

The background of the cover is a photograph of a diver in a cave. The diver is positioned in the center, facing away from the camera, with a trail of bubbles rising from their regulator. The cave walls are dark and jagged, with a large, vertical rock formation on the right side. Light streams in from an opening at the top, creating a bright, hazy atmosphere. The overall color palette is dominated by blues and greys.

ADVANCED DIVER MAGAZINE

Spring Issue 1 • 1999
US \$7.00

Remembering A Legend
Sheck Exley

Crystal Beach Cave & the
Dragons Lair

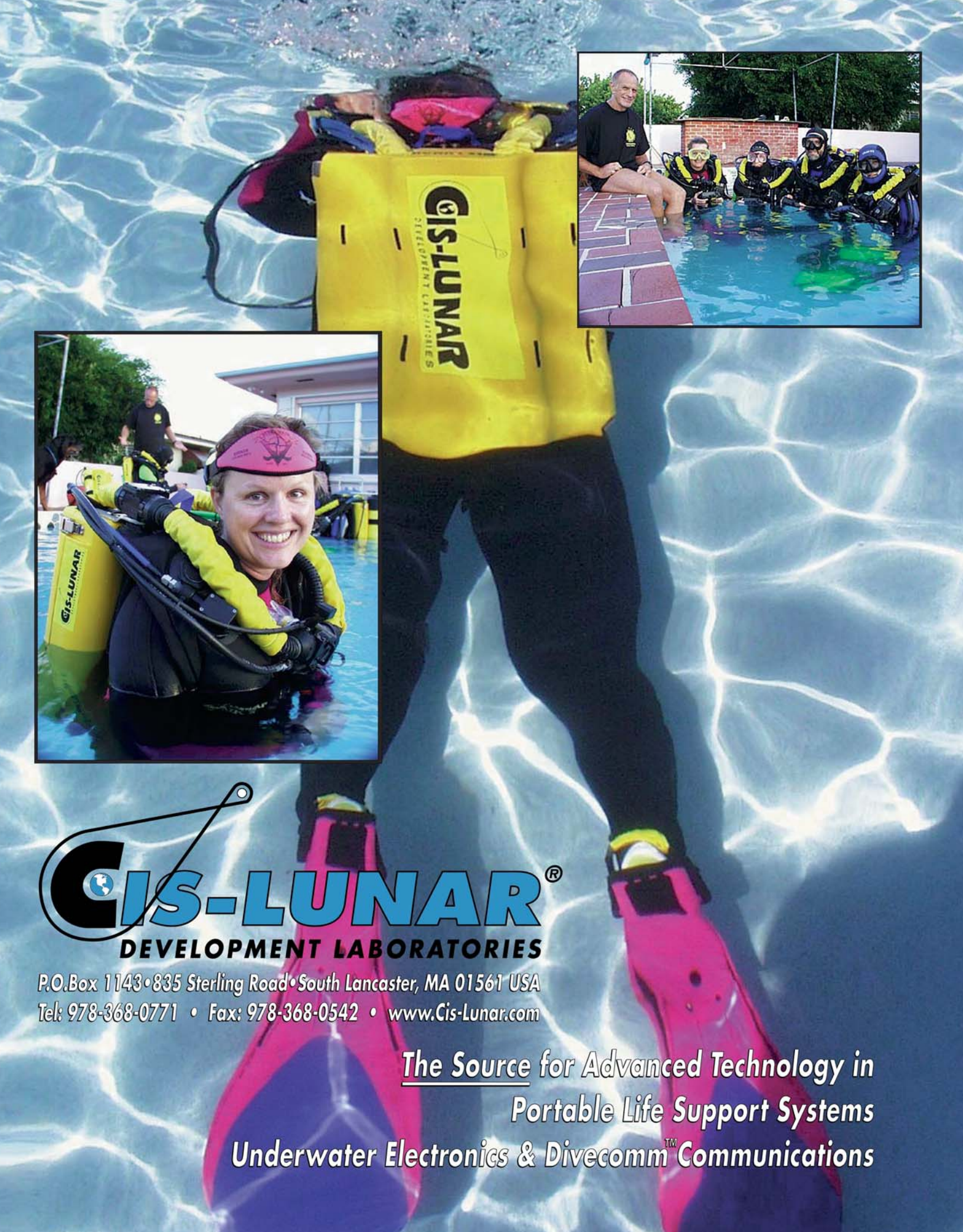
Lift Bag Ops

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Shipwreck Of The
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Death of Tech Diving

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ISSUE**



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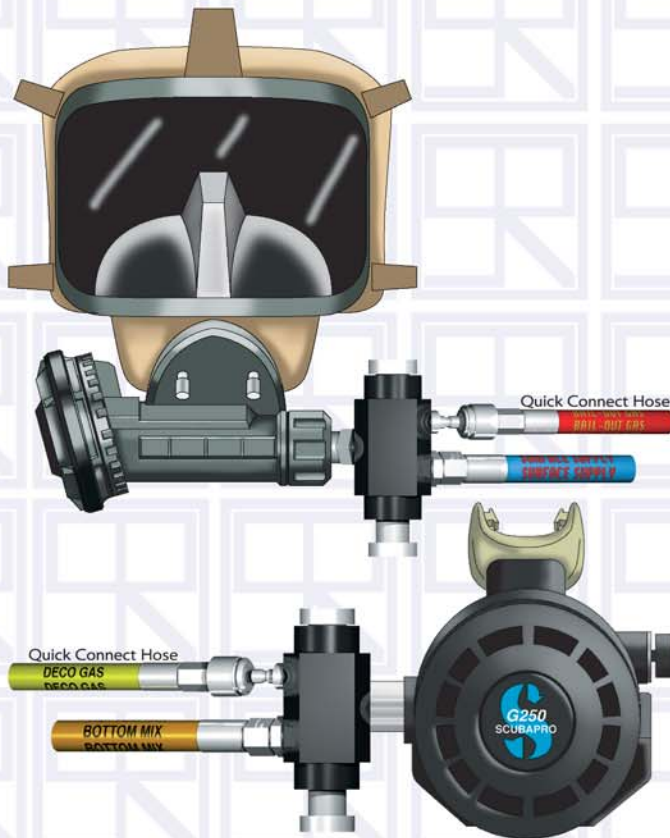
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Article Submission: Articles run from 1000 to 3000 words. Text should be saved as a text only with line breaks file for IBM or IBM clones. Mac's can be sent as simple text or pagemaker files. Each article must have multiple high quality photos either in 35mm slide or as standard prints. Materials will not be returned unless requested. Advanced Diver Magazine is not responsible for lost photos, computer disks or any other items received.

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WARNING!

Diving is a potentially dangerous activity. Neither Advanced Diver Magazine, its contributors nor its staff accept liability for diving related injuries incurred by our readers. All materials within Advanced Diver Magazine are for informational purposes only and not a substitute for dive training.

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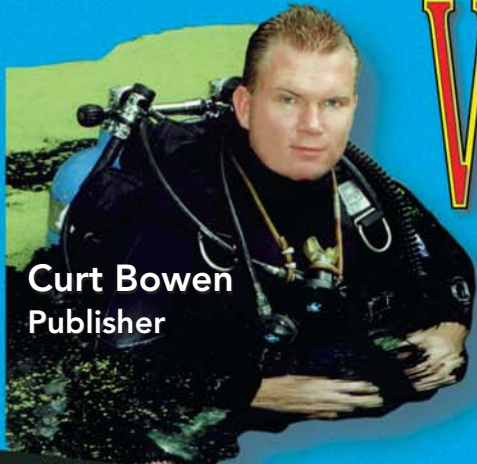
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Cover: Entrance to Cow Springs, FL USA
By: Thaddius Bedford

WELCOME



Curt Bowen
Publisher

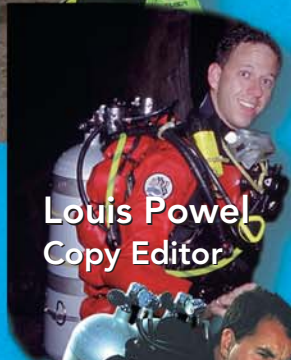
Welcome to the Premier Issue of Advanced Diver Magazine.

Imagine a magazine dedicated to continuing education for all divers, a "How to" guide to the newest techniques and a forum for new technologies and the latest discoveries. Imagine a magazine that will inspire and challenge divers from Advanced Open Water to the most experienced technical divers. This is my vision for Advanced Diver Magazine.



Leroy McNeal
Dive Staff

In 1994, with the immanent downfall of the magazine Aquacorp, I decided to start another technical diving magazine to fill the upcoming gap. This was the beginning of DeepTech Journal. Over the next two years, Win Remley and I produced several outstanding issues until his death in a boating accident in 1996. Into the picture came two new business partners, Bret Gilliam and Fred Garth, and many more issues of DeepTech were produced. Then on January 4th of this year, I receive a phone call from an advertiser asking about the sale of DeepTech Journal to Peterson Publishing. It was several days later before I was able to get in touch with Fred Garth and learned that DeepTech had been sold without my knowledge or approval. Once again there was a gap to be filled.



Louis Powel
Copy Editor

Advanced Diver Magazine is here to stay. What is the difference between Advanced Diver and other magazines? The answer is a Publisher and dedicated staff of divers who care about the reader and their longing for knowledge. This is what Advanced Diver is about, collecting the knowledge, experience and ideas from all types of divers around the world and sharing it with you.



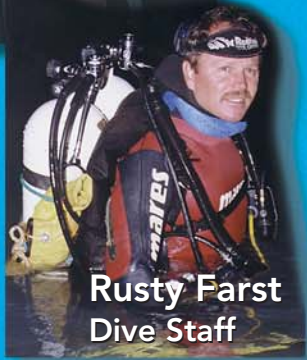
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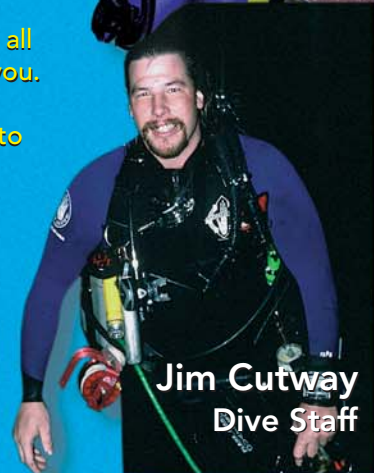
Thaddius Bedford
Photographer

I hope you enjoy our premier issue and look forward to many more outstanding copies to follow.

Curtis L. Bowen Publisher, Advanced Diver Magazine



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PONDEROSA



By: Nancy DeRosa

A TRUE JEWEL OF THE YUCATAN

A unique new destination is emerging in the dive world, and it is growing with great excitement and passion. Instead of taking a boat off shore to a wall or wreck, these new adventurers are traveling inland. They ride in cars and hike through dense jungle to explore the cavern systems of the Yucatan Peninsula.

Here you will find one of the most unique and largest sinkholes or "cenotes" that is open to all levels of divers, Ponderosa. You begin your journey with a 2-km drive down a dirt road into the primitive Yucatan jungle. Leaving civilization behind, you feel in touch with the jungle, untouched by modern development yet only an hour's drive south of Cancun.

Nine years ago, Tony and Nancy DeRosa were the first to explore Cenote Ponderosa. First they had to find the cenote by cutting a path through a distance of jungle at the end of the road, down a slope and around a grove of thick jungle foliage. They did this all while hauling their dive equipment on their backs. Luckily,

they came with large reels in hand, filled to the brim with knotted line. For what they were about to see was grander than they could have ever imagined.

This is their story: "When we finally arrived at this incredible cenote, we were more that excited to think of the adventure on which we were about to embark. The pool of water was brilliantly clear and full of beautiful tropical mollies, South American tetras, sailfins, cicles, river catfish, eels and turtles, along with mosses, lily pads and more. Around the sides were 10-20 ft cliffs with trees drooping their mammoth fruits near the water's edge. We spotted a balsam log floating on the surface with spiny cactus attached and thriving as it meandered to and fro with the wind current across the surface. A mother duck and her five ducklings paddled off to the north side of the pond, I was just hoping that we would not bother them enough for them to take refuge away from their paradise.

"As, I mentioned before, this lake was surrounded by a full-scale

cliff. We had no choice but to lower our tanks down to the water some how. There was a fallen tree nearby and we decided to move this over and use it to slide our doubles down to a small outcropping of limestone. Here we set up our equipment and soon were ready for the dive. We started, of course, with a very healthy tie-off at the surface and started our swim to the northwest. Since all the water systems in the Yucatan tend to flow to the ocean, northwest is a good bet for the direction to check out first. To follow the lead upstream was the bonanza guess. We descended to the site of a gigantic tunnel lying in front of us, beckoning with a warm welcome.

"As we started to explore, we immediately saw another light at the end of the tunnel. Was this heaven? This huge passage is filled with decorated walls and big limestone boulders mounded together on the passage floor now called the "Corral". These boulders mark a time of ancient earth movement and the place where they fell from the ceiling has long

since been covered with new decorations. We must be looking at Mother Nature's creation of 10 million years or 150 million years. Who knows really? But she has certainly spent some time on this passage.

"As we swam further along, we found a unique halocline at about the 35-foot level. Haloclines are a very interesting phenomenon and are common to the cavern systems in the Yucatan. They are the invisible lines between the lighter, cooler fresh water and the heavier, warmer salt water that seeps up

from the ocean below. As you pass through these haloclines, you mix these two waters together giving the appearance of swirling oil spinning off your body and equipment. It is even stranger for the diver in back as now their vision is a beautiful blur.

"We looked down at a giant limestone boulder lying on the cave floor. It bloomed with fossilized sea shells, centers of conches, sea urchins and smaller snails and crest shells that seem to have lived on these remains, one on top of the other, piled high, embraced in porous limestone and bedding rock.

"Nearing the Corral, we saw where a giant grove of jungle foliage had fallen through the thin earth, giving the Mayan Gods a new cenote. The mangrove tree roots are now intertwined amongst themselves in a fury of growth. The tropical life seems to flourish again with the onset of sunlight and sky. The green mosses healthily attach to all that is stable. And the fish thrive in another jungle paradise.

"The Corral is a fairly big breakdown. There were large tunnels breaking off to left, which hinted of future explorations. We found ourselves in one of these passages, just yearning for tomorrow, another day and another dive with beautiful darkened ribbons of sunlight streaming from the ceiling, making bands of enchanted rainbows against the off-white walls.

