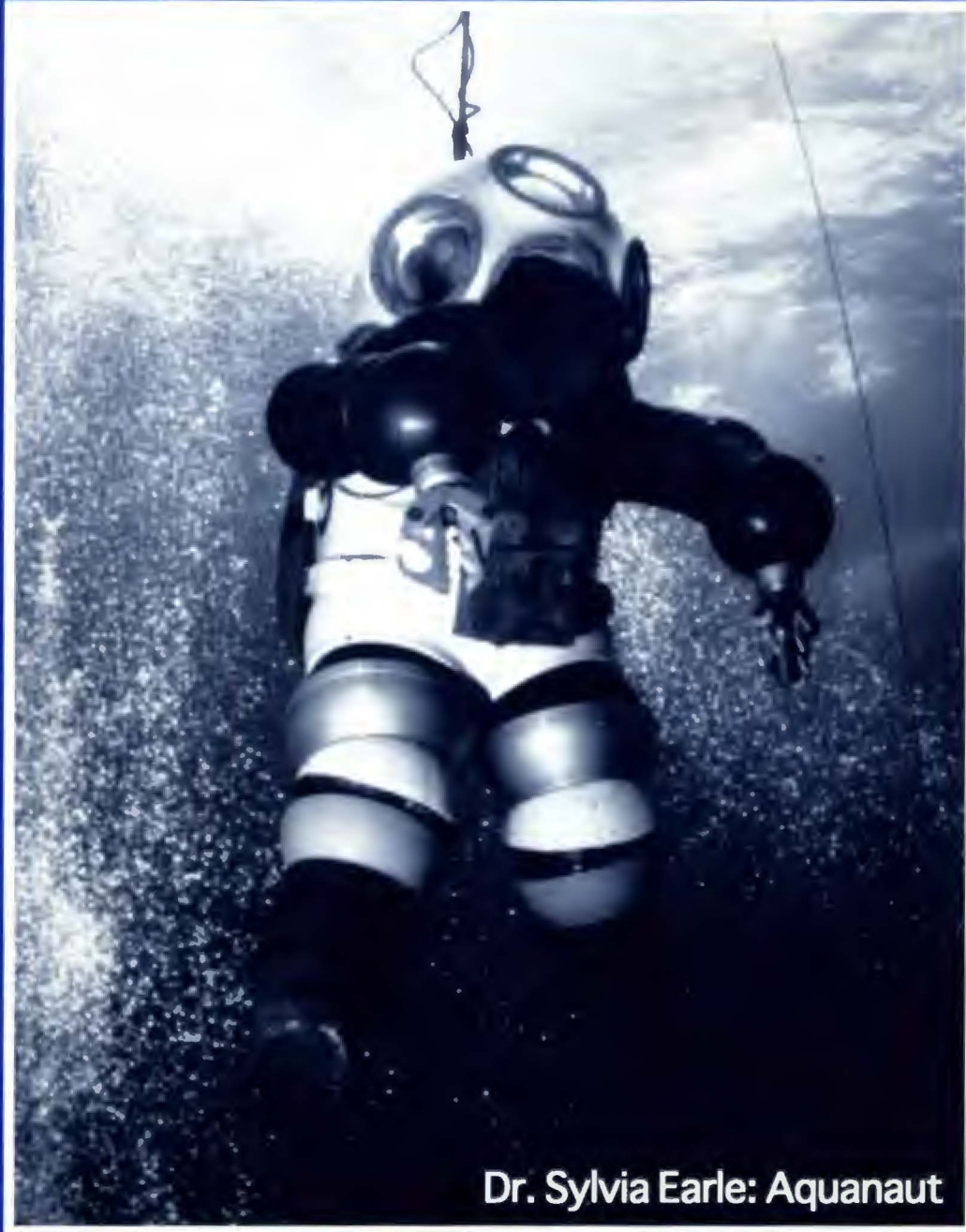


SUB AQUA

VOLUME 5, NUMBER 5

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JOURNAL



Dr. Sylvia Earle: Aquanaut

***Exclusive
Sylvia Earle
Interview***

***Divers
and the
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***Wrecks,
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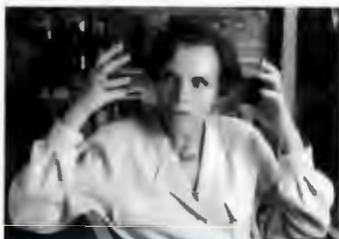
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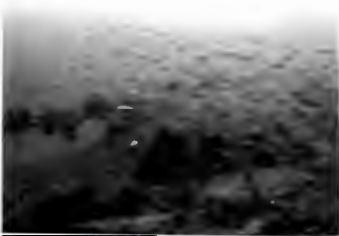
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On the Cover - Dr. Sylvia A. Earle descending to the bottom of the ocean in the One Atmosphere JIM suit. Photographed in Hawaii by Charles Nicklin, Images Unlimited, Inc.

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September/October 1995
Volume 5, Number 5

Sea Change



It was Shakespeare's *Tempest* which Sylvia Earle quoted in naming her book.

"Full fathom five thy father lies;
Of his bones are coral made;
Those are pearls that were his eyes;
Nothing of him that doth fade,
But doth suffer a sea-change
Into something rich and strange." 1611

Webster's Second says: "Sea Change: A change wrought by the sea, as in the forming of a pearl; hence, marked transformation, as to something richer and finer."

After falling under Dr. Earle's spell and passion for the ocean environment, we asked SUB AQUA's writers and editors to talk about change. What changes have you seen in your diving area? Have divers changed their thinking and become more focused on environmental issues? What are the effects of the elements, and of humankind on the seas? Who is taking action?

We've found that even though environmentalism is politically correct today, scuba people have a long history of activism, because we were able to see the changes first hand. To the average person, his friend the scuba diver is an expert on the oceans, which is a great responsibility. Sylvia Earle calls us "ambassadors for the ocean."

The environment has undergone a tempest. Perhaps a sea change is upon us.

Joel D. Silverstein, Editor

Divers and the Environment

By Bill Bleyer



Henry Moeller, a biology professor at Dowling College on Long Island and a diver for 43 years, shudders when he recalls the scientific reef exploration trips he made early in his career when no one gave much thought to the environment.

"We'd be working on a coral reef in the tropics," he says. "We would never think twice about being heavily weighted and sitting on a reef. We used to take an anchor out and throw it out at a site and not give any thought to what was on the bottom."

Things are very different today, Moeller says. There are permanent moorings and buoys to avoid anchor damage. And divers are trained in certification and specialty courses to maintain proper buoyancy and not touch the coral.

Dive groups and environmentalists agree that divers have come a long way to developing ecological consciousness since the early macho days of scuba diving. Now most divers have a lot in common with Jacques Cousteau and other underwater environmental pioneers. But some environmentalists say divers *still* need additional training to avoid mucking up the underwater environment they enjoy visiting.

"If you talk about all the sources of reef degradation I would say divers are probably near the bottom of the list," says Cliff McCreedy of Oceanwatch, a year-old non-profit membership group devoted to conserving coastal resources and marine life through education and volunteer action. "But I think there needs to be more attention on diver awareness. Divers have the most to lose."

"We're always going to have some bad apples somewhere," says Lynn Nettles, publisher of *Florida Scuba News*. "But I would say the majority of divers are very environmentally conscious. When I first started diving we didn't know that if you stood on the coral it was going to harm it. We touched things. We messed up things we shouldn't have messed up. But now we tell other people not to touch the coral. You try to educate them so they are conscious about it because we want something to dive on. We don't want to destroy it."

Nettles thinks divers have spearheaded the move towards environmental sensibility among the public at large. "When I first started the magazine 11 years ago I used to get really upset because people were dumping stuff in the ocean and not thinking any-

some of the techniques used by treasure hunters such as air lifts. While these techniques stir up the bottom, she says, "To me that's not worse than what the Army Corps of engineers does when they totally destroy an area to put sand up on a beach."



NYC Sea Gypsies divers Tony Smith and Larry Cohen can be found at local beach clean-ups year round.

thing about it. Even when I would call politicians I was getting a deaf ear. And now it's totally different. I think it's divers who have brought it to the public's attention."

At this point, Nettles says, "I think every charter boat operator in the state [Florida] is very conscious of environmental concerns. They put in a great deal of effort to make people aware of what to do and what not to do to preserve the environment during their dive briefings. They do it because their business depends on it and because they care."

The only ecological complaint Nettles hears now about divers these days is about

Bruce Terrell, maritime historian and marine archaeologist for the National Oceanic and Atmospheric Administration, says, "My sense is that divers are more environmentally conscious than they used to be, especially in our sanctuaries. I think people become more proprietary when they get involved with volunteer programs, which is something all the sanctuaries encourage."

On the other hand, Moeller believes divers are still doing damage to reefs in warmer climates. And Howard Klein, Long Island diveboat owner and executive director of the American Sport Divers Associa-

tion, says he hasn't seen much change in diver attitudes over the years. "I find that their environmental awareness has basically always been the same. It depends on the individuals. Some people will never be environmentally aware and some are aware from the day they start diving."

Klein says that while he finds divers in Florida to be generally ecologically sensitive, the exception is divers who spear fish. "Spear fisherman will kill anything that moves. They're not real sensitive to the environmental needs of the marine life."

Many divers credit the training agencies and specialty courses for getting the ecological message out to the dive community. "I think the dive programs that NAUI and PADI offer are very cognizant of the damage a diver can do who's not paying attention to his feet or buoyancy," Terrell said.

"It's something that we've been incorporating into all the courses for years," said PADI spokesman Scott Jones. "It's particularly stressed in specialty courses such as Peak Performance Buoyancy. If you've got good buoyancy, you'll be a less intrusive diver." PADI also distributes a video on proper buoyancy techniques. PADI also offers an underwater naturalist course to educate divers about different ecosystems. "It is designed to inform the divers about what they are seeing and the impact of their interactions with the aquatic environment that they're diving and what can be done to protect it for future divers."

Jones said the PADI International Resort Association has been extremely active as an intermediary between the diving community and countries in the establishment of mooring buoys. The association worked with the state of Hawaii and other government agencies to put on a seminar on mooring buoys at last year's industry convention.

But PADI's most visible environmental activity is Project Aware, which stands for Aquatic World Awareness Responsibility and Education. The program was introduced in 1988 and was the first to target divers as a group, Jones said. "Project Aware is the single most popular program that PADI has ever introduced. The reason is pretty obvious. The environment and protecting aquatic areas is something that everyone has a vested interest in." The project has worked with government agencies and the Center for Marine Conservation to support beach and reef clean-ups around the world. Project Aware spawned a non-profit organization called the Project Aware Foundation that distributes money to environmental organizations that work on aquatic projects.

"I think the diving community is probably ahead of the general population with regards to concern for the environment," says NAUI director of training Jed Livingstone. Part of the explanation is the stress on the

subject in training courses. The environment "is part and parcel of every one of our programs, There's an environmental theme in every NAUI course, We have an underwater ecologist program with the emphasis on both coral reef and kelp forest."

Some environmentalists, however, contend that efforts of the training agencies, while laudable, don't go far enough. McCreedy believes environmental awareness is not stressed enough in certification courses. "I would say divers are environmentally conscious. It's just that the dive industry is behind a curve in meeting that demand for environmental education. That's the void we are trying to fill at Oceanwatch."

The group is trying to fill the void with a one-session seminar called Protect The Living Reef, now being offered at the National Aquarium in Baltimore. "It takes divers through basic reef ecology and teaches them about coral and why it is so fragile. It tries to inspire the diver to take responsibility for interacting with the reef safely." The course deals with proper buoyancy control, streamlining of equipment and proper swimming techniques. The slide presentation will be taken to other facilities in the coming year.

