of rockfish, sculpins and flounder are to be found here, and they are easily photographed. Large scallops can be found in 80-90 feet/24-27 meters of water.

LARGE MARINE LIFE

Those who wish to encounter dolphins and whales are best advised to head to Newfoundland in July or August. Water temperatures will be warmer, but the trade-off is that the visibility will usually be less than when the water is cold.

Many species of whale come to Newfoundland, including Beluga, Fin, Humpback, Minke, Pilot, and Pothead. While nothing can be guaranteed, it is possible to snorkel or even to dive with them, if you get lucky. Whale watching has become a popular tourist attraction.



IRON ORE FREIGHTERS

The upright freighters off of Conception Bay's Bell Island are all stunning. Massive white, brown, and pink anemones colorfully garland the intact, steel wrecks.

PLM 27, a nickname for the Free French ship *Paris Lyons Marseilles 27*

Length: 404 ft/123 m

Depths: 100 ft/30 m; deck is at 60 ft/18 m

Highlights: the deck's machine gun, munitions, an intact propeller, and the remains of a lifeboat.

S.S. Saganaga

Length: 410 ft/125 m

Depths: 114 ft/35 m; deck is at 72 ft/22 m

Highlights: torpedo hole large enough for a diver to swim through and access one of the holds, then up to the deck. Fairly spacious, open companionways on the superstructure provide ample opportunity for swim-throughs.

S.S. Lord Strathcona (sister ship to *Rose Castle*)

Length: 460 ft/140 m

Depths: 121 ft/37 m; deck is at 88 ft/27 m

Highlights: intact stern gun, manufacturer's plaque, munitions.

S.S. Rose Castle (sister ship to *Lord Strathcona*)

Length: 460 ft/140 m

Depths: bow is in 138 ft/42 m, stern is in 158 ft/48 m; deck depths range from 101-121 ft/31-37 m.

Comments: Because she is the deepest of the four freighters, she has been less subject to damage from icebergs passing overhead. As a consequence, she is the most intact of these wrecks, and the most visually stunning.

Highlights: some of the deck rigging can still be seen, the radio room, part of a torpedo lying in the sand, off of the stern. If you plan on seeing this, it's advisable to run a guideline so that you can get back to the wreck and the anchorline.

Visibility on any of these wrecks typically ranges from 30-50 ft/9-15 m, depending on the time of year (see "Travel Advisory" sidebar). When water current is present, there's ample opportunity to stay in its lee, using the wreck's structure to shield you. You may also wish to use the technique known as the "pull and glide" to navigate the wreck while conserving both energy and breathing gas.

Penetrating any of these wrecks is interesting. Plenty of open space combines with natural light filtering in through torpedo holes, portholes, and open cargo holds to provide a surreal view of the wreck's interior. Use of a good underwater light will allow you to see much more detail than relying only on natural light, of course. Yet many areas of these wrecks are open enough to give you a good feel for the interior without the use of a light. As with any wreck penetration, proper training and equipment are a must.

ICEBERGS

While diving on an iceberg is unique, it also requires special knowledge to avoid being hurt or killed by a calving or overturning structure. May and June are the best months to encounter icebergs, but the very conditions that let them form and arrive in Conception Bay also make it a hazard. Nadine Wedd is the Ocean Quest's Dive Center manager. She cautions, "Icebergs have their own weather system around them. Because they are usually colder than the surrounding air and water, fog is often present around an iceberg, and often only in its immediately vicinity. It's also not unusual to see a cloud directly over an iceberg on an otherwise clear day. The temperature difference means that the ice is inherently unstable. Big chunks can break off unexpectedly, or the entire thing can flip over without warning." Only an experienced operator with local knowledge should be trusted with getting you safely to and from an iceberg dive.

SCREECH ME

Every Newfoundland visitor will find themselves subject to a unique cultural ritual before being allowed to depart. "Screeching" involves nebulous native phrases that must be properly pronounced, drinking copious quantities of "Screech," and some other fun surprises. A successfully "Screeched-in" visitor will be allowed to return. Once you've had a taste of the local diving, you'll be sure to want a repeat.

About the author: Bernie Chowdhury is the author of the non-fiction, international top-selling book, ***The Last Dive***, which has been published in 10 foreign languages.

For more information:

www.newfoundland.com

www.stjohnsairport.com

www.foundlocally.com/StJohns/index.htm

www.oceanquestcharters.com



TRAVEL ADVISORY

Visa and Documentation Requirements: All visitors who reside outside Canada should have a valid passport to enter and exit the country. U.S. residents are not required to have a visa for short visits to Canada.

Currency: Canadian Dollar.

Getting There: St. John's is only about 45 minutes by car from Conception Bay. Visitors coming from outside Canada can fly directly into St. John's airport.

If driving to Newfoundland, you'll have to take a ferry to get to the island. Make sure to make reservations.

Diving: Ocean Quest Adventure Resort in Conception Bay South can provide accommodation, rental gear, and breathing gases, including air, nitrox and oxygen for qualified divers. Instruction is also available. Ocean Quest has its own charter boat, and will be happy to book a complete package.

Dive Season: May through October is the prime dive season. May and June are best for iceberg diving. July and August are good times for whale encounters. September is best for the warmest water.

Visibility: Typically best earlier in the season when the water is still cold, and algae has not bloomed. Steve Moore is the Program and Expeditions Manager at Ocean Quest Resort. He says, "May is my personal favorite time of year for diving in Conception Bay. The water is clearest then, but water temperature hovers around zero Celsius (32 degrees Fahrenheit)."

Temperatures:

May-June: water temperatures are in the 32-40 F/0-2 C range. Air temperatures range from 50-60 F/10-15 C.

July-August: water temperatures can be up to 50 F/10 C. Air temperatures can hit 80-90 F/26-32 C.

September: in shallow water, temperatures can be as high as 63 F/17 C. Air temperatures drop to the 50s F/10 C, or cooler.

October: cold air and cooling water is the norm.

ADM ON-LINE



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The other half of the kit has a 4 foot PTFE lined SS braided hose with a female quick connect on one end and a valve, 5000psi digital gauge and a DIN adapter with a bleed valve.

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OUROBOROS

Closed Circuit Rebreather

Text and Photography by Leigh Bishop



After a long wait, deep wreck photographer Leigh Bishop finally gets his hands on one of the UK's latest CE approved closed circuit rebreathers, a product likely to capture the attention of serious and advanced divers. When the new Ouroboros rebreather arrived, there was no time to delay...he headed straight off to Egypt for a taste of the "Silent Red Sea."

The instructors for the week would be marine engineer Kevin Gurr and extreme cave diver Phill Short, individuals who were instrumental in the design and development of the unit as well as the popular VR3 dive computer that the unit's software is based on.

The Ouroboros rebreather incorporates a completely back mounted system, similar to the US military MK15.5/16, with improvements over other previously available commercial units. The first improvement is mechanical, and combines a more robust breathing loop (due to the internal counter-lungs) with armoured breathing hoses. Everything is protected within a carbon Kevlar shell. The second improvement is in the electronic computer systems for control, logging, and decompression requirements analysis. The unit adopts a "no tools" ethos, and has been designed with user preparation in mind. A self-packing scrubber means no more tapping the side of the canister for ten minutes, and dives can be turned around very quickly indeed.

The solenoid, controllers, and software power systems on this unit are independent of the breathing loop; thus, the unit is intrinsically safe. With the lack of metal components inside the loop, internal condensation is reduced to a minimum. Oxygen cells are positioned in the unit in such a way as to avoid water contact no matter what position the diver moves into, thus reducing problems of water across the cells membrane.

The software is designed to draw minimal power from the batteries, which give a minimum of 40 dive hours depending on backlight usage. All on-board electronic systems are powered by ordinary batteries that can be purchased from any store in the world. The unit incorporates two litre cylinders; though larger cylinders can be adapted, if required. Kevin Gurr pointed out that the low volume 3.2mm stainless pneumatics of the system are designed for minimal gas usage, as are the counter lungs that also run on minimal volume. Two litre cylinders may run adequately for most dives; however, deep wreck divers and serious cave divers can supplement this by simply plugging in off-board gas supplies when required.

Kevin also took the time to explain the extensive work he has done in the design of the flow dynamics and work of breathing to compensate for any hydrostatic imbalance. The hoses themselves are protected by ballistic nylon and an internal stainless steel spring, making them crush-proof and very durable. The automatic diluent valve kicked in nicely on descents, and could be isolated when not required. Interesting also was the fact that off-board gas plugs into the unit and, like on-board gas, is directed dynamically through the ADV or the solenoid depending on what the selected gas is, be it diluent or oxygen. A nice feature also is the oxygen shut-off valve isolating the solenoid in the event of a failure, and allowing manual gas injection.

In keeping with a philosophy of reliability, safety, and variances in diving style, the Ouroboros can also function completely without the main electronics computer system. The unit incorporates a backup independent PO₂ display system that shows both the millivolts and normalized PO₂ reading for each cell. This provides an alternative and /or backup system that gives the diver adequate information with which to perform or complete a dive, manually controlling the set point through the manual O₂ addition valve.

The scrubber is a radial donut design with a patented system that assists dwell time and molecular collision, which in CE testing proved 40% more efficient than other tested scrubbers. Set high in the top of the unit, some 2.7 kg of lime placed inside managed to shift the weight to make the in-water trim just right and running on minimum loop volume.

Before any exploration of the magical silent beauty of the Red Sea could begin, there were certain training requirements to be met. Each dive in Egypt began with an open circuit bailout test on the wreck before the instructors introduced the main skills. The live-aboard Emperor Divers charter had moored over the *Thistlegorm*, and the morning's dive found everyone on the topgallant forecastle for a skill session before exploring the remainder of this famous wreck. The first skill would be a hypoxic drill simulating that the PO₂ in the loop had fallen below sustainable life supporting levels. This assumes the solenoid or manual injection has failed, and that visual and tactile alarms have activated. The alarms are incorporated into a heads up display as well as the primary electronics; as additional backup, a vibrating mouth piece is also activated.

All alarms are recorded into the system's memory, and can be downloaded from the electronics pod via an infrared port to the user's laptop computer for analysis. The software details the entire dive from stack temperature and usage to PO₂ — and even whether the diver aborts the pre-dive five-minute stack pre-breathe.



Another skill incorporated into the Ouroboros Module One Course is flying the unit on the heads up display (HUD) without the use of the primary electronic controller or back up passive O2 display. A neat arrangement of LED's mounted on the diver's mouth piece behind obvious marked displays show alarm status, decompression, and both solenoid and oxygen information. As experience was gained, flying the unit by the HUD alone increased. During the truly silent night dives along the reefs, the brightness was simply adjusted during the dive.

Diving with rebreathers really comes into its own when surrounded by the inhabitants of the reef. The ability to approach and swim with fish and wildlife without them becoming apprehensive is a serious advantage to photographers. During the dives in the Red Sea, the divers swam endlessly with turtles and all manner of interested fish. The silent no-bubble approach is certainly the key, and to be able to enjoy this with the sophistication of the Ouroboros technology is something else indeed.

Leigh's first closed circuit dives were made during the early 1990's using the Prism, then later a rebreather that went on to be called the Inspiration — not to mention the Cis-Lunar MK4 some ten years ago now. Since those days, he has made quite a number of CCR dives to say the least! What could he learn new in the water? Well, quite a lot, actually! The Ouroboros is a very sophisticated CCR, and its developers require a serious and focused training module for both beginning and advanced divers. These guys really put students through their paces. Even when they don't seem to be watching, don't bet on it.



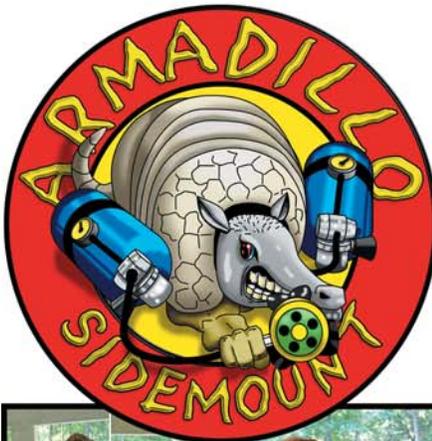
Phill Short produced a mirror to spy on his students as he led the way around those Red Sea wrecks! Each dive would then be followed by a thorough debrief where everyone could learn from each other's dives, and any problems that might have arisen.

The Ouroboros rebreather has been designed for military, commercial, scientific, professional, and sports diving. The design of the unit has been achieved with a no-compromise approach to rebreather design, incorporating specific fundamentals in reliability and safety, ease of maintenance, simplicity of operation with sophisticated alarms and monitoring, flexibility in operation and modularity, redundancy in system failure solution scenarios, upgradeability, and reprogrammability.

Although the design is new, the experience of the personnel concerned encompasses knowledge and experience gained in over 15 years of development and use of underwater electronic products as well as in extreme diving. The product is an evolution of the best parts of rebreather design, coupled with a fully upgradeable full-function control system. So what about factory support? The Closed Circuit research and design team are now occupied full time with development and software engineering, and clearly state that each unit comes with complete factory and technical support. Be on the look out for regular bulletins on product accessories. This product is priced at a hefty \$14,000, and perhaps is not an average entry-level rebreather. The well thought out on-board safety and back up that is manufactured into the design has already attracted some of the world's most serious technical divers. Having dived the test units, Leigh's initial concerns over weight, size, and ease of use have subsided. Since writing this, cave divers have been recording depths of 600 feet on the unit, and British wreck divers in the ocean have made regular 330 feet dives.

