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The Forum for North Atlantic Diving

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U - 140

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U - Who

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WE CAN NEVER FORGET

The fear of a nation, their desire to win, their contempt for life; these are what created the U-Boat. Unsuspecting ships traveling with goods and passengers along the Atlantic coast suddenly exploded from torpedo attacks. Seaside towns finally turned their lights off in the evening to allow Allied ships to sneak by the wolfpacks of *Operation Drumbeat*.

The Germans had been experimenting with *Unterseeboots* as far back as 1465 but it wasn't until 1906 that the German Navy officially had a submarine, the *U-1*. Until World War I the U-boat hadn't flexed its strength and power. Seventy-eight years ago this month the *U-21* sank the first warship with a torpedo. During WW I 390 U-boats were built, which ultimately sank 5,708 international ships totaling over 11 million tons. After four years of terrorizing the world Germany fell and lost the war. The end of the war for Germany also meant the surrender of her U-boats.

On September 1, 1939, Germany invaded Poland and World War II was launched. This time Germany was incessant on winning the war. They lay waste to millions of people, obliterated races, tortured and experimented with humans — these atrocities were in the name of the *Führer*.

Although Germany claimed to be unprepared for WW II she had trained sailors during peacetime in U-boat operations and began the war with only 57 U-boats. This wouldn't stop them. By the time the war ended Germany had built over 1,100 U-boats. These were responsible for sinking 148 Allied warships and 2,779 merchant ships a staggering total of over 14 million tons.

This issue of the *Journal* focuses on U-boats along the Eastern seaboard. Unfortunately, noted author and historian Professor Hank Keatts' vacation caused him to be MIA from this issue. We do appreciate his and George Farr's work in *Dive Into History: U-Boats*, an invaluable reference in this issue and look forward to future contributions.

Dan Berg writes about the most popular Northern sub, the *U-853*. Resting in 130 fsw off Block Island the 853 has been producing artifacts and bone-chilling dives for over 25 years. Captain Dan Crowell, the *Seeker's* third diving captain, tells us about the *Mystery U-Boat* found just a year ago off the coast of New Jersey. Ironically it wasn't even identified as a German U-boat when again it took a life.

Barbara Lander heads out with the Clayton-Gentile team and discovers a World War I U-boat, possibly the *U-140*. There will always be pioneers to set the course of history, Clayton and Gentile do it again. Barbara also profiles the first diver on the *Mystery U-boat*, Captain John Chatterton. Warren Mackey is back with a review of *Operation Drumbeat*, a book about the German war on American shipping by Michael Gannon.

We also introduce Dr. Stephen Lombardo — avid wreck diver and instructor. Doc talks about carbon dioxide and the toxicity it can create.

This issue also includes two important letters correcting us from the last issue, a regulator review and a small tribute to those unsung heroes, the dive mates. Kirby's back and no lobster is safe, almost.

As divers, the U-boat has provided us with an underwater array of thousands of shipwrecks. Yet the lives that were lost, the families torn apart and the atrocities of war should never be forgotten. For some these cruelties will remain in their minds forever. We mustn't forget the U-boats either.


Joel D. Silverstein, Editor

U-853

The Tightrope Walker

by Daniel Berg

The *U-853*, which had been nicknamed by her crew "*Der Seiltaenger*" (Tightrope Walker), was a type IXC German U-Boat. Commissioned on June 25, 1943, she was 251.9 feet long, 22.5 feet wide and displaced 740 tons.

On May 1, 1945, Hamburg radio announced that Adolf Hitler was dead. Grand Admiral Karl Dönitz took over as *Der Führer* and immediately began to arrange a surrender. On May 4, with World War II quickly coming to an end, Admiral Dönitz gave the following order "*All U-boats cease fire at once. Stop all hostile action against allied shipping. Dönitz.*"

We're not sure if the *U-853* received his transmission or simply refused to obey his orders. US Naval experts considered U-boat captains among the most fanatical members of the German military and predicted that some would continue to fight despite Dönitz' order.

On May 5, the *U-853*, which had been prowling the waters northeast of Block Island, torpedoed and sank the coiler *Black Point*, killing twelve men. Two minutes later, the *SS Kamen*, a Yugoslav freighter, radioed word of the sinking. Within an hour a US Navy Task Force, which was in the area, began hunting the *853*.

The *USS Atherton* found her within three hours and the attack began. The Navy used Hedgehogs (rocket launched projectiles), depth charges, a total of three ships, and two blimps for the attack. After an assault with depth charges, various bits of debris floated to the surface, including a pillow, a life jacket and the U-boat captain's hat. This was only a trick. The Navy's sonar then caught the sub moving east.

Again and again, in a cat and mouse game to the death, the Navy's sonar would locate the U-boat and the attacks would resume. The first attack had started at 8:29 PM. The Navy continued its assault until 10:45 AM the next day when *U-853* was declared officially dead. The



The grim remains of wartime captured by Brian Skerry.

Navy vessels headed for port with brooms at masthead, the Navy's symbol for a clean sweep.

On May 6, Navy divers from the vessel *USS Penguin* dove the *853* and attempted to penetrate the wreck to recover records from the captain's safe. These divers were using surface supplied air and couldn't easily fit through the tight hatches of the submarine. The next day, Ed Bockelman, the smallest diver on the *Penguin*, volunteered himself for the task. He was accompanied by Commander George Albin. Bockelman was able to squeeze through the conning tower hatch, but the floating lifeless bodies of German crewmen blocked further penetration.

For years after her sinking, rumors spread that the *U-853* had a cargo of treasure on board. One story claimed that \$500,000 in jewels and US currency were hidden in 88mm shell cases, sealed in wax. Another rumor was that \$1,000,000 in mercury was hidden on board, sealed in stainless steel flasks. These rumors have spurred many salvage attempts over

the years, none of which, to the best of my knowledge, have been successful.

Today, the *U-853* sits in 130 feet of water off Block Island. She is sitting upright and intact on a sand bottom. Her hull still contains a variety of German artifacts ranging from china, bottles and gold rings to brass artifacts. Penetration of the wreck is possible but should only be attempted by experienced wreck divers.