"There is an area along the most southern side where we found a large pile of pottery shards, so we ascended to discuss what we saw. At the surface, was a ledge with more pieces of Mayan pottery above our heads and a unique stacking of flattened rocks piled up in small stacks. These stacks looked like rock piles com-

monly used as trail markers. We took off our gear and stretch up over the ledge. A narrow air cave extended out into the jungle. This was really unbelievable. We decide to explore this lead another day.

"We headed back now with a glowing heart from such an incredible day of exploration. As we gave the ol' thumbs up turn signal, we started back towards the original entrance where we had begun just over an hour before. Our entire dive was a mere 1,800 feet of swimming but at least 1,800 precious moments to remember.

"Near the entry point, we noticed a slight patch of air floating high along the ceiling. We ascended carefully through a few large ceiling cracks and crevices to find yet another wonder of this cavern: a small air dome filled with hanging bats. Our lights seem to disturb them, and we know that we can not stay long. We were in complete amazement at what this system has just allowed us to share, as if nature hasn't already given us enough of her beauty. Hauling our tanks up the cliff and preparing for our walk out, we heard the sound of the beautiful Mott Mott bird with a "to-ool to-ool to-ool". It was a truly remarkable day, and one that will remain with us for our entire lives."

Today, easy access makes Cenote Ponderosa one of the more popular sites for both cave and cavern diving. The owners have provided the diving community with a fine road, a strong set of stairs leading to the water's edge and a staging platform for both divers and snorkelers. Tables for equipment preparation, a changing area and bathrooms surround the cenote with a clear-cut path.

See Aquatec Villa DeRosa ad on page 47



PONDEROSA



SUBMARINE COAST

NEWPORT RHODE ISLAND



CAPE FEAR



USS L-8



BlackPoint

U-853



USS BASS

By: Stephen Brady

Newport Rhode Island is well known for its white sandy beaches, yacht races, jazz festivals and enormous homes. Countless novels have captured its extraordinary past, from a small resort town to the booming prosperity of the Gilded Age. Famous local boy, Oliver Hazard Perry commanded his US troops at the Battle of Lake Erie and left us with the now famous quote, "We have met the enemy and they are ours." Jackie and John F. Kennedy were married in Newport and he used Hammersmith Farm as his summer White House. The history and magic of this town is well known, but its hidden secret is the history and intrigue which lies beneath the surface of its waters. These are the stories of the wrecks and their dives.



Cape Fear



October 29, 1920 was a calm and clear night. The 276-foot experimental concrete freighter, Cape Fear left Providence for Newport News Virginia. With open ocean ahead, Captain Biggins and his crew expected a safe passage. Little did they know they were just minutes from disaster. The passenger ship, City of Atlanta was inbound from Norfolk to Providence under the command of Captain Garfield. Entering the east passage of Narragansett Bay, Garfield saw Cape Fear coming directly towards them. He gave the command to steer to port and signaled Cape Fear expecting them to do the same. Aboard the Cape Fear, panic overcame Captain Biggins and he ordered the helm hard over. Cape Fear turned directly into the path of the City of Atlanta. In a heroic attempt to save lives, Captain Garfield ordered that the impaled bow of City of Atlanta remain in Cape Fear's side to slow flooding. Only when both ships were at risk of sinking did he order his ship to pull away. Cape Fear sank in three minutes taking seventeen men with her.

Cape Fear lies in 190 feet of cold, dark water in the east passage of Narragansett Bay, one of the most active shipping channels in the northeast. Slack tide is the only time to dive her safely so Captain Lloyd Sunderland helped us load gear aboard the dive boat Mermaid's Tavern to ensure a timely departure. Within minutes of leaving the dock we were ready to hook into the superstructure. Our dive team consisted of Andrew Fallon, Lou Lagace, and myself. Lou and Andy used a 17/25 trimix with a maximum depth of 165 feet, while I chose the Atlantis I rebreather. We were pleasantly surprised with the 30-foot visibility and an amazing amount of ambient light. The grapple secured, we had 22 minutes of bottom time to

explore. Photographs were taken, cargo holds were penetrated and a solid brass doorknob was recovered. Our decompression was completed just in time to avoid the strong currents of the outgoing tide. Cape Fear is a rewarding dive but is very challenging because of its depth.

U-853



U-853 was launched in June 1943. She survived numerous patrols until February of 1945 when she was ordered to the coast of New England. Despite an order for all U-boats to cease aggressive action, 24 year old, Captain Helmut Froemdsdorf fired a single torpedo and split the coal-carrying Blackpoint in two. She sank in 20 minutes taking 12 of her crew with her. Four U.S. warships then converged on U-853 and sank it with its crew of 56 men on the morning of May 6, 1945.

Although we had secured our own permanent mooring line for the summer, we were not surprised to find someone else using it along with the four other charter boats on sight. But we were undaunted as we tied up and got ready to enter the water. Passing 90 feet the conning tower and forward damage hole suddenly came into view. Visibility was 20-25 feet and large schools of fish scattered as we dropped to the submarine's deck. Our dive plan called for a maximum depth of 125 feet and a 25-minute bottom time during which we hoped to photograph the forward torpedo tubes. We entered the wreck through a damage hole directly forward of the conning tower and swam towards the bow passing the radio room, galley and officers

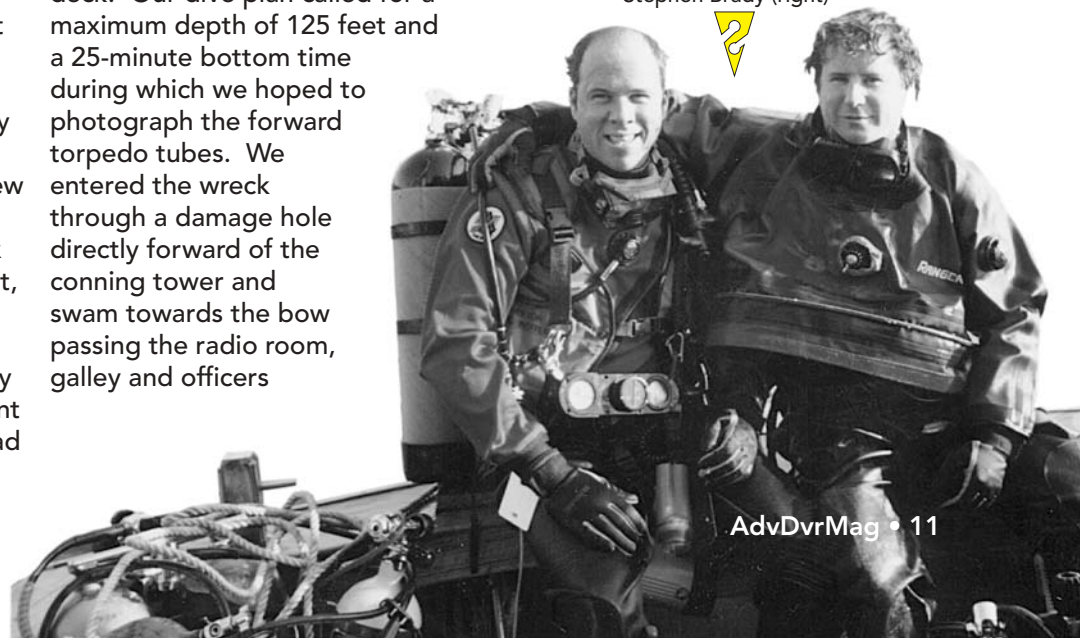
quarters as we went. We were surprised to be the first divers to enter here today and were rewarded with clear water. After photographing the torpedo tubes we called the dive and turned to follow our line back out. With visibility near zero, the small white line we had laid was a reassuring guide and our exit was made safely and easily. After our decompression, we returned to the dive boat and discussed one of our best U-853 dives yet.

Blackpoint



The Blackpoint sits upright in 80 feet of water and the bow is upside-down in 105 feet. Diving the stern section you can clearly see the large deck gun and scattered armament. Of even greater interest for some is the life that covers the entire area. Eel, sea raven and an occasional blue shark grace the waters around this wreck. Hydroids, Anemones and numerous soft corals make for tremendous photo opportunities. The bow section is 700 yards to the south and is more technical because of the numerous areas of penetration available. The greatest hazard here is disorientation because she is upside down. Diving the bow and stern makes a great two-dive day with numerous challenges at both sites.

Andy Fallon (left)
Stephen Brady (right)



USS Bass



Built in 1924 at the Naval Shipyard at Portsmouth New Hampshire, the Bass was designed as a war machine. This 342-foot sub was plagued with design and mechanical problems. She was so big that her propellers came out of the water when she would dive, thus making her impossible to steer. Her diesel engines were not reliable. And, oddly enough, the Bass leaked. Near the end of a wartime patrol in the Pacific Ocean, a fire broke out killing 26 of the 80 enlisted crew. Shortly after that tragedy she was converted to a cargo and troop carrier. Unsuitable even for this assignment the USS Bass was sunk by a PBY-5A in March 1945 and used by the Navy as a sonar target.

Her bow section split and sank first and now lies at 159-feet, 60 feet away from the rest of the


wreck. The hull of the Bass sits upright and entry is made easy by a forward hatch at 138-feet near the break. Entry and exit is tight because of the piping, conduit and cables that litter the interior. A wreck reel is a must. About 100-feet into the wreck, past the engine room and galley, we entered the control room. A ladder led us up to the all-bronze conning tower at 130-feet. This is a very tight area with heavy silt. The bow section offers easy access to the officer's lounge and forward torpedo room hatch, which is sealed. Average visibility is 20 – 30 feet, but it can be up to 70 feet at times. Depth makes this a challenging dive.

Submarine L-8



Built in 1915 at Portsmouth New Hampshire, the L-8 was the first sub commissioned by the US Navy. A Simon Lake design, she

was capable of only 5-10 knot speeds and could remain underwater for only 150 miles before having to surface. Because of her limitations, she was only capable of near coastal duty. She was sent to the bottom during target practice with the first use of a magnetic torpedo. The L-8 lies in 105 feet of water. Visibility is usually limited to 10 feet or less, but the L-8 is a good site for training and macro photography.

Answering the call of challenge and intrigue, history and discovery this New England diving Mecca has it all, American and German submarines, an experimental concrete freighter and great opportunities to penetrate historic wrecks. Everyone who has explored the mysteries of these waters, whatever their level of certification, will have something in common when memories of past Newport diving experiences become conversation. 



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4 Hands 2 Brains

Dive Buddy: A person who shares in and enhances the fun of scuba diving while providing a source of redundant gas, equipment and emergency assistance if necessary.

Let's face it, often dives that begin with a buddy become a solo dive before they are over. Accidental separation due to low visibility, miscommunication of the dive plan or just not paying attention to each other may force buddies to end their dive alone.

Solo diving for experienced recreational divers, although frowned upon, is widely practiced. But we are no longer talking about recreational diving. Technical diving, where a direct ascent is impossible because of an overhead environment or required decompression, demands a considerable amount of planning, experience and control.

One would argue that proper technical diving practices and equipment already provide the required redundancy for almost any situation. After all, you are trained to be self-sufficient. What benefit can a dive buddy offer if you are properly outfitted with redundant equipment? You already have two regulators, three lights and an isolation manifold. But the most important piece of redundant equipment is an extra brain. That is right, your buddy can offer the ability to

think in an emergency.

When situations arise and stress builds, a diver's ability to think clearly can be compromised. Add nitrogen narcosis and task loading to this and you've created the scenario for an accident. This is when your redundant brain can provide assistance by making the right decisions and taking the necessary actions.

Does this mean we should never conduct another solo dive? No, what it does mean is that solo diving requires much more dive experience. Book knowledge is important, but only experience can teach you to react properly in a stressful situation. Would you rather have a doctor just out of medical school cut you open or one that already has thousands of hours on the cutting table?

Currently there are no statistics comparing directly the number of deaths while solo diving to buddy diving. We know how many solo diving fatalities there are, but it is unknown how many solo dives are conducted compared to the number of buddy dives. Still we must assume that solo technical diving is considerably more dangerous than buddy diving due to the loss of a redundant brain and an extra set of hands.

Whether diving deep wrecks, caves or other advanced dives, new technical divers should never consider diving solo. And those of us with ample experience should take solo diving more seriously.

When solo cave diving carry an extra stage cylinder but don't use it unless a true out of air emergency occurs. In solo wreck diving carry an extra cylinder of bottom gas that will provide enough volume to reach the first decompression stage cylinder. And never push yourself beyond your current experience level on a solo dive. The best thing is to be honest with yourself. If you feel comfortable and confident, continue farther.

But if the little voice in the back of your head says to slow down or turn the dive, listen. We all want to live to dive another day, either solo or with your buddies.



Advanced Gadgets



An Introduction to Technical Diving CD-ROM introduces the realm of technical diving through the experiences of the expeditionary team El Proyecto de Buceo Espeleologico Mexico America Central, led by world record holders Jim Bowden and Dr. Ann Kristovich.

This CD-ROM defines, elucidates, and pictorially portrays the various types of technical diving, as well as the equipment and skills needed to safely participate and/or pursue certification. Although it is not intended to be a substitute for formal training, An Introduction to Technical Diving CD-ROM provides comprehensive detailed information in a beautifully illustrated format and can be used as either a reference source or an educational aid for divers of all training levels.

An Introduction to Technical Diving CD-ROM is available through the Grale Company for \$29.95. You can contact them by telephone at 1-888-514-7253 or on the web at <http://www.grale.com/>



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Powering the new dual beam lighting system is NiteRider's incredible Nickel Metal Hydride (NiMH) battery. The rechargeable 13.2 volt 3.8 Ahr battery weighs 31% less than a comparable NiCad system, allows up to 31% longer burn time and 33% shorter recharge time. With the battery system, the BlackWater 3000 dive light will burn for 3 hours and 15 minutes in its 12-watt mode, 2 hours in the 20 watts setting and an hour and 20 minutes in the blazingly bright 32 watts mode.

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The features of the O2 Stick Oxygen Analyzer are a nitrox diver's wish list come true.

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HID-18 Retrofit Kit

Sartek Industries Inc. announces the introduction of the HID 18 Retrofit Kit. The retrofit kit will allow any diver who presently owns a canister light with a Goodman type handle to be able to now have a Sartek HID 18 light head.

The HID 18 light head contains an 18 watt HID arc lamp and ballast which because of its output of between 4700°K and 5500°K creating a much whiter light makes it an excellent choice for video or photography.