Find out more at www.ccrb.co.uk
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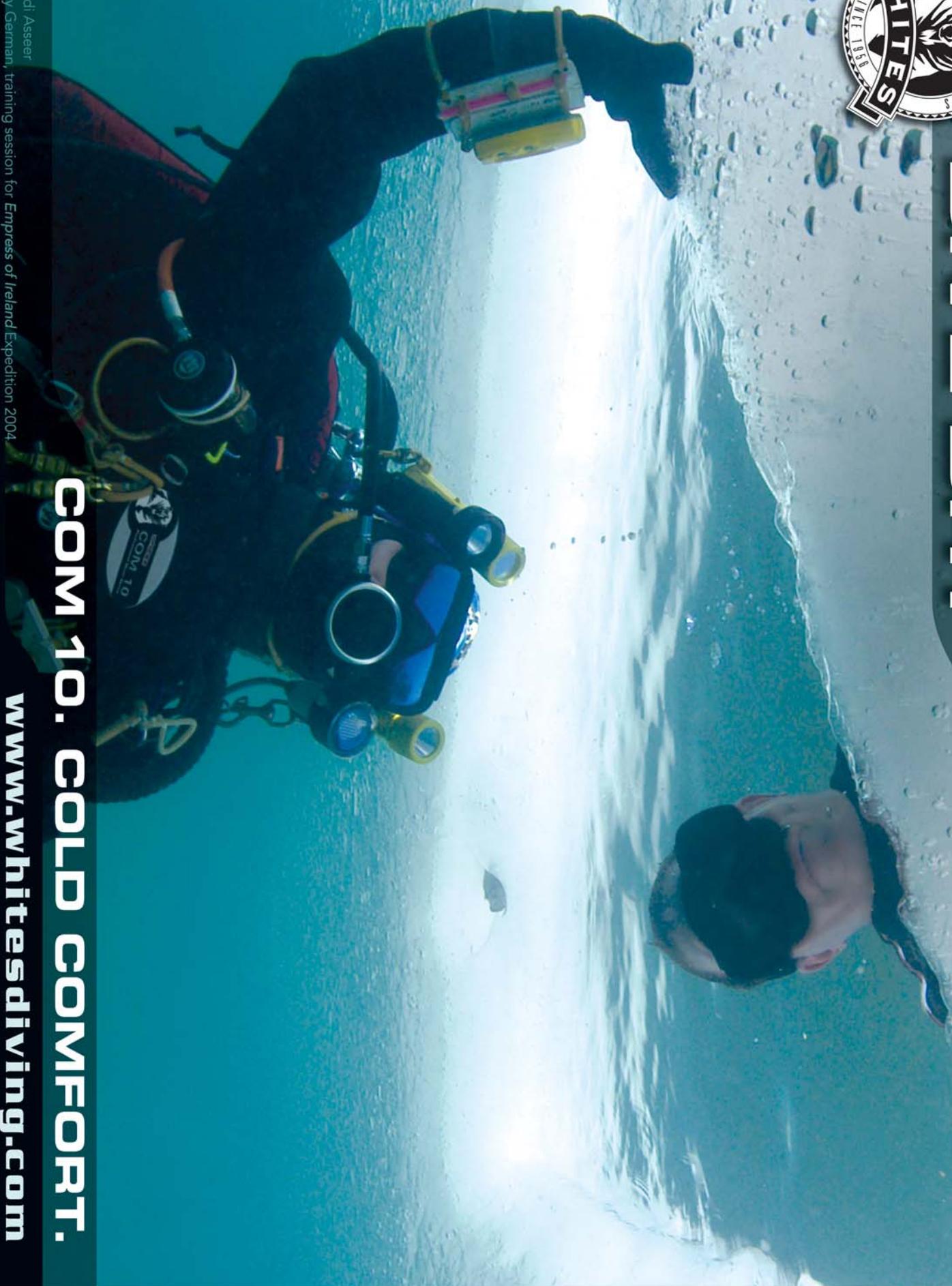
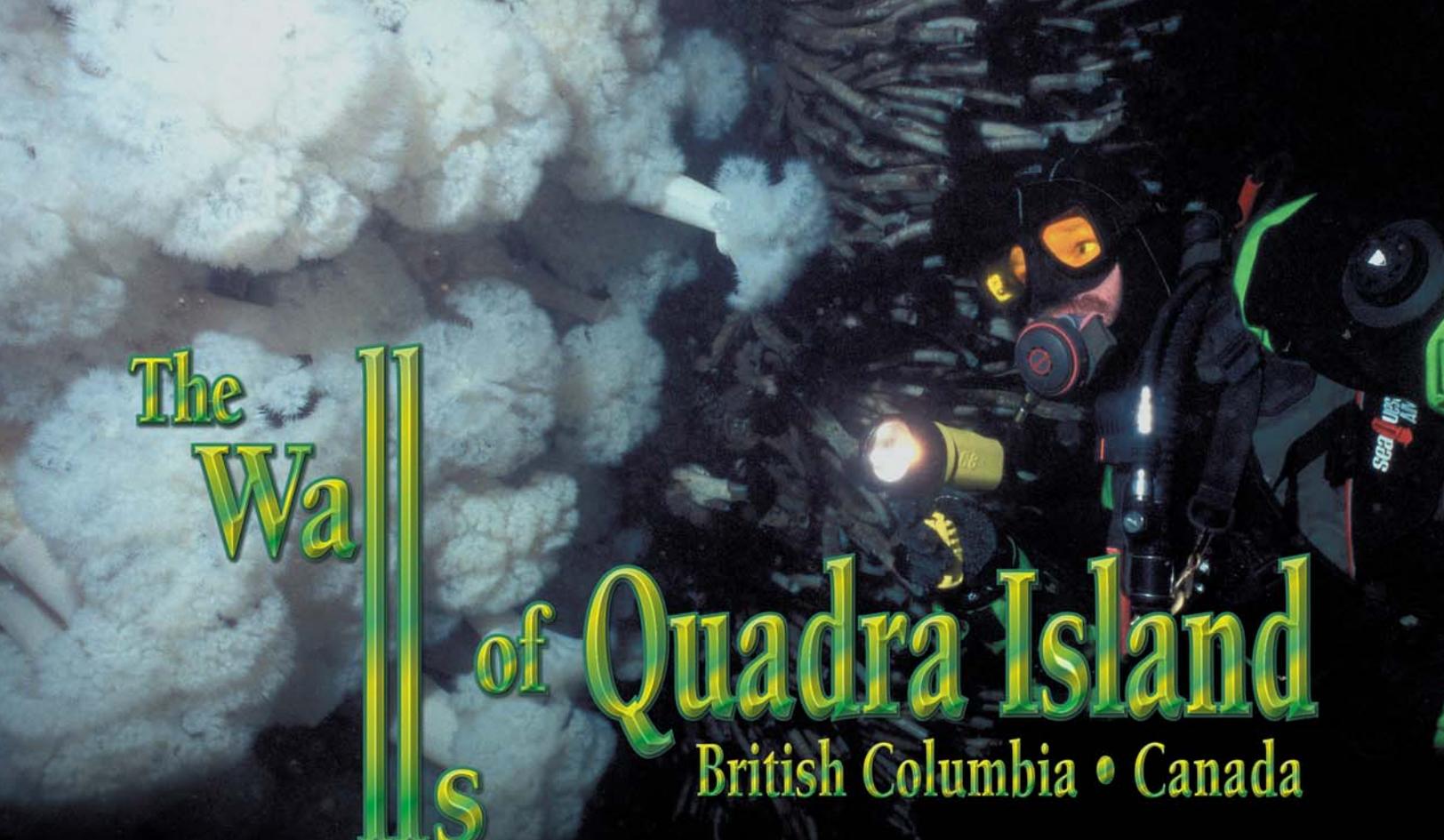


Photo: Rudi Asseer
Diver: Terry German, training session for Empress of Ireland Expedition 2004

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The Walls of Quadra Island

British Columbia • Canada

Text and Photography by ADM Staff Writer John Rawlings

Are you guys ready? The gruff voice shouted over the engines, "You need to go when I say go!" Glancing toward my right, I could see my burly friend, Earl Lowe, hanging on to the wheel with one hand while he peered at his watch on his other wrist, his bushy beard slightly parting in the wind. Every now and then he would glance at the water, checking its condition. Its condition had MY full attention because the current was streaming past like a flooding river! The only things keeping us next to the rocks of Steep Island were the twin outboards howling next to me. My buddy, Sparky, stooped on the other side, also staring at the boiling water with wide eyes. "What are we DOING?!" I muttered to myself as once again I was forced to consider my sanity. Suddenly, there was a perceptible change...the water seemed somehow different...slower...the roar of the engines began to die as Earl eased them back. Slack had arrived. He hollered, "Go, Go, GO!" and the two of us strode off the sides into the still foaming water.

We had planned an immediate descent; but as I plummeted downward into the green darkness, I felt out of control. The current that previously had been racing past our boat was now racing downward, carrying us with it. I inflated my wing in measured bursts and gradually began to feel myself slowing. Out of the corner of my eye, I could see Sparky doing the same. Eventually, at around 90 fsw, we halted and turned to face each other, hooting and hollering into our regulators. Spark's eyes seemed to fill his mask...it'd been one HELL of a ride! Still, something seemed odd and out of

place. Sparky hit on it before I did, and pointed to our bubbles. It suddenly dawned on me - our bubbles were still heading downward about 20 feet below us with the current, then flowing horizontally for about 50 or 60 feet before finally being released to head upward. I've never seen that before...I've not seen it since.

Turning, we headed toward our goal - **Steep Island Wall** - and with a few kicks a gorgeous panorama appeared. We entered a forest - the likes of which few will ever see. Thousands of Northern Feather Duster tube worms (*Eudistylia Vancouveri*) stretched off into the distance as far as we could see. They were the largest I had ever seen, approaching two feet in length. Their burgundy red and blue hues glistened as our lights darted over them, the "feather-dusters" instantly darting back into their long tubes at the slightest touch. Earl had timed it so that we could spend a few minutes photographing these wonderful creatures before the tidal currents once again took control. So I hurriedly began snapping shots as fast as I could, Sparky occasionally moving into the viewfinder at my signal to provide "finesse" to some of the shots.

Almost imperceptibly, I could feel my body being tugged across the face of the wall - our time was up - the current had shifted. Letting it take us, we began to pass living swatches of colors splashed onto the great wall at random. Dozens of species of sponges of all shapes, sizes, and colors were interspaced with thousands of multi-colored anemones, the gaps between them highlighted with brilliant pink encrusting



hydrocorals and algae. Again, my trigger-finger worked overtime and the shots began to add up. Bright red and purple sea urchins were everywhere, haphazardly tossed about like spiny baseballs around a batting cage. Various species of Rockfish stared at us from their favorite perches atop ledges or sponges, each a gorgeous scene begging to be photographed. The current continued to increase, and we moved faster and faster through the water column – the rainbow of colors seeming to dart past. Approaching a ledge sticking out from the wall, Sparky saw a huge Puget Sound King Crab and pointed it out to me. Clinging to the wall with one hand, I attempted a shot, only to have the force of the current tug at my camera and mask. Letting go, I was swept down current, spotting several more of the huge crabs on the ledge just above the one we had seen. Giggling like fiends, we flew across the face of the wall like Superman, the occasional dogfish shark coming in to check us out before darting past us. Occasionally, a lone juvenile rockfish would make the mistake of getting too far out from the rock, and would be swept briefly along – inevitably a predatory ling cod would suddenly fly up from the bottom, swallow it whole, and then drop back down...the cycle of life and death at high speed! As we sped past the panorama of the wall, the bright colors seemed to flash by us like cards being shuffled.

Quadra Island is located off north-central Vancouver Island in British Columbia, Canada, directly across from the town of Campbell River. Famous for its good visibility coupled with astonishing and colorful marine life, the area is an underwater photographer's dreamland, the colors rivaling anything found anywhere else in the world. Earl Lowe and Deb Seymour have operated Abyssal Diving and Lodge since 2000, with Earl handling the diving end of the business while Deb handles the lodge, although both are trained chefs with a passion for feeding their guests well. Not a luxury hotel, the lodge is more like the comfortable wilderness home of a good friend – a home to which you have been invited. That is the overall ambience of the place – a warm welcome to good friends whose passion just happens to be diving. Located within minutes of the ferry landing at Quathiaski Cove, and facing the famous Discovery Passage, the location provides ready access to some of the finest diving the area has to offer. Earl likes to say that "our invertebrates are force-fed," and that is not far from the truth – the currents in Discovery Passage and Seymour Narrows constantly providing a never-ending stream of nutrients. This has caused a vast array of multi-colored invertebrate life that blankets the region underwater, covering virtually every square inch of rock. Sometimes I stare at some of the photographs that I have taken off Quadra Island, and am astonished that I simply cannot find ANYTHING in the photo that is not a living creature.

Earl has a gift – an almost uncanny ability to judge water and current conditions as if he can sense what is about to happen. I've never known him to be wrong, and his skills have led us to some extraordinary dives. There are literally dozens of dive sites in the Quadra Island/Campbell River area – each one with its own "personality." Some are perfectly suited for newer divers, while others are strictly for highly experienced or technical divers, the nuances altered by the vagaries of the tidal currents. Each time we dive off Quadra Island, we experience unique sea life interactions and amazing beauty, but over time some of the sites have become my favorites. One of the most beautiful sites has the

mind-boggling name **Row and Be Damned**, and has gained a reputation amongst photographers for unparalleled opportunities sparkling with life and color. The first thing that catches your eye here are carpets of gorgeous Strawberry Anemones – tiny and glistening brilliant red like their namesake, these small colonial anemones dominate the walls and rocks. Interspersed with bright yellow sponges, various species of Rockfish make use of these lush “carpets” to softly perch on them as if on a throne. Puget Sound King Crabs (*Lopholithodes mandtii*) of enormous size also dwell here, their fluorescent blue and orange colors flashing out like beacons when struck by a diver’s light as the huge crabs scuttle about on their rocky ledges. Isolated and territorial Tiger Rockfish (*Sebastes nigrocinctus*), named for the dramatic tiger-like stripes on their bodies, will peer at you from their favorite cleft or ledge. Huge purple and red sea urchins abound, their sharp spines giving one pause about touching the bottom. Occasionally, a giant predatory Sunflower Seastar will encounter an urchin while hunting, its multiple legs recoiling backward when encountering the needle-like spines.