Many divers choose to enter the wreck through one of her deck hatches or conning tower hatch. These circular hatches are a little tight but it is possible for a diver to squeeze through them. Please remember that getting in is only half the battle, the real trick is getting back out. The *853* also has a hole in her pressure hull both forward and aft of her conning tower.

Through these openings divers can easily enter the wreck. As on most wrecks, any disturbance and the silt covered floor can reduce visibility.

continues on page 5

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WRECK VALLEY continues

Wreck penetration is not something you can learn from any book or article or even from years of open water experience. You must slowly approach it through adequate experience, training, equipment and a good mental attitude. [Evolution.] The following is an account from one of my earlier dives on the submarine.

While diving with my partner, Billy Campbell, we penetrated the hole just forward of the conning tower. We swam forward room by room, carefully finger walking so as not to kick up any silt. While moving through a hatch between the second and third room I found myself stuck. I tried moving forward but was restrained and when I tried to back out I was still caught. Now this was a little strange because the hatch was plenty big for one diver wearing doubles and a pony bottle, but nevertheless I was stuck.

I was in 130 feet of water and three rooms deep into a submarine. I took a quick glance down and there in front of me were two shoes and two leg bones, one of the sad fatalities of the War. At that moment I thought I would panic, then I caught hold of myself and thought out the situation.

First I checked my air supply, it was fine. Next I started to feel for what had me snagged. Bill, who was behind me, saw I was caught but couldn't get close enough to help. I could feel that the snag was on my left side and high up by my tanks.

With one hand I felt around and found that one of my pressure gauge hoses had caught onto a small pipe. By trying to move forward or backward it would not come free, but by simply leaning to my right it came loose. This whole scenario happened and was resolved in less than one minute. It had caused no panic and my air consumption was still normal. Bill and I turned around and explored more of the wreck as we exited. This time I was lucky.

The *U-853* is one of the most historic and interesting wrecks off Block Island. She has something for everyone. Experienced wreck divers can investigate deep into her interior for artifacts while novice divers can explore the beauty of the submarine's exterior and her marine life way out on eastern Long Island in an area called Wreck Valley.



U-853's crew and officers. Photo courtesy Frank Persico collection.

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FIRST WW I U-BOAT FOUND ?

Story and Photograph by Barbara Lander

Years of research paid off for Ken Clayton and Gary Gentile as they descended through 260 plus feet of water off of the Virginia Capes and the hulk of a wreck appeared. They believe this wreck to be the *U-140*, an American prize of war, scuttled after WW I.

Pandemonium reigned among the experienced wreck explorers still on deck when Clayton, the first to emerge after nearly two hours in the water, spit his regulator from his mouth to announce, "It's a sub." He later confessed to cutting his decompression a few minutes short so he would be the first to surface.

(Not as risky as it sounds since he used oxygen for decompression on an air schedule.)

This was the first dive of an exploration trip planned by Clayton and Gentile. The search area was within an area the Navy used as its Southern Drill Grounds. The numbers coincided with latitude-longitude information Clayton had gleaned from the deck logs of navy destroyers involved in sinking WW I German war vessels.

Only one dive was made on the U-boat, with none of the thirteen divers finding anything that would positively

identify the vessel. Even general identification was a matter of speculation as the trip ended; the narcosis factor left the divers unsure of what they had seen. What was known for certain was that the vessel was large, the hatches were sealed, and no one saw any breaks in the hull. The heavy, water-tight hatch construction indicated a sub, but was it American or German?

A structure that appeared to be a hatch coaming protruding about three feet out of the pressure hull added to the mystery. American subs had coamings that rose about eight feet over the hull; German U-boats appeared to have no coamings.

Clayton and Gentile knew the *U-140* should have been at that location, but what they saw during their dive didn't look like the many U-boat photographs they had studied. A sleepless night reviewing pictures and materials collected in years of research lead them to independently reach the conclusion this was indeed the *U-140*. The explorers theorized that the outer hull and its adjoining catwalk had completely disintegrated, leaving only the pressure hull with few identifying features. Careful evaluation of photographs led Clayton and Gentile to surmise that in this case the coaming was an elongated hatch. The extra length was needed to rise above the outer shell that made U-boats look boat-like.

Another feature that aided the tentative identification was the sheer size of the wreck. None of the divers was able to swim the U-boat from end to end.

The *U-140* was 311 feet long, had a beam of 29 feet, a draft of more than 17 feet and a submerged displacement of 2483 tons. This was huge compared to the U-boats of World War II; for instance, a Type VIIB was about 90 feet shorter with submerged displacement of only 857 tons.

During the next dive you can be sure that divers will be searching for four bow torpedo tubes and two more on the stern. If they can gain entrance to the U-boat's interior, they will be looking for a builder's plaque dated 1918 inscribed "*Germaniawerft of Kiel.*" Little else would

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The Explorers — Bottom row, Alstair Hamilton and Brad Sheard. Top row, Jon Hulbert, Harvey Storck, Rick Culliton, Gary Gentile, Brian Skerry, Ken Clayton, Gene Peterson, John Moyer, Bart Malone, Peter Feuerle and Barb Lander.

remain in the *U-140*; it was stripped of everything that could be of use or study value before the vessel was sunk.

The *U-140* was commissioned into the German Navy March 28, 1918. It had only one war patrol, that to the American coast. On that single patrol the *U-140* flexed its offensive might by sending 30,594 tons, seven ships, to the bottom.

After the war, the *U-140* and five other U-boats were awarded to the United States as prizes-of-war. They toured the United States to promote the sale of Victory Bonds and were scrutinized by scientists, engineers, and naval personnel.

The *U-140* was also called the *U-Weddigen*, after its first commander. It was in the first class of U-boats to be named. An ironic parallel can be drawn between the U-boat's namesake and her demise. Kapitanleutnant Otto Weddigen, of *U-9* fame, was among the first to demonstrate the power of the U-boat as an offensive weapon, heralding a new era of naval strategy. Weddigen accomplished this by sinking three British armored cruisers in less than one hour.