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OMS™ Cylinders

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REMEMBERING A LEGEND

SHECK EXLEY

Photos: Dr. Ann Kristovich



"You are going your way to greatness. Peak and abyss. . . . They joined together. . . . Before my highest mountain I stand and before my longest wondering: To that end I must go down deeper than I ever descended." Zarathustra, F. Nietzsche

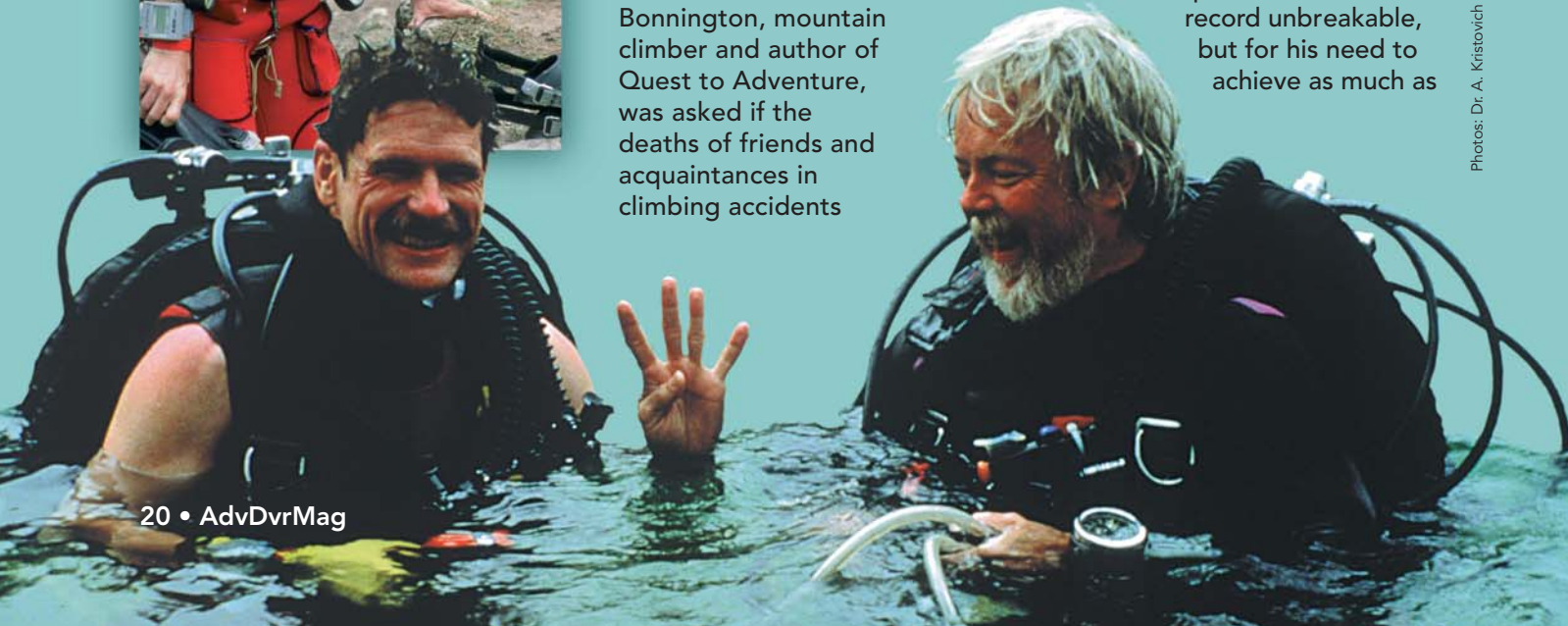
"Every field of human endeavor from Tidily Winks to space exploration has its champions and its marks for human endurance and achievement. Without them there would be little or no human progress for we would have nothing to measure our efforts by or encourage us to try harder. It is difficult to imagine any aspect of our lives that is not enhanced by competition, the drive to excel and the recognition of excellence." Sheck Exley, Caverns Measureless to Man.

had ever led him to question the value of his sport he answered, "No. Because you know . . . climbing is dangerous. . . . You know that risk is an inherent part of the game. So you have got to accept it. It does not reduce your sadness at the loss of a friend. The tragedy is not for the person who got killed, it is for the wife, the girlfriend, the children and parents. It is the people very close to that person who are bereaved and lost and left without him. The individual who gets killed has had a full life. He has gone out right on top, doing something he enjoys doing. The tragedy is within the survivors."

So it has been with Sheck's death. I still feel a terrific sense of loss because I enjoyed his company, his passion and his craft. It is my loss, however. I believe that he was never more alive than in those moments of trial in virgin space. It is easy to die. It is very hard to live. Sheck met life head on, with few misconceptions. Only death deceived him as it eventually does us all. Even then, during our "year of living dangerously" that we spent preparing for our dive, he addressed the consequences of the myriad dangers we faced. His eyes were wide open. Never did he make light of the risk, but it was important for him to make the dive. It was personal. He already had the record. Still he had to go deeper, not to make the record unbreakable, but for his need to achieve as much as

Mexico, April 6, 1994. Sheck Exley, my mentor and friend, and I were prepared to dive deeper than anyone has ever dived independent of submarines or commercial habitats. Sheck never returned.

Was it worth the risk of loosing the world's greatest dive explorer to go deeper than any other man on scuba? It is easy to question the value of any endeavor when a death occurs. When Chris Bonnington, mountain climber and author of *Quest to Adventure*, was asked if the deaths of friends and acquaintances in climbing accidents



Photos: Dr. A. Kristovich

Exley's World Record Dives

World Depth Records

1977	340 ft	Boiling Hole	↑
1981	360 ft	Die Polder	
1987	660 ft	Mante	
1988	780 ft	Mante	
1989	867 ft	Mante	
1993	863 ft	Bushmansgat	↓

Cave Penetration Records

6/29/70	2099 ft	Blue Spr, FL
4/12/72	2450 ft	Devils Eye, FL
3/31/74	3000 ft	Devils Eye, FL
4/13/75	3105 ft	Devils Eye, FL
4/20/75	3305 ft	Devils Eye, FL
5/4/75	3956 ft	Manatee Spr, FL
5/11/75	4110 ft	Manatee Spr, FL
3/19/78	4457 ft	Hole in the Wall, FL
3/26/78	4527 ft	Hole in the Wall, FL
10/14/78	4802 ft	Blue Spr, FL
11/4/78	4816 ft	Blue Spr, FL
6/21/81	5847 ft	Big Dismal, FL
7/26/81	5914 ft	Manatee, FL
8/8/81	6867 ft	Manatee, FL
8/23/81	7665 ft	Manatee, FL
1/28/89	10,244 ft	Chips Hole, FL
12/16/90	10,939 ft	Cathedral, FL

he could. He had to go deeper for himself

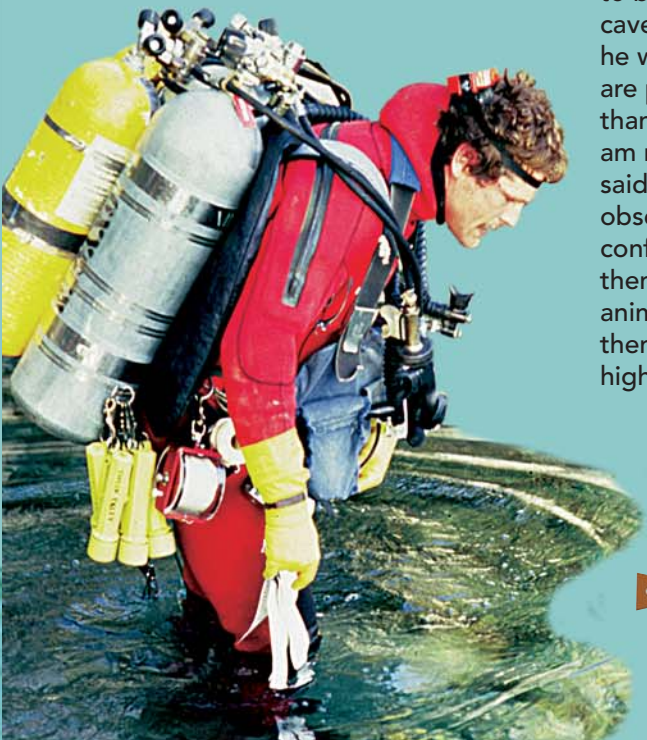
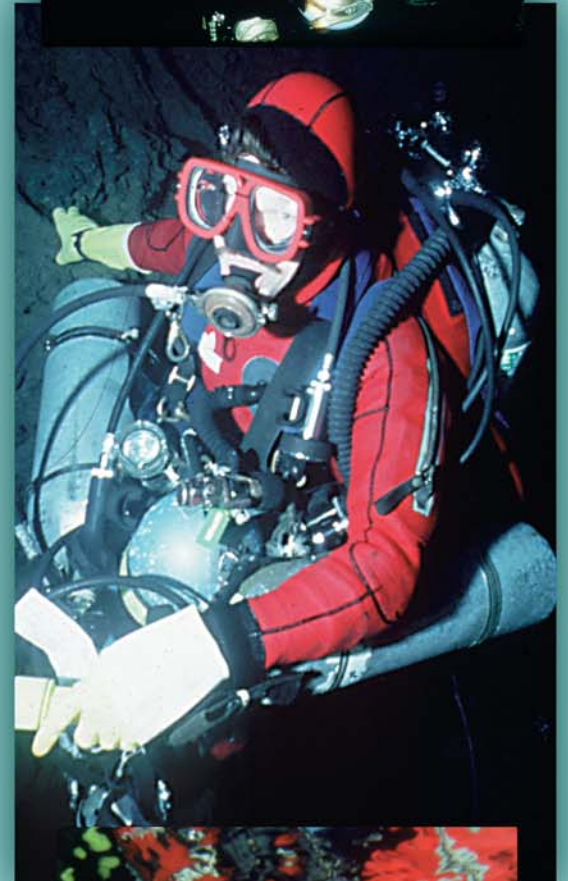
I first met Shek in 1988 when he was making his world record dive to 780 feet / 237 M in Nacimiento Mante, another deep spring in Mexico. He was alone in that great beautiful system. His support team of three was waiting his return. In this egomaniacal discipline of cave diving, it was

refreshing to see a man accomplishing the impossible without the fanfare and entourage that we so often see in much lesser endeavors. Perhaps the bond we formed as dive partners was because so much of our diving history had been solo. We worked together, but the dive was our independent effort. Space and time separated our major efforts. We needed the focus that comes from being independent of others and masters of our own destiny.

Shek took little advantage of his fame as the deepest diver. He was a modest individual, a gentleman, respectful of his colleagues and fellow cave explorers, both wet and dry. It is an unfortunate truth that the greater your accomplishments, the greater the opposition and animosity. Still, I cannot remember him ever saying a bad word about anyone. There are so many critics with an acute case of the Jehovah Complex, wanting to save us all from ourselves. I am sure that he had reservations about some of his critics and the bad manners that seem to be so much a part of the cave diving community, but he would softly say, "They are probably better divers than I am" and let it go at that. I am reminded of Mark Twain who said, "Indecency, vulgarity, obscenity — these are strictly confined to man; he invented them. Among the higher animals there is no trace of them." Shek was, indeed, a higher being.

Perhaps the greatest complement to an individual's lifetime of accomplishments is in the respect of his peers. The

Continued on Page: 41



INTERVIEW TERRENCE N TYSALL

FOUNDER / PRESIDENT CAMBRIAN FOUNDATION

June of last year the Navy research vessel, Kelly Quest, sat at anchor above the historic Civil War wreck of the U.S. Monitor. On board were divers from the Navy, NOAA and the Cambrian Foundation. The only thing more exciting than being chosen as a diver on this expedition was trying to track down the elusive Terrence Tysall, founder and president of the Cambrian Foundation, and keeping him still long enough for an interview. It was truly a joint effort that required four extremely large, muscle bound Navy hard hat divers with the ship's cook guarding the exit.

Terrence is a true leader with the drive and ability to get the job done. Always full of energy and enthusiasm, he is continuously gathering divers, boat captains and broadcast companies for research explorations around the globe. Working side by side with government officials, he is a ready guardian for our ocean environment.

ADM: What got you into diving?

TNT: My uncle and Jacques Cousteau. My uncle was a SAR [Search and Rescue] swimmer in the US Navy. He told me stories about Navy frogmen that, of course, caught my interest. Also Jacques Cousteau specials on TV fascinated me. From the moment I saw them, I knew I would have to learn to dive and participate in adventures like I saw on television. I never missed a show.

ADM: What is your favorite kind of diving?

TNT: Whatever I am doing at the moment.

ADM: How long have you been diving?

TNT: Since I was eight. Twenty-four years. My uncle and my brother introduced me to scuba diving. I'll never forget my first breath on scuba.

ADM: What is your military diving background?

TNT: I was a sonar tech in the US Navy, and I was fortunate enough to work with the Navy Special Warfare community.

ADM: I understand you hold a number of diving records. What are they?

TNT: I don't to my knowledge, at least not things that are listed in the record books.

There are places and wrecks where my dive buddies and I have been the first divers to have the privilege to visit. But

as for records, I wouldn't know about that.

ADM: What about your dive to the Edmund Fitzgerald in Lake Superior?

TNT: Mike Zee and I feel fortunate to have participated on such an incredible expedition. We had hoped to conduct a series of dives on the site, but the famous Lake Superior weather had other things in store. The most lasting impressions of the dive would have to be the cold, the darkness, and of course how incredibly isolated you

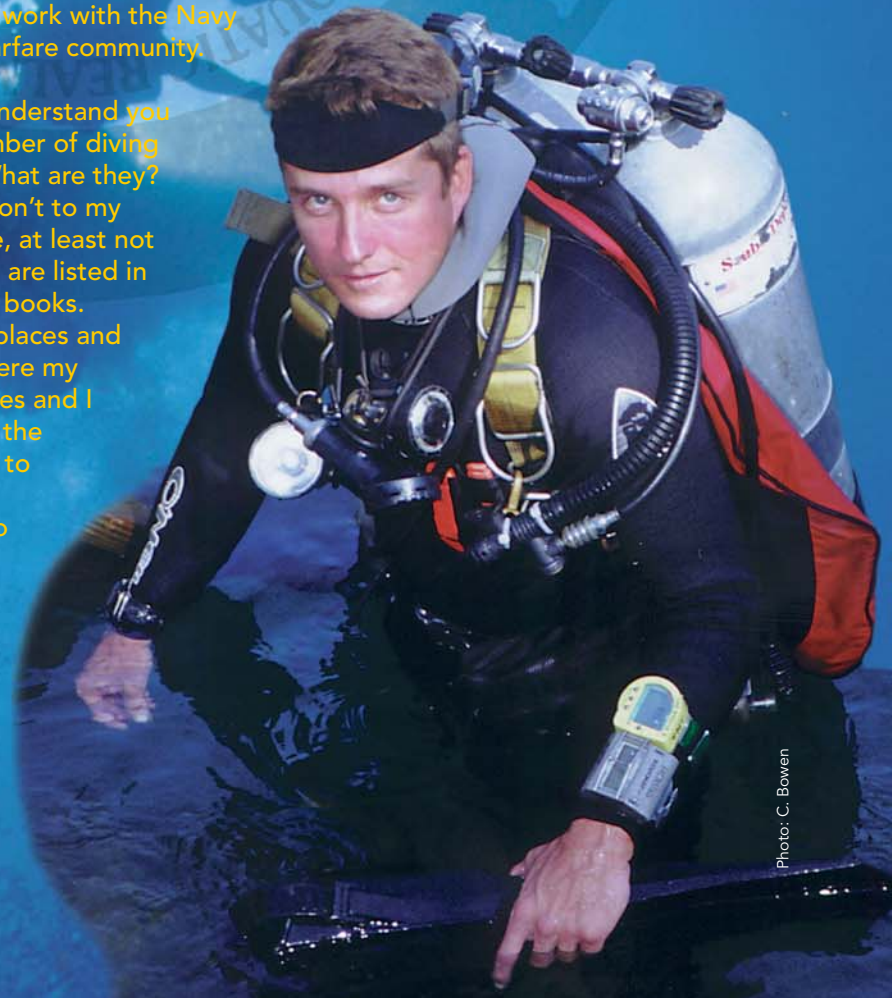


Photo: C. Bowen

feel from the rest of the world in that deep dark lake.