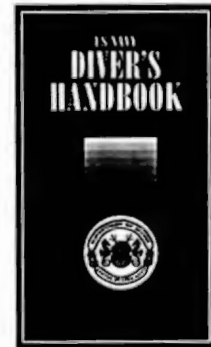
"In the past you'd see more gear dangling," says Bruce Ryan, environmental programs associate for the Center for Marine Conservation, a Washington-based group stressing science-based advocacy and education to protect the marine environment. "Now people are a lot more aware and bringing their gauges up and holding their alternate air sources closer and not having a lot of hoses and things hanging off them, That's better diving too."

But Ryan, who's been diving for 20 years, says there's still a need to get the message out to some divers, particularly beginners. "It's there in the certification courses - it's a chapter in everybody's course, it has changed substantially in a lot of programs." But he says the training agencies place their emphasis on the physics of the diver underwater and not enough on the need for environmental protection.

Beneath the Sea, the Westchester, N.Y., based non-profit community service group dedicated to protecting the ocean environment, tries to get the message out to young people even before they start diving. The group's president, Armand Zigahn, says, "The awareness of the sub-ocean environment has been increasing strongly even within the last couple of years. We're working with the kids through our Ocean Pals program." The program is a national poster contest for kids with an ocean environment theme - this year it's saving the manatees. "The primary purpose is for them to learn themselves and tell their friends and to teach their families about becoming more aware of what's going on in the oceans." ■

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Decaying Time Capsules

By Daniel Berg



Many marine archaeologists and arm-chair sailors believe that shipwrecks are near perfect time capsules and that the artifacts contained within them are therefore protected for future generations. In some cases they may be right. For example in the Great Lakes, in deep, cold, fresh water, the remains of a shipwreck will stay intact for decades. However, as anyone who has ever gotten out from behind the desk and splashed into the real world of salt water wreck diving knows, due to ocean storms, corrosion, and wood boring worms, shipwrecks are anything but stable intact time capsules.

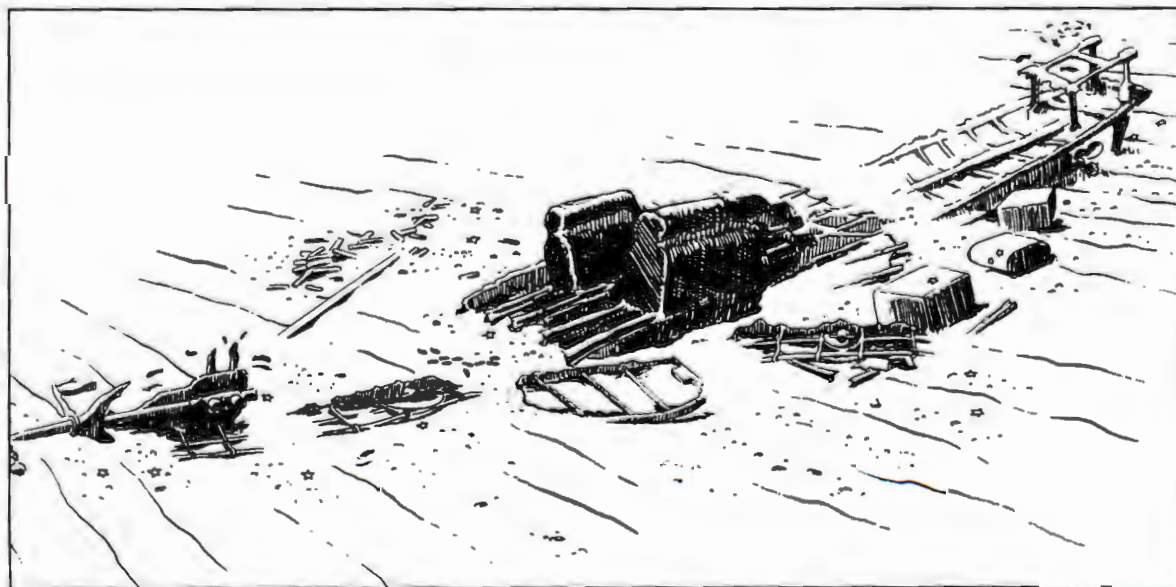
All ocean shipwrecks are in a constant state of change. Some are breaking up, sinking, deteriorating and being constantly subjected to the relentless power of Mother Nature. Most shipwrecks, even the largest most photogenic intact remains, are destined to be beaten and pounded into flat half buried debris fields. If the wreck is taking such a beating, so are the artifacts within. In my opinion any artifacts recovered are really being saved. Wouldn't you prefer to see an artifact display of intact china rather than only broken pieces? That's basically the difference between recovering artifacts or leaving them

unprotected on the ocean sea bed.

Let's look at the basics of why wrecks break down. The rate of destruction for any given ocean shipwreck relates directly to the vessel's construction material, and depth of water. In the same conditions wood vessels will break up faster and easier than steel hulled ships. Shallow wrecks get pounded and scattered much faster than their offshore counterparts simply because of the greater constant effects of surge. Even deep wrecks are effected by surge but it takes much larger waves to cause damage. Most wrecks don't get destroyed by one wave or even one storm; even wrecks in the 100 foot range are regularly affected by the relentless beat of wave action. One thing that has always astonished me is the sheer power of Mother Nature. I have witnessed huge hull plates on the U.S.S. SAN DIEGO swing open and then slam shut in a seemingly endless beat caused by the surge of surface rollers. Eventually, the hull plate breaks free and falls away leaving the vessel's interior and artifacts accessible to the powerful surge's destructive force. Storms are even a greater threat. In 1992 a powerful Noreaster hit the Long Island area and caused major changes on many local shipwrecks. A

few winches were turned over on the OREGON, one breaking a china dish. Hull plates were torn off the U.S.S. SAN DIEGO. The stern of the R.C. MOHAWK was destroyed and her bow section, which had been upright, flipped over. Many shallow wrecks like the BLACK WARRIOR were unearthed by the storm, leaving artifacts littered for miles across an otherwise barren sea bed. These artifacts were picked up daily by local trawlers and clam dredges fishing the shallows near the wreck. Other wrecks were also affected, The VALERIE E, an intact clam dredge, moved almost 75 feet inshore. In the process one of her propeller blades bent 90 degrees. The ALGOL's stern pivoted almost 200 feet off her original position.

Currents can also cause wrecks to break up relatively quickly. In 1989 the BRONX QUEEN, a wooden fishing boat, went down not far from the entrance to New York harbor. Within only a few months the powerful currents had washed away all but the heaviest machinery from the site. The change was so drastic and within such a short time that on my second trip to the wreck I really thought I had anchored on the wrong wreck. It wasn't until I found her distinctive vari-



The BRONX QUEEN sank during a winter storm in December 1989.

This 110 foot long wooden fishing vessel has all but vanished in less than five years.

Sketch by Dan Berg



Captain John Lachenmeyer with china plates that led to the identification of the YANKEE. Originally named GERMAN in 1890 she was sold to the Pittsburg Steamship Company which primarily ran steamers in the Great Lakes. The YANKEE was en route from Norfolk to Boston when she collided with the ARGENTINA in June 1919.

able pitch propeller half buried in the sand that I recognized the wreck. I wonder what happened to her pilot house artifacts? They are certainly not protected in a time capsule but possibly lost forever to the ocean's powerful currents.

Most wrecks lying off Long Island's South Shore sit on a sand bottom. Just as the waves wash sand away from your feet when standing in the shallow surf, these wrecks are all slowly sinking. Eventually, most will become completely buried. Once they are buried the artifacts within will be lost. When I first explored the U.S.S. SAN DIEGO's remains we couldn't get below 110 feet if we wanted to. Now it's quite easy to descend to 120 feet in her stern wash out. Even wrecks like the LIZZIE D are showing signs of sinking. At one time 80 feet was the absolute maximum depth on the site, yet a few weeks ago we found ourselves in 82 feet of water. Fortunately, we don't have to worry about all the shipwrecks in Wreck Valley being swallowed up in quick sand. Sinking a few feet can take decades.

Other changes that occur to wrecks are not caused by nature. These are positive changes, such as the constant efforts of recreational divers to uncover the true maritime history of the area. By recovering key artifacts from these decaying hulks, sport divers have identified most of the areas wrecks. Only 15 to 20 years ago there was no publicly available historical information on the wrecks in the North East area. Because of sport divers we now have several books, magazines and even a cable TV series that

keeps the public informed. Wrecks like the DURLY CHINE, KENOSHA, TARANTULA and just recently the G&D (YANKEE) were all identified by divers recovering a key artifact. Each identification brings us closer to an accurate maritime history. The most recent wreck discovery was due to Captain John Lachenmeyer's recovery of a dish from the wreck known as the G&D. The emblem led us to a steamship company which then steered us through some fascinating research to the vessel's true identity — the YANKEE. John had been diving this wreck for nearly twenty years. This wreck may not have physically changed, but now as an identified ship with a researchable history, she is a much more interesting site.

For some time now divers have been given a bum rap by politicians as well as archaeologists. They claim that wreck divers pillage and destroy, stealing artifacts for their own personal gain. Yet they refuse to accept these artifacts into their so called public maritime museums. If left alone most delicate artifacts would succumb to the same corrosive and powerful forces that destroyed the host vessel. Let's be realistic and try to work together. Sport divers are among caretakers of our maritime heritage. As a group they document, preserve and display the artifacts recovered as well as each wreck's condition. For divers every detail of a wreck's history and condition past, present, and future is critical. Sport divers can and should continue to preserve our precious maritime history by saving whatever artifacts possible from these decaying time capsules. ■



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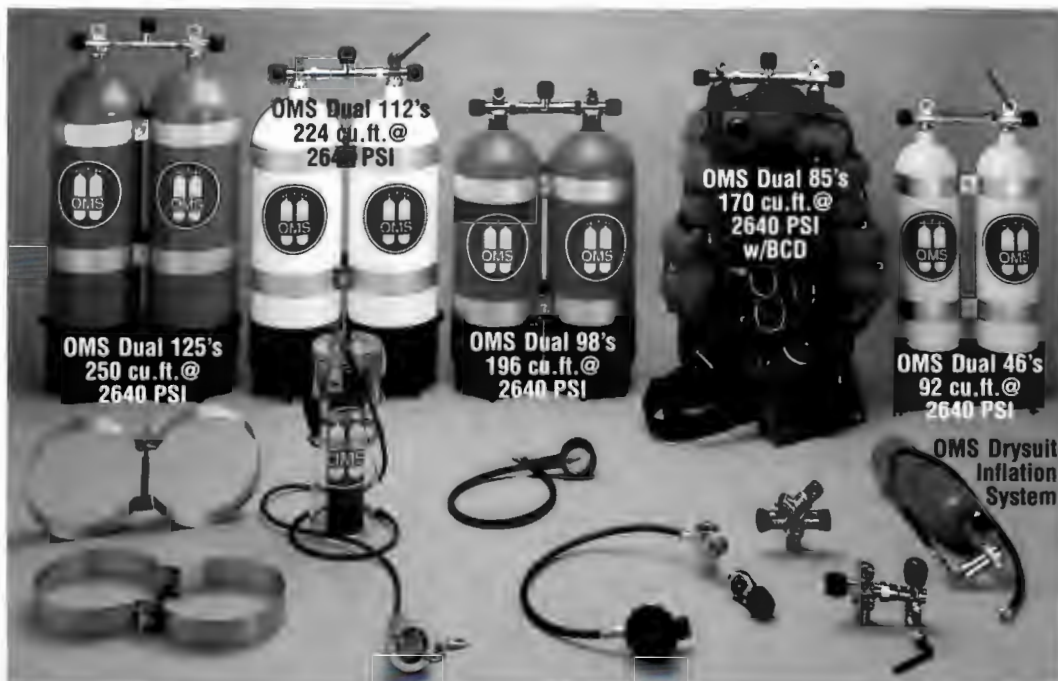
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The Baleen

By Captain Eric J. Takakjian



A four and a half year search ended on September 17, 1994 when the wreck of the seagoing tug **BALEEN** was located off the Massachusetts coast. Built as the **JOHN E. MEYER** for the Barnett and Record Company of Duluth, Minnesota, she was launched on March 17, 1923 at the Manitowoc Shipbuilding Corp., in Manitowoc, Wisconsin. The **JOHN E. MEYER** was considered a state of the art vessel at the time of her launching. Her steel hull was 102' long and her triple expansion steam engine developed 750 horsepower. The tug was equipped with a steam powered towing winch on the stern, an unusual and innovative piece of equipment for 1923.