According to Gary Gentile's forthcoming book, *The Shipwrecks of Virginia*, the *U-140* was one of eleven German warships to become embroiled in General Billy Mitchell's efforts to demonstrate the efficacy of air power. The *Dickerson* (DD-157), took one hour and twenty-four minutes to sink the *U-140* with 39 shots, scoring 19 hits. This was a dismal showing for the navy compared to the swift dispatch of the *U-117* by General Mitchell's bombers. The sinking of warships by aerial bombardment heralded a new era of offensive strategy. The eventual result was the creation of an independent U.S. Air Force.

The end result leaves six WW I era

U-boats sunk in American waters. According to naval records and photographs of the sinkings, the *UB-148* lies 600 yards south of the *U-140*; indeed, a yet unexplored mark on the depth finder exists in that spot. Clayton and Gentile have planned another expedition to that site.

The *U-117* and the *U-111* are also off the Virginia coast. The *U-111* is believed to be in 1600 feet of water. (Too deep to dive?) The *UB-88* rests in 300 feet of water off San Pedro, California and the *UC-97* rests unfound in Lake Michigan in water believed diveable.

After 71 years, *U-140* is the first of these U-boats to be found.

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OPERATION DRUMBEAT:

The Dramatic True Story of Germany's First U-boat Attacks Along the American Coast in World War II.

By Michael Gannon. Harper and Row, 1990.

A book review by Warren Mackey



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Operation *Paukensschlag* (Drumbeat) was the code name for the first German assault on maritime commercial traffic in the [North] Western Atlantic during World War II. German U-boats hunting from Nova Scotia to Florida, in the Gulf of Mexico, and the Caribbean during the first six months of 1942 sent nearly 400 ships and thousands of men to Davey Jones's locker, threatening to sever Britain's lifeline of troops and supplies. Operation Drumbeat inflicted far more damage to the United States and Allied war effort than the Japanese wreaked at Pearl Harbor.

The primary focus of Gannon's book is an impeccably researched and well-written narrative on the two action-packed patrols of the German U-boat *123* that resulted in the sinking of eighteen Allied ships. And on its commander, Reinhard Hardegen, who received Germany's highest war decoration, the Knight's Cross. The *U-123* was one of five U-boats which carried out the operation. Gannon recreates conversations and events that allegedly transpired among the participants, interweaving historical facts.

The book gives detailed accounts of U-boat equipment, operation and attacks, and personalizes the crew who operated the *U-123*. The sinkings of the *Coimbra* and *Varanger* as well as many other vessels are described in detail. The author's sources are impressive. They include interviews with Hardegen and other surviving crew members, the *U-123* war diaries, former United States, British, and German military personnel and documents.



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The United States Navy knew from British intelligence that the U-boats were coming to America's East Coast but failed to act on the information. For months there were no convoys; there were few patrols of battleships and airplanes; lights of coastal cities continued to betray ships offshore; departures, destinations, and cargo of merchant ships were announced over the radio. As a result, hundreds of ships and thousands of Allied lives were lost.

The major flaw of the book relates to Gannon's discussion of the Navy's pitiful response to the attack, which does not receive the attention it deserves. The author merely assigns blame, particularly toward Admiral Earnest King, rather than exploring the Navy's poor performance and searching for answers. His conclusion seems judgmental. It is not mentioned that the Pacific war effort took valuable resources from the defense of the East coast, and the author does not consider the time required to gear up defense in the Western Atlantic.

Nowhere in his work does Gannon state that congressional budget allocations for substantial numbers of new ships did not come until 1938 and 1940. And he does not mention that the Navy did not have sole authority to order coastal municipalities to dim or turn out lights. Despite this shortcoming, *Operation Drumbeat*, like the German film *Das Boot* (The Boat), will be of enormous interest to U-boat buffs.

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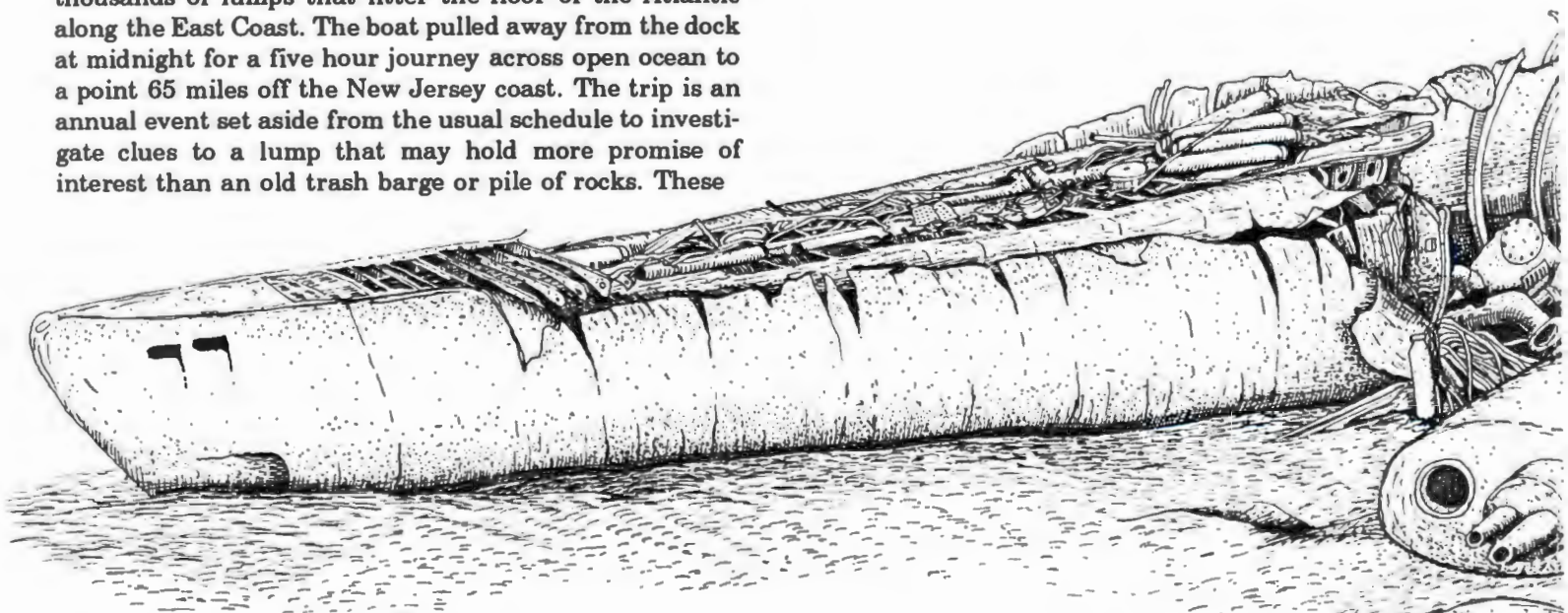
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MYSTERY U-BOAT