ADM: What is your deepest dive to date?

TNT: 600ft. It was a boring tune up off of the Florida coast. We were extending depth ranges feeling out the physiology so to speak.

ADM: What do you consider to be your most challenging diving project to date?

TNT: The next one. Once they are finished you look back and learn what must be done for the next one. It goes along with the old adage "the only easy day was yesterday!"

ADM: What did you do when you got out of the military?

TNT: I worked as a marine mammal trainer in Busch Gardens, Tampa and was quickly hired to work at the Dolphin Research Center in the Florida Keys as a member of the Mammal Staff, a trainer. I was there for almost three years. From there I realized that I needed to pursue diving full time.

ADM: What is the Cambrian Foundation?

TNT: The Cambrian Foundation is a 501C3, federally recognized not-for-profit organization dedicated to research, education, preservation and exploration of the aquatic realm. While this is a very broad mission statement, our projects try to leave an aquatic legacy to our children and our children's children. For example, our project on the Civil War iron clad ship, the U.S.S. Monitor, is trying to preserve and recover this historic wreck so that it will not be lost to the elements. It is said that there were 40 patentable items on the U.S.S. Monitor. We know of two, one of which, the Captain's head or toilet, was recovered by Cambrian Foundation divers on our educational expedition last July. The expedition to Belize in 1997 is

still producing information for the scientists and geologist throughout the world. During just that one expedition we conducted cave surveys, speleothem and core sampling, not to mention Doppler studies, pseudomonas bacteria growth studies, and many more. It's just incredible what you can learn on one of these expeditions!

ADM: Why did you form the Cambrian Foundation?

TNT: Originally it was an offshoot of the Bikini Atoll community diving program, a proposal to the Bikini people concerning the management of their significant submerged resources of their home island. Our intent was to teach indigenous peoples to teach their own populations so they would be better able to manage those resources themselves. We were marshalling our resources for that project, [and] it was suggested to us that we form a nonprofit organization to help give legitimacy to the project and also to give a tax benefit to those that were helping us.

ADM: What is the Cambrian Foundation's unspoken mission statement?

TNT: Teaching people to work together. A year ago no one would have believed that a civilian organization would be working side by side with the US Navy and NOAA from their vessels. Even the NOAA officials thought we were very close to crazy when we proposed this. We have shown that we can both work side-by-side and get other organizations to work together in a fluid manner. Getting groups or





By: Michael Garman

There it sat, just over 2,000 feet from the entrance. A virgin tunnel waiting to be explored. The original explorers of the cave system, Brett Hemphill and Rudy Sturm, had taken a quick peek into the tunnel. They had seen a white layer in the water that resembled the hydrogen sulfide-rich waters commonly encountered in many stagnant, water-filled sinkholes. Therefore, they considered this side tunnel a dead end and continued their exploration forward along the main line.

Brett and Rudy asked my wife, Sherry, and I to take a look into the side tunnel during one of our research dives. We made the first exploration dive into the side tunnel in April 1996. We tied off an exploration reel to the main line and swam into the unknown. We were apprehensive as we saw the white layer in the water ahead. I expected to be assaulted by the noxious taste of hydrogen sulfide as the toxic gas perme-

ated our skin and regulators. The layer appeared thick. Maybe it would cause numbness in our lips and tearing of our eyes. An unpleasant thought over 2,000 feet from the entrance.

To our surprise, there was no noxious taste or side effects. We were floating above a swirling white "cloud." We were mesmerized by the patterns created in the flowing spring. Five hundred feet into the tunnel, I tied off the reel and turned the dive. We exited the tunnel slowly as visibility was obscured by the swirling cloud, which had been stirred by our fins on our way into the tunnel. Occasionally, a crayfish, disturbed by our exhaust bubbles, would dart to safety behind its haze. The tunnel resembled what we imagined a dragon's cave might look like filled with dragon's breath. So, we named the tunnel the Dragon's Lair. And we set out to uncover the mystery of the cloud: What was it? And where did it come from?

The Spring

A slick on the surface of the Gulf of Mexico marks the location of Crystal Beach Spring. Here, fresh water from the Florida aquifer spews from a rocky depression 18 feet below the surface. The rocky, barnacle covered entrance is a stark contrast to the sandy, grass covered bottom surrounding the spring basin. The cave system is guarded by three no-mount restrictions that lead to the Fitting Room. The Fitting Room is a 7-foot tall, 10-foot wide room, located at a penetration of 80 feet and a depth of 40 feet. In the Fitting Room, divers don the tanks that they have pushed and pulled through the no-mount restrictions. From this point forward, the system can be negotiated with back-mounted double tanks.

The first 1,250 feet of the cave system is known as Thunder Road as the rumble of outboard boat motors and jet skis cruising the intercoastal waterway overhead

can be heard by the divers in the cave system. The walls are carved from beautiful white limestone and decorated by the dark brown, iron-rich mineral goethite. The maximum depth is 55 feet, and there are a wide variety of faunas. Feathery hydroid colonies are attached to the ceiling, walls, and rocky areas of the floor along with mussels that appear out of place. White cave crayfish can also be seen actively crawling among forests of hydroid colonies. If you take the time to look closely, you may even see small hydrobid snails on the rocks among the mussels and hydroid colonies.

The first large room in the cave system, at a penetration of 1,250 feet, is the R and B Room, named after discoverers Rudy Sturm and Brett Hemphill. Mussels cover the walls of this room. Here the cave drops from a depth of 55 feet to 95 feet. Small vents in the floor of the room discharge saltwater from the Gulf of Mexico at high tide. The rocks on the floor of the room are covered by large hydroid and entoproct colonies up to a foot in length. The entoproct colonies have a structure resembling sea fans.

Leaving the R and B Room, you pass through two smaller rooms before reaching the Bypass Tunnel. The Bypass Tunnel is a large hour-glass shaped tunnel that allows divers going farther into the system to bypass a 50-foot long restriction that is too small and silty to accommodate scooters. The restriction was assumed to be the only passage leading to the farther reaches



Divers Left to Right: Shane Moore • David Reichert • Sherry Garman
Brett Hemphill • Rudy Sturm • Michael Garman

of the cave system until Rudy discovered the Bypass Tunnel, which had been hidden by a rock outcrop. This area of the cave system is interesting because it marks the maximum extent of saltwater intrusion during the highest high tides that occur monthly during the new and full phase of the moon. This coincides with the maximum penetration of the hydroid colonies, indicating that the hydroids depend on the periodic siphoning of saltwater into the system for the nutrients necessary for their survival.

The Bypass Tunnel ends back at the main line. Here the tunnel is a series of short bedding plane restrictions separating small rooms. In this area of the cave, the mussels gradually decline in numbers. By the time you reach the "T" in the line leading to the dragon's Lair the mussels are no longer present. Apparently, there are changes in the water chemistry or nutrient

availability between the Bypass Tunnel and the dragon's Lair.

The Secrets of the Dragon's Lair

The beautiful swirling clouds of the Dragon's Lair continually beckoned us to return. Brett, Rudy, Sherry, and I were able to capture some of the alluring beauty of the Dragon's Lair on videotape. In fact, nature filmmaker Shane Moore was so captivated by the video of the Dragon's Lair that he completed cave training and certification and practiced in the springs of North Florida in order to have the opportunity to observe and video this phenomenon himself as part of a documentary on the springs of Florida.

Some of the first clues to the identity of the cloud came when we borrowed a Hydrolab that would continuously measure pH, salinity, oxidation-reduction potential, temperature and dissolved oxygen

Surface boil of spring water on
the Gulf of Mexico

concentration during a dive. The Hydrolab was clipped to the top of a scooter and taken on a series of dives into the Dragon's Lair. Once in the Dragon's Lair the instrument was swum through the cave and slowly taken from the ceiling through the cloud to the floor. The results were astonishing. Below the cloud a razor thin halocline-thermocline separated the spring

water (76 degrees F, 1 part per thousand (ppt) salinity) from warmer saltwater (78 degrees F, 32 ppt salinity) below. In addition, the saltwater was slightly acidic with a pH of 6.8 (normal ocean water is basic with a pH of about 8) and had an oxidation-reduction potential less than zero, indicating reducing conditions devoid of dissolved oxygen. This contrasted to the

freshwater, which had a pH of 7.3, a positive oxidation-reduction potential, indicating oxidizing conditions, and a dissolved oxygen concentration between 1 and 2 milligrams per liter (mg/L).

This type of environment is ideal for chemolithotrophic bacteria, which uses reduced compounds such as hydrogen sulfide as an energy source for growth. This



Sherry Garman in the Fitting Room getting ready to don her doubles.



Hydroids growing from dark brown goethite on the floor of Thunder Road.

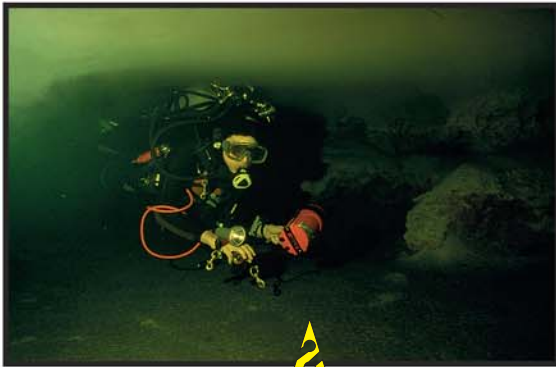


Russell Hannon (left) and Michael Garman at the Crystal Beach boat ramp getting ready to head to the Spring with the Zodiac fully loaded.

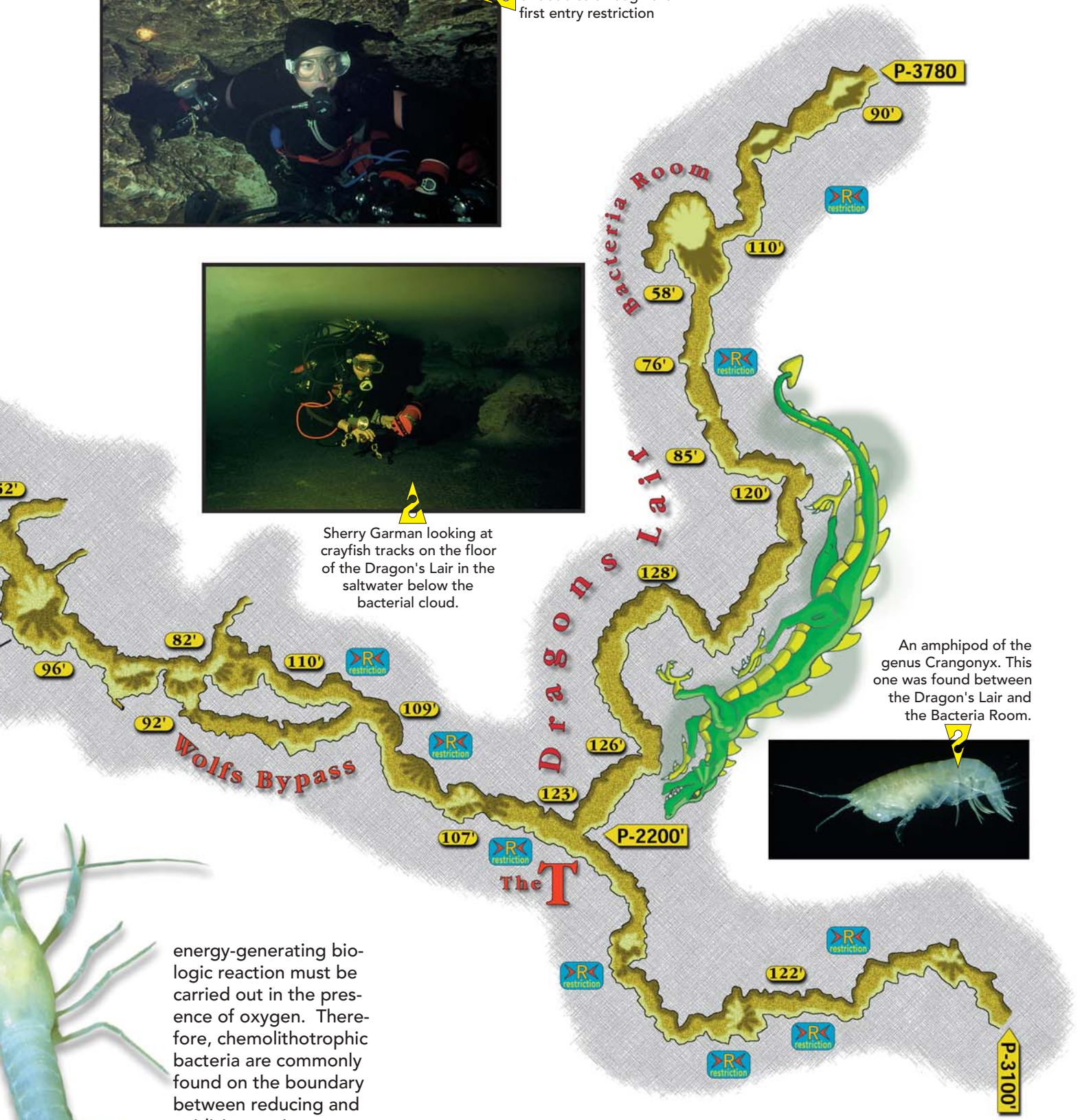




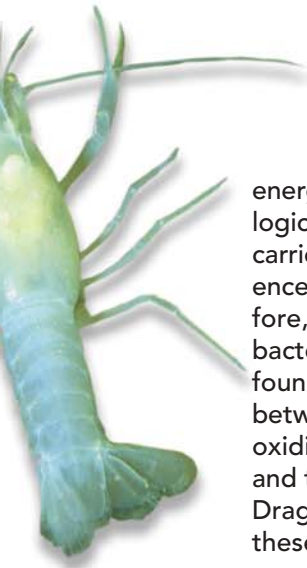
Sherry Garman pulls a set of doubles through the first entry restriction



Sherry Garman looking at crayfish tracks on the floor of the Dragon's Lair in the saltwater below the bacterial cloud.