Another site that I find to be literally amazing is known as **Copper Cliff**. A sheer cliff wall emblazoned with geologic colors, it plunges 300 feet down to the water and then extends over 100 feet below the surface to a field of boulders at its base. Black Cormorants cling to the wall like spiders, staining the rock below them, while a golden brown forest of bull kelp hugs the wall at the water’s surface. Starkly smooth like a wall in your home, the wall is enshrouded with giant Plumose Anemones, looking like colossal mounds of cotton balls as they gather nutrients from the passing current. Orange cup corals are also present here in huge numbers, appearing like scattered gems. Deeper on the wall, one finds majestic Cloud Sponges (*Aphrocallistes vastus*) in various shades of white and gold, looking like the skeletal remains of an alien in a sci-fi movie. Long sinewy wolf-eels can be found amongst the rocky rubble at the base, often peering out of their lairs as if waiting to interact with a passing diver, or maybe even to be fed a tasty urchin. Hoards of Spiny Dogfish Sharks (*Squalus acanthias*) will often follow divers, interested in all that you do, and often darting in like arrows past your heads as if playing with your minds. I always surface from this dive feeling amazed, and there are dozens more!

Abyssal has two dive boats, both Aluminum and designed to handle the tidal currents as well as easily dealing with the occasional encounter with floating logs – a common occurrence where logging is a major industry along with huge tidal changes. The 37-foot *Tantalus* is used for larger groups or in colder weather, and has a full cabin with ample space. The 26-foot *Most Outrageous* is a custom dive-tender with twin Yamaha outboards. Nitrox is available at the Lodge, as is Argon. Helium is also on hand, and Trimix is currently partial pressure blended. Due to their reputation and fine location, Abyssal has been doing extremely well, and planned expansion is on the horizon. Part of this expansion includes the acquisition of a compressor dedicated to Trimix as early as next year.

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It is surprisingly easy to reach Quadra Island from the mainland of BC utilizing British Columbia’s fine ferry system. Reservations are available on many routes, making things even easier. More information can be found on their website, www.bcferrries.com, or by calling 1-888-BC FERRY from anywhere in North America, or 1-250-386-3431 from outside North America.





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The Japanese destroyer that almost altered the course of history!

HIJMS *Amagiri*

Text and photography by Kevin Denlay

In the early hours of August 2, 1943, His Imperial Japanese Majesty's Ship *Amagiri*, a potent Fubuki Class destroyer, was racing north through the narrow confines of Blackett Strait in the Solomon Islands. A formidable weapons platform by the standards of the time – with three twin 5" main gun mounts, three sets of triple 24" torpedo tubes, numerous 25mm anti-aircraft guns, and abundant depth charges – she had already seen her share of action in WWII. Having just completed a troop/supply drop at Vila on Kolombangara Island (as part of the regular "Tokyo Express" runs tasked with supplying Japan's increasingly beleaguered island garrisons), she and her three consort destroyers *Hagikaze*, *Arashi*, and *Shigure* were in a hurry to get home to Rabaul before dawn so they wouldn't fall prey to daylight American air power. With no time to lose, they were moving at top speed...well over 30 knots. However, stationed in Blackett Strait to intercept just such nightly runs were several U.S. Navy PT boats, also known as motor torpedo boats, idling about and looking for trouble. For one of those PT boats, serious trouble was on the way!

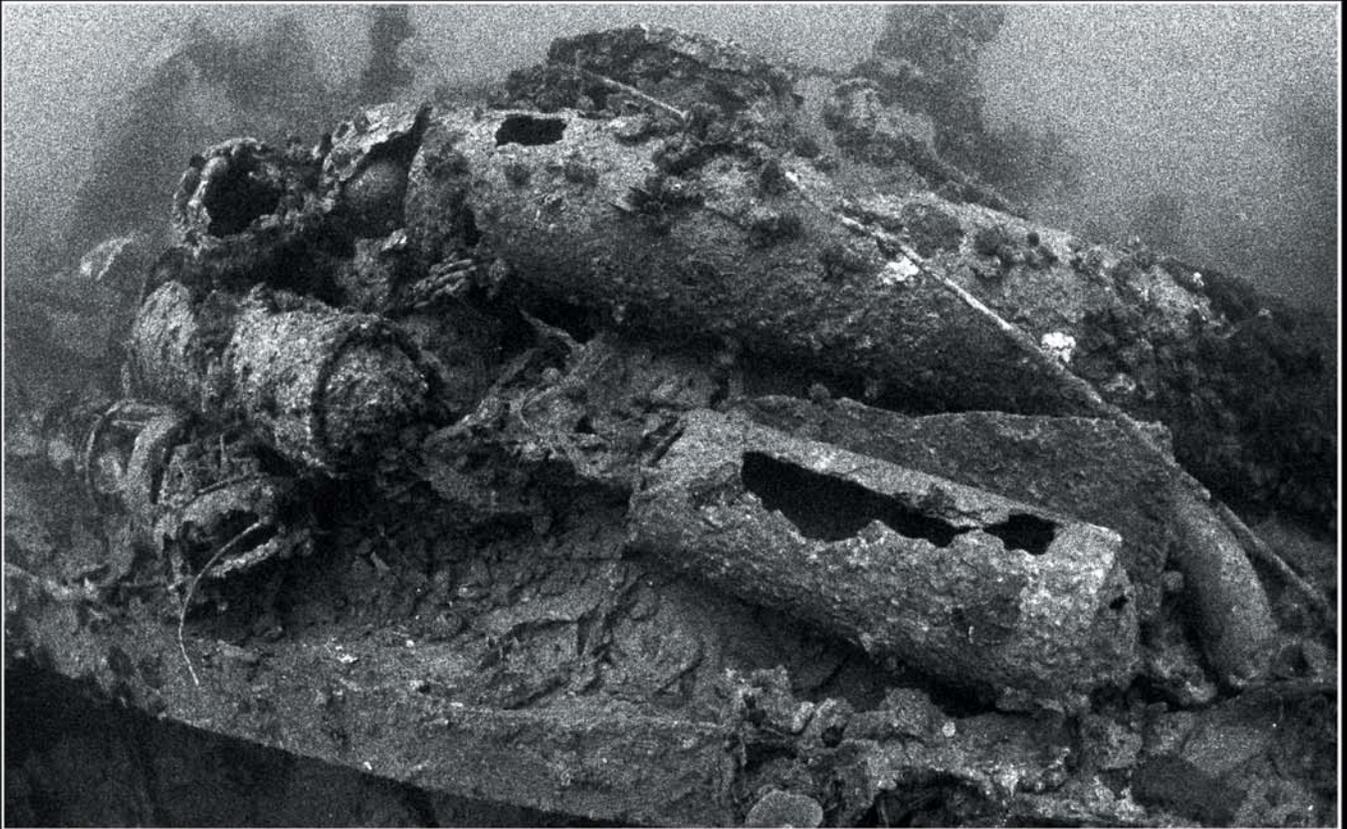
In command of that one boat, *PT 109* as a matter of fact, was none other than a young lieutenant (junior grade) by the name of John F. Kennedy. Though just

another of the many PT boat skippers at the time, he was destined to become President of the United States of America. Suddenly and without warning, as his PT boat had no radar, off the starboard quarter the sharp knife-like bow of a speeding ship was seen bearing down on his much smaller craft. Before Kennedy had time to evade, *Amagiri* had sliced through the tiny PT boat, killing several of his crew and leaving the rest adrift in the inky darkness of Blackett Strait. And the incident had happened so fast that not a single shot had been fired by either ship! Managing to make it to shore on a tiny islet the next day with the surviving members of his injured crew, Kennedy soon showed the courage and leadership qualities that would serve him well in later life. Every night for the next several nights, Kennedy swam back out into the treacherous current-wracked waters of Blackett Strait hoping to find another patrolling PT boat to come to their rescue, only just making it back to the relative safety of the islet each morning.

Eventually, native Solomon Islanders stumbled across the survivors; a message was sent via the natives to other Americans, and Kennedy and his surviving crew were finally rescued. So we are left with the tantalizing question: Given Kennedy's dramatic presidency, and the tumultuous events that ensued while he

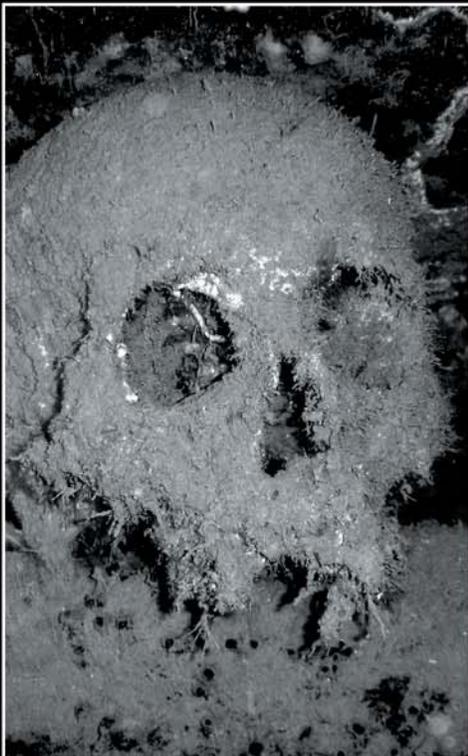


HIJMS *Amagiri* showing her pre-war configuration. Note that the torpedo tubes do not yet have their crew's protective enclosures and the aft five-inch gun mount above the deckhouse is still in place.



Above: Scattered about *Amagiri* amidships, like giant felled logs, are numerous reload or 'spare' torpedos.

Below: Human remains inside the wreck of the Japanese minesweeper W16 attest to the horrors of war.



was president — the Cuban Missile Crisis standoff with the Soviets is still considered the closest the world has come to all out nuclear war — and his subsequent assassination whilst in office that brought Lyndon Johnson to power — just what might have transpired in those later years had Kennedy died that fateful night in the Solomons, and not gone on to become president? As the name of the book that describes the discovery in 2002 of the wreck of *PT 109* by the renowned explorer Robert Ballard implies, it was truly a *Collision With History*.

As for *Amagiri*, she hardly felt the collision with the relatively small PT boat, and made it safely home to her base at Rabaul. She continued to be involved in numerous Tokyo Express runs as well as skirmishes with the U.S. Navy over the next eight months, surviving them all. Nevertheless, *Amagiri's* luck eventually ran out. On April 23, 1944, off the east coast of the Indonesian island of Kalimantan (Borneo) - about 60 nautical miles south of Balikpapan in the Makassar Strait - she met her demise by striking a mine believed to have been laid by the U.S. submarine *Tautog*. There she lay undiscovered by divers for almost sixty years, until her final resting place was located with the aid of side-scan sonar in only 28m/92ft of water by Vidar Skoglie / *MV Empress*. The wreck was positively identified during subsequent dives in October 2003. That just goes to show, in some parts of the world at least, you don't always have to go deep to discover historically significant and still virgin wrecks!

As it turned out, almost fifteen months transpired before the live-aboard dive vessel *Empress* had a chance to get back to the *Amagiri* wreck site - because her resting place is "off the beaten track," so to speak - and this was one voyage I was not going to miss. My wife and I boarded *Empress* in Ujung Padang (Makassar) on the Indonesian island of Suluwesi, after flying there from Brisbane via Bali on Garuda Airlines. We then spent several days diving on the nearby wrecks of the Japanese minesweepers W11 and W16 while waiting for errant expedition member Phil Yeutter to arrive - but that's another story. (As this

was to have been a special exploratory expedition, there were to be no other "regular" guests on board except for delayed *Empress* stalwart Phil.) After his arrival, and a casual two-day crossing of the Makassar Strait that included some side-scan searching along the way, we arrived late one afternoon above *Amagiri's* wreck site. We anchored up, set the down-line, and were soon in the water on this famous, or infamous, as the case may be, warship.

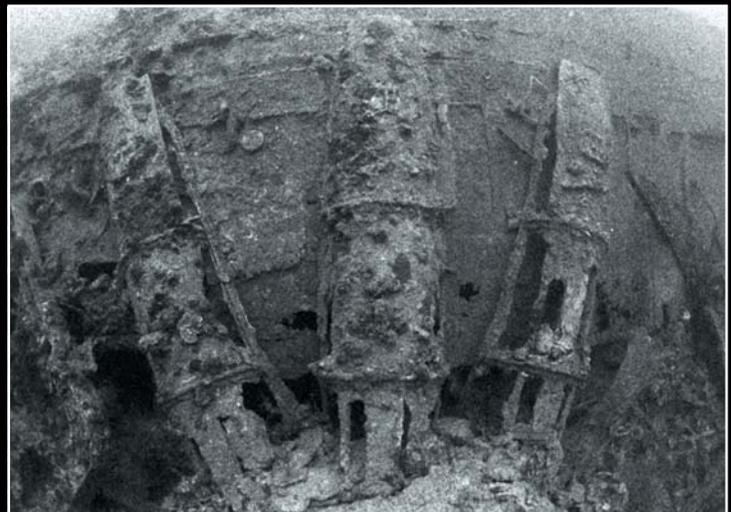
The wreck now lies more or less on its starboard side, although because of the combination of shallow depth, seasonal wave action, strong currents at times, and ample evidence of explosive fishing practices (i.e. "dynamite bombing"), she has collapsed down into herself and split open more than any other warship I have ever seen. In some parts, it looks like someone has taken a can-opener to her! Nevertheless, this doesn't mean that she is not one seriously awe-inspiring dive. If anything, this structural collapsing has opened up areas of the ship that normally would be very difficult to access. Probably the most dramatic destruction is under the forward twin 5" gun mount, and the area around and beneath the bridge where it appears an illegal "fish bomber" got the surprise of his life – in all probability ending his life – when his bomb set off the forward ammunition magazine! A huge area is simply vaporized with hardly a recognizable item remaining. Most of the hull, all of the deck, and all of the lower bridge structure is simply gone or now in matchstick size pieces. (Note: This destruction was definitely not caused from the mine hit. Rather than take almost two hours to sink as *Amagiri* reportedly did, damage of this kind would have sunk the sturdiest ship immediately.)