Story and Sketch by Captain Dan Crowell

An expedition on September 2, 1991 aboard, the dive boat *Seeker*, left Manasquan inlet to examine one of thousands of lumps that litter the floor of the Atlantic along the East Coast. The boat pulled away from the dock at midnight for a five hour journey across open ocean to a point 65 miles off the New Jersey coast. The trip is an annual event set aside from the usual schedule to investigate clues to a lump that may hold more promise of interest than an old trash barge or pile of rocks. These



clues are usually obtained by trading locations with fishermen, or dragger captains who wish to avoid these lumps so as not to lose their nets.

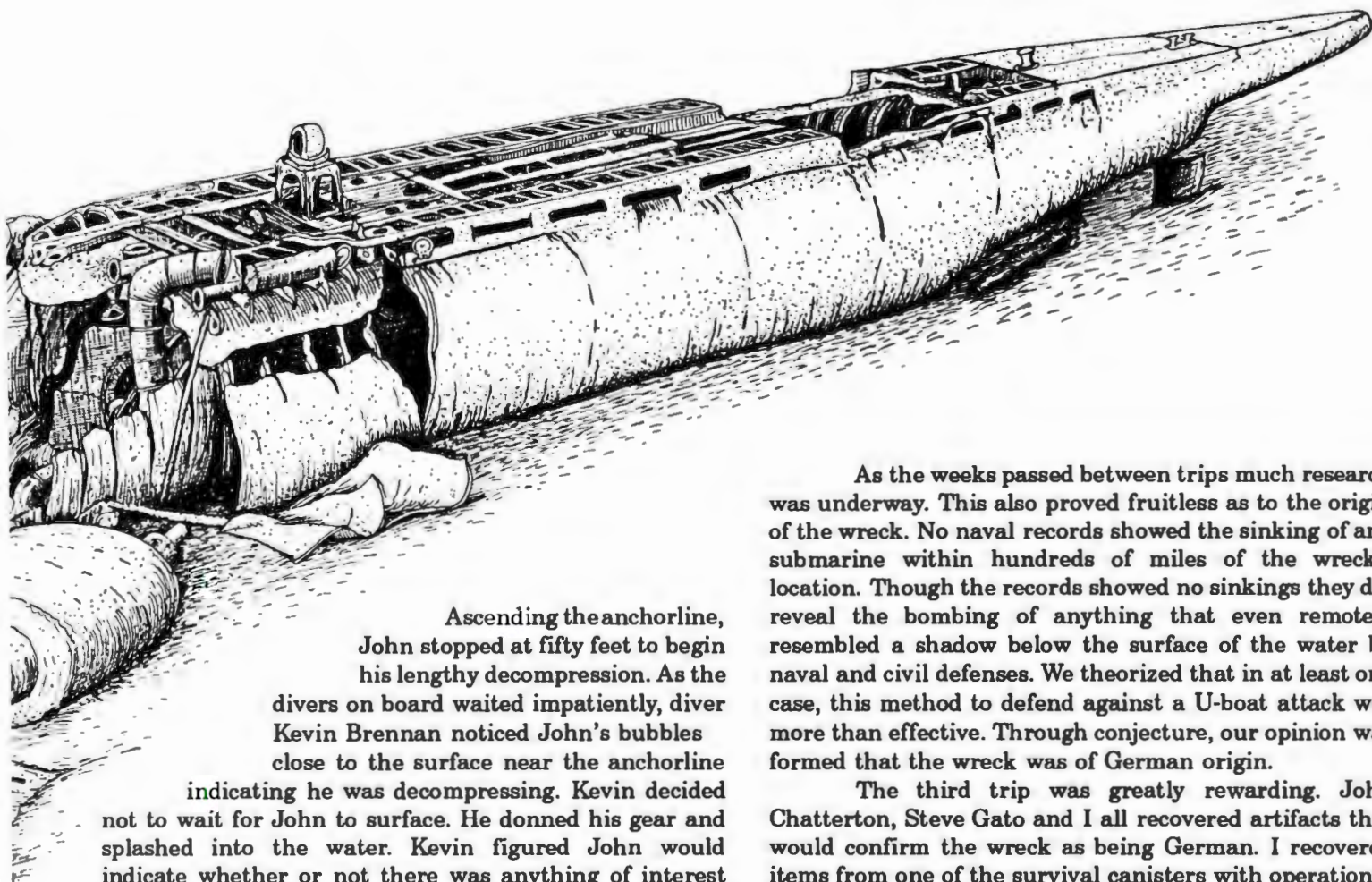
As *Seeker* neared its destination, Captain Bill Nagle — owner, operator of the boat— was called to the wheelhouse. The sun had just risen into a clear sky and the seas were tolerable as he took over the helm. On approach to the coordinates Captain Bill slowed the engines and began a search pattern. Within a few minutes an erratic jump on the bottom recorder traced an outline of an object resting on the bottom. The signal was given to toss the grapnel off the bow. The anchorline jerked back as the grapnel clambered over the wreckage then fitched up securely, and the line was quickly tied off.

A glance at the depth sounder revealed deeper water than anticipated. Captain John Chatterton decided to tie in the anchorline and make a reconnaissance dive. He quickly geared up then flopped over the side of the boat. Descending the anchorline, John reached the bottom and quickly re-secured the grapnel so it couldn't

pull free of the wreckage. It was very dark and visibility was only 10 to 15 feet as he continued his survey. With light in hand illuminating only a small

area John swam along what appeared to be the upper edge of the hull. He recalls noticing the top of the hull curved inward to meet the deck area, unlike a ship, which would have a gunwale that protrudes above the main deck. "Another barge," he thought to himself.