An amphipod of the genus Crangonyx. This one was found between the Dragon's Lair and the Bacteria Room.



energy-generating biologic reaction must be carried out in the presence of oxygen. Therefore, chemolithotrophic bacteria are commonly found on the boundary between reducing and oxidizing environments, and the white cloud in the Dragon's Lair is one of these boundaries.

Next we were carried sterile syringes in PVC tubes back to the Dragon's Lair in order to collect samples of the cloud. The samples

LIFT BAG



Recovering artifacts from underwater requires a basic knowledge of salvage technique, finesse and force. Whether you want to salvage a porthole, anchor or the entire ship, you must plan how to make your recovery and have the power to do it. Liftbags are the workhorses of underwater recovery.

Lifting objects off the bottom may seem simple, but there are always risks involved. A heavy artifact can be sent plummeting back to the bottom if a line should break or come loose. At the same time the lift bag will shoot to the surface clearing a path of divers or equipment that may be in the way. Divers should never position themselves anywhere in the water column, above or below an object being lifted! Lines and clips can easily entangle a careless diver causing serious injury or death. And controlling the buoyancy of the bag during ascent is imperative. If air is not vented, it will expand as it is brought to the surface and can get out of control. If too much air is vented, the object can be sent back down.

LIFTBAG OPERATIONS

Lift Bag Sizes and Types:

There are several different styles and sizes of lift bags for different applications. Recreational open-end bags usually have a lifting capacity of 50 to 250 pounds. Commercial open-end bags range in size from lifting capacities of 150 to 75,000 pounds or more. Commercial pillow bags have lifting capacities from 500 to 75,000 pounds or more. And specialty bags, such as pontoons, are often designed for specific jobs.



Several questions you should ask yourself when planning a salvage operation:

How much does the object weigh?

Determining the exact weight of an object is often very difficult if not impossible. Calculate as best as you can what the object would weigh on land, and bring at least that much lifting capacity. Often objects that have been submerged for long periods of time will fill up with mud and silt that will also need to be lifted. Beware! This sediment may shift or fall out of the object while it is being moved and can cause substantial weight loss or imbalance. Be prepared at all times for possible runaway bags.



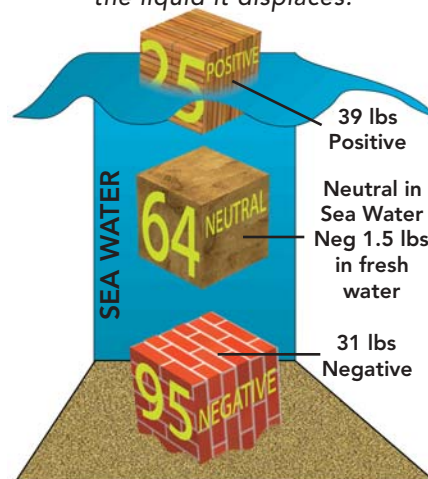
An object immersed in a liquid, either wholly or partially, is buoyed up by a force equal to the weight of the liquid it displaces.

How many lift bags will be required to lift the object safely?

The size and shape of the object, such as a car or boat, will determine how many lift bags should be used and where to position them for a controlled lift to the surface without capsizing the object.

How deep is the object?

If the object is in shallow water, 15 feet or less, pillow bags will be needed to raise the object. Pillow bags can be positioned to cradle the object and may even be used to lift it completely out of the water. In deeper water, open end bags can be used for better control as the bag rises from the bottom, but these may leave the object hanging several feet below the surface because of the lengths of the ropes used attach the bags. Once the object has been raised using an open-end bag, additional pillow bags can be positioned under the object to lift it completely out of the water. Pneumatic boats can also be used to surface the object by maneuvering them below the object and inflating the pontoons.



Continued on Page: 34

CAVE SOFTLY

Aerial View of Cow Springs
Front Cover



By: Shelley D. Orlowski



As divers, we have all seen the beauty of the underwater world. It is this beauty that draws most divers to go under water in the first place. Jacques-Yves Cousteau and National Geographic specials brought the underwater world of coral reef and colorful fishes into our homes and beckoned us to come and see for ourselves. Some divers become bored with all of the “pretty fishes.” They search for other underwater mysteries — caverns, caves and wrecks — that offer new challenges. I was bored with the “pretty fishes” to start with. It was the first video I saw of cave diving that drew me in, with its pristine limestone formations and tunnels eroded bit by bit over millions of years.

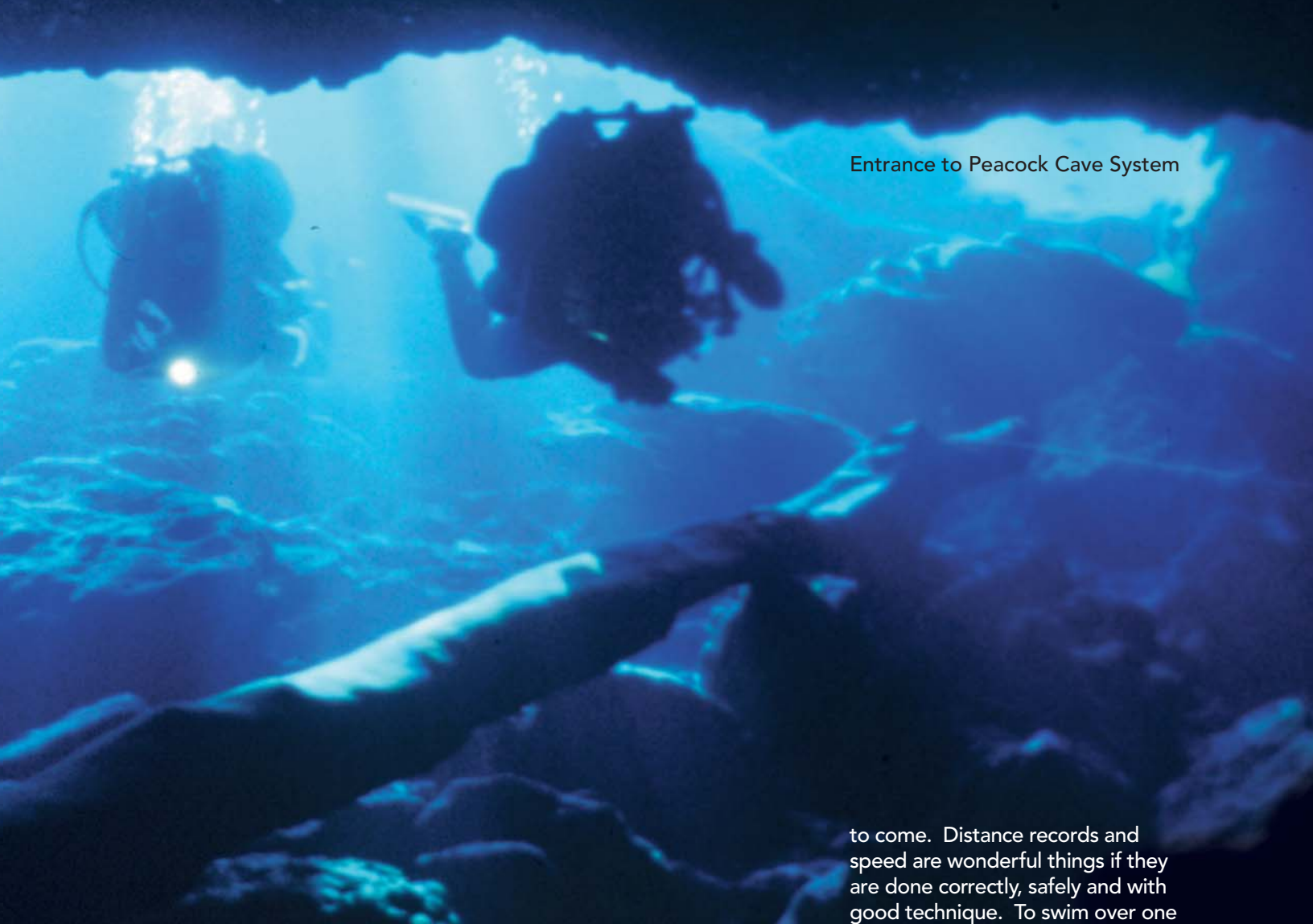
You too have been lured to the caves and are certified to dive in an overhead environment. Think back to the first few dives that you did. Remember the beauty and awe that filled you on your first look

back at the cavern entrance. Recall the rays of sunshine spilling through the cavern zone, the clarity of the water, the silhouette of the other team of divers as they entered the cavern. Remember thinking, “This is why I’m here.” Remember the feeling of peace and tranquility that filled your soul as a witness to the wonder of Nature.

We were taught in our cavern and cave classes that good equipment, streamlined gear configuration and a mature attitude were needed for this type of training. We were also taught that technique was important, not only to decrease our air consumption and reduce drag, but also to keep the system clean. “Take nothing but pictures. Leave nothing but bubbles. Kill nothing but time.”

It seems that more and more emphasis is being placed on

distance records, speed and specific brands of equipment. Whatever happened to pride in one’s technique? Now when someone asks if a team was in a certain tunnel, it is probably not because they saw a jump or gap reel, but because of the amount of silt there is still hanging in the water column. We have all seen the blatant destruction of our caves. The initials “BOG” carved into the rock in several North Florida caves. “REST AREA” carved into an outcropping in the Peacock system. “STEFAN” cut into the clay with letters a foot high in a French cave. We have all seen this kind of destruction, and the outcry against it has received much attention. But what about the more subtle kinds of destruction?



Entrance to Peacock Cave System

What is subtle destruction? Subtle destruction is the damage that is done with a careless fin kick, buoyancy control that is not controlled, and overall bad technique. The greater the number of certified cave divers, the more traffic the caves will see. So we must all do our best to conserve the beauty and integrity of these systems.

Cow Springs has recently been acquired by the NSS-CDS, and they have established certain rules for the system. One of these rules states that only Full Cave certified divers are allowed in the upstream tunnels. This was done to protect some of the tremendously magnificent stratified clay banks. Unfortunately, even the establishment of these rules has not stopped the damage. Bonnet Springs is another system with special restrictions. To

dive Bonnet you must be Full Cave certified, have a hundred cave dives and be guided by someone who has been there before. The increase of traffic in Bonnet in recent years has produced scars in the clay that can never be removed. These scars are enough to bring tears to the eyes of someone who remembers the original beauty of this system.

I ask all of you the next time you are in a system stop and look to see the subtle destruction. Count the little rocks on the floor from when someone banged the ceiling. Look at the brand name of the fins imprinted on the floor. Smooth out the handprints and fingerprints left in the clay. Improving our technique should be an ongoing task. It is our responsibility to protect the beauty of our caves and to keep them beautiful for other divers and the divers of generations

to come. Distance records and speed are wonderful things if they are done correctly, safely and with good technique. To swim over one hundred feet a minute is no big deal. But to swim one hundred feet a minute without leaving a silt trail or damaging the cave is something to be proud of.

When you are cave diving stop and look back. Are there little pieces of rock tumbling off the ceiling and walls? Is there a silt cloud following you? Ask your buddy to help you with some constructive criticism. There is no such thing as the perfect cave diver, although some of us would like to think so. However, that is no reason not to strive for perfection. Watching a good cave diver is like watching a good ballet. They are poetry in motion. That is something we should all strive for.

Dive Safely and Cave Softly.

Shelley D. Orlowski IANTD IT #233
NACD I-108•BOA IANTD

Part One

ARTIFACT PRESERVATION BONES



Not all desired artifacts are man made. Prehistoric remains of mammals, reptiles and fishes are often found in silt mounds, rock layers, caves and ocean floor sediments. These fossils can either be rock hard or, if trapped in the soft clay layers, extremely fragile. Without proper

excavation and preservation these artifacts can deteriorate quickly leaving nothing but a pile of bone chips. As with any artifact recovery and preservation the main word is "Patience"!

Excavation:

Underwater excavation of fossil materials is considerably harder than surface projects because of their environment, poor visibility and dive time restrictions. Unlike bones uncovered on the surface, fragile bones discovered underwater cannot be treated with hardening material or cast jackets while they are being exposed. In some cases just the fanning motion and slight water movement over the bones can destroy them, care must be a priority.

Proper excavation also includes field notes, sketches and sequential numbering of

artifacts as they are being unearthed. As much information as possible should be recorded as to how the fossils were positioned. This will help greatly with the final reconstruction process. Video of the entire excavation will provide much of this data but additional attention should be taken to record multiple angles of each piece.

Transportation from the underwater site to the preparation table is sometimes very difficult. Just piling the bones in a goodie bag will cause serious damage. Many times fragile bones will require their own container, large ziplock baggies work well for this process. Large trays which allow the bones to be laid out without touching each other is preferred if possible. [see illustration on next page]

Keep all artifacts fully submerged in water until the cleaning process has been completed.

Preparation:

If the bone was removed from sea water, a 21 day salt removal process is required. Cleaning consists of the removal of unwanted rock, soils and stains from the bone. Keep the bone wet during the whole cleaning process, drying will harden clays making them difficult to remove. Soak the bone in a mixture of 50% denatured alcohol 50% water for several minutes to soften any soils. Remove from solution and soak in 100% denatured alcohol. With dental tools and a tooth brush remove unwanted materials. Some stains can be removed

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with Hydrogen Peroxide or a light citric acid. Place clean bones in a dryer for several days or allow to air dry for ten or more days. Denatured Alcohol can be purchased in any professional paint supply store in large quantities.

Hardening:

Bones at this point can be very brittle and a chemical hardening is required. Two chemicals are required to make the proper hardener.