Forward of the twin 5" mount that now lies on its side, the foredeck is mostly intact and orientated vertically with capstans and anchor chains clearly visible. The sharp bow, which had sliced so easily through *PT 109*, sits up somewhat off the seabed with several large stingrays making their home in the resultant alcove under the wreck. A "buckle," or indentation, part of the way down the actual bow stem itself is very prominent. Could this be from a weakening in that area from the collision with *PT 109*, and subsequently having collapsed/deteriorated over time at a faster rate than the rest of the bow?

Nothing remains of the lower bridge except a tangle of cables and piping, while the rangefinder and director atop, although collapsed, are still clearly recognizable, as are several other smaller spotting devices lying nearby. Traveling aft, one crosses the now soft-coral encrusted tripod mast stretching out on the seabed. Immediately behind this are the remains of the forward funnel with the boilers now exposed beneath it, where the deck has parted and slipped down from the hull itself. Lying just aft of here is an upside-down set of empty triple torpedo tubes. The remains of another funnel comes next, and then a pile,



Above: The forward set of triple torpedo tubes now lies upside down on the bottom, the tubes themselves half-filled with sand. This is the only torpedo mount where the crew's protective enclosure is still partially intact, when view side on.



Above: The aft set of triple torpedo tubes have completely collapsed and are now splayed fan like on the port deck.

Below: The wreck of *Amagiri* is now so coral-encrusted that in many places it more resembles a reef than a shipwreck, as the barrels of the aft five-inch mount, now lying on its side, clearly shows.



literally, of reload – or spare - torpedoes strewn randomly about like thick felled logs! Just a little further aft is the second set of (again empty) triple torpedoes. These are upright and intact, although they have collapsed through the deck, allowing penetration into the tangled remains of the engine room. Also collapsed nearby are two sets of triple 25mm anti aircraft guns, while out on the seabed rests another completely intact torpedo. Close by, the third and final set of triple torpedo tubes lays splayed fan-like on the remains of the port deck with their protective “house” completely rotted away, and the tubes also empty. (It is presumed from finding all nine torpedo tubes empty that the action-ready torpedoes inside the tubes at the time the mine was struck were either ejected over the side, or fired off to lighten the ship in the interim before she actually sank.)

More evidence of explosive fishing practices is also discernible aft, but not to such an extent as forward. Her X or number two twin 5” mount is missing from above the aft deckhouse, confirming that it was definitely removed and replaced by several lighter triple 25mm anti-aircraft weapons during a refit in late 1943, and which now lie detached on the sand beside the wreck. Just aft of this structure is the Y or number three twin 5” mount lying on its side, with the gun crew’s protective enclosure completely rotted away, fully exposing the twin gun breaches and barrels that point directly aft. Scattered about abaft this general area are numerous depth charges, and depth charge “throwers” or catapult devices.

A little further on, the wreck abruptly ends with the rounded stern well collapsed. Just under the stern, two relatively large high-speed propellers are clearly visible, as is the rudder, all partly buried in the sandy bottom. This alcove, where the wreck is partially held up off the bottom by the Y shaped propeller-shaft braces, is home to several large stingrays, both black and spotted, along with the odd banded sea snake, and a massive school of barracuda were regularly seen circling the stern.

Fish life of many sorts abound, both large and small - including several variety of stingray and a number of very inquisitive sea snakes - while both hard and soft coral growth thrive. In fact, there is so much hard coral growth in many places that it sometimes takes several dives to recognize just what the object is you are actually looking at. Probably the only drawback on the wreck is that it is now liberally adorned with long-spined sea urchins waiting to spike the unwary - as in me - diver. Yes, on my very first

dive, while squeezing into the handling room of the aftermost 5” mount, I inadvertently swatted an urchin hard, leaving my right hand feeling like someone had poured acid on it for the rest of that dive. Ouch!

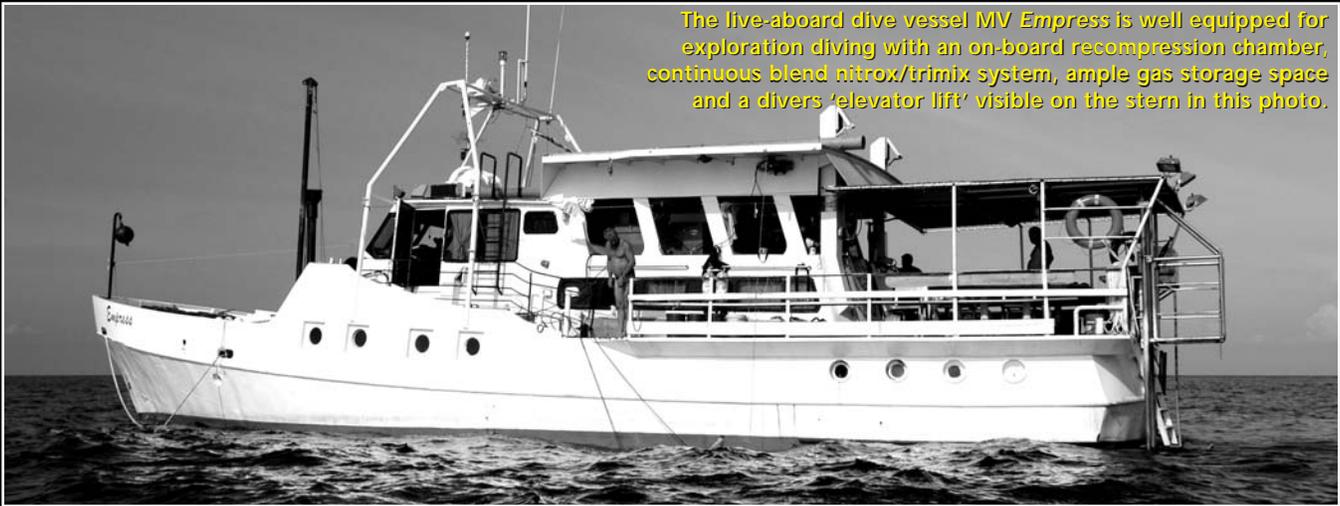
Unfortunately, because of our unscheduled delay departing Makassar, and *Empress’s* other commitments, we could stay on the wreck for only a couple of days. On our last night on-site, as if to give us a taste of what might have been, an intense tropical storm came through with spectacular lightning strikes and booming thunder, whipping up the sea and making it rather uncomfortable trying to sleep whilst at anchor. Thankfully, by morning it was gone, leaving a glassy sea with a long rolling small swell for our last day of diving.

Diving my Mk15.5 closed circuit rebreather at such shallow depths as *Amagiri* lies, was really a treat, as it meant I could conduct dives of two hours (or more) duration with less than fifteen minutes of decompression! And I must say, it sure was a nice change diving where the actual bottom time of the dive itself was much longer than the subsequent decompression portion. But, as they say, “if you can’t do the time, don’t do the crime,” so I suppose I shouldn’t complain.

On the initial *Amagiri* discovery dives in October 2003, the group on board at the time had visibility of 20m/65ft or more; but because we were diving in the rainy season we had only about 12m/40ft or less at



A wall of five-inch shells stored in the aft magazine deep inside the wreck of the Japanese minesweeper W16.



The live-aboard dive vessel *MV Empress* is well equipped for exploration diving with an on-board recompression chamber, continuous blend nitrox/trimix system, ample gas storage space and a divers 'elevator lift' visible on the stern in this photo.

times. However, for a pleasant change, the ambient light level on the wreck was quite high because of the reflective sandy bottom. And currents while we were on site were minimal...another treat. Nevertheless, as is so often the case, just as we were getting very familiar with the intricacies of the wreck site it was time to leave, so an overnight steam brought us to the Kalimantan port of Balikpapan. From there my wife and I flew back to Bali, and then on to our home in Australia, while *Empress* continued on to her home base in Singapore. As it turned out, the very next day

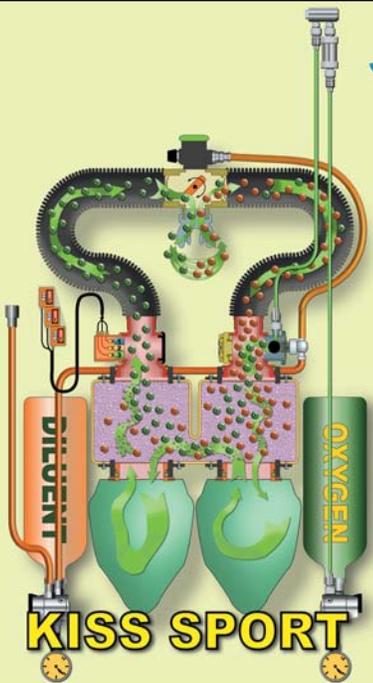
she found several previously undiscovered/uncharted wrecks of large Japanese freighters - or "marus" - that had been sunk by U.S. destroyers in the daring Battle of Balikpapan raid in February 1942...giving me all the more reason to go back to explore this area again with *Empress* in the future!

For information on *MV Empress* charters contact Vidar Skoglie at:

vidar@octa4.com.au

or the author can be contacted at:

altdive@ozemail.com.au



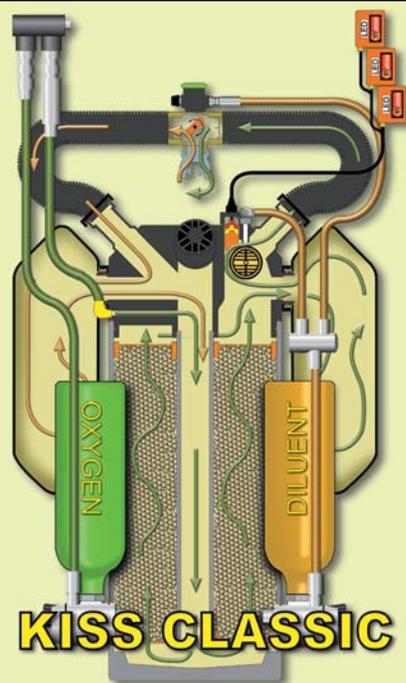
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BUFORD SINK *& Little Gator Siphon*

Text and Photography by Curt Bowen

Chassahowitzka National Wildlife Refuge is an enormous preserve that contains over 33,000 acres of natural Florida wilderness. Located on the central west coast of Florida, this preserve provides a habitat for deer, fox, waterfowl, turkeys, gopher tortoise, and the elusive black bear.

Stretching between U.S. 19 on the east and the Gulf of Mexico on the west, the Chassahowitzka Refuge contains miles of rolling sand hills that are covered with pine and palmetto forests, low-lying freshwater swamps, and endless winding rivers that lie within brackish saw grass flats. This is one of the few true Florida ecosystems of any great size that is still available along the Gulf Coast. There is, however, much more to this large wildlife habitat, much that is hidden from the sight of the local hikers, campers, and hunters. Just below their feet lie some of the largest submerged cave systems within the state of Florida...the famous deep chambers of the Eagle's Nest system, siphon drains like Gator, and tombstones.

The whole refuge sits on top of a massive karst region littered with sinks, springs, and siphons. Due to its remoteness, and the difficulty of gaining access through the waist-deep mud swamps, choked pine and palmetto forests, and endless saw grass flats, many of these cave systems still elude even hard-core cave explorers.

Will Walters discovered Buford Sink in 1973; but with the closure of the lands in the 1980's and 1990's, all exploration within this region came to a halt. In 1999, the State of Florida opened this land for recreation and continued exploration.

Buford Sink contains one of the most beautiful cavern dives in Florida. A small triangular entrance drops through a thin layer of limestone, and into a massive clear water ballroom. Giant white boulders slope downwards from 70 feet to a cave zone starting at 145 feet. A wide passage then slopes downwards until it pinches down into a twelve-inch high water siphon several hundred feet from the entrance.





Photo: Jitka Hyniova

It is located deep in a pine swamp, over a quarter mile walk from the nearest dirt road...making access to Buford a challenge in itself. Most of the walk is down an old fire lane, then a short 150-yard march through a mud swamp. Depending on the season, this short march can vary from somewhat easy to knee-deep water and sinking several times up to your waist in thick black mud. Adding a hundred pounds of doubles to your back takes this trek from extremely difficult to almost impossible.

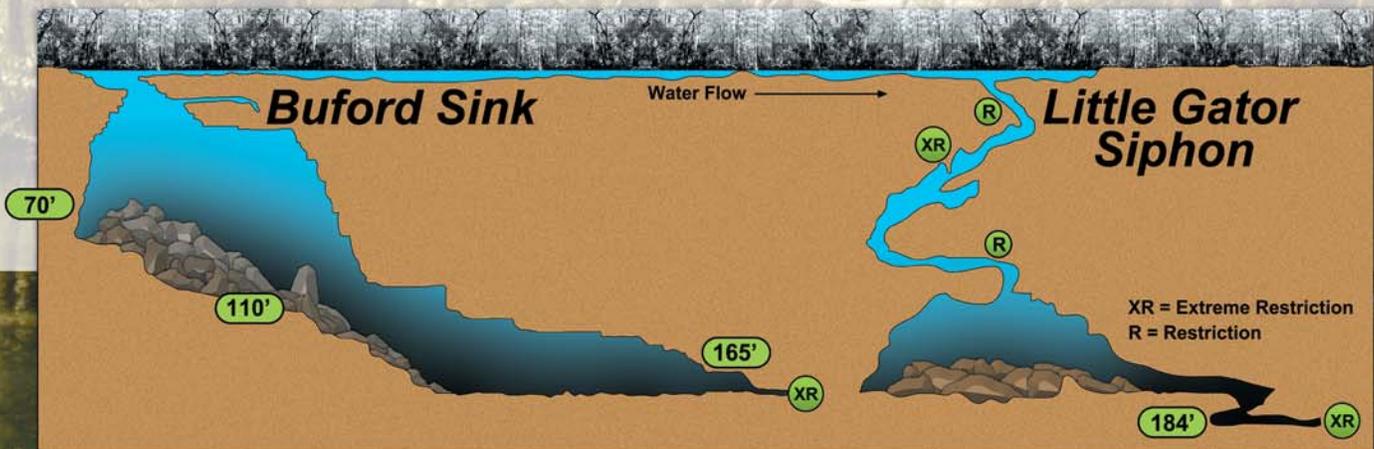
In 2003, explorer Brett Hemphill walked down the small river run on the surface from Buford, and found a small siphon entrance. With his Armadillo sidemount harness, he squeezed downwards through the narrow crack, following the water flow deeper into the ground. At a depth of 80 feet, he encountered a no-mount beach

Above left: Megalodon rebreather diver Jitka Hyniova explores the log filled head waters of Buford sink

Above: An old land tripod is used underwater to obtain this 30 second exposure of Buford Sink cavern zone. The shot was taken at a depth of 110 feet, looking up the breakdown pile towards the triangle shaped entrance hole. Nikon D100, 2.8 @ 30 seconds • 10.5mm Lense • Aquatica housing • No Strobe • Green Force video lights used for timed fill lighting.