Continuing he noticed a hatch and again it was unlike one found on a ship or barge. This one was built to withstand great pressure. Pictures started forming in John's mind as he surveyed the wreckage further. A high pressure cylinder and narrow beam were revealed while swimming up over the wreck. The answer was soon unveiled. "It's a sub!" John excitedly looked for evidence to substantiate his discovery. Checking his gauges, the bottom timer indicated the dive was over and John reluctantly swam back to the anchorline.



Ascending the anchorline, John stopped at fifty feet to begin his lengthy decompression. As the divers on board waited impatiently, diver Kevin Brennan noticed John's bubbles close to the surface near the anchorline indicating he was decompressing. Kevin decided not to wait for John to surface. He donned his gear and splashed into the water. Kevin figured John would indicate whether or not there was anything of interest before he made the descent. When Kevin reached the anchorline John saw him and quickly scribbled something on his slate. As Kevin made his descent, John held out his slate: "SUB!" Kevin's eyes opened wide with excitement, then he ascended to alert the others of their impending dive. The remaining divers moved about in a frenzy to don their gear. Each exuberant to be one of the first to dive a virgin wreck. The excitement must have been too much that day for not one artifact was recovered to give any clue of the wreck's origin.

The next trip proved unproductive and ended in tragedy. A diver [Steven Feldman,] for reasons unknown, was rendered unconscious and swept away in the current. He was not recovered until several months later, far from the wreck, by a commercial fisherman. Diver John Yurga did recover the first artifacts that day but they added no immediate evidence to the wreck's identity.

As the weeks passed between trips much research was underway. This also proved fruitless as to the origin of the wreck. No naval records showed the sinking of any submarine within hundreds of miles of the wreck's location. Though the records showed no sinkings they did reveal the bombing of anything that even remotely resembled a shadow below the surface of the water by naval and civil defenses. We theorized that in at least one case, this method to defend against a U-boat attack was more than effective. Through conjecture, our opinion was formed that the wreck was of German origin.

The third trip was greatly rewarding. John Chatterton, Steve Gato and I all recovered artifacts that would confirm the wreck as being German. I recovered items from one of the survival canisters with operational instructions written in German. Steve Gato recovered a part of U.Z.O., a torpedo aiming device with the Kriegsmarine insignia stamped into it. John recovered china from deep inside the wreck. Not only did the china have the Kriegsmarine insignia but also the date, 1942. John's find narrowed the field of research considerably but the definitive answer to the mystery remained elusive.

On the fourth and final trip of the 1991 season many more artifacts were recovered. One in particular may hold the key to unlock the mystery. A knife with a name crudely inscribed in the handle was recovered by Chatterton near the same area as the china.

Though the wreck holds no real archeological value or treasure. The thrill of discovery and exploration is more than enough reward to justify the time, expense and risk of those experienced and daring individuals willing to be part of the adventure.



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Open Forum

Do you have something on your mind? What about a gripe or difference of opinion? Maybe some information you would like to correct us on? Send letters to the editor. Short and to the point works well here. It's your forum.

HYPOTHERMIA OR HYPERTHERMIA WHAT'S IN A NAME?

Dear Joel:

What a great issue the latest *Sub Aqua Journal* on DEEP diving was! I really enjoyed every article, and read it cover-to-cover in one sitting. Made me want to explore deep diving. As president of a diving club, [Rockland Aquanauts,] I appreciate your emphasis on safety first, a theme throughout all issues of SAJ.

One comment about Hillary Vidars' article on dehydration. The definition of "hypothermia" was incorrect, and may be misleading to readers. The definition given was that of hyperthermia. Perhaps an erratum is necessary.

Melissa L. Bogen

Dear Melissa,

You're right! We goofed and Hillary was kind enough to correct us too so I think we'll let her explain where we erred. Our appologies to you and especially to Hillary!

Dear Joel:

I've just perused the August issue of *Sub Aqua Journal*. I liked the overall presentation, and the way in which the deep diving theme was addressed.

However I was dismayed at the editorial mistakes in my article, *Diving and Dehydration the Inside Story*. . . You incorrectly mixed up hypothermia with hyperthermia. My original material emphasized how dehydration predisposes a diver to both of these serious maladies. But in your rendition, hypothermia was incorrectly defined as "heat stress," when in fact hypothermia is "cold stress," or a lowering of the body's core temperature below 95 degrees F.

Hillary Vidars, Ph.D.

Here are some other important corrections.

Last month's cover photo was shot by Barbara Lander. The diver who was plunging into the deep blue sea was Captain Billy Deans.

The photograph on page 10 of the shuffle board court on the *Andrea Doria* was taken 220 feet below the surface by Brian Skerry.

Captain John Chatterton

by Barbara Lander



Captain John Chatterton is a professional commercial hard-hat diver. He works with supplied air on underwater construction. "A commercial diver has to be a jack-of-all-trades." John is a classic.

He began as a medic in the army and moved on to respiratory technician. Four walls around him all day were driving him crazy so he abandoned the medical field for construction. Later, while doing construction in Cape May, John asked himself, "Would I rather be working on land or out there, on the water?" He abandoned construction for the high seas and commercial fishing, later for commercial diving.

Unlike many commercial divers, John retains his love of fun diving. Weekends find him exploring the wrecks off New Jersey. Although a sport diver since age 10, it was 12 years ago that he began diving New Jersey wrecks seriously. His captain's license was a result of his association with Captain Bill Nagel, owner of the dive boat *Seeker*. He told John the captain's license was his ticket to the *Doria*, one of John's favorites wrecks.

John prefers his spot as the second captain on the *Seeker* to running his own charters. He explains: "If I had to be the guy in the wheelhouse, if I had to run the charter, that's real work and I can't go diving. It's no fun."

One of John's biggest thrills was being the first diver to explore a newly discovered sub that he has dubbed the

"U-who." Hidden for almost 50 years by 230 feet of cold Atlantic water, it has defied every attempt at positive identification. John has discovered artifacts that prove that the vessel is a WW II U-boat, including dated china from inside the wreck. The [outer] configuration of the torpedo tube is also consistent with that of a Type IX U-boat.

Dr. Dean Allard of the Naval Historical Center was not very interested when he first met with John about the U-boat. "We know what it is," Allard confidently stated. He explained that for national security reasons they maintain a complete list of all wrecks in the coastal waters of the United States, so John could not see or copy them. But they compromised and allowed John a look at the list from the small area matching the latitude and longitude of the U-boat. Allard was amazed when his records showed no match for John's coordinates.