The **JOHN E. MEYER** worked out of the port of Duluth for Barnett and Record, doing general barge towing on the Great Lakes. Her primary duties were towing iron ore and coal barges between ports on Lake Superior.

In June of 1940 the ship was sold to the Pringle Barge lines of Cleveland, Ohio. Her new owners renamed her the **JESSE JAMES**. Operating out of the port of Toledo, Ohio, she was assigned to duties towing the self-unloading coal barge **MADIA** between Toledo and Detroit. In January of 1940 Pringle Barge Lines was purchased by the Oglebay Norton Company, the same company that owned the **EDMUND FITZGERALD**, of Great Lakes shipwreck fame.

After forty four years of service on the Great Lakes, the **JESSE JAMES** was sold in August of 1967 to Nickerson Tug and Transit Co., of Tampa, Florida. The length of time she spent working in fresh water no doubt contributed greatly to her seaworthiness after so many years of service.

During the winter of 1967-8 the **JESSE JAMES** was repowered with a new 3,000 horsepower diesel engine at the Hendries

Shipyard in Tampa. At the same time a new towing winch was installed and the deckhouse and smokestack were rebuilt. After her refit the **JESSE JAMES** worked out of Port Everglades, Florida, docking ships and towing barges between various Florida ports. In July of 1969 her new owners renamed her the **BALEEN**.

After a short time working in Florida waters, the **BALEEN** was sold for the final time on March 4, 1979 to the Reinaur Transportation Company of New Jersey. The **BALEEN** was transferred to Reinaur's Boston division, Boston Fuel Towing, Inc., and her new homeport became Bath, Maine. The **BALEEN** was put to work docking ships in Bath and other central Maine ports, as well as towing oil barges between New York and various ports throughout New England.

On Wednesday October 29, 1975, the **BALEEN** departed New York, bound for Bos-



Tom Mulloy examines the steam powered towing winch on the stern of the BALEEN.



Brian Sherry

ton, towing a barge loaded with two and a half million gallons of home heating oil. Shortly before 3 P.M. on Thursday the 30th, a fire broke out in the tug's engine room, while the tug and tow were approximately two miles off Manomet Point in Cape Cod Bay. Efforts by the crew to extinguish the fire were unsuccessful, and the blaze quickly raged out of control. Luckily the captain was able to get out a distress call before the tug's crew was forced to abandon ship into the tug's liferaft. Two helicopters from Coast Guard Air Station Cape Cod rescued the six men from the raft and the two crewmen on the barge. Fortunately no one was seriously injured in the incident.

Firefighting efforts by the Coast Guard were hampered by forty knot winds and heavy seas. The Coast Guard Cutter HORNBEAM and two commercial tugs stood by the burning tug and her barge throughout the night. By the early morning three more Coast Guard vessels had arrived on the scene. The weather had abated enough by this time to allow firefighting efforts to continue. And the blaze was extinguished by seven A.M.

Shortly thereafter the HORNBEAM took the stricken tug in tow. The commercial tug CHICOPEE placed her towing bridle on the BALEEN's barge and the procession began to make its way slowly towards Boston. The BALEEN was still connected to her barge by

2,000' of 2 1/4" tow wire.

For some unknown reason the Coast Guard decided to tow the BALEEN stern first. The stern of the tug was riding much lower in the water due to the large amount of firefighting water in the bilge. The tow proceeded very slowly and by early the following morning, November 1, the BALEEN was noticed to be riding much lower in the water than previously observed. At around six A.M., almost within sight of Boston, the BALEEN plunged to the bottom, still connected to her barge and the cutter HORNBEAM. The wire parted almost immediately, and the HORNBEAM cut her own hawser free shortly after that.

According to the chief engineer on the CHICOPEE the BALEEN would never have sunk if she was towed bow first. Reinaur Transportation and Boston Fuel decided not to salvage the tug. The costs of doing so would far outweigh her actual value.

The BALEEN lay virtually forgotten on the bottom until 1989 when Grey Eagle Charters began searching for the wreck. After countless hours of research and days spent looking, the BALEEN was finally located on September 17, 1994. The first divers to dive the wreck were David and Patricia Morton, Brian Skerry, and the author.

The BALEEN is a unique and exciting dive. She rests completely intact and upright,

with a list to starboard, in 170fsw. The top of her wheelhouse and smokestack rise 30' off the bottom. The upper part of the superstructure shows evidence of the extreme heat of the fire; many plates are buckled and the interior of the wheelhouse was gutted. The wreck is loaded with artifacts, including numerous portholes and cage lamps. The first two divers on the wreck, Dave and Patricia Morton, recovered the tug's large bronze fog horn and peep whistle. A lot of the ship's fittings are lying around on the deck of the tug and a large telegraph is standing on the after end of the boat deck.

It is possible to penetrate the wreck in many locations. On the main deck level the galley, crew's quarters, and upper engine room can easily be accessed via the doors on the sides of the deckhouse. On the boat deck the captain's cabin can be entered through a hole in the after bulkhead of the wheelhouse. The wheelhouse can be entered from the doorways on either side; the teak doors were consumed by the fire.

Visibility averages 20-30' and little or no current is ever present. The water temperatures are usually in the high 30's or low 40's on the bottom; surface temps vary from the mid 50's to high 60's in the late summer. The BALEEN is one of those "can't-get-enough-of" dives that wreck divers will be enjoying for a long time to come. ■

One may think that beauty is a minor feature for a regulator. However, if beauty combines hydro-dynamic shapes, high-tech materials, and ergonomics, then it becomes a major feature. At least as important as the many characteristics that make the MR-22 Abyss DFC regulator perform unique under the most severe conditions, the widest range of temperatures, and at extreme depths. Designed for extreme diving, the Abyss is therefore ideal for recreational diving. It is an advanced version of the MR-12 Voltrex DFC, which has been recently approved (September 1993) as "substantially surpassing the Class A ratings" by the US Navy Experimental Diving Unit. The brand new design of its first stage allows optimum hose positioning and features two inclined HP ports used for pressure/depth consoles, air integrated computers, and redundant pressure gauges. Moreover, the MR-22 Abyss DFC first stage incorporates an upgraded DFC (Dynamic Flow Control) system, which delivers consistent high performance breathing characteristics under all conditions, while the limited internal components are virtually maintenance-free for your increased diving safety. The MR-22 Abyss DFC ... how could divers expect anything more from technology? It's not by chance that it's from Mares.

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Tanks for the Reefs

By Bill Bleyer

They protected American troops in Vietnam and the Persian Gulf. Now they benefit Long Island fish, fishermen and scuba divers.

With a shove from a bulldozer, 20 obsolete Army Sheridan tanks and armored personnel carriers, including four with desert camouflage from taking part in Operation Desert Storm, were pushed off a barge in August to augment three artificial reef sites off the South Shore.

The armored vehicles were dropped - with a huge splash and a ring of foaming air bubbles escaping as they sank - in about 65 feet of water off Fire Island, Jones Beach and Atlantic Beach. It was the most dramatic addition to the state's artificial reef program since it began in 1962. The state Department of Environmental Conservation manages 10 sites around Long Island: one in Smithtown Bay on the North Shore, two in Great South Bay near Kismet and seven in the ocean from Shinnecock to Atlantic Beach. All were created from concrete debris, old vessels, junk tires or even an old lighthouse.

The DEC obtained the vehicles through a Defense Department program that aims to sink up to 6,000 obsolete tanks and personnel carriers in the next few years, said Major William Mathers of the Army National Guard Training Battle Lab at Fort Dix, N.J. Several hundred have already been placed in waterways around the country.

"We do it to provide opportunities for recreational fishing and sport divers," said Steve Heins, a DEC marine resources specialist who manages the reef program. "The reefs attract fish and form a foundation for the growth of a reef ecosystem." Curious tautog and other fish will inhabit the tanks and personnel carriers immediately, he said, but it will take about two years for northern coral, barnacles, mussels, hydroids, sponges and anemones to cove the exterior surfaces.

"The armored personnel carriers are definitely more valuable as habitats than the tanks," Heins said of the M-113 tracked vehicles that weigh 25,886 pounds. "They're an open structure with a lot a surface area. There is a lot of dead space inside the tank." But the tanks are seen as more sexy for divers



Once weapons of war, these Sheridan tanks will become home to a multitude of sea life on the bottom of the ocean.

Bill Bleyer

so Heins made sure to ask for five of them.

"They are going to be excellent training sites," said Christine Schnell, president of the Long Island Divers Association. "They are shallow and near inlets. They will be fantastic additions to the reef. Within a couple of years they will be beautiful."

Another drop of 20 vehicles is planned for the Shinnecock and Moriches reefs, until a brush fire interfered with the logistics. While the tanks dropped were lightly armored M-551 25,000-pound "airborne assault vehicles" that can be airdropped to support airborne units, the next round will feature M-60 battle tanks that weigh 113,200 pounds.

"We're still utilizing these types of vehicles," Mathers said of the personnel carriers, "but there's hundreds of thousands of them and as we upgrade they are being replaced by the Bradley Fighting Vehicle."

He said some have been given to allied armies but the rest are of minimal scrap value because the thickness and hardness of the steel makes working with the metal very difficult. But this strength is a plus on the reef. "A car would probably last in the ocean about

10 years. These will last 50 to 100 years."

Before the tanks and personnel carriers are pushed off a barge by a bulldozer in an operation handled by the DEC, Army, Coast Guard and contractor hired by the Army, they have to be "demilitarized." The tank guns are made inoperable and "we take out all the engine and transmission fluid, the fuel tanks if we can't get them are thoroughly cleaned." National Guard units did the cleanup.

Doors were removed from the armored personnel carriers so fish and scuba divers could move through them easily. On the tanks, hatches were welded partially open to encourage the entrance of fish, but not divers.

Mathers said the government estimates the reef program will generate about a billion dollars a year from increased fishing revenue and tourism along coastal areas.

The day after the vehicles were dropped, diveboat SOUTHERN CROSS skipper Phil Galletta visited the Fire Island site. Four of his customers and his two crew members explored four of the armored vehicles. They came back with a machine gun shell, Army padlock and other items left inside by cleanup crews. ■

The Hang Line

San Diego Law Suit Ends

Long Island diveboat owner Stephen Bielenda has dropped the lawsuit he filed in May against the U.S. Navy to gain control of the U.S.S. SAN DIEGO off Fire Island.

Bielenda, owner of the WAHOO and president of the Eastern Dive Boat Association, went to Federal Court seeking to be named custodian of the 504-foot armored cruiser sunk by a German mine in 1918. Bielenda acted because the Navy has moved to reassert its ownership of the SAN DIEGO this year and the dive community was afraid the Navy would bar divers from visiting the deteriorating hulk.

The Navy, which sent a dive team to Long Island this summer to survey the SAN DIEGO, insists it has no plans to prohibit diving on the wreck but it does want to stop divers from removing artifacts.