Above photo inset: Photographer Curt Bowen sets up his underwater tripod system in an attempt to shoot the massive Buford Sink cavern zone. Photo by Jitka Hyniova

Below Illustration: A simple drawing of the size, depth and distance relationship between Buford and Little Gator Siphon.





Above right: Looking up through the entrance you can see the dark silhouette of submerged tree trunks. Located deep within a Florida swamp, you must keep your eye out for large alligators and water moccasins.

Left: The cool waters of Buford sink are inviting after the quarter mile trek through the swamp mud.

Below: A 180 degree view of Buford Sink. Little Gator siphon is located down the small run to the right. Note the wood duck house on the right, placed by the park service in an attempt to repopulate the swamp.

ball sized restriction. Removing both of his sidemount cylinders, he pushed them in front of him—past the extreme restriction, and into the larger passages below. At 145 feet, the passage opened into a large breakdown room that sloped off to one side. Again following the water flow deeper into the ground, he discovered a continuing passage that ended in a 15-inch high bed plane at a maximum depth of 184 feet.

Accruing some decompression requirements, he made his way back towards the surface, through the extreme restriction, then into the small entrance crack where he stopped for the required decompression. Lying face down in the dark tannic waters, he waited for the decompression time to pass.

Suddenly, he felt a log slide down onto his back and leg. Twisting, he dislodged the log; and, without alarm, continued his decompression. But the log again slid back down onto his back. Irritated, Brett twisted his head around to see how this log was positioned. Peering through the tannic water, he soon discovered that the log had a nice row of white teeth. It seems he had decided to do his decompression in a favorite sleeping location of a medium-sized alligator—now resting on Brett's back.

Completing his decompression time – underneath the gator – Brett slowly slipped out of the tight quarters, trying not to wake up or startle the reptile in the process. After this exploration dive, Brett named the cave Little Gator Siphon.



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A GREAT LAKES “TREASURE”

SS METROPOLE

By Jeff Moore, David Trotter and Mickey Trotter

Before telling the story of the discovery and exploration of the SS *Metropole*, we will revisit the ultimate Great Lakes treasure expedition that occurred in the late 1970's and early 1980's. There is no one who speaks with greater authority on Great Lakes treasure than Garry Kozak. It is through Garry's shipwreck discoveries and exploration activities that we can measure and determine the real value of what lies beneath the surface of the "Inland Seas" ...and provide answers to the question of real "wealth" in the Great Lakes.

You need to appreciate that Garry is not your typical "occasional" shipwreck hunter, but an individual destined to change how shipwrecks are discovered in the Great Lakes. Garry began searching for and discovering shipwrecks at the age of 16 with a small boat and depth sounder. This is an unusual activity and obsession for someone who normally would be focusing on the more earthly things in life at such a young age. However, it has been confirmed from several reputable sources that Garry did not leave these other important matters unattended.

After two years of college at Wayne State University in Detroit, Michigan, Garry completed a commercial diving course, and spent 3 years as a commercial diver in the early 70's. During this time, he became exposed to the newly developed commercial tool, the side scan sonar manufactured by Klein Associates. Garry immediately realized the potential of side scan for discovery

and exploration, and initiated historical research to determine the Great Lakes shipwreck that would make him "wealthy." The search narrowed to the "ghost ship" of Lake Erie, the Steamer *Dean Richmond*.

SS *Dean Richmond*

On Friday the 13th in 1893, the 238' Steamship *Dean Richmond* left Toledo, Ohio, destined for Buffalo, New York, with a confirmed cargo of 200 tons of lead and 100 tons of zinc ingots. In addition, there were rumors of copper sheeting and a consignment of gold for Wells Fargo. The *Dean Richmond* never reached Buffalo as the horrific Lake Erie gale caused her disappearance with all hands. Only flotsam and bodies were discovered coming ashore a few days later, which confirmed the demise of the ship and all hands onboard the ill-fated vessel.

Here was a shipwreck with the potential for substantial wealth — certainly worth the undivided attention of Garry. With limited financial backing, Garry quit his "day" job (commercial diving) and focused all his energy on locating the *Dean Richmond*.

For three years, from April through September, Garry searched for the elusive *Dean Richmond*, living on meager funds while continuing to support the search effort. When Garry was again searching for temporary work in 1978, Marty Klein offered him a job at Klein

Associates. It was very apparent to Marty that Garry had developed into one of the most skilled side scan sonar operators in the U.S.

During the nine years of search effort, Garry often wondered if he had missed the *Dean Richmond* due to errant navigation, misinterpretation of the side scan printout, or Loran C position errors. With nearly 600 square miles of Lake Erie surveyed, and the discovery of 28 shipwrecks, finally, on June 15, 1983, with Kathy (his wife) aboard the research vessel, Garry had target number 29 on the side scan sonar. The size and unique characteristics of the target matched the *Dean Richmond*. It had taken nine years and more than \$100,000 to print the *Dean Richmond* image on the side scan paper.

Now it was time to recover the \$100,000 spent, and make some real money! Unfortunately, the *Dean Richmond* was in 110' of water and upside down. Working the *Dean Richmond* site "on shares" with Massey Commercial Diving of Alpena, Michigan, recovery of lead and zinc was going as well as could be expected, under the circumstances. However, there was one minor, or should we say, major problem—the value of the cargo recovered averaged \$4,000 per day, but it was costing \$6,000 a day to recover it. To make matters worse, no copper sheeting was located; and the mysterious consignment of gold, supposedly placed on the *Dean Richmond* by Wells Fargo, was not to be found. After two weeks of losing more than they were making, Massey Commercial Diving and Garry Kozak finally terminated the cargo recovery effort from the *Dean Richmond*.

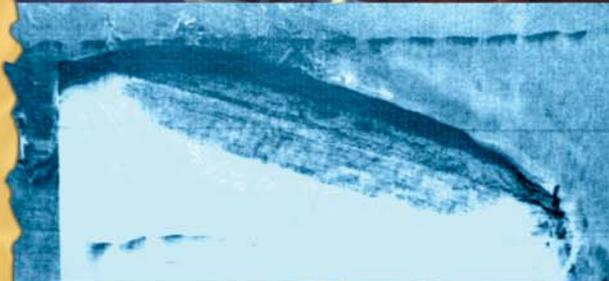
SS *Metropole*

The keel was laid in the shipyard of R. Shepard Shipbuilding Company of Huron, Ohio. Progress was quickly made on the small steamer, 100' in length with a beam of 22', and she was launched on June 23, 1883. *Sakie Shepard*, an unusual name, resulted from a combination of the shipbuilder's last name and the first name of a daughter of one of the owners. At the time she was placed into service, the vessel was owned by a group of six investors residing in the Detroit, Michigan, and the Toledo, Ohio, area.

The steamer was small, even for the 1880's time period, as she was initially commissioned for fishing and excursions. However, her size did not prevent her from having a very unusual history with several tragedies. The first occurred on April 27, 1895, when the *Shepard* sprang a leak five miles off the mouth of the Maumee River in Lake Erie, sinking in 50' of water. One sailor lost his life, and there was much discussion about the captain's actions during the sinking—and whether or not his actions contributed to the loss of life when the ship was abandoned.

One month later, the *Sakie Shepard* was raised and towed to Detroit for repairs before again being placed into service. The following three years were uneventful, until June 14, 1898. While tied to the dock at Courtright, Ontario, the *Sakie Shepard* caught fire, was burned severely, and finally declared a total loss. The story of the diminutive 100' steamer should have ended then.

Despite her age, size, and hull damage, there appeared to be a glimmer of hope in 1900 for the little steamer as she was towed to Detroit for rebuilding. Purchased by Hugh R. Havey and Captain John Stevenson, both of Detroit, she was lengthened from 100' to 118'. Her upper works were rebuilt, and she was re-registered as the *SS Metropole*. Finally, in July of 1900, she was launched for her third and final time.





Despite small size and shallow draft, she was profitable for her owners since the *Metropole* was able to enter smaller ports to pick up cargo that the larger vessels were unable to accept. However, the *Metropole* was aging and on borrowed time; large steel ships were already on the drawing boards. For example, the SS *Daniel J. Morrell*, 603' in length, was built and launched in 1906. These ships were the "giants" of the early 1900's.

On August 8, 1903, ten years after the foundering of the *Dean Richmond* in Lake Erie, the little steamer was southbound in Lake Huron with a load of barrel staves for a cooperage (barrel manufacturer) in Cleveland, Ohio. There were moderate seas as the *Metropole* was making her way across the mouth of Saginaw Bay on a bright, sunny day. Unfortunately, Lake Huron's Saginaw Bay is notorious for claiming the lives of many ships.

The Chief Engineer noticed the water in the lower bilge was rising at an alarming rate. Upon further inspection, it was determined that the tube that enclosed the propeller drive shaft had broken free from the hull. The water was rising rapidly, and the Captain ordered the two bilge pumps be manned. Sailors battled against the rising water for only a short period of time before realizing that the ship, and perhaps the crew, was doomed. It was time for the Captain to make the decision to "abandon ship." The *Metropole* was fifteen miles from shore, and sinking. Their only chance for survival was to rely on the small yawl on the stern.

The sailors launched the yawl, and all onboard the *Metropole* made it safely into the small open boat. They rowed the yawl with great energy in an effort to clear the sinking *Metropole*, which threatened to capsize the smaller boat. The *Metropole* continued to settle in the water until the very tips of the 70' masts slipped below the surface. Lake Huron had claimed another victim.

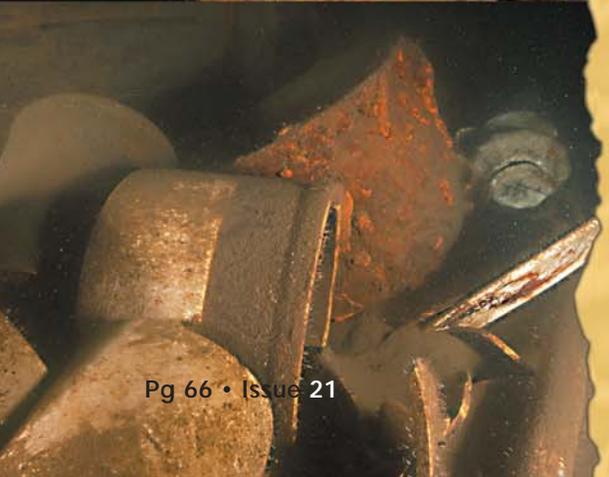
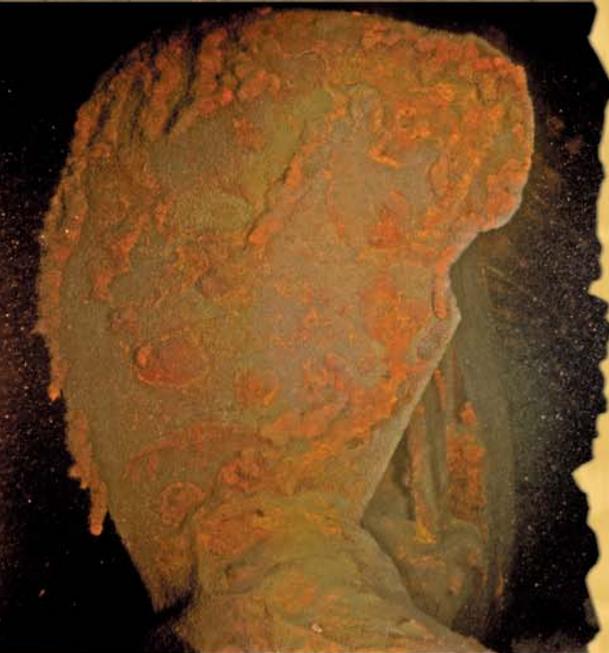
The yawl contained all of the crew, including the Captain; however, it was unclear whether they would survive the ever-dangerous conditions of Saginaw Bay. Although the short, choppy waves were somewhat moderate, the small yawl was being pushed into the open waters of Lake Huron. Each sailor knew his best chance for survival was to put forth maximum effort to move the small boat fifteen miles south, to the "tip of the thumb," near Port Austin, Michigan. With maximum effort, and after many hours, the crew managed to row ashore, completely exhausted but safe.

THE DISCOVERY-JUNE, 1999

The 32' RV *Obsession Too* continues to prowl Lake Huron, having already made discoveries earlier in the year. A blurred image appears on the side scan paper, 500' from the RV *Obsession Too*. We close in on the new target, calibrate the side scan to provide better image resolution, and are amazed as the image begins to unfold on the paper. Can it really be an intact shipwreck? Will she give up her identity? And what secrets will she share with us as we explore?

The first divers to descend into the stillness of the *Metropole* site note that it was like stepping back in time while on the silent decks of the sunken steamer. Ninety-six years after her sinking, the *Metropole* sits upright on the bottom of Lake Huron, as if ready to continue her journey. The secret to her remarkable condition is contained in her cargo holds — the steamer is still full of barrel staves. It is apparent that her plunge to the bottom was gentle, likely buoyed by the thousands of wooden staves unable to escape the sinking ship.