Chatterton has run into more than one dead-end in his research. A trip to the U-boat Archives in Germany netted him the crew lists from many U-boats and much other information that has been useful and interesting, but not complete to ID the U-who.

In a bizarre turn of events, he traced a name inscribed on the handle of a recovered dinner knife to its still-living owner. The ex-seaman explained that he had *lost* the knife, had never been to America, and was unable to provide any clues to the identity of the U-boat.

Still John has tracked down his clues with the doggedness and professionalism of a detective. He has made about twenty trips to the *U-505*, a Type IX U-boat on display in Chicago's Museum of Science and Industry. "I found the china about three feet from where it is [displayed] on the *U-505*." As he toured the *505*, John made a list of about twenty details that could positively identify the U-who, including the plaques on the [lower] torpedo tubes.

Back in New Jersey, John carefully planned his penetration to the bow torpedo room over the course of several dives. However, he finally arrived to find the two lower torpedo tubes corroded into oblivion. The wreck remains the unidentified "U-who?" and Captain John Chatterton's quest continues.

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Dive Mates *The Forgotten Heroes*

by Joel Silverstein

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Have you ever taken a class of thirty wide-eyed, excited, inquisitive, precocious and sometimes nasty children on a field trip? Well if you have or have heard a story about one of these trips you'll get what I mean.

Back in 1989 I was mating on a charter boat out of Key West. On any given day we would have divers with and without all kinds of experience. Some scenes would range from not knowing how to set up gear to not knowing how to swim. These were the days of rescue practice.

On occasion I have crewed on a very busy North Atlantic dive boat. Here the routine is much different. They don't take divers on tours or hold their hands underwater. What they do is make pre- and post-dive safety a priority.

The life of a North Atlantic mate is not as easy as you may think. Sure, they get to go diving *most* of the time, and yes, many of them get to go on the choice trips. But they pay a price for the privilege of serving.

First off, dive mates rarely get paid by the captain. Working on an exchange — they work, they dive, (usually only one dive a trip), a simple arrangement. They must have their own gear, including tanks, timers, safety equipment, they even buy their own air.

So what does the mate do besides dive? Many boats will have several mates (four is common) each having a certain responsibility.

There is the tie-in mate. He or she will tie the anchor into the wreck so the boat doesn't break away while you are diving. This is a physically challenging task. Often the anchor doesn't snag into the wreck where you want it so it has to be moved. Have you ever tried to carry twenty-five pounds of anything at 100 fsw with 150 feet of anchorline attached? The tie-in mate does that.

Next there are the deck mates. They prepare and handle the anchor and buoy lines. Once the anchor is in, they secure ladders and other safety gear and prepare the boat as a diving platform. Once "the ocean is open" they help divers dress and enter the water.

A fourth mate will be in charge of signing in divers, checking certification

cards, and collecting boat fees. This mate may also be the diver who will release the anchor after all divers are onboard. Often this mate will also be a certified dive master who can sign off your log book when your diving day is done.

You may be saying, "That's not so hard," and on some days it's not, it's even a lot of fun. Just keep in mind those days when it's rough for you, but not for others, the mates work then too. What the mate also does is observe.

They are constantly looking around at every diver to be sure that any accident they can predict can be prevented. A simple thing like a twisted hose they help you with while dressing or reminding you to turn on your air makes all the difference. Even helping you on with your gloves. The dive mate has to be a jack of all trades, able to fix gear, console the new diver, and make your day as safe as possible on the boat. That's what they do. The dive mate is your buddy on deck.

Earlier this year the *Sub Aqua Journal* sponsored a training program for over 60 mates and captains in oxygen administration and medic first aid training, by *Lifeguard Systems*. When there is an accident they are prepared to help you. On occasion they even put their safety in jeopardy. When a diver gets lost or is having trouble they are there to assist.

After the day is over and you're on your way home, the mates stay at the dock for a few hours. They clean the boat, replenish the water tanks, recoil the lines and make sure they are in good condition, and prepare the boat for the next trip. While the tips are being shared (it has become common place to tip mates in appreciation for their work), the captain will discuss whatever problems the divers had that day and what everyone learned from the trip. Preparation for the next run — a floating classroom.

Dive mates can be paralleled with volunteer fire fighters. They take their jobs seriously, they do it freely and they love it. The next time you think the mates are just having fun, remember that in a moment's notice they are on the job for you. Hug a mate, the next time you see one!

OCEAN EDGE 6700XT REGULATOR A GREAT RECREATIONAL REGULATOR

A product review by Joel Silverstein

So what's new about another regulator? First off this one is not finicky. The second stage is made of high impact, lightweight plastic. The lightweight material allows the regulator to rest comfortably in your mouth with no jaw fatigue



even after repeated use. Unique to the second stage design is the interesting oval purge button. Even with the thickest of gloves access was extremely easy.

Another good feature of the 6700 is the Adjustable/Balanced second stage. Adjusting the second stage allows the diver to control the inhalation resistance while diving. I like my regulator to be adjusted so that it almost free flows on the surface; the dial feature allows me to control that free flow while entering and exiting the water.

The first stage boasts two high pres-

sure and six low pressure ports, allowing infinite hose positioning. Made of chrome-plated marine brass, this unit is built to take a beating. The 6700 comes with a yoke mount plus there is a DIN adapter available making it even more versatile.

The first stage was designed to meet all Navy specifications as a Class A regulator, delivering a high volume of air at any depth. Its technical performance has been certified by Reimers Engineering (a leading independent testing laboratory).

We used the 6700 in both shallow and deep water (to 156 fsw) without any trouble. The unit was reliable and we wouldn't hesitate to use it on any recreational dive. However, as I have mentioned before, no regulator is perfect right out of the box. These units, like most, are manufactured by machine so it's a good idea to have it tweaked by a good service technician before use.

The 6700 Adjustable Balanced Second Stage with the Balanced Piston First stage should provide years of dependable use and enjoyment.