Bielenda said that discussions with Navy officials resolved his major concern: "the wreck staying open for sport divers. I never wanted to own the wreck. All I wanted to do is protect diver's rights to be able to go there and dive on the wreck."

Another reason he won't pursue the case is that "we didn't get financial backing - a couple of dive boats and one or two people and that was about it."

Dropping the case leaves unresolved the artifact removal issue but Bielenda said "I think that's open to discussion. I want to work with the Navy on some kind of organized retrieval or a system like in South Carolina where you register with the state and you recover artifacts and the state has the option to look at them and decide if it wants them. If it's worthwhile to put it in a museum, fine. Otherwise the diver can keep it. Less than one percent of the things recovered by divers in South Carolina are taken by the museum."

For now Bielenda said he won't take any more SAN DIEGO artifacts personally but won't stop his customers from doing so.

Otto Orzech, who has been handling the SAN DIEGO issue for the Naval Historical Center in Washington, said "we're pleased," when told of Bielenda's decision. "We're looking forward to working with the Long Island divers in a constructive way."

The SAN DIEGO was the only large American warship sunk in World War I. It lies upside down in 110 feet of water seven miles south of Fire Island. The Navy and archaeologists say removing relics is illegal looting that deprives future generations of divers of the chance to appreciate maritime history. But sport divers and some historians argue that bringing up portholes, china and ammunition is preservation of historical items that would otherwise be destroyed by the forces of nature.

Bielenda and other Long Island divers contend the Navy abandoned the ship and sold it to a metal company in 1957 for scrap, so it's finders-keepers for artifacts. But the government notes that under international admiralty law, warships have sovereign immunity and remain the property of the country that commissioned them forever unless the government takes legal steps to abandon the ship. In this country, that requires an act of Congress. ■ Reported by Bill Bleyer

City Island Museum Opens

18th and 19th century shipbuilding, America's Cup 12-meter yacht defenders, P.T. Boats and submarine chasers, sailmakers, and more. You don't have to drive all the way to Mystic or fight the crowds at South Street to learn about New York's nautical heritage. Just opened in the historic 1897 Public School 17 building by the City Island Historical Society, this charming museum has lots for the whole family. There are artifacts, photographs, displays about famous builders, costumes, rare documents, and even a re-created schoolroom. Best of all, you get to talk with original clamdiggers - City Islanders who still spin yarns of the days of sail. ■

Hours: Sundays and Wednesdays from 1 to 5 P.M. and by appointment.

The City Island Museum
190 Fordham Street
City Island, NY 10464

Nautical Collector

The Journal of Nautical Antiques, Collectibles & Nostalgia. **Sub Aqua** readers interested in artifacts and things nautical will enjoy this well crafted and friendly magazine. In depth features and attractive photos cover the world of marine art and historic seafaring centers. Published out of a 19th century sea captain's house in New London, Connecticut, *Nautical Collector* is not far from the Mystic Seaport. Many advertisers are galleries and antique dealers who specialize in sailing memorabilia and artifacts. We like this magazine.

Published 8 times a year. Annual subscriptions are \$36. per year. *Nautical Collector*, P.O. Box 949, New London, CT 06320. ■

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Sylvia Earle: Aquanaut

An exclusive interview by Jeffrey J. Silverstein

From the day her acclaimed book *“Sea Change”* came out, Sub Aqua had been trying to track down Dr. Sylvia A. Earle as she criss-crossed the world’s oceans. Finally, on the Internet, we discovered that she was to be meeting with the graduate students at Woods Hole Oceanographic. Her celebrity descended upon the Institution, as crews from Time Magazine and CBS vied with the grad students for her time. But we think she saved the best for our readers, in a private late night session overlooking the ocean.



Joel Silverstein

What are your first memories of the ocean? I always enjoyed taking a bath. As a child vacations were spent on the New Jersey Shore and I distinctly remember being knocked over backwards by a wave. It got my attention — I am told that I was three years old. I got tumbled quite a bit and I guess at first I was disoriented and a little bit scared. I wound up finding the bottom with my feet, standing up and just loving it — and jumped back in and got doused again.

What really lured me into the sea and has kept me there is the existence of those terrific critters that are a few feet from any shore. I remember the horseshoe crabs along the Jersey Shore in large numbers and I spent

a lot of time trying to turn them back into the sea. I didn’t realize that they wanted to be up on the beach so that they could lay eggs so that there could be more horseshoe crabs. I thought I was doing a good deed as a kid by patiently picking them up and walking them back out and turning them, gently returning them to the ocean. I don’t think I caused much damage to the horseshoe crab population. Things in the ocean just seemed so obviously more diverse and interesting than I could find in any fresh water or terrestrial place.

My family moved to Florida when I was twelve, to a place right on the Gulf of Mexico. It was a time when Clearwater had

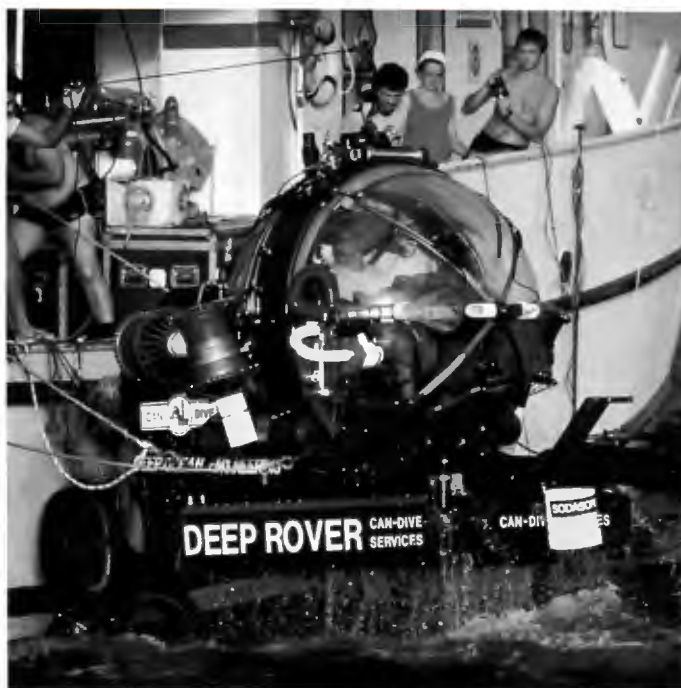
clear water. It's the changing nature of the oceans during the time that I've been a witness that inspired me to write the book. As a scientist I might have written quite a different book but what I felt was important to say, in a scientifically sound way, was "Wake up! Look around. Don't you remember when things were better than they are now? Can't you be inspired to do something about it?"

Did you decide that you wanted to formally study marine biology or oceanography? It wasn't oceanography initially, although I fell in love with the ocean. It was life and I chose as many science courses as I could take and all the things that related to it. Biology made my heart beat fast. I just knew that's where I belonged. I didn't know what to call it but I read everything I could find. I loved William Beebe's adventures and that certainly inspired me. I can remember as a twelve and thirteen year old just glued to a spot on the floor sitting cross legged in the library just burning through those stories.

On one of SUB AQUA's covers we showed a first edition of Beebe's *Half Mile Down*. It's a treasure. They used good paper then. Illustrations were wonderful. It was just enchanting. When Cousteau's book *Silent World* came out in 1953 I devoured that as well. It was just fascinating to think of being able to actually get down in the water. I knew that's what I wanted to do. I soon had a chance. It was in the summer of 1952 that I first tried a copper diving helmet in a river in Florida. The Weekewatchie River now filled with mermaids and commercial development.

Then it was a wild river and you could park along the roadside nearby and walk through the woods and get to the absolutely pristine clear river. Some still are, but many like the Weekewatchie River have been just terrorized — changed — dredged. That's where I tried a copper diving helmet. It was borrowed from a friend whose father was a sponge diver. That first experience of breathing underwater, even though it wasn't as wonderfully free as using scuba, nonetheless I thought... well it was a miracle. Beebe had described diving with a helmet in a famous series of lines in his books. He advised people to beg, borrow or steal — do whatever — but get yourself under water and use a helmet. That was before scuba. He would have loved using something that would enable him to be free. It is such a gift to be able to see fish on their own terms.

What do you remember seeing under that river that first time? In the book I talk about seeing a gar lazily swimming around and small fish that seemed to be curious about my presence. You could see some things from the surface because the water was so clear but it's different being down there. I was not



DEEP ROVER - the manned deep submersible vehicle which Dr. Earle used to explore 3,300 feet below the surface of the Pacific ocean.

Deep Ocean Engineering

weighted properly. I didn't have any weight except this heavy thing on my shoulders. My feet kept wanting to float out from underneath. I was down for a while before I realized curiously that I felt a little dizzy and the air was a little stuffy. About that time someone came down and signaled for me to go up. It turns out I was getting the exhaust pumped into the intake from the compressor. I guess maybe twenty or thirty minutes. It wasn't long enough to be lethal but I didn't really mind. I was underwater!

You were a teenager. Having taken whatever classes I could in high school I started Junior College at St. Petersburg and then I went to Florida State University. That same summer, in '52 I had a chance to take classes again in biology, botany and discovered the Alligator Harbor Marine Laboratory. It was Florida State's small young system.

The first class in marine biology for that school was being taught that summer and I had a chance to tune into some of what the students were doing and listen to some of the professors and I went out on field trips. During a subsequent summer I signed up to take that class and that's when I met the man who was later my major professor, Harold Humm. He taught the first class and the second one and I was thoroughly hooked after that. I became fascinated with the phenomenon of bioluminescence. Through the influence of Harold Humm I became interested in marine plants. I discovered, once I began to look closely, how beautiful they are and how important they are as the fundamental source of energy. All these little critters that I liked had to have something to eat and a place to live and a way to translate the sun's energy to something that they could use. Of

course the magic trick is photosynthesis. I was seeing things that weren't in the books yet. There were lots of new things in the Gulf of Mexico that even now haven't been described and recorded. The ocean is largely, even now some years later, largely unexplored. Places that are a few feet from where people spend a lot of time are often neglected and overlooked. That's certainly the way it was in my backyard in the Gulf when I was a kid. There are more books now. It's a rare dive when I don't see something unexpected.

You decided to stay in the academic world? It never occurred to me that I could do anything else.

How did you learn to scuba dive? Well the first, of course, was always memorable. I think we actually had access to the Desco Full Face Mask with air supply to the surface. I tried that before I tried scuba but Harold Humm managed to get two scuba tanks with a big double hose regulator for that summer class in 1953. Our diving class was very simple. There were no instructions as such. The two words of instruction were "breathe naturally" which meant, breathe out — don't hold your breath.

There simply weren't the kinds of guide book choices that now make such things really simple. You learned as you went and the rules gradually became known as people through trial and error discovered that "Oh yeah! You can get into trouble on a single tank of air," or any number of such things that are now just routine.

Since those early years you've seen much change. It's change on a geologic scale. What I have witnessed in my lifetime is like



Swimming with the spotted dolphin in the Bahamas.

Al Giddings - Images Unlimited, Inc.

seeing ten thousand years go by. It's not just modification of the shoreline, shifting and changing and filling and dredging. It's also the alteration that comes through what we are deliberately or accidentally putting into the ocean. It is changing the nature of the place. I think one of the least understood and the most important areas of change is in terms of what we are taking out. What's being removed from the sea and thus disrupting, modifying, nudging, shifting, changing. So much has happened in so short a time. For me it seems short. I was just... I was a kid not long ago. Still am in some ways, I hope.