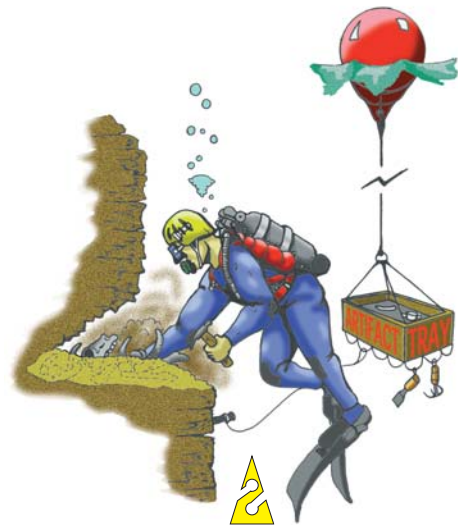
1. Acetone, can be purchased in any professional paint supply store in large quantities.

2. Butvar B-76, if you cannot find Butvar you can use 12 ounces of Duco Cement which can be purchased in a local hardware store.

Mix 1/2 cup Butvar (or 12 ounces of Duco Cement) to 1 gallon acetone and stir well. Submerge the bone completely into the hardener for 2-3 minutes or until the bubbles stop. If the bone is too large for submersion, paint the hardener on with a paint brush. Dry for 24 hours and repeat. Multiple applications of hardener may be required. Allow several days for the final drying.

Note: Many countries and states have laws prohibiting the excavation of archeological sites, please review the laws in your area prior to removing any artifacts.

Part II of Artifact Preservation will cover the correct procedures for preserving Iron and wood. 👍



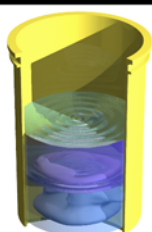
Diver using a float tray which helps to prevent damage of artifacts during excavation and transportation to the surface.



Bone and Ivory Preparation

Artifacts Recovered from Sea Water

DAY 1 - 7



Immediately after surfacing submerge artifact fully in:
50% Sea Water
50% Fresh
Soak for 7 days

DAY 8 - 14



Drain container to 1/2 and refill with fresh water
Soak for another 7 days

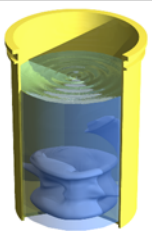
DAY 15 - 21



Drain container fully and refill with fresh water
Soak for another 7 days

Larger objects may require more time to soak.

Cleaning Procedures



Soak in 50% Water
50% Denatured Alcohol
Warning: Denatured alcohol is extremely flammable. Keep in a well ventilated area away from open flame or spark. Read container for additional warnings!



Remove from the 50/50 solution
Place in 100% Denatured Alcohol
Remove unwanted materials with dental tools and a tooth brush.
Hydrogen Peroxide can be used to remove some unwanted stains.

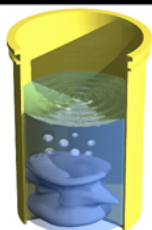
Repeat Procedure if Needed

If bone is too fragile to clean, allow bone to dry and brush on hardener

Place in drying box for 3 - 7 days or allow to air dry for 10+ days

MIXING HARDENER: 4 ounces Butvar B-76 to 1 Gallon Acetone OR 12 ounces Duco Cement to 1 Gallon Acetone

Bone Hardening Procedure



Submerge completely in hardener until bubbles stop. Remove and allow 48 hours to air dry.
Warning: Acetone and Butvar are extremely flammable. Keep in a well ventilated area away from open flame or spark. Read container for additional warnings!



If bone is too large to submerge, apply several coats with a paint brush. Allow to air dry for 48 hours.

Repeat Hardening Procedure Several Times if Needed.

WARNING
Only store chemicals in air tight metal containers.
1 gallon empty paint cans work well.
Store in a well ventilated area away from open flame.

Illustration: C. Bowen

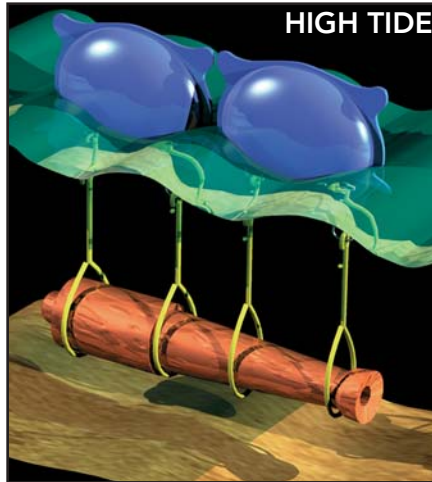
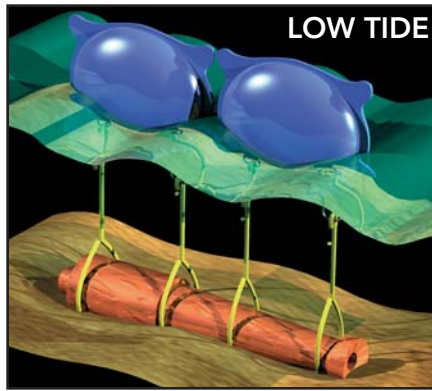


Are there places to securely attach lines?

Time underwater will erode and weaken many convenient tie-offs. Main support frames or beams should be used when possible. If there is no reliable way to affix the lines and structural beams are not usable, you will need to make a cradle of lines and bags surrounding the object from multiple sides.

Is the object stable enough to lift?

Deterioration of the object may weaken it and cause it to break apart under the stress of the lift. This could result in pieces falling off and send a positively buoyant lift bag screaming to the surface. To reduce this risk, use several smaller bags rather than one or two and spread out the stress.



Is the object stuck in the seafloor?

Over time an object may sink into the sea floor and become stuck. Breaking the object away from the bottom can require a huge amount of lift or the removal of a substantial amount of sand or sediment from around the base of the object. (see two illustrations to the left) If the object is located in a body of water with drastic tides, it can be broken free by attaching large lift bags or a boat to the object with very tight lines at low tide. As the tide rises great amounts of lift can be obtained without the worry of a runaway bag. After the object is broken free of the sea floor, it can either be pulled into deeper water if possible or lift bags or lifting lines can then be safely attached to the item while it is suspended a couple feet from the bottom.

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Can the object be brought directly to the surface?

Moving an object horizontal can be complicated. Moving an artifact through decks, hallways, hatches or elevator shafts often takes an enormous amount of time, energy and air, especially if the object has to be moved up and down in the water column to get it into open water. This requires planning, skill and a lot of patience.

Can I get the object onto the boat or will it have to be towed back to shore?

Removing an object from the water can be the trickiest part of the salvage. Remember that the object weighs a lot more out of the water than in it. If the object will be towed to shore and removed at a dock or lifting station several additional liftbags should be secured to the object. These help support the object if some of the lift bags should break free or loose air during the trip in to shore. And be aware of the depth of the object you are towing. A large object hanging under open-end bags may draw 20 feet or more.

What are the current condition?

Mother nature can put a huge burden to any salvage. Strong currents can make placing lines and lift bags like flying a kite in a hurricane. Poor visibility makes tying lines and communication between divers very difficult. Decompression and the need for huge amounts of gas to fill the lift bags hinder deep-water jobs. And high seas place great pressure on the lines and slow the transportation to shore.

Lift bags can do the work of raising an object regardless of its weight, but they cannot think. The planning and safety of a salvage operation is up to you.



LIFTBAG KNOTS

TIEDOWN KNOT

This knot acts like a pulley system allowing loads to be secured very tightly.

BOWLINE

Used to secure a line and is easy to untie

CLOVEHITCH

Used to secure an object tightly

By *Jarrold Jablonski*

THE DEATH OF

Change can come so quickly that sometimes it goes unnoticed. Many divers can remember that, in the not too distant past, groups like PADI marshaled to ban technical diving from the scuba industry's largest annual trade show. And diving leaders were outspoken against it, like *SkinDiver* editor Bill Gleason who led the charge, claiming that Enriched Air Nitrox was Snake Oil. Well, times are changing. Even PADI, a true bastion of recreational training, has an enriched air program. And agencies like NAUI are tugging hard on the purse strings of technical diving. NAUI is going full speed ahead with rebreather, deep air, and trimix training. It does not take a soothsayer to imagine a time when most recreational organizations will cross the technical frontier. This recent change of heart by recreational organizations leads one to ponder these rapidly changing times.

For example, why are organizations, many of whom avoided the hint of technical diving like the plague, suddenly embracing technical diving with a new found fervor? Perhaps less obviously one might ask how these evolutions might change the very fabric of technical diving? For example, what defines technical diving if it becomes commonplace? The activities associated with technical diving (deep, non-standard gas mixtures, overhead environment) have always been a bit out of the mainstream. In fact, it was Mike Menduno's *Aquacorps* that first coined the term, and made its associated activity, more mainstream. *Aquacorps*, a now defunct magazine, was the first magazine to cater almost exclusively to this growing

market. Many diving leaders paid only distant attention as *Aquacorps* and its flamboyant style began a dialogue that openly discussed historically taboo topics. Yet, as the numbers grew and new markets were developed, it became increasingly difficult to ignore their impact. Interestingly enough, this technical diving minority, seemed to be filled with the stuff of market analysts' dreams. While their ranks were small, the technical community contained active divers. They were willing to travel, and they liked to spend money.

One can see evidence of the growing impact of technical diving by reviewing the growth of the companies and services that catered to their interests. Even solidly recreational manufacturers have begun to nip at this unique market. The financial incentives associated with the growth of technical diving bring us full circle and back to the interesting trend of open water agencies starting to embrace technical diving. The more mainstream aspect of technical diving has brought about many changes with multi-gas computers and commonly available rebreathers. How then is the changing landscape of dive training going to impact technical diving? One might naturally assume this change could be for the better as larger organizations bring their financial might and varied resources to bear in the creation of new training materials and a widely expanded market. Yet, others might be justified in their concerns as they ask if these organizations are qualified for such training?

The standards by which one might evaluate the qualifications of individuals or organizations are

fraught with personal opinions and individual bias. Consider some of the unique complications. Diving in general, and more particularly technical diving, is a self-regulated activity, forcing business entities to regulate and thereby limit their own business. Some might argue that this is a bit like asking the fox to regulate the hen house, but in the larger scheme it has met with fair success. Most probably, because it is in the best interest of all training organizations to prevent government intervention, thereby creating added incentive for self-regulation. Yet, we have seen a progressive trend toward easier courses and more streamlined training. Courses appear to be growing shorter and less academically robust every year. The "anyone can dive" mentality propagated by many mainstream recreational groups seems to conveniently impact the fiscal bottom line. The debate over what a student must do to become qualified is a matter of significant debate, but it is an inescapable reality that people grow better with experience. However, it seems to be more the rage to reduce educational time or even more recently to eliminate any specific time requirement.

To be sure, diving on a calm day in warm water on a 30-foot deep reef is not filled with many difficulties. The simplicity of such activities has led to discussions of a coup in novice training, allowing individuals only the most minimal time before they are allowed to begin diving. Some individuals promote the elimination of many fundamentals in the training curriculum. Why waste time with tables when we have computers? And why bother with air sharing if we dive shallow?

TECHNICAL DIVING!

Certainly the declining time requirements associated with recreational training are a discussion unto themselves but this trend will necessarily have an impact upon technical diving. Consider that many leading technical educators already have great difficulty with the low knowledge and skill level of even advanced open water divers. Indeed, many an open water instructor has proven unqualified for certain forms of technical training. A further dimming of dive qualifications in the open water community coupled with the infiltration of recreational agencies into technical diving leads one to ponder the repercussions. Will the fiscal decisions and mass market demands that guide most businesses drag down the qualifications and ultimately the abilities of the technical diving student?

What about the technical

training agencies? The previous discussion has focused largely on the dilemma of recreational organizations entering the technical training arena. This might lead one to assume that some consensus exists as to the superiority of technical training agencies when, in fact, there is at least as much debate over the curriculum of these organizations. A case could be made that these companies are suffering from their own recreational dilemma. While the recreational agencies strive to assimilate the good parts of technical training (continued education, financial rewards and repeat students), technical agencies seem caught in a quest to enjoy the recreational community's strengths (simplicity of training and quantity of certifications). Consider for a moment the seemingly obvious: training agencies make money by training divers and renewing instructor certifica-

tions. The more individuals that move through their programs, the more successful the organization.

How is a person seeking quality training supposed to make sense of the array of promises made by agencies and individuals? The claims to be the best, or of the greatest quality, seem to blend together, leaving individuals to make a sometimes difficult choice. A sensible course of action is to evaluate several personal factors associated with the instructor or agency.

For example: What is the instructor's personal diving history? Unfortunately there seems to be a growing trend of instructors that teach activities for which they have little experience themselves. Even more common is for instructors to have almost no personal time in the activity under question but claim dozens or hundreds of dives that were made in an instructional



DIVER

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D E M A I 9 9 9

setting. Be sure that your instructor does the kind of diving you are considering, and be sure they do so on their own time. This is the only way they can gain the experience that students will actually find useful.

How often should an instructor teach and/or dive? While there are some very good instructors that teach casually (i.e. they have real jobs in addition to teaching) students should strive to get a feel for the time these individuals spend in the water. Instructors with regular jobs have one unique benefit in that they may be less caught up in the business of the certification process and be more inclined to focus on quality instruction. The downside is that their normal job, coupled with their teaching and a daily fitness routine, leaves precious little time for the personal dives that will make them a good source of information. Instructors that do not dive recreationally are not taxing their own ability and are not accumulating the experience that allows them to relay valuable information.

Is the instructor involved in the diving community? While there may be a fair degree of dissidence in the diving community, look for an instructor that is in touch with current trends, techniques, and equipment. Maintaining an active role in the community and/or remaining in touch with current research is a serious obligation and one that too many instructors do not take to heart. Whether your instructor has been teaching one year or 30 years, there is still much to learn. You want to be sure that your instructor is a good source for the most current information.

Does the instructor take their role seriously? Instructors that do not make an effort to remain current with new developments or do not maintain an elevated level of fitness are unlikely to be a very efficient educator. Maintaining a quality educational presence is about much more than an original investment.

Instead it involves a great deal of dedication with regular fitness training, personal diving and academic review. Unfortunately, some educators tend to view instruction as a casual sideline.

Educate yourself. The tricky used car salesman's biggest frustration is an educated consumer. If you are educated then you are likely to be able to sort out the inefficiencies in an instructor's abilities or to seek elaboration on areas that seem in conflict with your information. Regardless of your instructor's ability, you will gain a great deal from a strong period of pre-study.