EVENTS CALENDAR

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OCTOBER

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NOVEMBER

- 1 Dive New Jersey... And Beyond
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Ocean Place Hilton, Long Branch, NJ, 9 AM - 6 PM.
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DECEMBER

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Recently we have been hearing more about carbon dioxide (CO₂). Once thought to be no more than a lowly by-product of respiration, it has now achieved the status rivaling the Grim Reaper himself, for reasons that we will explore. First, a little background.

Table I compares volumes percent of the major players in inspired versus expired air. Note the dramatic, ninety fold change in CO₂ from inhalation to exhalation even at rest.

Consider how the CO₂ could build up in a closed space with poor or absent ventilation, as in a submarine trapped at the bottom. What we know today about

CO₂ toxicity has been gleaned from experiences in underwater habitats, diving bells, submersibles, recompression chambers and closed circuit systems. Recreational diving equipment is designed to minimize "dead space" allowing as little CO₂ as possible to be rebreathed.

Since carbon dioxide is a by-product of normal metabolism, our bodies are accustomed to dealing with it at the surface, where its concentration is approximately 0.05%. Empirically, the maximum allowable CO₂ has been found to be 1% surface equivalent. A simple formula relates surface equivalent to depth through ATAs.

To find the surface equivalent of air at 250 feet (8.57 ATA), multiply 0.05% by 8.57 ATA to get 0.43% S.E., well within acceptable limits. This is, of course, at rest with a well tuned regulator appropriate for the depth of 250 feet.

Table II illustrates human responses to elevated levels of carbon dioxide. The effects start with difficult breathing and

anxiety (4 to 6%) and move on to loss of consciousness (15 to 20%) and ultimately convulsions beyond 20%.

If CO₂ builds up for any reason, our bodies are automatically stimulated to involuntarily breathe faster. This response is to try to regain our disrupted acid-base balance. Hyperventilation of this kind can have profound implications at depth, not only because of a limited air supply, but also due to thermal and hydrational considerations.

Add to this the potential for increasing nitrogen narcosis as divers begin to see and hear themselves breathing like a freight train. Furthermore, a severe throbbing frontal headache can result

Table I

ELEMENT	INSPIRED	EXPIRED
N ₂	78.02%	74.5%
O ₂	20.84%	15.7%
H ₂ O	.050%	6.2%
CO ₂	0.04%	3.6%

from dilation of blood vessels in the brain. Finally, increased CO₂ has been shown to potentiate oxygen toxicity that is always a consideration with any exotic mixtures and/or deeper dives.

What causes carbon dioxide to accumulate? The reasons can be divided into the *acute* and the *chronic*. An *acute* cause of CO₂ buildup could be exertional, perhaps born of a desire to swim the entire length of a wreck against a current or to engage in prolonged battle with a large lobster. Another exertional cause might be a regulator that required too much effort for inhalation or exhalation, or both. Some regulators that are fine for shallow dives require herculean lungs at greater depths.

Chronic exposure to elevated levels of CO₂ usually is the result of a pulmonary disease, such as emphysema or asthma. Since conditions such as these are contraindications to diving, the afflicted are characteristically either unaware or unconcerned. However, since their CO₂

Table II

% CO ₂ at SEA LEVEL	EFFECT ON HUMANS
0-4%	Normal
4-6%	Difficulty Breathing Anxiety
6-10%	Impaired Thinking
10-15%	Severely Impaired Thinking
15-20%	Unconsciousness
20% plus	Convulsions

receptors may be blunted due to chronic exposure to high levels of carbon dioxide, their primary stimulus to breathing may be lost, leaving solely their hypoxic drive to "remind" them to breathe. This is not a good scenario, since hypoxia at depth is the last thing in the world you want to depend on as a breathing stimulus!

It is possible, moreover, for tolerance to develop to accumulated carbon dioxide, but this may create an even more dangerous situation. Studies on monkeys and dogs exposed to high levels of CO₂ showed that when levels were gradually reduced to normal, nothing happened. However when they were abruptly exposed to room air, most of the animals experienced severe cardiac arrhythmia and death.

How many unexplained deaths can be accounted for by a combination of over-exertion and too rapid an ascent rate is an area for further investigation. This is especially difficult because CO₂ levels can only be measured by colorimetric (e.g., Draeger) tube analysis, or by non-dispersive infrared analyzers. As a murder weapon, carbon dioxide can be likened to an icicle melting in the sun.

In summary, be physically fit and of good health, have quality equipment well suited to the depth you are diving. Breathe normally (no "skip breathing") and have a nice, relaxing dive. When you hear the phrase "don't work too hard," take the advice to heart. You could be saving yourself from the effects of carbon dioxide toxicity.

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KIRBY'S KORNER

The Jones Beach Jetty

An Evening of Adventure

by Kirby Kurkomelis

We had just filled up our gas tank at Scotty's Bait and Tackle. Heading on our way through Reynolds Channel to Jones Inlet a few minutes away, the weather was perfect for a night dive. A cool breeze felt refreshing, it blew the smell of gas behind the boat. The channel was busy with boats, some fishing others enjoying the hot summer night.

In the distance a star making its way through the reddest blue sky seemed lost. Sea gulls were standing guard on their pilings, waiting for a handout from a friendly fisherman. On shore a tired sailor folded his gill net, probably thinking about tomorrow's catch. Looking down at the water it was a dark clear blue with jellyfish dancing across our hull. Ahead the inlet.

The Jones Beach Jetty, New York: a long rock jetty that extends from the shoreline south at a 90 degree angle. Its purpose: to stop erosion of the beach and to protect Jones Inlet from filling up with sand. During storms the inlet can be very dangerous. Large rogue waves come out of nowhere along with a fast current.

The Jones Beach Jetty is a fabulous living reef with all types of marine life. With plenty of 10-pound blackfish to scurry in and out of the submerged rocks, monster stripers that travel between the jetty and the *Tea Wreck*, a few choice lobsters waiting for my light to entice them out of their holes.

Moving south inside the inlet, we talked about our dive plan. I started to double check some of our night diving equipment. Extra line, back-up lights, chemical sticks and of course my bug bag.

Navigating in as close as we dare to the jetty, our eyes watched for rogue waves that could capsize our boat. Once Don set the hook our fears were gone. As an added precaution our friend Mike would keep the boat lights on until we returned.