What are we taking out of the ocean? There is a perception that fish are free. That they are there for the taking and some almost feel that we have an obligation to take them. Some can't stand to think of a fish that is edible swimming and think "we just have to go get it and remove it from someplace where it is not doing anybody any good and bring it in where people can turn it into something of value." It is one of the attitudes that must be changed if we are to somehow find a balance and get things on an even keel. We have disrupted them through what we are removing in large quantities, largely without real understanding about how many can be taken out without causing collapse or at least significant disruption. It shouldn't be surpris-

ing when you think of how little we know about any species in the ocean. Even those that we think we know pretty well like cod. How is it that until the very recent times we didn't know the fact that cod migrate over long distance via what are now known as cod highways? Why didn't we know that before we started to take big slices out of their population? Why didn't we know that it appears to be so that the older fish actually lead the younger fish? Those experienced ones that are six, eight, ten years old know the way to areas where they can find appropriate breeding grounds or appropriate food sources. And if you take all the big ones, which is what we do, you also take that experience. You take that understanding. I know it sounds rather dreadful to some to believe that fish have understanding. Fish can learn. Fish can think. I have no doubt. They are not Einsteins but they are sensitive creatures. I think of them more like the birds of the ocean. We ought to empathize more with fish than we do. They certainly experience pain and touch. They vocalize. They react. They're curious. Some of them are clearly upset when something happens. They are disturbed. They have emotions. I have no hesitation about using such terms with a straight face.

Part of the reason that we're blind is that it's for selfish reasons. We don't want to know. We don't want to feel guilty when we kill them or injure them or treat them badly.

They are not just passive lumps of meat with fins.

And yet that is the impression that a lot of people seem to have. "Oh! That's okay. I'm a vegetarian. I only eat fish." Give me a break. Fish are living creatures.

We don't photosynthesize ourselves so we have to eat something. I wish that people would eat smart and that they would eat much lower on the food chain. To make a pound of tuna fish is on the order of 50 or 100 thousand pounds of plants at the bottom of the food chain working through to make a single pound of ten year old high-speed move-around tuna fish. They burn through energy like a teenager.

They consume something like 25% of their body weight a day just to keep their engines stoked. We are so cavalier about taking these incredibly beautiful, magnificent creatures and turning them into sushi. How primitive we really are. Where is the sophistication we think we have when we can with supreme indifference take this product of hundreds of millions of years of history and think of it only in terms something to be consumed with lemon slices and butter. We have to eat, but to eat with a stone for a mind seems to be saying that we don't want to know. To know means we might care and to care means we might not do this and gee... "They really do taste good."

How did you get involved in submersibles and specialized suits? I had a chance to use a remarkable little submarine called the DEEP DIVER. It is a diver lockout submarine. When I was at Harvard in 1968 Ed Link had put together something with the Smithsonian Institution. The Smithsonian-Link "Man and Sea Project." I had a chance to go down in the submarine in the Bahamas. We spent two weeks going around the bottom of the ocean, exploring, diving every day from the ship that supported the submarine.

It was 1969 that I heard about the Tektite Project and applied for that. It shocked everybody. Nobody thought women would apply. When several of us did it really set things into almost a panic mode, so I'm told. They had to decide, "Well are we going to put up with women on this project or not?"

Newspapers were all over it. It was quite a scene given that nobody expected women to apply and be accepted and actually go through a project living under water for two weeks and emerge successfully. We got the ticker tape parade treatment down on State Street in Chicago and rode in the special car that Mayor Daly had constructed for the Pope.

It was interesting in part because at the same time the Apollo Space Program was underway. 1969 is when the first footprints were left on the moon. And our dive in the Tektite habitat was in 1970 and that was

the year of Apollo 13, of course. *Aquanaut* sounded a little bit like *astronaut* and, in fact, there was a valid parallel with the sea-space activity because much of the same technology can be applied in either dimension. It's life support systems. To go into space you have to protect yourself from no atmosphere, essentially a vacuum. Going deep in the sea, it's an enhanced atmosphere with great pressure.

How did you get involved in diving much deeper? I'd always longed to do it and I think the inspiration first came from reading Beebe's stories. When the TRIESTE made its descent to the deepest part of the ocean in 1960, I thought "that's for me." I really wanted to do that. Life occurs everywhere. You don't just stop arbitrarily at some depth in between. Life doesn't stop so what's this business of only going to 50 or 100 or 1,000 or 5,000 or 10,000 feet? Why limit your perspective? I heard people trying to make an argument for doing that. "Oh, there's plenty to do to keep us busy for the next 500 years in the first 100 feet of the ocean." We must not ignore the rest. We don't stop ninety percent of the way up the mountain. We go all the way because we really want to know what it's like. But so far we've resisted for the most part the urge to explore the deepest parts of the sea.

You haven't resisted that urge. No. But haven't so far amassed the necessary dollar support to build the submersible of our dreams. My dreams anyway.

Bob Ballard told us "there's no unreachable." I think I would agree. All that it takes is a mind set, a will. We've got the technology. It's not unreachable in a theoretical sense. It's just that in actual sense we are not doing it. Why are we not doing it? Beats me because it's just the attitude. We need to change the way we people think. I just believe with my whole heart that if people know better, they will do better.

What's the deepest you've gone? The deepest solo dive I've done has been to 1,000 meters in DEEP ROVER. Before that I went to 1,250 feet in the JIM SUIT solo without a tether.

The JIM is the one atmosphere articulated suit, a hard suit that was first designed back in the twenties and still regarded by some as a pretty cool looking machine. It incorporates some very modern concepts such as rebreathers and manipulators that can work under many pounds of pressure — six hundred pounds per square inch at 1,250 feet.

It's an earlier version of the Nuyton-type suit. That's right the NEWT SUIT. In fact it was Phil Nuyton who helped drag the initial JIM out of seclusion and put the designer of the



Joel Silverstein

JIM suit into the spotlight again to essentially be authorized to take that technology and go another step with it. That's where Graham Hawkes came in with redesigning certain aspects and finally developed a whole new system called WASP that looks much like the JIM but it has no legs. It just has a tube at the bottom and thrusters. You are not just totally dependant on muscle power.

What did you see at 1,250 feet that you hadn't seen before? Oh! Lots of things. 1,250 feet was in Hawaii at a depth location six miles off shore in the Ali Neui Ha Ha Channel off Makapuku Point. I think one of the first things I was conscious of is even though it was high noon on the surface, bioluminescence was obvious when we got down to about 750 feet. It wasn't completely dark. In fact, even at 1,250 feet it wasn't completely dark.

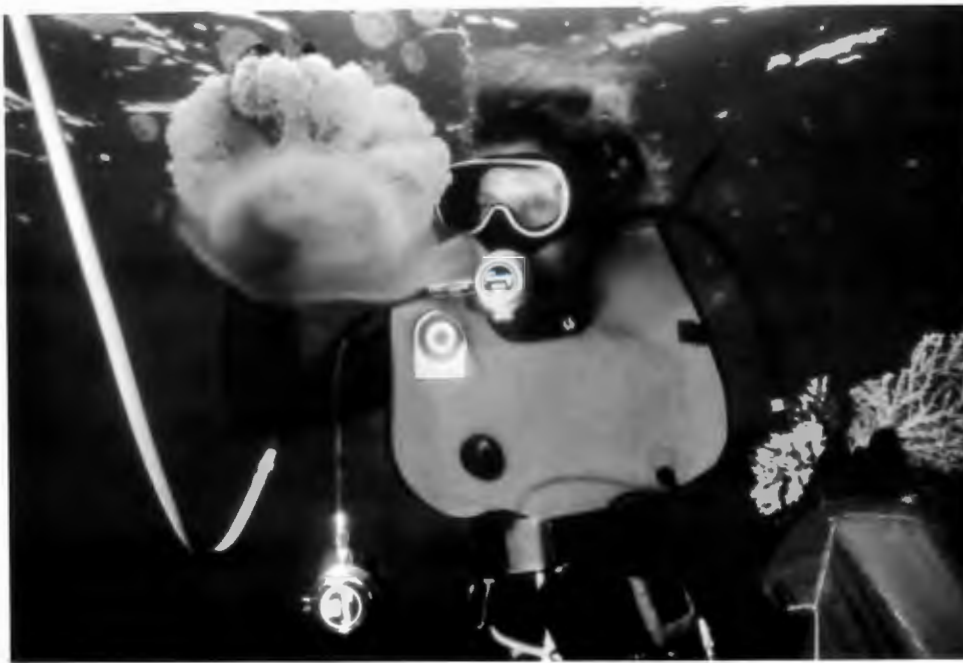
You could see with the lights out on the little submarine that accompanied me 50 feet — it was clear blue warm water. But the bioluminescent phenomenon is found in many groups of animals. I think the first ones I noticed while making that descent were little microorganisms, probably dinoflagellates, maybe bacteria that were mixed up with marine snow. You could see a lot of light as we made the descent. Most exciting from my perspective were sea fans and whip corals. Corals that grow on the sea floor and just

make a big spiral that when you touch it flashes with blue fire. There were little rings of donut-like structures that range from the point that you touch it both up and down. If you touch someplace near the top and touch someplace near the bottom simultaneously, these pulses of blue fire come together. I stood watching what's going to happen when these rings of blue fire collide as they spiral down this whip coral. What happens is they pass through each other and continue on the other side.

Sounds like animation from a sci-fi movie. Definitely real.

And DEEP ROVER went 1,000 meters down. That's right. The first one was one person. Two that have recently been built for France are two person systems. Either person can drive. It's part of the joy of it. I've used the two person system during sea trials, but in the one person system I had a chance to first go off San Diego to a depth of 1,000 meters.

What's different at 1,000 meters? Lots of things. There is no evident light from above for one thing but just different creatures that have adapted to a completely dark atmosphere. They don't like to be in the presence of a lot of light. They will just avoid it. Things that have just developed in that other atmosphere, that other realm.



Studying jellyfish in Truk Lagoon.

Al Giddings, Images Unlimited, Inc.

You were asked to be the chief scientist of NOAA in 1990. I went to NOAA with two or three things very much on my mind. I wanted to see the National Marine Sanctuary Program supported and expanded. It did expand, not enough to suit me, but there's still a mind set that various categories of people say "That's my ocean. I want to be protected there but I don't want anyone else muscling in." Fishermen have had that attitude. Some of the treasure hunters have had that attitude.

It's really hard to deal with when the numbers of people have grown so much in such a short time putting pressures on the limited resources available.

The other major thing was the National Underwater Research Program. It is a tiny little piece of NOAA. NOAA doesn't love it. It's been zeroed out more years than it has been put in, even though at a very modest level. I expected to be frustrated but I didn't realize how frustrating the process really would be. It was a golden opportunity in some ways to work from the inside out as a part of the administration at a fairly senior level... But there are trade offs. The pluses certainly were in the category of having access to people and to equipment. To fly around the Florida Keys for example in a NOAA helicopter, to be taken to the storms lab to look at how we are sensing the nature of storm generation over the Gulf of Mexico... Throughout the continent how we use space information from the shuttle and from satellites to get greater insight into issues. I went to Saudi Arabia a number of times. I went to the Persian Gulf six times overall during about two years. Things I know I could not have possibly done as a

student, an outsider, a civilian.

I left in '92 and I stayed for an additional year as a consultant to really do some additional follow-up work on those areas. Mainly sanctuaries and the aftermath of the Persian Gulf War and to whatever extent I could be supportive of NURP. It has just also seemed to me such a token commitment but a commitment that should be made, that we allow some of our national wealth to be used to take care of underwater habitats. To take care of ALVIN. To support the overall understanding of the oceans instead of the little dribs and drabs that do come in one way or the other for support. We need a major full speed ahead ocean agency.