Do not be fooled by the discount structure. Nearly all individuals understand that in the grand scheme they get what we pay for. Unfortunately this knowledge rarely keeps people from trying to get more for less. Quality instruction is no exception, and educators that play pricing games or offer discount training simply do not value their own time. It is ironic that people will spend thousands of dollars on equipment and travel, yet try to save a couple hundred on an education that could save their lives.

Does the agency matter? The most common recommendation for finding a qualified educator is to ask friends and associates. While this is typically sound advice it leaves one to question the difference between agencies. After all, is not the main thrust of these different organizations better training? Why then would most people contend that looking at the agency is of little relative merit? In truth, most training is fairly similar and the requirements often barely distinguishable. Furthermore, most active instructors teach for a host of different organizations simply to meet different student preferences. The questions prospective individuals should ask about a qualifying agency are not unlike those asked of the individual instructor. In fact, one could ask to what degree the

agency strives to insure their instructors' diving safety, experience, currency, fitness, and professionalism.

Global Underwater Explorers: Why another agency? The perceived decline in educational excellence coupled with a rejection of the conventionally accepted risk of deep air diving has led numerous diving leaders to marshal their support behind a new educational effort. Global Underwater Explorers is a new organization founded by leading educators, scientists, and explorers to redefine the nature of aquatic education. This Cousteau-Society-meets-world-class-instructional-organization has the most stringent educational standards in the industry. As a largely volunteer based organization GUE is not subject to the same instructional concerns that plague typical organizations. While conventional training organizations support their efforts by training divers, GUE is a broad-based organization with a wide range of international research and exploration initiatives. Not only does this free the agency from the financial restraints imposed on other organizations, but this wide educational base also allows students and fellow educators access to an unprecedented educational resource.

What can I do? Individuals can have a positive impact on the educational community by supporting individuals and organizations that demand quality education and by placing a high value on the educational process. Educators and organizations tend to give people what they want and unfortunately people have been led to think they want shorter, less expensive courses. The student/customer is the one most hurt by the growing trend of simplified curriculums. And ironically the consumer is also in the best position to help redefine the nature of aquatic education.

Nature has a habit of seeking the path of least resistance, and yet

the greatest advances seem inextricably tied to the growth found in adversity. The infiltration of recreational agencies into technical diving and the increasing trend of simplified curriculums are clearly a path of reduced effort. However, in their hearts individuals are aware that time and effort are required to produce things of quality. Whether or not the rise in technical diving fatalities, the specter of government regulation or just plain common sense will encourage change in the educational community is yet to be seen. However, regardless of its direction the next decade of diving is sure to be at least as interesting as its defining history.

For more information about curbing the trend toward lax training standards or for details about getting involved in educational and research activities please visit Global Underwater Explorers at www.gue.com.

Jarrold Jablonski is an avid cave explorer, researcher and instructor teaching and diving predominately in the North Florida area. His diving excursions frequently take him to some of the most remote reaches of the planet, including world record cave explorations to nearly three miles (18,000 feet) at a depth of 300 feet. Trained academically as a geologist, Jarrod has founded Global Underwater Explorers (www.gue.com), an elite diver training agency that is heavily involved in international research and exploration projects. He has served as the Training Director for the National Association of Cave Diving (NACD) and on the training committee for the National Speleological Society-Cave Diving Section (NSS-CDS), National Association of Cave Diving, and the International Association of Nitrox and Technical Divers. He has also been a board member of both the NACD and the NSS-CDS. Jarrod has trained more than 1,500 divers while maintaining an active role as an explorer and researcher with thousands of hours in aquatic environments around the world.



Dragons Lair
Continued from Page: 27

were packed on ice and sent to cave diver and microbiologist Dr. Robin Brigmon. In his laboratory, some basic tests showed that bacteria from the cloud had the ability to use reduced sulfur compounds as an energy source for growth. He also found evidence of heterotrophic bacteria, which feed on the organic compounds created by chemolithotrophs and protozoa, one-celled predators of bacteria. These data indicate that the cloud is a small ecosystem based on the energy derived from chemosynthesis, similar to ecosystems found in the ocean's deep hydrothermal vents. This type of ecosystem is interesting because it does not rely on photosynthesis like most ecosystems, which get their energy from sunlight.

It is possible that some of the troglobitic (cave-adapted) crustaceans, including amphipods, isopods, and crayfish, found in the Dragon's Lair feed on the bacterial cloud too. Strangely enough, the silt floor below the cloud is completely covered with crayfish tracks. Apparently, these freshwater animals are able to withstand the saltwater while foraging for food. Another strange discovery below the cloud, was the coating on the walls. An orange biofilm completely coats the walls within the saltwater zone. The biofilm even drapes from rock overhangs creating biologic stalactites. Obviously, there is much more to learn from this cave.

As exploration has progressed in Crystal Beach Spring, more unusual discoveries have been made. The Orange Room, located on a small side tunnel

off the Bypass Tunnel, contains orange colored saltwater rich in diatoms, an algae that forms silica shells and usually depends on photosynthesis for all or some of their energy needs. The Dead Zone is a side tunnel in warm saltwater at a depth below 120 feet. It is devoid of invertebrate fauna but contains bacterial stalactites up to 5-feet long hanging from the ceiling and orange fungal mats 6-inches thick on the floor. The Bacteria Room is similar in size to the R and B Room but contains orange bacterial and fungal colonies that resemble sponges in the nooks and crannies of the limestone walls. As research and exploration continues more discoveries are sure to be made.

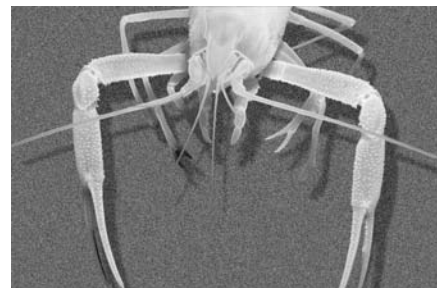
Hydro Geo Environmental Research, Inc. is performing the Crystal Beach Spring research and exploration project. The unique ecosystems within the cave system are being studied as part of my doctoral dissertation at the University of South Florida.

The project is supported by the:

NACD
American Underwater Lighting
Neptune Divers of Largo
Depth Perceptions of Brandon Cochran Undersea Technology

Project information on Crystal Beach Spring and other underwater cave research projects in West Central Florida can be found at:

<http://www.mindspring.com/~hydrogeo>





people to work together to the best of their ability is certainly a plus for the Foundation.

ADM: Where do you see the Foundation going in the short term?

TNT: Community activities, the final reciprocity agreement with NOAA, AAUS [American Academy of Underwater Sciences] acceptance, significant member base increases, and getting the public more involved whether they are divers or non-divers. Project wise: scientific studies in the Bahamas or Belize, and in the Solomons and the Yucatan, growing exponentially and getting the word out, more educational and preservation activities.

ADM: In the long term?

TNT: To be the preeminent aquatic based research / education organization on the planet.

ADM: I understand you are not receiving a salary from the foundation, nor do you pay your most valuable workers. How do you pay the bills?

TNT: I teach, mostly technical classes including cave diving, deep diving, mixed gas classes and gas blending and salvage and logistics. Two other members of the Foundation and I have recently formed a new corporation named Benthic Technologies. Benthic means bottom dweller. We figured it was appropriate.

The main reason we formed it was to completely separate the teaching and other activities from the Cambrian Foundation's endeavors. Hopefully someday soon the Foundation will be able to pay all of our hardworking volunteers a salary, but as for now, one step at a time. The other directors of Benthic (technical instructors, Kyle Creamer from Roanoke, VA and Tim

Gallagher from Fort Collins, CO), share my "aggressive" training philosophy, and also never wanted the Cambrian Foundation to be seen as a training organization. Benthic is a for-profit organization that not only helps pay the bills but also gives us the ability to train government personnel and those from the private sector as well. You can get in touch with us at Benthic Technologies by calling 407-620-5910 and leave a message.

ADM: Since you do what most people consider having fun for a job, what do you consider recreation?

TNT: I have just discovered downhill skiing, skydiving, hiking, mountain climbing and pretty much anything else outdoors.

ADM: What do you consider to be the biggest or most important issue facing the diving industry today?

TNT: Training instructors to teach higher standards. It is getting ridiculous what some instructors are putting out. Putting out well trained students takes a lot of time and hard work and many instructors are not taking the time or getting paid the money to do it correctly. Specifically, on the technical end, the agencies and the instructors are treating it like it is a natural extension in the diving educational progression. Technical diving is a risk that each diver must examine to determine if it is acceptable and then must be trained to the Nth degree and beyond!

ADM: How do you feel about the great increase in the number of instructors and divers entering the technical diving arena?

TNT: I think the technical field is such a minute piece of the pie and more and more instructors are teaching it without the experience to do so. By nature of what they are, a certification agency pays the bills by the

number of certifications. The trend seems to be instructors giving things away, thus lowering the standards. People are shopping for price on a potentially life-threatening activity. It's becoming a Wal-Mart mentality in an arena that cannot allow shortcuts. A student cannot be knowledgeable because he does not have the training. Unfortunately, the student does not know his training was substandard until it is possibly too late.

ADM: If you had to pick one lasting thing you would like people to remember you by, what would it be?

TNT: Two things - first, that I didn't just point out problems, but was a part of the solution, and second, that I left the world a better place for my children.

ADM: What do you think the biggest issues facing the marine

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environment are today?

TNT: Overfishing and pollution. We were hunter-gatherers as a species until we learned better, then we settled down and created cities and learned to farm. This gave us the time to develop culture. We need to get away from the hunter-gatherer mode when it comes to the oceans. Habitat degradation is another factor. Everyone wants a beach house but we must face the fact that we can't all live there.

ADM: We have Green Peace, The Cousteau Society, Earth Island, and Nature Conservancy to mention a few. Is there really a need for another environmental organization?

TNT: This is an obvious answer because I am biased. Yes. We are focused on our most basic resource, water. We do not want to replace these organizations but to augment them. In some areas I feel we can surpass them. No single organization can cover all of the boundaries that need to be addressed. Today the world functions under the sound-bite mentality. Everyone wants quick and easy solutions, the kinds that are solved by the end of an hour-long TV program. As we all know, in the real world it just doesn't happen that way! The issues we face everyday as a species are incredibly complex, so how could we expect the solutions to be less so. We are all going to have to roll up our sleeves and solve them. We have a pretty incredible deal happening on this planet right now with no spares around. Let's fix the one we have! What choice do we really have?

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(See Ad on Page 50)



Sheck Exley
Continued from Page: 21

best diving champions in the world still mourn Sheck. Some of these individuals, like Olivier Isler, were and still are deeply saddened by his absence. What a wonderful legacy because I believe, as Sheck did, that Olivier is the greatest cave diver in the world today. Interesting enough, he too, is a solo actor in his great accomplishments.

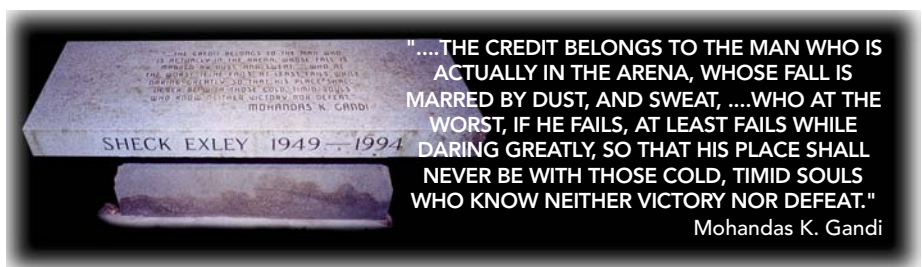
Recently I made a trip to Zacaton to check the water conditions before we mounted a major effort. Standing alone, waist deep in the waters of El Nacimiento, the spring entrance to El Pasajae de Tortuga Muerta and beyond to Zacaton, I noticed that the day was unsettled, stormy, windy, like the day Sheck died. The winds were blowing the palms and gusts swirling in that massive system moved the grass islands like relentless behemoths. I was alone this time, and although I had traversed the cave so many times in the last several years, I found this reminder evoked more emotion than I anticipated. We had such plans to follow our successful dive to the bottom of Zacaton. There were so many places we wanted to dive around the world. This too is my loss. I may yet dive those exciting virgin places but I cannot dive them with Sheck.

Some years ago I selfishly dedicated my life to live my dreams and to never put off the opportunities that are so often relinquished because of perceived obligations and responsibility. When we were invited to go to South Africa and dive Bushmansgat the summer before our dive in Zacaton, I declined,

knowing that I needed to train and that we had a deeper system over here. Besides, I was sure that the future held great promise for us to dive exotic and exciting systems in Yugoslavia, Namibia and other we places we plan to dive after Zacaton. Not joining him in South Africa was a contradiction to my pledge. I put off something dear for another day that will never come.

This tribute to Sheck has been a difficult task for me. I chose to try and show the spirit he possessed rather than to simply chronicle his many achievements. Those achievements are indeed grand, but it was his passion that made them possible. He was an inspiration to us all because of his spirit and passion for his craft. He was a banner for the individual and what one man could accomplish, often against great odds. Historically it is one individual's pioneering breakthrough that leads the rest of us out of the trees. And they often pay a tremendous price for the boon we receive.

Sheck still dives with me on every dive I make. He is discussed around the campfire as if he were still here. I am not a religious man, so immortality to me is in the memories of our friends, the worth of our work, the legacy of gentlemanly conduct and the inspiration that will drive future efforts to accomplish the impossible. Sheck said one night in our camp in Mexico that the greatest complement to a teacher is to have his students go on to surpass all their teacher's accomplishments, to go to greater heights in life, and I would suppose, to greater depths.