Except for a broken smokestack, and an upper stern cabin that washed off the ship to lie scattered on the bottom, the *Metropole* is in



near perfect condition. It is a testament to the ease with which she settled on an even keel to rest on the floor of Lake Huron. One of the most prominent features to unfold before the divers is the intact pilothouse at the front of the ship. Fragile, wooden pilothouses do not survive sinking...except for the *Metropole*. Normally, the rapid outward rush of air and the sea washing over the deck of a sinking wooden steamer will cause the fragile "uppers" to crumble and scatter.

THE BOW

The roof of the pilothouse has wings extending out on both sides. This acted as a walkway so the captain could move across the roof and look down the entire side of the ship. These "bridge wings" allowed the Captain to see exactly what was happening with the ship, so he could give the wheelsman precise orders for maneuvering into or out of the docks. Many contemporary ships are built with "bridge wings"; but it is uncommon to find a vessel of this vintage with this unique feature, especially a ship sitting upright on the floor of Lake Huron for nearly 100 years.

Swimming into the pilothouse, the divers grasp the wheel and peer out the bridge windows over the expanse of the bow. They almost feel the pulse of the steam engine churning the ship forward. But in reality, the five-foot diameter wooden wheel stands ready to turn the ship on its present course to nowhere. The wheel is connected to the rudder by a series of chains and levers. This allowed a single helmsman enough leverage to hold the six-foot by four-foot rudder against the force of the water, in order to turn the ship. Just in front of the wheel, the divers discover the compass, mounted and intact, and still pointing to magnetic north. The glass face of the compass has cracked due to the extreme pressure at depth, but the compass card is still readable after spending many years unnoticed.

Another unique feature of the *Metropole* was discovered inside the front cabins below the pilothouse, and on the front portion of the hull surrounding the windlass. During the exploration, the divers uncovered writing nearly 100 years old on the walls. Initials of long forgotten crewmen adorn both sides of the hull's interior. There were a number of sets of initials, presumably painted by the ship's crew, along with other painted images. Next to one set of initials is the date "2/6/99." At first, the reaction was: "Who was here four months before us?"; then we realized the date was 2\6\1899.

The divers all felt an uncanny personal connection with the sailors who had sailed on the *Metropole*. To see this type of transcendent communication written on the walls of the cabins and hull caused the divers to "relive" the days, 100 years ago, when the ship was alive with iron men in wooden ships. Each set of initials represents a name, a face, and a life now gone. The initials are the most significant reminder about lives lived and stories untold, now buried in forgotten cemeteries along the shores of the Great Lakes.

THE STERN

The upper level stern cabins are in disarray with sides and roof lying on the floor of Lake Huron. Despite the loss of the galley cabin, the cook stove remains on the upper deck along with many dishes, crocks, and a dinner bell, all partially buried in the silt. The smokestack, whistle, and some dishes lie on the floor of Lake Huron, a few feet from the stern, on the port side.





On the cargo deck, divers swim into an enclosed stern passageway that completely encircles the engine and lower stern cabins, and come out the other side of the ship, again on the cargo deck. Inside the stern passageway, the divers locate a number of handcarts for moving cargo, and a workbench for repairing items that might break while the ship was in service. Seeing and touching these tools of a different era connect the divers to the men who labored and lived aboard the *Metropole*, particularly those men that made the "great escape" as the vessel was sinking.

While inside the stern passageway, a door is opened and cans of paint are found neatly stacked on the shelves. Large shovels, with their unique handles for the coal stokers, are hanging on the wall. Graphic reminders of the nearly fatal fire loss of the steamer in 1898 line the passageway wall. The four sets of large white fire hoses, wrapped in place on their spindles, are ready to douse the fire that will never be.

The Steamer *Metropole* rests in quiet repose over 100 years later; a unique, one-of-a-kind ship that in "death" has greater fascination for us today than during her twenty years of service on the Great Lakes.

EPILOGUE: GREAT LAKES TREASURE!!!

As Garry Kozak can attest to, and as the shipwreck hunters know, the real "treasure" in the Great Lakes is not the monetary wealth on the sunken ships. It is the history of Canada and the U.S., the solving of "history's mysteries," and the adventure and opportunity to go where no one has ventured before.

There is always *HOPE* of treasure (\$\$\$) that drives the imagination. The Steamer *Water Witch* was lost in Lake Huron with all hands in 1863, a year after she was built. Reliable reports indicate she was carrying \$20,000 in specie (coins) in the safe at the time of her disappearance.

Garry Kozak, has been employed for 27 years by Klein Associates. David Trotter met Garry in 1983 when purchasing a Klein Side Scan Sonar Unit.

David Trotter and the Undersea Research Associates (URA) team have been discovering shipwrecks in the Great Lakes since the 1970's. In a "one-of-a-kind" odyssey, the team has surveyed with Klein side scan sonar over 2,000 square miles of Lake Huron. Due to the cost in money and time, it is an event unlikely to be duplicated. David has discovered 80+ virgin shipwrecks in the Great Lakes.

Barkentine *H. P. Bridge*

David Trotter and the Undersea Research Associates (URA) team have announced the discovery of the 163' sailing vessel *H. P. Bridge*. She is the most intact Barkentine to have been located in the Great Lakes. Built in 1864 during the Civil War, and sinking in a collision in 1869, she has been sitting upright on the floor of Lake Huron for 135 years with all masts (3) standing, bow sprit in place, ornate eagle figurehead, bell mounted on the foredeck, access to the stern cabin, and the captain's stove pipe top hat residing on the aft deck. The story of the discovery, exploration, and history of the Great Lakes Barkentine *H. P. Bridge* has been produced in the video/DVD titled "Frozen In Time."

Please visit the URA website www.shipwreck1.com

SS METROPOLE

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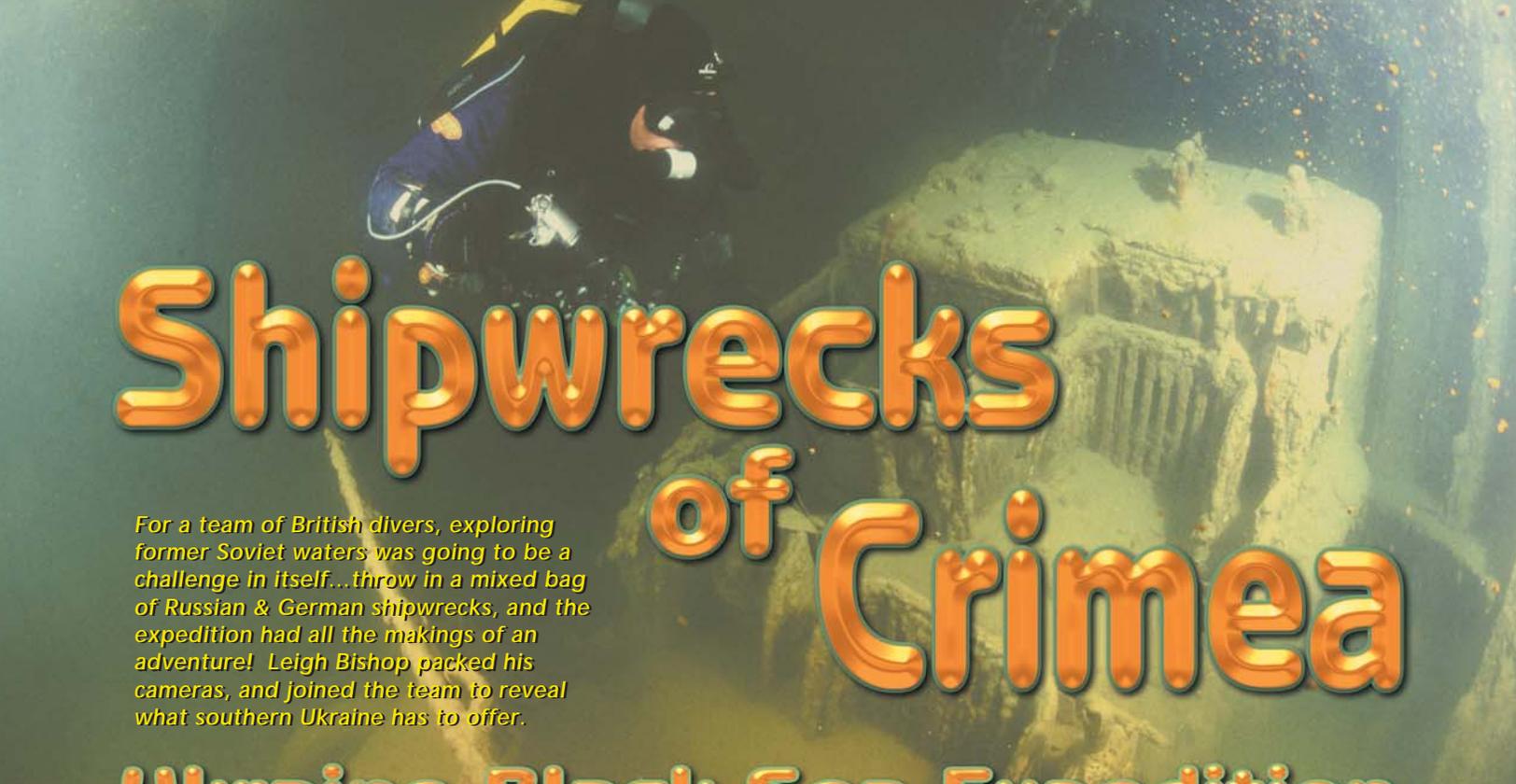
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Shipwrecks of Crimea

For a team of British divers, exploring former Soviet waters was going to be a challenge in itself...throw in a mixed bag of Russian & German shipwrecks, and the expedition had all the makings of an adventure! Leigh Bishop packed his cameras, and joined the team to reveal what southern Ukraine has to offer.

Ukraine Black Sea Expedition



Text and Photography by Leigh Bishop

As interesting as the name sounds, the Black Sea is not as black as one would expect—at least not in Crimea in southern Ukraine. Dropping below the surface, the clarity of the water here is excellent (although very cold at around 4-6° C—so dry suits and gloves are certainly the choice of the day). In fact, conditions are not unlike the typical European diving thousands of people enjoy every weekend.

The sea supposedly gets its name from the dark seawater; however, the wrecks in the Black Sea are covered in living mussel, often to the extent that otherwise identifiable sections of wreck become nearly impossible to distinguish! Wrecks in the Black Sea are also quite intact, both shallow and deep, and it's not until you venture inside that things become recognisable in comparison to their mussel-covered exteriors. Even with little or no current, divers are soon made aware of the disturbance to the silt layer that lightly covers the mussel growth as they swim across the wrecks.

The Black Sea is located south of European Russia, east of the Balkans, and spans Bulgarian, Turkish, Ukrainian, and Russian coastlines. Generally, the Black Sea has very deep waters; in fact, as an example, the world's deepest cave "Krubera" (located on the eastern edge of the Black Sea) drops well below 2000 meters. Many of the wrecks we dived on during this expedition were, however, located in the shallow waters around the edge of the Sea—in more friendly depths that everyone can enjoy.

The idea to explore wrecks in the Black Sea was the brainchild of New Frontier Diving instructor, Jeff Keep. For some years, Jeff had been intrigued with this part of the world, although it wasn't until he discovered an abundance of shallow water wrecks in existence off Crimea that he decided to mount his own expedition based out of the Ukraine. Jeff Keep's team would use closed circuit rebreathers, a first in the Black Sea, and it was vital to build up a relationship with Russian and Ukrainian contacts in order to help things along in the

planning period. Correct visas, paper work, and—above all—transportation logistics are vital when contemplating an expedition in the former Soviet Union. What's more, you will require a valid invite from a resident with a fixed address before a visa is granted.

The team would operate from the relatively new dive vessel named *Frigate*, a 35-meter former Russian Navy hospital ship, converted and now operating as an oceanographic research and scuba diving charter. With nine double cabins as well as compressors aboard, the vessel is well suited to the task and holds well in a rough sea. Before meeting the Ukraine dive crew, our team flew into Kiev with a connecting flight south to Sevastopol, and then a reasonable drive to Balaklava on the southern tip of Crimea.

UJ 102

There are many wrecks to choose from, in a wide range of depths, and the waters are suited to club diving right through to advanced trimix diving. Our stay was just a week, so we decided to explore some of the shallower wrecks and make a return at a later date to examine deeper sites of interest. Not far from Balaklava harbour, our first wreck, the *UJ 102*, was well suited for a check out dive using our rebreathers that had just been transported half way across Europe. The depth was rather friendly as well at just 22 meters to the seabed. Lying upright and very much intact was this German submarine hunter that is reached at the shallowest point of just 16 meters. The only sustained damage to the wreck appeared to be a bulkhead aft of the engines where the hull on either side had also broken away—shaping the wreck effectively into two sections. Elsewhere, the upper wheelhouse had long since gone, and the very stern section appeared slightly twisted to starboard, perhaps as a result of sinking. The wreck

Top left: While exploring the inner holds of the Volga Dons wreck, divers discover the remains of a Nazi jeep.

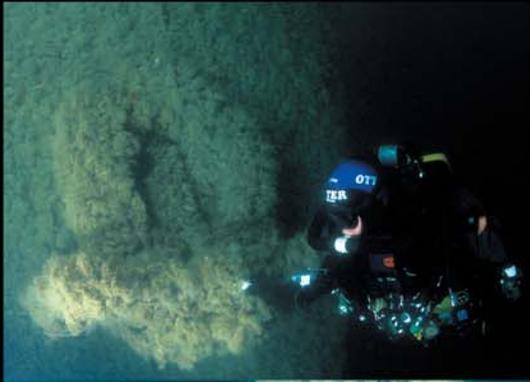
Top right: Anchor winches on the *UJ 102*

Second down on right: A view inside the collapsed engine room of *UJ 102*

Bottom right: Antonello Paone closes in to shoot mooring bollards on *UJ 102*

Below: Our expedition vessel *Frigate*, a 115ft/35m decommissioned Russian hospital ship, meets us at the sea port of Balaklava on the Crimean Black Sea.





made for an excellent first dive with much to see, especially within the ship itself. Although one thing noticeable in comparison to other European wrecks is the lack of marine life—especially fish. The stern of this wreck was particularly interesting with its large open deck space, machinery, and unusual cable laying equipment. A clean, white sand seabed made for good sunlight reflection and thus ambient light; unless venturing inside, a torch was simply not necessary.