Your reasons for writing *Sea Change*? The hope was that this could be like the two by four. "Wake up, wake up!" Ignorance is the biggest problem. It really is. Full stop — that's where the action needs to be placed. We need to stop stupid policies in terms of what we are putting in and what we are taking out of the ocean. But if we have to focus on the one area that is most effective — get at the question of ignorance. Try to communicate to the widest possible audience in the best possible way what the nature of the oceans is all about, why we should care and what we can do to turn things around and get off this downhill slide. Get ourselves to a point where we know that the next day is better than the last and the next one better still and so on toward some profound restoration. It doesn't mean that we know exactly what to do to put things back together again. Often just backing off and leaving them alone may be the best course of action.

What can divers do? Number one is to try to understand better what's really going on. Getting yourself in tune with as much information as possible. But it cuts both ways. Exposure of more people to the ocean means greater risk that some damage is going to be done, but the tradeoff for my money is worth it because people come back as ambassadors for the ocean. They can't avoid it. They've seen it, they've felt it. Having seen a fish, having been inspected by a grouper — it just changes the way that you think. It just alters your mind set. To being inspected by any sea creature. After all, we are aliens.

How about vicarious diving with ROV's - any difference? Oh I think there is. Did you ever try to eat a meal in France by looking at a picture or know what the forest is like by seeing a film? Now films can do a lot. They certainly can. I am a great advocate and a true believer about the power of films but it is not like being there. It just *isn't* even with the helmets that create a virtual reality.

You can get a lot of the feel for "being there" but it is still not the same. We've got our eye, mind, hand coordination working with us when we are down as divers or in a submersible directly. You bring your experience right there to the place where the work is taking place. You bring your judgment. You bring an ability to be surprised and not just passively taking in stuff that's there. If you get surprised, a machine doesn't know how to react. Try to build a brain-sized computer.

When you are 85 what are you going to be looking for? Onward and downward, of course. Yeah! We happen to be in a package that has limitations, but why insist that be-



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cause you've reached a certain chronological age that you are, therefore, finished? Knowledge is cumulative. Judgment is cumulative. It ought to get just better except that our body tends to let us down a bit and so you just have to be more clever about getting to do what you want to do. I was diving just a few months ago with an eighty-two year old doctor from Orlando, Florida who was keeping up with the best of us.

What I think I mourn more than seeing people who become physically less able is when they lose the spark, the spirit, the desire to explore, to question, to live, and sometimes it happens very early on. I've seen some very stuffy eighteen year olds, some terribly boring forty year olds. They forget that they are live creatures on this amazing planet with the ability to think and dream and plan and make a difference and if I ever get to the point where I stop doing that then I ought to take one very deep long one-way dive.

They've called you "Queen of the Deep." They've called you "Mermaid." What's your favorite nickname? My kids call me The Rogue. Out in San Diego they called me "Her Deepness," which became "Her Royal Deepness," which became "Queen of the Deep," which became "Hey You."

They called the female aquanauts some strange things. The aquanauts - the guys - were aquanauts. The women were called aquabelles and aquabeauties, and aquanettes and aquanaughties. I don't know what they thought we were doing down there. Suppose they called the astronauts, "astronaughties" or "astrobelles." Especially like Kathy Sullivan and Sally Ride. What would they do? They'd probably punch them out. ■

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Environmental Policy Making and Monitoring



By Hillary Vidars

Our enjoyment, safety, and for many of us, financial investment in diving, depend on the vitality and the accessibility of dive sites. I personally believe that all divers should be actively involved in preserving and protecting the marine environment both underwater and topside.

When diving, we can further marine conservation through proper boat anchoring, buoyancy control, correct weighting, using a proper kick and controlled movements, keeping our equipment and body profile streamlined, and by using responsible etiquette. Although divers should respect the environment and its inhabitants wherever we dive, it is especially critical when diving near coral reefs and other fragile habitats. You should also stay alert to and report changes and problems which you notice when diving. Such information is invaluable to marine scientists and management agencies. Another way in which divers can help the environment is by participating in cleanups and by removing debris sighted during every dive (note: divers should only handle debris which can be removed safely).

Unfortunately, although being environmentally responsible during diving is helpful and important, it isn't a cure all. The problems in our oceans and waterways are the result of large scale abuses. Industries and heavily populated cities which generate pollutants, sewage, and debris, over-fishing by commercial entities, and habitat destruction by developers are the culprits. In Cozumel, for example, the government recently granted a permit to developers to build a cruise ship pier over a beautiful living reef which was a favorite dive site. In the U.S. Senate there is currently a heated debate over a bill which, if ratified, will vastly weaken the Clean Water Act. This will

affect the safety not only of drinking water but also of water in recreational areas, including dive sites. This bill has already passed in the House. To combat problems of this magnitude, divers and citizens in general have to become outspoken and actively involved in making, monitoring, and sometimes challenging environmental policies.

Most people do not realize that they possess a powerful weapon for protecting the marine environment. That weapon is our vote. Too many people never exercise their right to become involved in the legislative process because they don't think that they can make a difference. They assume that Capitol Hill is monopolized by big time lobbyists who work for wealthy industrial interests. Whereas lobbying is indeed a part of American politics, legislators must also consider the needs and desires of their local constituents without whose votes they cannot be re-elected. With knowledge and an organized approach, divers can make a real impact.

To be effective you basically need to do only three things: **LEARN** about the issues. **ORGANIZE** your ideas, and if possible, network with others. **SEE** that your concerns are heard by the appropriate legislators, committees, and/or regulating agencies.

Learning about the issues can be the most time consuming of the three steps, but without a basic grasp of environmental issues and their current status, your efforts will not be as effective. Some of the best ways to learn more about the problems in the marine environment are enrolling in college courses, reading books and magazines, watching films, videos and TV specials, attending lectures and dive shows, participating in field trips, and joining programs sponsored by aquariums and libraries. If you want

to stay abreast of environmental legislation, read the *Federal Register* and/or the *Congressional Record*, available in most libraries. There are also several computer networks and software companies which offer information and discussion forums on environmental issues.

As clichéd as it sounds, there really is strength in numbers. The best way to get involved in environmental activism is to join one or more non-governmental environmental groups (NGO). Most NGOs are national or international organizations with regional branches. NGO's are usually not-for-profit organizations and have modest membership fees. By joining an NGO, you will have access to current information through their own newsletters and magazines and the opportunity to network with many people who share your interests and concerns.

No matter how impassioned and knowledgeable your position on an issue may be, if it doesn't reach the right people, it won't count. My new book *Marine Conservation for the 21st Century*, contains helpful directories of NGOs, government agencies, a list of laws that protect the marine environment, and strategies for interacting with legislators at the local, state, and federal levels.

Marine conservation is a complex and arduous goal, but it is an achievable one. As premier citizens of the "water planet," divers have the power to see that changes for the better are enacted. While progress (and occasionally setbacks) take place, it is important to be patient, persistent, and to refrain from being discouraged. One of the best ways to stay motivated is to recall the words of the late anthropologist Margaret Mead: "Never doubt that a small group of concerned citizens can change the world. Indeed, it's the only thing that ever has!" ■

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(800) 421-7248

DIALOG INFORMATION SERVICE

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Palo Alto, CA 94304
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EARTHNET

Long Island, NY (516) 321-4893 or
New York City (212) 226-9045

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Non Governmental Environmental Groups

There are several hundred NGOs in the U.S. and abroad. The following are some major NGOs which have many divers and/or which focus on environmental legislation action:

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Lori Brown and Kathleen Casey from the New York City Sierra Club, Coral Reef Action Group at the Orchard Beach, New York cleanup on International Beach Cleanup Day.

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Hillary Vidars is an internationally recognized speaker, educator, and author. She is Member of the Explorers Club, a Fellow of the American Society of Oceanographers, and a recipient of the President's Take Pride in America Award. Hillary is currently teaching environmental science at New York University.

The U.S.S. Monitor Then and Now



By Rod Farb

In less than a decade, there have been changes in the philosophy of management of the U.S.S. MONITOR shipwreck that are as significant as the physical changes in the shipwreck structure itself. In 1982, when I first sought a permit from the National Oceanic and Atmospheric Administration (NOAA) to dive on the U.S.S. MONITOR, the agency had very different ideas about access than it does today. Access to America's most famous shipwreck was jealously guarded by NOAA at the behest of the professional archaeological community. In fact, the MONITOR's status as the nation's first National Marine Sanctuary was born from the idea that the shipwreck, once discovered, had to be protected from pillagers and plunderers. From the time of its discovery in 1973 until June, 1990 when my team became the first to scuba dive to the site, only NOAA had

visited the wreck— though they did so remotely by submersible. In 1979, archaeologists, tethered to a submersible, made lock out dives on the 235 feet deep site and began the first hands-on survey of the ironclad. Other than a trial experiment with non-research scuba divers in 1994, dives on the U.S.S. MONITOR are permitted only for research purposes. Since 1990, other groups of civilian scuba divers, armed with research permits, have followed our lead in exploring the wreck. Sport divers have provided NOAA with good first-hand information about the wreck's status every year since 1990.

In the early 90's NOAA's relationship with some sport divers was tumultuous, but today much of that has changed for the better. Though NOAA cited safety as its major concern in prohibiting divers from visiting

the site prior to 1990, the near-death of two amateur divers in 1992 has been the only serious incident among scuba divers since then. In the early days of free-swimming scuba exploration of the wreck, divers were prohibited from touching it; today, tape measures and grids placed by sport divers often adorn the site. In 1993, the first civilians were allowed to recover artifacts from the site when my team brought up five glass bottles that were discovered the previous year by team member, Mike Phipps. Earlier the same year, I was invited to dive as part of NOAA's MONITOR Archaeological Research and Site Survey project, the first time a sport diver participated with the agency on the site. And in 1994, I was awarded a two-year permit for research on the MONITOR in contrast to previous years when my permits had been awarded on a year-by-year basis. Much of



A 1992 view of the propeller skeg and part of the lower hull that are torn away from the main hull and lean to starboard.

Rod Farb

The propeller skog and hull plate (left) have pulled apart from the main hull creating a large gap.



Rod Fairb

the credit for the positive way NOAA interacts with sport divers today in terms of access to the MONITOR is due to John Broadwater, MONITOR Sanctuary manager since 1992. A professional archaeologist with a strong sport diving background, Broadwater realized that sport divers were a large untapped resource for the agency. With his help and with the agency's guidance, divers began to write reasonable and doable research proposals that would serve to get the divers onto the site and would provide NOAA with solid data to augment their own research and management of the sanctuary. Perhaps as equally important is the positive change in sport diver's attitude toward NOAA's management of the site. Today, the MONITOR National Marine Sanctuary is well-served by the cooperative relationship between NOAA and the sport diving community.

What physical changes in the MONITOR shipwreck have taken place since 1990? The most obvious changes have taken place in the stern area of the wreck and at the stern end of the port armor belt. In 1990, the sternmost part of the lower hull was intact and the propeller bracket was upright attached to the rest of the hull. By 1992, the propeller bracket had leaned approximately 30° to starboard and had torn away a large portion of its attachment to the lower hull leaving a large gap where there had once been solid hull. The opening created access to the shaft tunnel and led to the discovery

of a heretofore unknown bilge sieve which was attached to the hull. Each year since then the propeller bracket has fallen further to starboard until now it rests barely 20° off the debris field on the bottom. Across from this area to the north is the stern end of the port armor belt. In 1990 and 1991, we reported a large vertical crack in the north face of the belt located approximately four feet from the stern end and running nearly the height of the belt. The crack allowed the outermost plate of the armor belt to swing outward like a hinge. By 1992, the outermost plate had fallen off. By 1993, the sternmost end of the port armor belt had fallen off leaving the armor belt 3.8 feet shorter than it was the year before. In 1990, two metal deck plates located near the turret were reported to be sprung, hanging down with the unattached end of each plate separated about a foot from the deck. Today, the sprung end of each plate rests on the sand bottom. In 1994, the innermost part (south side) of the port armor belt aft of the turret was intact. Today, viewing videotape taken during the Tysall-Lander trip to the site this past July, it appears as though a large section of plating there has fallen to the bottom. The lower hull of the engineering spaces that rest on the engine and boilers does not appear to have shifted to starboard more than was apparent in 1990. There is, however, evidence that the lower hull near the amidships bulkhead has sagged downward and shifted slightly downhill to star-

board. This is particularly disturbing since the mostly unsupported lower hull here is supported by frame members on the port side that are bending under its weight; they are bent more now than they were in 1990.