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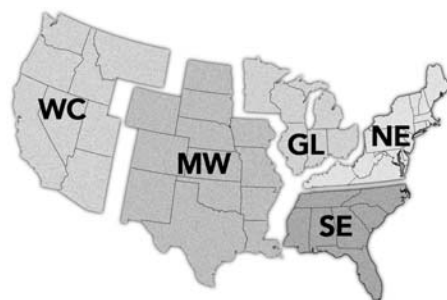
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VIENNA 1873-1892

Whitefish Point, Lake Superior

Heading northwest towards Whitefish Point, the 191-foot vessel Nipigon had two schooners in tow, Melbourne and Delaware. Up ahead, the Vienna was sailing towards her. As the distance between the two vessels closed both captains

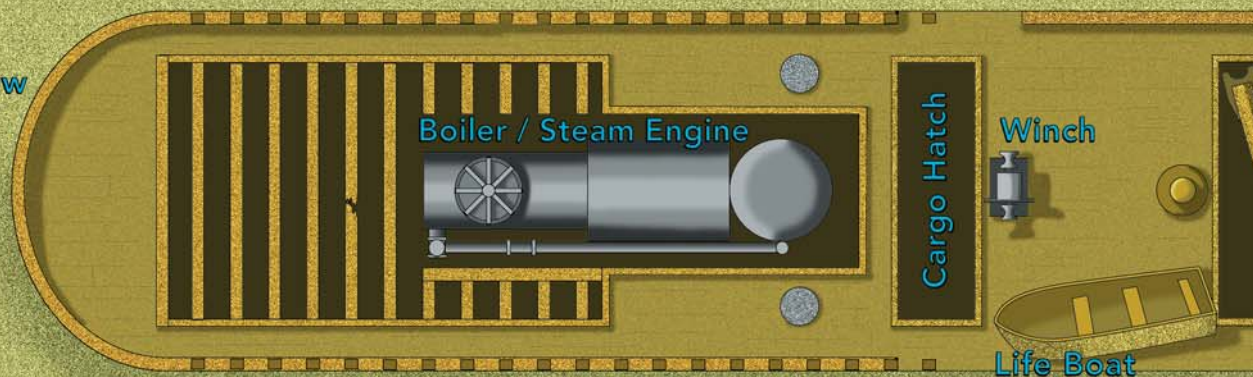
sounded port-to-port passing signals. All seemed to be going well when suddenly the 626-ton Nipigon veered sharply to port crashing into the Vienna just behind the pilothouse.

The bow of the Nipigon sliced deep into the hull of the Vienna

locking the two vessels together. The crew of the Vienna, dazed from the impact, scrambled to the safety of the undamaged Nipigon. Noticing that the two vessels were locked together the captain of the Nipigon attempted to push the Vienna into shallow waters just

By: Curt Bowen

Single Screw
& Rudder



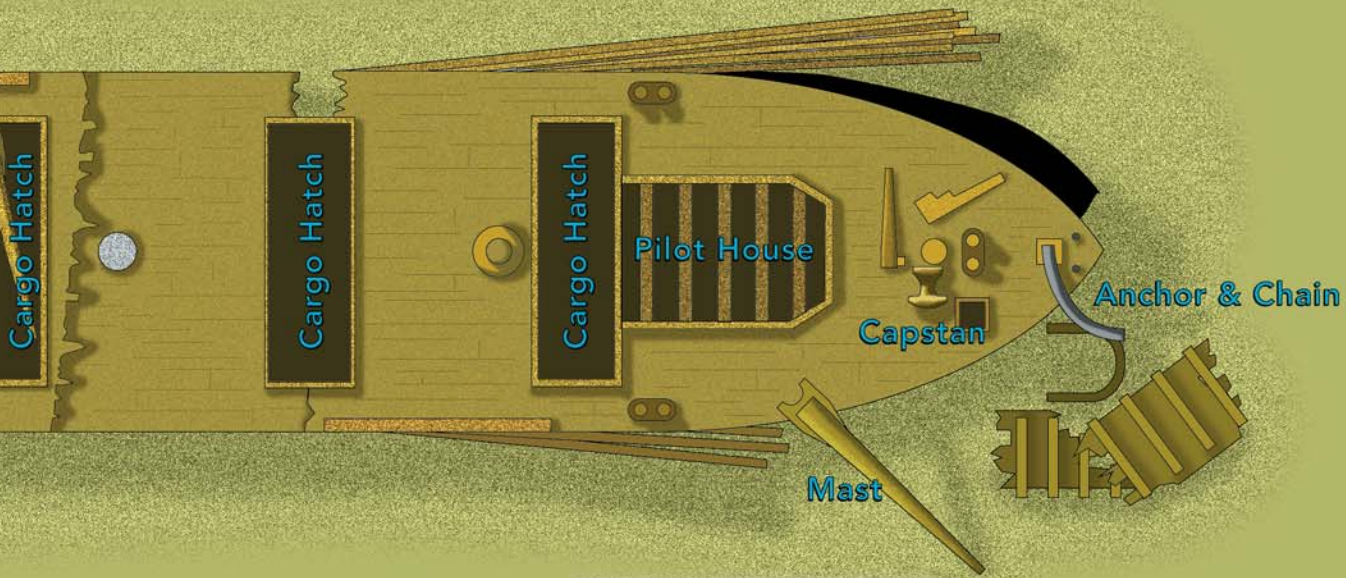
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Shipwrecks of Whitefish Point Lake Superior

Vessel Name	Configuration Wood or Steel	Weight (Tons)	Cargo	Year Built	Date Sunk	Depth (ffw)	Method Sank
John M. Osborn	178 ft. Wooden Steamer	891	Iron Ore	1882	Jul 27, 1884	180	Collision/Alberta
Comet	181 ft. Wooden Steamer	621	Silver Ore	1857	Aug 26, 1875	240	Collision/Manatoba
John B. Cowel	420 ft. Steel Steamer	4,731	Coal, Iron	1902	Jul 12, 1909	220	Collision/Issac Scott
Superior City	429 ft. Steel Steamer	4,795	Iron Ore	1898	Aug 20, 1920	265	Collision/Willis King
Zillah	202 ft. Wooden Steamer	1,100	Yacht	1890	Aug 20, 1926	252	Winter Gale
Miztec	194 ft. Schooner Barge	777	Salt	1890	May 14, 1921	50	Storm
Myron	186 ft. Wooden Steamer	676	Lumber	1888	Nov 22, 1919	50	Storm
Panther	237 ft. Wooden Steamer	1,373	Wheat	1890	Jun 27, 1916	105	Collision/James Hill
Drake	201 ft. Wooden Steamer	1,102	Unknown	1882	Oct 2, 1901	55	Storm
Sagamore	308 ft. Whaleback Barge	1,601	Unknown	1892	Jul 29, 1901	72	Collision/N. Queen
Samuel Mather	246 ft. Wooden Steamer	1,576	Wheat	1887	Nov 22, 1891	195	Collision/Brazil

south of Whitefish Point.

With a shutter the two vessels separated and the Vienna's bow submerged below the surface. As the vessel's bow plummeted towards to lake floor, the force of the water rushing over its hull ripped the crews' cabins free and snapped its mast off at the deck. The bow smashed into the lake floor with such great force that the upper deck was ripped from the hull, splintering the port and starboard sides out like a banana peel. Vienna's pilothouse was ripped from the deck and fell to the lake floor in front of the wreckage. With the bow firmly anchored, the ship's deck and many interior braces cracked in half, unable to support the weight of the stern. The Vienna settled quickly to its icy grave, where it would lay undisturbed for over seventy years.

Curator of the Whitefish Point Historical Society Museum, Tom Farnquest, Lake Superior Dive Charter Capt. Mike Zee and Great Lakes ship wreck explorer Thaddius Bedford contacted

videographer Rusty Farst and myself to conduct an extensive survey of the Vienna for documentation.

The Wreckage lies in 147 feet of freezing, 37-degree Lake Superior water with her deck at 135 feet. The cold alone limited our dive to no more than 45 minutes on the bottom and one hour of decompression. The long decompression was possible due to the late-summer thermocline at 40 feet where the water was almost 60 degrees. The visibility was its normal 15 to 20 feet.

Due to the cold water and limited visibility the survey took five days and 22 dives to complete, totaling 38 1/2 hours of dive time. Air was used as the bottom gas with 100% oxygen for the 20- and 10-foot decompression stops. Argon was used for drysuit inflation. We used standard line survey methods along with hundreds of photos, hours of systematic video and multiple underwater sketches. The information collected gave us an accurate picture of how the vessel sank, locations of key

artifacts and structural deformity, and a good idea of the Vienna's current condition after one hundred and eight years underwater. All the data collected will be used by the Great Lakes Shipwreck Museum to promote the conservation of our underwater shipwreck heritage located around Whitefish Point and the Great Lakes.

Lake Superior is known for its spontaneous gale force winds, high seas, dense fog and crowded shipping lanes. Every ship moving on Lake Superior has to maneuver past Whitefish Point and over the last hundred and fifty years many have been lost due to rough seas, grounding or accidental collision. Below is a list of some of the more popular wrecks located within a few miles of the point.

Curt Bowen is an expert in shipwreck and underwater cave survey, Founder and Publisher of Advanced Diver Magazine, Founder and original Publisher of DeepTech Journal, and NAUI Mixed Gas Instructor Trainer



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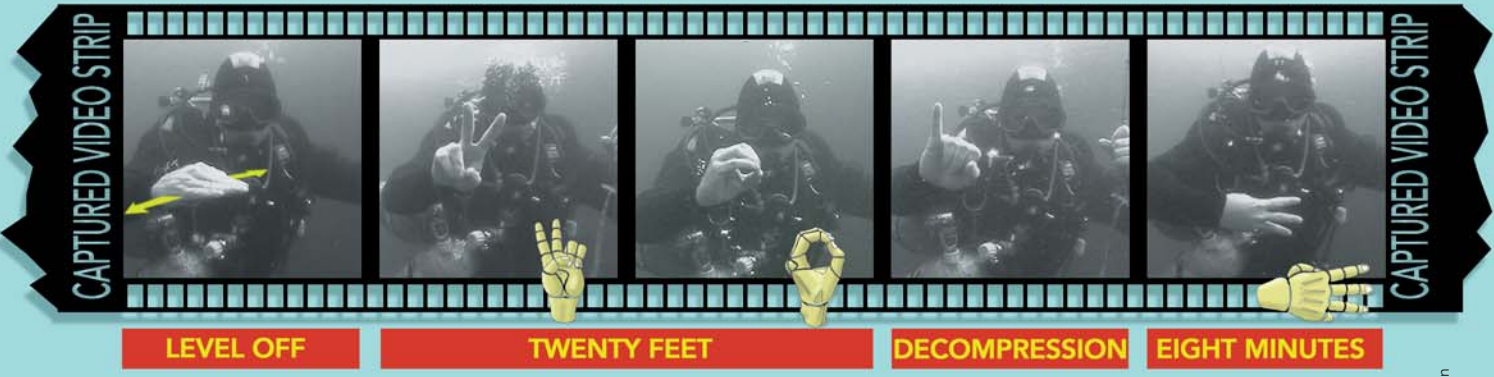
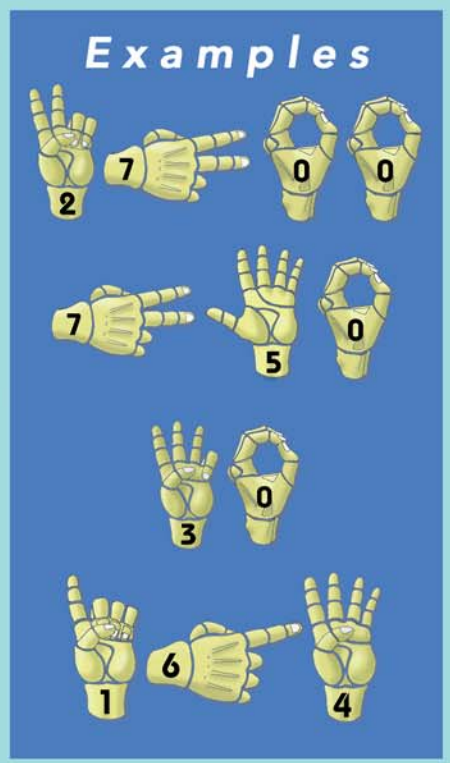
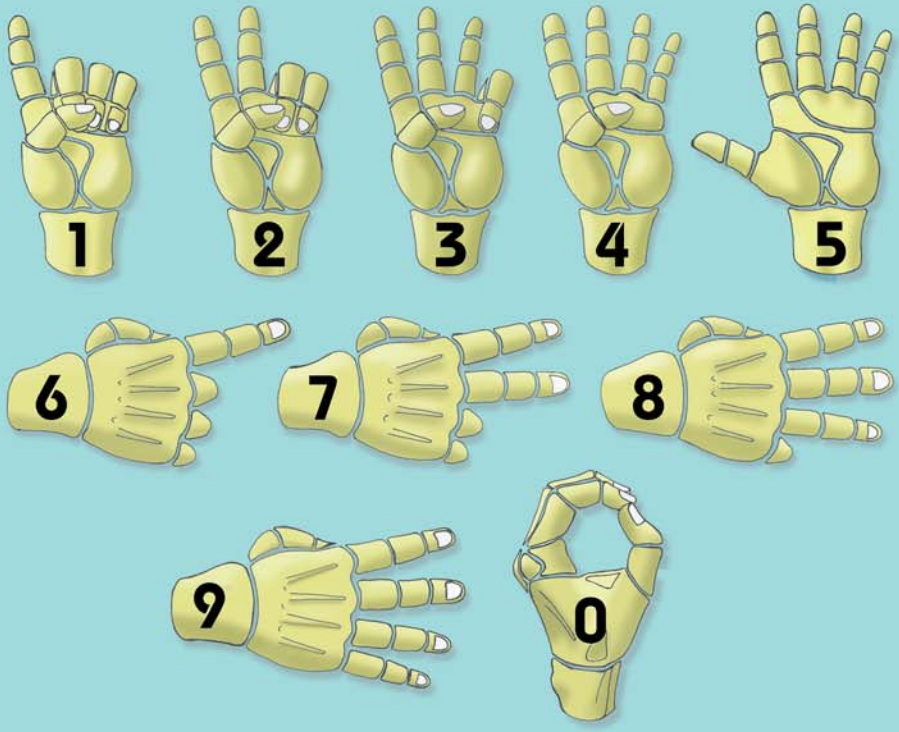
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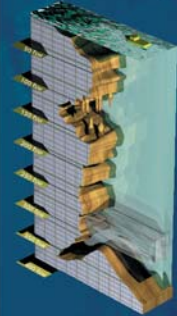
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Shipwrecks of Whitefish Point Lake Superior

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The new NiTek C packs nearly all the features of our standard NiTek into a convenient package that's small enough to wear all the time — just as you would a watch. Among the first things you'll notice about the NiTek C is how incredibly light it is. This is because its case is carved from a solid block of titanium. As with all Dive Rite computers, you access NiTek C functions through the use of two, readily accessible push buttons. The NiTek C is so easy to use, you can quickly get up to speed on its functions by consulting a simple flow chart.

Unique to the NiTek C is its Timepiece Mode, in which it displays date, time of day and day of the week. Because of this feature, most NiTek C owners wear theirs all the time, in lieu of a watch.

For diving, the NiTek C's FO₂ can be set to Air, EAN22 through EAN50, or a Gauge Mode in which it functions solely as a depth gauge and bottom timer. This makes the NiTek C a valuable companion to Dive Rite's NiTek³, providing users with backup depth and time information when making multi-gas dives.



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