The sun disappeared over the horizon. We were gone. The water was clear with a hint of blue. My light was getting attacked by spearing. Swimming along

the sand bottom close to the rocks, my light started to make new friends. There was my first lobster, feeding on a broken clam shell. Like lightening he was gone — into my bug bag.

I spotted a four-eye butterfly fish chasing brine shrimp across a piece of white coral, unaffected by my presence. Out of the corner of my eye Don grabbed another lobster. [Proving once again, Don's hand is faster than the eye, we never saw him bag the first!] The current started to move but we had another 25 minutes of slack tide.

Along the bottom there are small rocks and some pieces of broken metal for lobsters to make their home. Plenty of blue claw crabs to fill up any dish, reaching out in defense of their territory. I heard some rumbling sounds on the surface. Just then another lobster dashes for cover inside a cave next to a rather large eel looking quite ominous. (I'll save this one for Don.)

Seaweed gently fanning the rocks to keep unwanted visitors from ruffing the covers of mussel beds as my gauges get tangled up in monofilament. Large blackfish sleeping between the rocks, I swam over keeping their secret. My spear was on the boat.

With 25 minutes into our dive and 8 lobsters between us, the surge had gotten very strong pushing us into the rocks. It felt like the waves on the surface had picked up too. At 15 fsw we saw small fish being tossed about, crabs scurrying for cover, seaweed torn from the bottom. It was getting time to head back to the boat.

We broke the surface amid crashing waves. The current throwing us into the rocks—not the place to be during a storm—then pushing us along the jetty towards the boat. A bright light swayed in the distance, Mike had not fallen a sleep. Thunder and lightening from the sky, rain bouncing off the water.

Mike stood fast, unfazed by the weather, flashing the way home with his light. Once in the boat, engine running, "Let's get and have dinner..."

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Sept 5 Arundo
6 USS San Diego

7 Iberia
12 Stolt Dagali
13 USS San Diego
19 Tarantula
20 Iberia
26 USS San Diego
27 Lizzie D

Oct 3 Yankee
4 USS San Diego
10 RC Mohawk
11 Iberia
17 USS San Diego
18 Lizzie D
24 Stolt Dagali
25 USS San Diego
31 RC Mohawk

Jeanne II*

Capt. Bill Reddan
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Sept 2 Local Lobster
5 Pipe Barge
6 Mystery Wreck
7 USS Algal
9 Local Lobster
13 Immaculata
16 Local Lobster
19 Lizzie D
20 Pilot Ship
26 Iberia
27 Cindy

Oct 3 Steamship
4 RC Mohawk
10 Pinta
11 Keagon
11 Turner
17 Lizzie D
18 Bald Eagle
24 Asfalto
25 Harvey's Woody
31 Captains Choice

Northern Star*

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Two Trips Each Day

Sept 5 Pipe Barge
6 Sandy Hook
12 Petland Firth
13 RC Mohawk
19 Mistletoe
20 British Korvette
26 Lizzie D
27 Fran S

Oct 3 Engine Wreck
4 Relief Ship
10 Mistletoe
11 Iberia
17 RC Mohawk
18 British Korvette
24 Lizzie D
25 Relief Ship

Sea Hawk*

Capt.'s Frank Persico
& John Lachenmeyer
(718) 279-1345
Freeport

Sept 2 USS Algal
5 Yankee
6 Iberia
7 RC Mohawk
9 USS San Diego
16 RC Mohawk
19 USS San Diego
26 Ambrose Lightship

Oct 3 RC Mohawk
4 Macedonia
10 Capt. Choice
17 Capt. Choice
18 Iberia
24 RC Mohawk
25 G & D

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Capt. Jim McKoy
Capt. Tom Conlon
(516) 242-0529
Fishing & Diving Charters
Captree

Southern Cross*

Capt. Phil Galletta
(516) 587-3625
Babylon

Sept 5 Reggie
7 USS San Diego
12 Kenosha
13 Lizzie D
20 Fran S
27 USS San Diego

Oct 4 USS San Diego
11 Mylon Castle
12 USS San Diego
18 Fran S
25 USS San Diego

Wahoo*

Capt. Steve Bielenda
Capt. Janet Bieser
(516) 928-3849
Captree

Sept 2 U-853
3 U-853
4 USS Bass
5 3-day Block Island
6 USS Bass, U-853
7 Grecian & Morel
9 USS San Diego
12 USS San Diego
13 USS San Diego
16 USS San Diego
19 USS San Diego
20 Oregon
23 USS San Diego
26 Tarantula & Kenosha
27 USS San Diego
30 USS San Diego

Oct 4 Oregon
10 USS San Diego
11 USS San Diego
17 USS San Diego
18 USS San Diego
24 USS San Diego
25 Oregon
31 Oregon

NORTH CAROLINA

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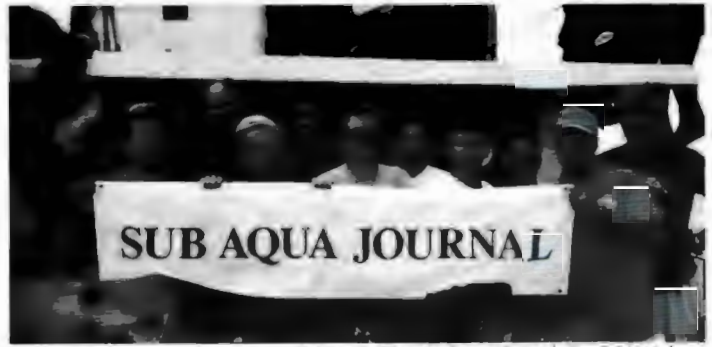
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LOCAL HEROES:

August 1992



Captain Mike and his group share a day on the *Algot* aboard Captain Bill Reddan's red white and blue — *Jeanne II*.



Oregon Overnighter aboard the *R/V Wahoo*.



Will Mc Beth and the new transom door of the *R/V Wahoo*.
Nice goin' Will he ever live this one down?



Dr. Pepe and Dick Long of DUI go diving on Los Coronados Island, Mexico.



Captain Rich Cassens



They even read the Journal in California aboard Capt. Rich Cassens' *America II*



Dave Reiger on the *Oregon*.



Mike Harbater ready to jump in.

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