There are other less dramatic changes in the site. Beams have shifted slightly, deck plates have become unattached, portions of the south side of the port armor belt appear more irregular and parts of the wreck that were covered have become uncovered and visa versa. Overall, except for the stern, the wreck looks much as it did in 1990. Certainly, the wreck has not disappeared in three years as one self-styled MONITOR expert predicted to the press in 1991. There are indeed major changes that occur throughout each year because of strong currents and the intervention of man. This is something that NOAA did not know with certainty prior to 1990 though they may have predicted it because they did not survey the site annually until then.

Since that time, annual trips by sport divers to do research on the site, plus NOAA's own annual inspections have revealed the extent and rate of change in the shipwreck's structure- changes that quite likely occur on almost a daily basis. Because of this fact alone, the presence of sport divers on the site since 1990 has had a very positive impact on the shipwreck and on our knowledge and management of this important symbol of American heritage. ■

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Artificial Reefs

Over the years we all wind up diving on many different kinds of artificial reefs. Many different kinds of objects are used the world over as artificial reefs. You can dive on shipwrecks, airplanes, cars, trains, buses, oil drilling platforms, scrap metal, concrete rubble, and recently tanks and armored personnel carriers on sites in both fresh and salt water. Almost anything left beneath the surface of the ocean will become an artificial reef as it blends into the undersea environment.

The most popular type of artificial reef is the shipwreck. Historically, ships have always found their way to the bottom, both unintentionally and intentionally. When a ship hits bottom the "reefification" process begins immediately. Plant and animal organisms floating free in the water begin attaching themselves to the structure. These organisms in turn attract the small fish that feed on them. Small fish localized in the area around the wreck attract larger fish who come and remain in the knowledge that they can get a meal. The larger fish attract larger fish, and so on.

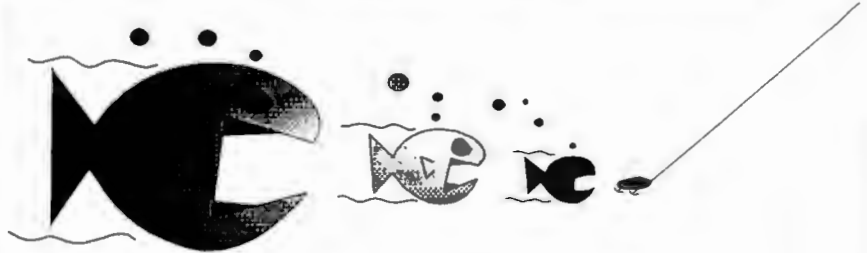
Ships that sink unintentionally can be quite a boon to sport divers and artifact hunters. The feeling one gets upon entering such a wreck is one of entering a place that has been frozen in time. This is evidenced by the presence of things that would not have been left behind if the vessel's end had been less traumatic. Human remains, cargo, life ammunition, overturned furniture and personal belongings all remain aboard as the life and death drama of a ship sinking is played out. These types of wrecks also have the downside effect of polluting the environment to some degree. Fuel and hydraulic oils tend to leak out of the stricken vessel as do all manner of chemicals and pollutants carried as cargo. Debris not attached to the ship floats off and becomes hazardous to navigation.

Over the years many vessels have been sunk intentionally as artificial reefs. While this type of reef has the perceived drawback to some divers of being sanitized, (cleaned of artifacts) the effect on the surrounding area is profoundly positive.

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By Capt. Joe Weatherby

erator and businessman who has been involved in the sinking of artificial reefs comments, "The biomass buildup is really quite dramatic. Reefs sunk not that long ago now are fully grown over and support a brand new fish habitat." The federal agencies interviewed were uniformly in favor of the various artificial reef programs throughout the country. "Artificial reefs take the pressure off the natural reef formations, they tend to give them some breathing room." said Alyson Simmons, spokesperson for the National Oceanographic and Atmospheric Administration. Bill Horn, an environmental specialist with the Florida department of Environmental Protection has had a lot of hands-on experience with generating and executing artificial reef plans. Says Horn, "These artificial reefs create a standing biomass in places that didn't exist before."

Artificial reefs are not without their detractors. There is a school of thought that holds that artificial reefs attract fish from a lot of the surrounding areas and concentrate them, thereby making them easier to catch. While this may be true in the period immediately following the sinking of a new reef, there is nothing to suggest this is true in the long term. "We make sure a vessel is cleaned of pollutants, that it is positioned far away from natural foraging areas to not influence the natural feeding habits of fish and that the artificial reef does not impact existing habitats like coral or sea grass beds." says Simmons. "We're seeing juveniles of all the different species." Slate says, "these things become giant hatcheries."

Artificial reefs have a big impact on local economies too. "I see these type of programs expanding." says Horn, "they're quite popular with municipal governments." Slate adds, "New reefs mean new business." Local governments view artificial reefs as permanent assets to the community that require no upkeep or payroll. Artificial reefs attract tourist dollars to places that might not otherwise get them and at times of the year that might otherwise be slow.

In a world where man's interest is often at odds with what is best for the environment it is refreshing to find that one can take a proactive stance on an issue that is good for all involved. ■

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Laws of the Sea

By Captain Roger Huffman



Shipwrecks change with time, that's one of the laws of the sea. Some of these changes are manmade, most are natural. When we dive on a wreck we seldom realize the changes going on in front of our very eyes. A little corrosion here, a little coral growth there, but all this happens too slowly to see. Seldom is a diver on hand to witness the moment when years of corrosive forces culminate in the actual collapse of a bulkhead. In time a wreck becomes a compost heap, slowly rotting away and providing fertile ground for divers to visit. Sightseers have something to look at, photographers have a subject, artifacters have a place to root around. Eventually Mother Nature eats the wreck and divers search out another dive site.

Currently the majority of North Carolina diving is done on ships sunk during WWII. During the war many of the wrecks suffered additional structural damage from depth charges. Then wire dragging operations were carried out to ensure a least depth of 60 feet over the wrecks. After this kind of treatment many of the wrecks were sufficiently broken up to allow a fairly rapid rate of deterioration. Those parts of the ships which were thickest have lasted longest. Thus we see bulk heading and decking disappear first while the heavier structural members last longer. If you dive a particular wreck long enough, and I'm talking a number of years here, you get to witness this. The bow section of the DIXIE ARROW is a prime example. Many of the vertical and horizontal structural members are still standing and some of the bulk heading is in place. But in the ten years I've been diving the wreck one of the main bulkheads has collapsed and several of the deck beams have fallen down.

Not all changes come so slowly. Several years ago we pulled up to one of the shoal wrecks in the springtime only to find that during the winter the wreck had completely sanded over. Nothing remained above the sand except one boiler and the engine. The NORTHEASTERN is another wreck that has covered and uncovered. A few years ago it went through a dramatic change and what once was barely a diveable wreck is now a



The DIXIE ARROW was struck by three torpedoes on the morning of March 26, 1942. The inferno fueled by a full load of crude oil raged for just over an hour before she sank in 90 feet of water. More than half of her crew of 33 died.

wreck that may one day rival the HESPERIDES for her beautiful marine growth.

The most dramatic change I've ever seen occurred in April of '93. The Labrador Current swept in with a vengeance, displacing the warm Gulf Stream waters and replacing them with a slug of cold water stronger than anyone could remember. The cold water moved the Stream twenty miles offshore and pushed down below Cape Lookout Shoals into the Morehead area. The charter fishing boats were seeing fish kills all over the place and commercial boats using dipnets

and hand gaffs brought in up to two thousand pounds of beeliners and red snappers killed or stunned by the cold water. It seemed like nothing could drive the water out and we still had cold, dirty conditions in June. When the water finally did clear up, the damage was appalling. Wrecks that had always had an inch or more of growth on them were reduced to bare metal. The wrecks on the northern end of our range were absolutely covered in mussels, a condition I haven't seen before or since. But the southern wrecks really suffered. Fish moved out of the area



Mariner's Museum

for lack of feed and we only had a third of the fish we usually have. Finally this year things seem to be getting back to normal. Growth is accumulating on the wrecks and as it does the fish are returning in good numbers. And just as after a good fire the marshes grow back prettier than ever, so the stripping of the old growth from the wrecks has made way for new, healthy organisms to flourish and repopulate. Constant change... that's the way of a shipwreck. ■

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A Living Fossil

By Kirby Kurkomelis

The dive season was put on hold for a few weeks by Hurricane Felix. Heavy winds and 15 foot waves pounded the East Coast of the United States. Sunny skies in conjunction with a heat wave seemed to add salt to an open wound. I felt like a fish out of water. One beautiful morning my son and I took a leisurely walk along the shore of Long Island. The beaches were filled with debris, broken logs, pilings ripped from docks, local treasures, clam shells, channel whelk (large snail) shells, and broken pieces of horseshoe crabs. I was saddened; I looked down to examine this old friend. My son asked me to explain....

Horseshoe crabs *Limulus polyphemus* are familiar to anyone who has walked the shores of the Atlantic beaches of North America. They are one of the oldest surviving species of animal living in the world. More than 200 million years old, they are practically identical to their ancestors. *Limulus* can be found nesting in bays, rivers from New York to Japan, and in most of the world's oceans. In fact, they are not really crabs, but living relics of an ancient class, *Merostomata*, which goes back in time to the Cambrian period. Fossils first appeared in rock a few million years ago. Horseshoe crabs are aquatic chelicerates with five to six pairs of legs, modified gills, and a spike tail. Subclass *Xiphosura*, the body is usually divided into two regions, a cephalothorax (prosoma) and abdomen. There are no antennae, a fang-like mouth, and pincer-like walking legs with modified feeding devices called pedipalps to transfer food to the mouth.

Horseshoe crabs are friendly - they live in shallow water on soft mud bottoms. Always moving, their triangular spike-like tail (telson) is highly mobile and may be used for pushing and righting the body when accidentally turned over, or in search of a mate. But then again they are dioecious; the reproductive system is essentially the same for male and female. Divers usually come across these creatures congregating in the intertidal zone along bays and estuaries. In early summer



J. Silverstein

Kirby and Storm examine the shell of a horseshoe crab that washed ashore after Hurricane Felix ripped through the coastline.

you can find female horseshoe crabs crawling on the beach between tides and burrowing into the sand with their armored shells. She lays as many as two to three hundred eggs, which are tan and white, and the size of a pinhead. At this point the male crab fertilizes them. During mating season the female will make many nests.

Horseshoe crabs are scavengers and feed on mollusks, worms and other small organisms, including bottom dwelling algae. Their hard outer dark brown shell (carapace) is smooth and horseshoe shaped. Above the carapace are two dorsal lateral ridges. Between them is a large eye which helps in navigation on both land and in water by certain patterns in the light from the sky. Also on each side are two small median eyes to enable the crab to tell night and day. Located posterior are five pairs of walking legs.

I take a closer look. It turned out that this one's shell was broken. Horseshoe crabs shed their shells periodically as do all crabs. That's why people call it a crab - but contrary to popular belief horseshoes are related more closely to modern land scorpions and spiders than any other creature. Horseshoe crabs have no natural enemies except man, who has an uncanny ability to push aside or destroy creatures he doesn't understand. ■

Kirby Kurkomelis is a PADI Master Instructor with a degree in marine biology from Queens College. He regularly dives the shores of southern Long Island and has been studying the migratory habits of the horseshoe crab for the past ten years.