The purpose of the expedition was not only to be the first western technical wreck diving team into the former Soviet Union, but also to share technical diving techniques with Ukrainian and Russian counterparts and to promote further interest in Eastern European diving. Each evening much interest was shown in the rebreathers by the diving crew; and with the wrecks becoming progressively deeper as the week went on, ideas and discussions of gas mixing drifted into the late nights. *Frigate* would now move east, and the next wreck to explore was the former transport vessel *Volga Don*.

Volga Don

Diving the wreck of the *Volga Don* reveals holds full of unusual cargo transported by the German forces during the Second World War. Within the forward hold, the divers discovered a relatively intact Nazi jeep, and an excellent example of a large 4-inch gun and platform stored for transportation in the ship's central hold. *Volga Don* was a Russian cargo ship captured in 1941 by the German Kriegsmarine at Mariupol harbour on the Black Sea, and then converted by the German forces for use as a military transport. In November 1943, she was hit in the stern by a torpedo fired from the Soviet

Top Left: Team diver illuminates the anchor of the *Volga Don*, still locked into its hole

Second down on left: Exploring the *Volga Don*'s exterior accommodation passageways

Third down on left: The empty interior of the Boson's locker on the wreck of the *Volga Don*

Fourth down on left: Diver appears from the fo'c'sale entrance on the forward section of the *Volga Don*.

Below: Diver exits the accommodation block aft of the *Volga Don*'s bridge.



submarine **L6**, and later sank after an attempt by the Germans to tow her in a storm for some 16 hours. Today she lies upright in a depth of just 33 meters, although her stern section is missing (broken aft of the engines presumably where she was torpedoed). At 25 meters, the diver reaches the topgallant forecastle marking the 2nd highest point of the wreck. A quick swim around the bow and anchors, then the diver drops down to the well deck before exploring further. Both port and starboard ladders remain in situ accessing the two deck levels, and it is behind both ladders that access is easily gained to the beautifully preserved area of the fo'c'sle's interior. Inside, visitors can see storm deadlight portholes set back in teak-clad rooms accessed by swimming the internal passageways past broken-hinged doorways. A small flight of stairs leads down to the forward cargo hold, and it is here that the previously mentioned Nazi jeep is stowed amongst other military supplies. The wreck is incredibly shipshape, adding to the ease of navigation that guides the diver over two large cargo holds before meeting a bridge construction and lower accommodation block. Either side of this intact towering blockhouse are companionways leading to various rooms, again full of preserved artefacts from when she was sunk. Atop of the bridge appears to have rotted out, leaving ample space to once again explore inside these spacious rooms. Aft of the construction, more fixed ladders lead from one upper deck to another before meeting a smaller cargo hold on the rear deck where the diver is able to see further internal staircases leading into the ship's depths, and subsequently into the engine room. The cabins on this wreck are full of personal items and bottles of all kinds - schnapps, wine, beer, etc., while some part of the cargo lies nearby off the side of the ship.

Crimea is steeped in history; and, on non-dive days, the Ukrainians couldn't go further out of their way to assist in transporting excursions to local cultural and historic places of interest—without missing, of course, the sampling of local wine. Balaklava is a town located in a well-placed natural harbour set back, as if disguised, from the coastline. It was at once the base for both secret Soviet diving activities and submarine warfare holdings. During our stay, we were guided through an underground submarine fallout base where Russian submarines were secretly hidden during World War II and throughout the Cold War. It has to be said that a week's diving here is simply not enough, especially when there is so much else to see land based. Expedition diver Neil McAllion soon discovered that being the logistics and transport manager is not what it's cracked up to be. After spending many hours negotiating paperwork with Ukrainian customs, he made a marvellous job of clearing the equipment before anyone could even think about diving.

The crew of the **Frigate** were always on hand to help. On a daily basis, chief diver Anatoly Ivanov, a former Russian Navy diver & Chernobyl scientist, and Max Svistoun made sure the line down to the wreck was well in place before anyone descended. Before each dive they would draw a sketch of the wreck on a white board for all

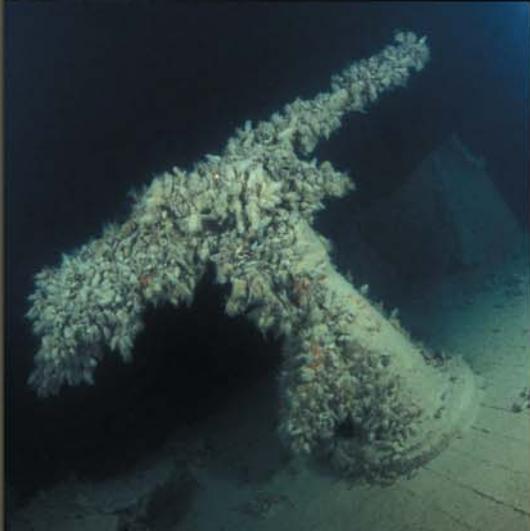
Top right: A large German artillery weapon, originally intended to be used against the Russian army, lies in total darkness deep within the holds of the Volga Don's wreckage

Second down on left: A look inside a Black Sea shipwreck describes how well they are preserved

Third down on right: The holds of many of the Black Sea wrecks are loaded with wartime supplies

Bottom right: Christian Malan enjoying a taste of the Black Sea on closed circuit.





to see. This way everyone, photographers especially, could plan in detail their dive exactly how they wished.

Varna

We dived several wrecks before the week's end, and enjoyed all of them. A deeper 85-meter wreck was substituted for a longer bottom time on the wreck of the **Varna** –another wreck sitting upright on a 55-meter seabed. **Varna** was a 2,143-ton Bulgarian military transporter carrying ammunition supplies in convoy when she was torpedoed and sunk by the Russian submarine **D4**. When the torpedo struck, her cargo of ammunition exploded; and, as a result, her stern section today lies broken off and well damaged. The remainder of the wreck lies virtually intact, even her amidships mast remains incredibly upright, proud, and rising to a depth of 35 meters. It is here that Anatoly and Max attached a line down to the wreck, leaving team divers to choose, once at the stem of the mast at around 50 meters depth, which end of the wreck they wished to explore. At the very bow tip of the ship, on the topgallant forecastle, a twin-mounted anti-aircraft gun remains in situ as a reminder of Black Sea warfare during WW II. Historic records show **D4** attacked **Varna** from over half a mile away. And the guns still point forward...telling the story that they were never put into use during the attack. Another mounted gun rests affront of the bridge, now on a collapsed wooden deck of 30° list. One of the holds on this wreck contains wooden bars; the other one is full of barrels which look like wine barrels. Several divers had the treat of venturing into the galley and forward accommodation area where everything appears as on the day it went down. Here, plates and saucepans remain on shelves, and deeper into the ship more wooden barrels remain wonderfully preserved.

In realistic terms, this expedition just scraped the surface of the wrecks on offer in the waters of Crimea in the Black Sea. With an enthusiastic diving crew aboard the **Frigate**, the future of diving again with our Eastern European friends is very much on the cards for us and many other divers alike.

The Team

Project Leader: Jeff Keep

Divers: Paul Todd, Neil McAllion, Eduardo Pavia, John Spurr, Ian Smith, Christian Malan, Steve Mortimer, Barbara Holgate, Irina Artyukhova, and photographers Antonello Paone and Leigh Bishop

More images of Ukraine wrecks can be seen on Leigh Bishop's website www.deepimage.co.uk whilst further information about this expedition can be found at www.newfrontierdiving.com

Top left: The mussel-encrusted anti-aircraft guns on the bow of the Varna

Middle left: A deck gun rests at 30 degrees in front of the Varna's bridge

Left: The expedition team divers

**back row left to right : Ian Smith, Paul Todd, Christian Malan.
Centre row left to right: Neil McAllion, Jeff Keep, John Spurr
Bottom row left to right: Antonello Paone, Barbara Holgate,
Eduardo Pavia, Iryna Artyukhova, and Leigh Bishop**



The Helmet Wreck

**Text and Photography by
Navot Bornovski
& Jim Rozzi**

We were eating freshly caught tuna sashimi and drinking ice-cold beer at Fish 'n Fins in Koror, Palau. The day had been a great one diving in the fabulously blue waters surrounding the island. In the morning, we saw giant clams, schools of jacks, sharks, barracudas, and one huge Humphead Wrasse that thought it was a member of the dive team. That afternoon we had taken a side excursion to Jellyfish Lake to snorkel in swimsuits among thousands of jellyfish which no longer sting. The site was truly incredible—which is another story. We had been on expedition to Truk and now Palau. Talk was lively, and we were discussing our last dive of the trip. Our hosts, Navot and Tova Bornovski, owners of Fish 'n Fins suggested that we dive a wreck right in the harbor near the dive shop. They told us about the "Helmet" wreck. We were pleased they mentioned it.

Our dive boat tied off to the stern of the wreck. Before entering the water, we were cautioned: DO NOT

PICK UP ANY AMMUNITION OR DISTURB THE DEPTH CHARGES!!!! Due to the age of the bullets, bombs, depth charges, and mortars, these pieces of history are very unstable and can explode.

We made our descent down the mooring line to the deck of the ship. The twisted and deteriorated guard rail surrounding the aft deck was our guide as we finned down towards the bow. The first sight, which immediately attracted the most attention, was a round aft gun platform. The gun barrel points to port amid the mangled steel of the collapsed gun mount. There are two depth charge release boxes located on each side of the platform; their lethal charges are still inside. After this point, we dropped over the rail to look at the propeller. The prop is almost completely covered by bottom silt. The rectangular rudder reveals the fact that no damage occurred to this part of the wreck. Decades of underwater marine growth cover the hull and the deck with thick layers of corals.

Palaun Adventures 2005



On the aft starboard side of the ship, a massive explosion had torn open the hull revealing the ribs of the ship, and scattered the drum-like depth charges onto the sea floor. The exposed main cargo hold reveals stacks of depth charges neatly arranged on the port side and, due to a massive explosion, scattered around on the starboard side. Under the port upper deck, stacks of helmets, now cemented together by decades of underwater corrosion, can be found. Between piles of rifles and ammunition, gas masks stare out at divers from the sediment.

The amidships superstructure is like a box. Along the port side appear the engine room's skylights, and a pair of engine room ventilators tower upward. The ship's main stack was resting on the bottom on its starboard side, now leaving a gaping hole in the middle of the deck. There is an inner passageway, leading to several small rooms, and a catwalk above the engine room. The wooden roof to the bridge is gone, allowing easy access to the wheelhouse.

The forward holds are penetrable through two large hatches on both sides of the forward light mast. No partition between the two holds exists, so we swam right through. The forward hold is half full of silt, but among the web of electrical wires, electronic equipment, and ceramic jars are three clearly visible huge radial aircraft engines.

On the raised bow, we found a two-headed anchor winch (very unusual) with anchor chains extending into the chain holds and to the anchors. Inside the forecabin were brass lanterns and an old taffrail log (a speed-measuring device).

As we began our ascent, we noticed the abundant, rich coral formations of Stag Horn corals, Brain corals, and Lettuce corals. Many species of tropical fish and a large selection of invertebrates were seen.

The dive was incredible, and so close to the dive shop. On the way in, we talked about what an excellent and rewarding night dive the "Helmet" wreck would be. After a week of wonderfully rewarding reef and wall dives, this wreck dive was truly an unexpected gem of the sea...soon to be a fond memory.

Fascinating Facts: The true name of this ship is unknown; she was not documented in any of the navy archives. Probably the ship was confiscated in Southeast Asia during the war. Wreck hunter Dan E. Bailey discovered the ship on January 18, 1990. Today the ship is called Helmet Wreck, the Depth Charge Wreck or X Wreck.

Location: Malakal Harbor, west of Koror.

Distance from Koror: A two to three minute boat ride from most Dive Shops in Koror.

Level of Diving Experience: Intermediate with Wreck Diver certificate preferred. This dive requires careful planning; the attractions on this wreck may cause distractions.

Diving Depth Summary: The ship is resting upright, at the base of a hill, with bow lower than the stern. The bow, pointing southwest, is in 110 feet (35 meters), and the stern is in 45 feet (15 meters).

Visibility: Weather dependent; close proximity to the reef raises sediment with wave action. Like all wreck dives, it is recommended to maintain neutral buoyancy while visiting the wreck to avoid stirring up silt. Visibility is best during incoming tide.

Currents: None





General Information

Length: 189 feet (57.6 meters)
Beam: 31.3 feet (9.5 meters)
Tonnage: Unknown (estimated to be less than 1,000 tons)
Built: Unknown

About the Authors:

Navot and Tova Bornovski are the owners and operators of Fish 'n Fins and the Ocean Hunter liveaboards. They traversed the seas on a four-year around-the-world sailing trip in the 80's, and fell in love with Palau. They worked aboard the Sun-Tamarin as cook and divemaster. Navot returned to Israel and completed his studies as a naval architect. He and Tova returned to Palau aboard their newly acquired Ocean Hunter liveboard to work alongside friend Francis "Mr. Dive Palua" Toribiong. In 1998, they acquired Fish 'n Fins as a family business. They founded the Micronesia Shark Foundation to do research, and to promote awareness to protect sharks throughout Micronesia. In 2000, Navot led a group of technical divers in discovering the USS Perry, the only US ship sunk in Palau. Their website is www.fishnfins.com

Jim Rozzi is a technical dive instructor, avid explorer, and Staff Writer and Photographer for Advanced Diver Magazine. He resides in Naples, Florida, with his wife Suzy.

Left:

Thousands of Golden Jellyfish, which are almost stingless, are found in abundance in Jellyfish Lake or Lake Ongeim'l Tketau in Palau. We snorkeled in swimming suits with the jellyfish, and did not encounter any stinging difficulties.