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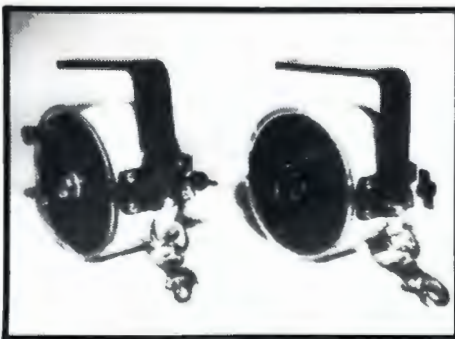
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Culloden Park

By Bill Bleyer

The wreck of the Revolutionary War warship H.M.S. CULLODEN will soon be a lot more accessible and maybe a lot more interesting, too.

Plans for Long Island's first underwater park in Montauk are moving ahead. Backed by state funding, the Town of East Hampton and Suffolk County have purchased 14 acres at Culloden Point from a developer that will provide public shore access to one of the most historic underwater sites on the Island. Now divers can only reach the site by boat or crossing private land.

The sands of Block Island Sound often cover what is left of the British man of war. The CULLODEN's crew burned it to the waterline to keep it out of American hands when it ran aground in 1781. Winter storm sometimes reveals traces of cannons or timbers.

But a recent visit by the group planning the park revealed the barest trace of the ship. Henry Moeller, a Dowling College professor who rediscovered the CULLODEN's location in 1971, and two officers of the Long Island Divers Association, noticed brown ripples running through the otherwise white sand. Those dark ripples about 15 feet underwater two miles west of the Montauk Harbor jetties are deposits of iron from rusting fittings on the timbers entombed below. When LIDA president Christine Schnell and secretary Janice Raber fanned the bottom with their hands, the sand parted to reveal what they believed to be an encrusted CULLODEN timber.

Divers in the future may get to see more than rust ripples, kelp, crabs and boulders covered with sea growth. The park planners hope to mount an archaeological dig to uncover some of the wreck and possibly bring relics ashore for conservation and display. Borrowing an idea from underwater parks in the Caribbean and in Lake George and Lake Champlain, they also envision underwater trails.

A 175-acre Culloden Point Park with access to the water became possible in June when the Suffolk County Legislature voted to chip in \$666,000 for the \$2-million purchase of 14.3 waterfront acres. There was

already \$1 million in state money available as a grant to the town, and East Hampton contributed \$340,000. The owner of the 272-acre property, 511 Equities of Manhattan, has agreed to donate 161 acres to the town to protect endangered species. The town will own two-thirds of the land and the county will control the rest.

For now, divers who bump along the dirt road from Lake Montauk must climb down a steeply eroded 25-foot bluff before they can swim out 200 yards to the wreck. Mike Frank, the county's deputy parks commissioner, says a permanent staircase would have to be built before access is permitted.

Walter Galcik, an environmentalist for the town, says that with state and Coast Guard approval, the wreck site would be marked by buoys. Divers coming by boat would be able to anchor outside the buoys and swim to the wreck. Keeping out boats would help protect divers from injury and the wreck from being looted. Cannonballs and other artifacts have been stolen in the past even though the wreck is protected by state law, the only wreck around Long Island in that position. The town will probably hire a caretaker to look after the parcel.

Galcik says the town would seek state permits to allow for excavation and possible recovery of relics for display in a new exhibit of Montauk area shipwrecks. An estimated 500 ships were wrecked around Montauk in the past two centuries. Items from the CULLODEN and the other ships recovered by the town and county or donated by sport divers could be displayed in the county-owned Third House museum in Montauk, which already houses an Indian museum, or at the Montauk Lighthouse. "Everybody in Montauk's got something in their attic or basement from the CULLODEN as well as objects from other wrecks," says Larry Penny, East Hampton natural resources director.

The CULLODEN, about 200 feet long, was launched in 1776. It was carrying 650 men in January, 1781, when it left Gardiners Island and tried to reach the ocean to ride out a storm. All aboard survived the grounding, and over the following three weeks, at least 46 cannons and other equipment were salvaged before the ship was burned down to within 15 feet of its keel. Other cannons were salvaged in later years including one found by Carlton Davidson of East Moriches in 1973 and now displayed at the East Hampton Maritime Museum along with pottery, silverware, shoes and other artifacts recovered by Moeller and his students.

"It's one of the most beautiful beaches to dive," Raber says. "And it has great visibility for Long Island." The visibility can reach 20 feet or more in the spring.

Schnell says. "Creating an underwater park here is very important for the dive community on Long Island because it sets a positive precedent in terms of access." ■

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Book Review

Marine Conservation for the 21st Century



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Well-organized and very complete, *Marine Conservation* is like a *Whole Earth Catalog* of tools and resources. It can be used as a core text for college-level courses on marine ecology, and as a do-it-yourself guide to actions and activities.

Most importantly to Sub Aqua readers, Hillary Vidars is a diver and diving educator. Sections of the book are devoted to all aquatic sports, with emphasis on techniques. *Marine Conservation* is beautifully illustrated with color photography and line drawings, and features copious glossary entries, appendices, references and contacts.

Perhaps the only problem with the book is that once a diver gets a copy in their hands, they'll have no excuse for not doing something.

Marine Conservation for the 21st Century by Hillary Vidars. Best Publishing Company
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November 10-12 Contact: 201-325-2964

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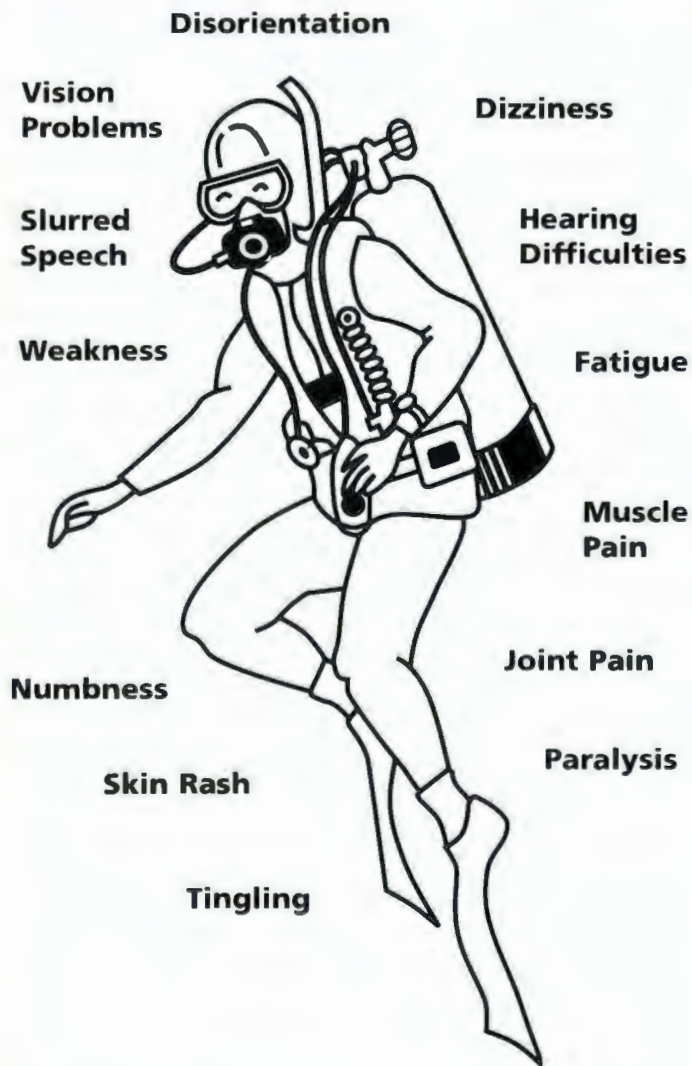
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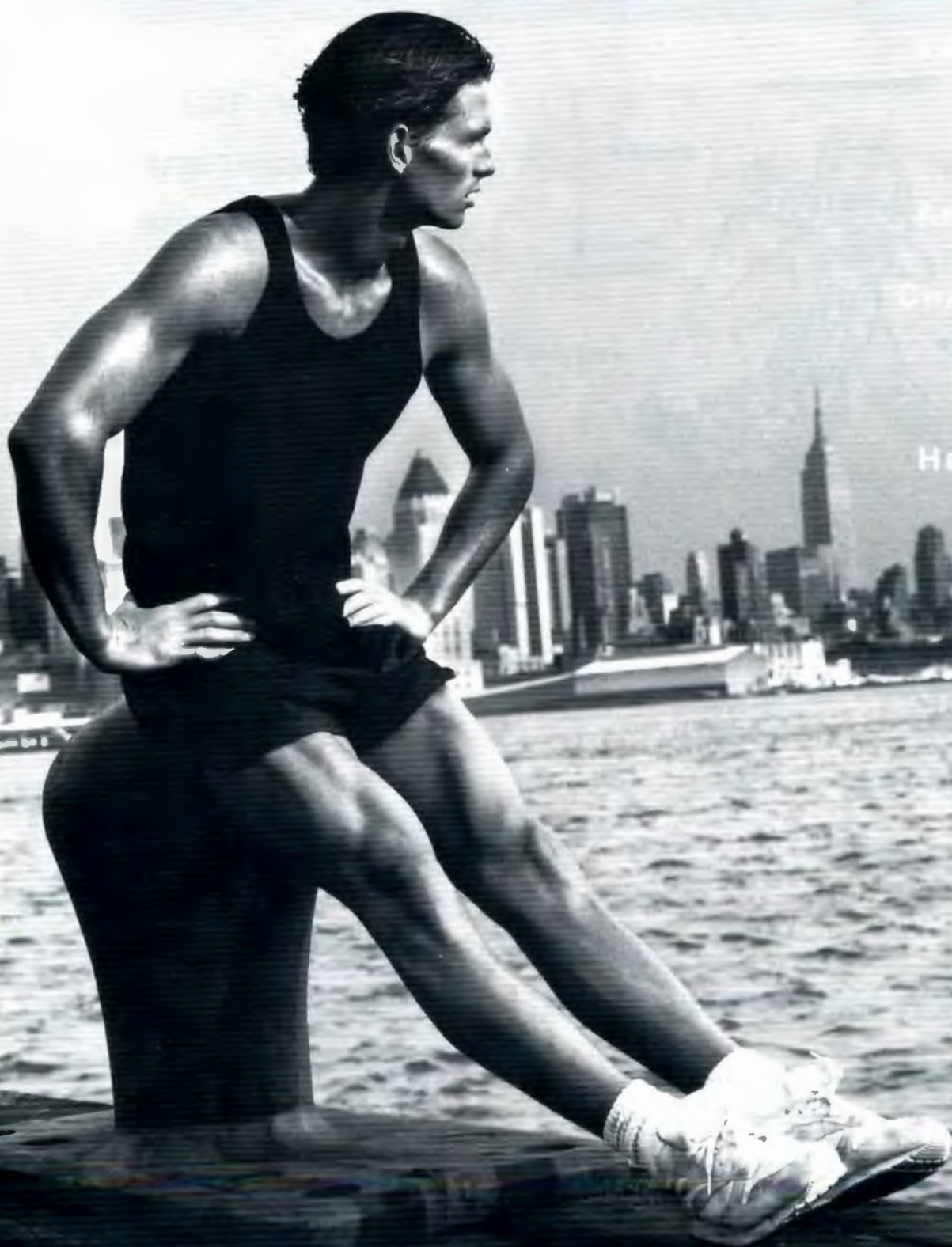
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