Right:

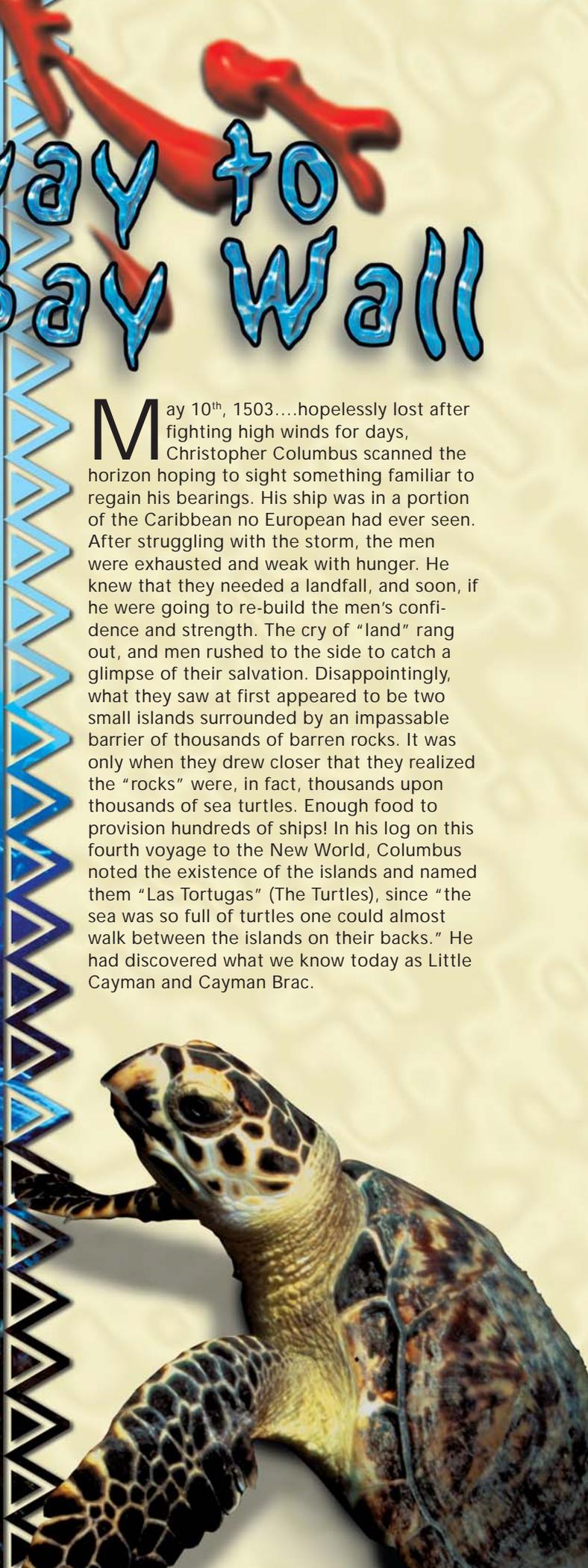
- 1. The ship was carrying war supplies for the Japanese army and navy. Stacks of Japanese helmets are strewn about the wreck. They are now welded together by sixty years of marine growth.**
- 2. A major portion of the ship's cargo was depth charges. Some are scattered about the wreck, but many still remain in the ship's hold**
- 3. This wooden box contains small glass vials. Possibly the vials are medical supplies such as morphine**
- 4. A crate of depth charge detonators**



Doorway to Bloody Bay Wall

Text and Photography by John Rawlings

May 10th, 1503....hopelessly lost after fighting high winds for days, Christopher Columbus scanned the horizon hoping to sight something familiar to regain his bearings. His ship was in a portion of the Caribbean no European had ever seen. After struggling with the storm, the men were exhausted and weak with hunger. He knew that they needed a landfall, and soon, if he were going to re-build the men's confidence and strength. The cry of "land" rang out, and men rushed to the side to catch a glimpse of their salvation. Disappointingly, what they saw at first appeared to be two small islands surrounded by an impassable barrier of thousands of barren rocks. It was only when they drew closer that they realized the "rocks" were, in fact, thousands upon thousands of sea turtles. Enough food to provision hundreds of ships! In his log on this fourth voyage to the New World, Columbus noted the existence of the islands and named them "Las Tortugas" (The Turtles), since "the sea was so full of turtles one could almost walk between the islands on their backs." He had discovered what we know today as Little Cayman and Cayman Brac.



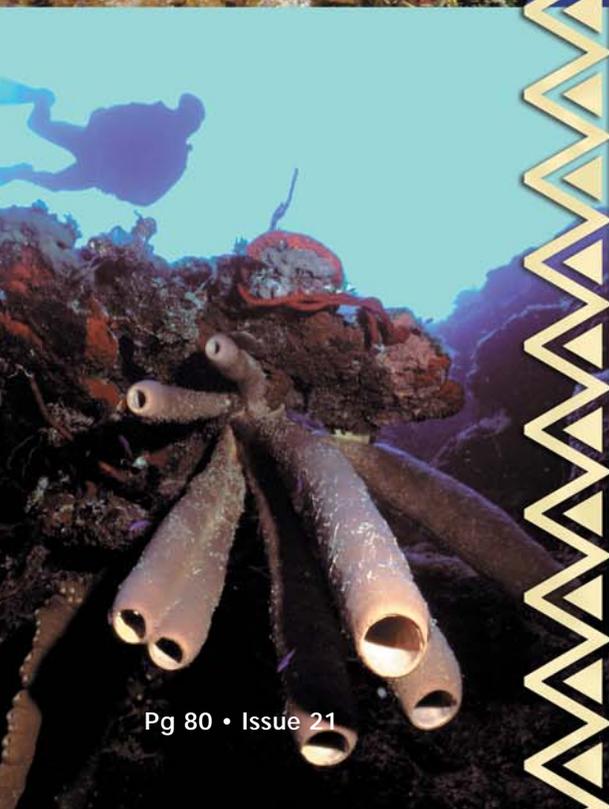
Centuries later we would “discover” one of them again...this time underwater.

Our plane descended through low cloud cover, and I caught my first glimpse of Little Cayman – a tiny jewel surrounded by a belt of white sand and turquoise. Struck by the size of the small island – less than 10 square miles – I wondered what it had looked like long ago from a ship’s deck. With a piercing shriek, the wheels of our Twin Otter struck the tiny airstrip, and I could feel the vibrations of the engines cutting back as the plane slowed. Bumping along the grassy strip, I craned my neck to look out the tiny window. Green brush was streaming past and, something odd, a soccer goal appeared at the edge of the runway – obviously the airport does double duty! Filing that first impression away in my mind, grabbing my camera case and hunched over like Quasimodo, I lurched toward the now open door, a wave of heat pulsating against my face from both the engines and the sun. Within moments our bags were snatched up, loaded, and in one of the most efficient “Slam, Bam, Thank You, Ma’am” moments I had ever seen, we were rocketing along in a minivan while our driver gave us an extraordinarily fast description of everything we passed. Literally minutes later, we strode through the doors of the Little Cayman Beach Resort and a delicious wave of cold air struck my face – I later realized that I had also passed through the doorway leading us to Bloody Bay Wall.

Little Cayman is the smallest of the three that make up the Cayman Islands and, as do her sister islands, sits atop an oceanic ridge overlooking the colossal Cayman Trench. At any given time, Little Cayman only has around 150 residents. Literally, there are more Iguanas in residence than people! The teeming crowds, shopping, thronging nightlife, and hustle and bustle found on Grand Cayman have no place here. Little Cayman is where many choose to “get away from it all”that, and to indulge themselves in some of the most absolutely superb diving the Caribbean has to offer. Little Cayman Beach Resort was founded in 1993 to meet BOTH of those desires, and its success has grown with each passing year as word has spread. A small all-inclusive resort for adults with superb dining and service staff, the operation specializes in meeting the needs of their guests. Nearly half of those arriving are, in fact, repeat visitors to the resort. Managed by Andy Murrant and Sam Baker, the resort is firmly set on a course that will continue to benefit both underwater photographers and divers of all skill levels. With Andy originating from Oxford and Sam from Bristol, they bring a well-organized and decidedly British flair to the resort along with exciting dreams for the future (more about those dreams later!).

The resort has one 46-foot dive boat and three 42-footers, each well taken care of and regularly rotated out for maintenance. The morning after our arrival, my





buddy, "Sparky" Campbell, and I found ourselves aboard one of them, the *Island Sister*, darting through the cut in the reef, rounding the point, and heading toward the famous Bloody Bay Wall. The afternoon prior, Andy had shared with us a wee bit of the history of this famous location, "You know, Bloody Bay originally got its name from a pirate battle. Apparently, they had a bit of a disagreement, and the bay actually turned bright red from the blood that was running out of the ships' scuppers." Sparky's eyes bulged out as he digested that information. I could see his mind work - visions of gold doubloons and pieces of eight taking away all rational thought. Treasure, looting and pillaging are always on his mind; and, as I prepared my equipment on the boat's camera table, I could see him out of the corner of my eye, dreamily watching the shore as he imagined the by-gone age of piracy that once flourished here.

Gin-clear turquoise water greeted us as the diesels stopped their roar, and the crew tied off. We had arrived at the first site of the week – **Mixing Bowl**. Anxious to get a taste of what was in store, the camera table emptied quickly; and soon we were descending, grinning into our regulators in anticipation. My eyes immediately caught sight of a sandy finger leading downward, cutting into the wall. With a nod, Sparky turned toward it. Together we dropped down the chute and passed over the edge of the wall down into an absolute kaleidoscope of colors that seemed to get more intense as we continued to drop. Our lights appeared to create rainbows as they danced off the thousands of sponges, gorgonians and invertebrates, some colors blending while others clashed. Looking through my viewfinder as I framed each shot, my mind raced. "My God! If this is what the **FIRST** dive is like, this week is going to be incredible!"

I have never been more of a prophet.

In decades of diving, I have often heard of the raw beauty of Bloody Bay Wall – the wild slashes of color and bizarre shapes enshrouding the sheer vertical face as it plunges into the depths. Bright sunshine thrusting downward from the surface with only inky blackness below – and now I was seeing it firsthand. Each site had a basically similar pattern – shallow, horizontal reef structure interspersed with sandy bottom leading to a sharp edge dropping into the abyss. In some places, the edge was so sharp that it appeared to have been sliced with a knife. Despite the basic similarities, each dive site also had its own unique personality that made it memorable; and I quickly amassed a list of favorites.

Ringer's Wall was one that simply took my breath away. The wall here is so pristine that at times I felt that I was the first to dive here. Huge stove-pipe sponges thrust their way outward from the wall in colossal clusters while bright red, yellow, and purple rope sponges hung down like clusters of snakes. Everywhere the wall was literally painted with encrusting sponges – oranges, yellows, blues, purples, and reds almost dancing before my eyes as I swept across the wall face searching



for photo subjects or scenes. Colonies of gorgonians quivered slightly as the current swept through them, their thin red fingers appearing bright against the deep blue. Here the antennae of a pair of lobsters poke out from a small cave - there a team of cleaning gobies slides in and out of the gills of a Nassau grouper as he waits patiently for them to finish their job - and over there a "tag-team" of barracudas lances through a school of bait fish like spears, bits and pieces of silver falling away into the deep after their passage. My thoughts of Little Cayman would be forever burned into my memory from this one dive alone.

And yet there were still others! Immediately west of **Ringer's Wall** is **Great Wall East** and **Great Wall West**, both of which fully live up to the first word in their names with almost violent swatches of color and a myriad of endless shapes. At these sites, the wall itself thrusts downward almost completely vertically, with various undercuts housing clusters of lobsters as well as huge channel clinging crabs. Colossal bright orange Elephant Ear sponges protrude from the wall; one huge specimen we found flapping slightly in the current much like its namesake. Barracudas patrol the face of the wall along with the occasional Caribbean Reef shark, while Nurse sharks and groupers are common along the upper edge - each of them constantly awaiting an opportunity. **Randy's Gazebo** is yet another site that will forever remain with me - all of the beauty of the other wall sites, yet with an intriguing structure surrounded by huge barrel and tube sponges. It almost looked as though it could be nestled in a country garden. The shape is so unique that it is an obvious photo opportunity. While I was happily taking advantage of it, I noticed two small turtles playfully twisting in our bubbles far overhead.

For me, photography will make a successful dive trip. The dive sites of Little Cayman provide ample opportunity for subjects, but what of support? The Little Cayman Beach Resort has an on-site photo and video center that is one of the finest I have encountered. A full-service operation, it offers E-6 slide processing, digital support, a wide assortment of film, batteries, and accessories, as well as the rental of Nikonos V cameras with a full selection of lenses. Their service department also offers general repairs and parts as well as emergency "first-aid" flood treatment for those with a bit of bad luck. Their professional photographers are well skilled, and conduct training in both still photography and videography. On the immediate horizon, Andy and Sam are acquiring new digital video equipment to be used by the staff as well as digital still cameras for use as rentals - all part of that "exciting dream" stuff I mentioned earlier.

Contacts and information: www.littlecayman.com



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25 Going Under Dive

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59 Jetsam Technologies

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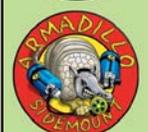
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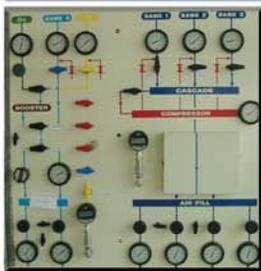
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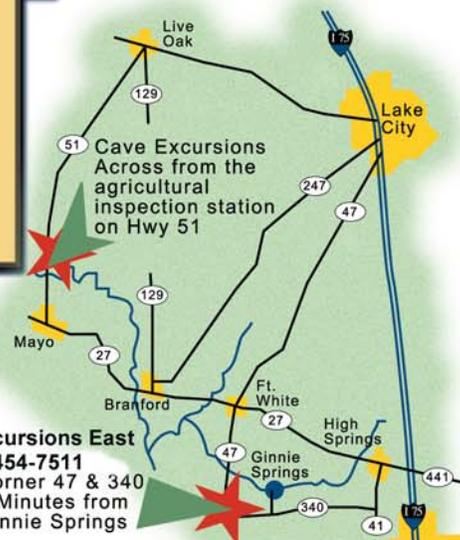
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