



The Journal of Diving History



Volume 19, Issue 2

Number 67, Spring 2011

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Propellers

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ONE ATMOSPHERE DIVING IN THE PACIFIC NORTHWEST



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FEATURE STORY

ONE ATMOSPHERE DIVING IN THE PACIFIC NORTH WEST BY SID MACKEN.....

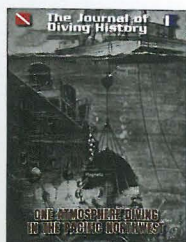
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The Pacific North West of the United States and Canada has a long recorded history of salvage diving stretching back into the 1870s. The loss of ships sailing between Seattle and Alaska provided work for divers using bells and standard helmet gear, as they sought to salvage both cargo and vessel. In addition to the traditional diving gear used, one atmosphere equipment was also developed by entrepreneurial engineers, hoping to create a diving machine that would make salvage in the frigid waters easier than it currently was. In this article, which was presented at the HDS 2010 Conference in Seattle, HDS Director Sid Macken introduces two elaborate creations from the early part of the 20th century: the Wiley Diving Machine and the Sissons Deep Sea Diving Machine. Each machine is a far cry from the one-man, one-atmosphere suits that came to the fore later that century, but they both worked. The author actually located one of them in the 1970s only to have it disappear without a trace. It is hoped that the publication of this paper will be a step back onto the path of diving history that helps relocate it.



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ON THE COVER

THE SISSON DEEP SEA DIVING MACHINE

An artist's impression of the Sisson Deep Sea Diving Machine at work on a sunken ship. The image is from an original circa 1920 prospectus published by Sisson, and distributed from his office in The Insurance Exchange Building in Los Angeles, California. Courtesy Leslie Leaney Archives.



Where There's a Will, There's a Way

Where there is a will, there is a way. This time-proven saying applies as well to diving as it does to any other trade. The constant search for easier, safer, quicker, better and cheaper has driven countless new products onto the market. In this issue Sid Macken reveals how two diving machines were brought to market in the earlier part of the last century to make the business of salvage diving easier.



©2008 Seyda Barer Iskender

These elaborate machines were both of a one-atmosphere design, and their market was the Pacific Northwest. One of them, the Wiley Diving Machine, was successfully operated to a depth of 175 feet and was the critical component in the raising of *S.S. Islander*. The other was the Sisson Deep Sea Diving Machine, which was apparently not so successful, but produced sufficient publicity that it was featured in overseas publications as well as domestic ones. The last chapter in its history has still to be written so it is possible that there will be a Part II to this story at a future date.

In the USA, after WWII, there certainly was a "will" to go diving among the more adventurous souls. The "way" would come out of the cockpits of WWII military aircraft. In this issue Ed LaRochelle takes us back to the post-war "Can Do" period, that saw many future-scuba divers converting aviation oxygen regulators into demand scuba regulators. Many of these Do-It-Yourself equipment builders worked in their garages and became our pioneer divers of the late 1940s. Others, perhaps looking for a cheaper "way" to dive than purchasing an Aqua Lung, followed the conversion steps provided in *Popular Science Magazine* in the early 1950s. Thus the Diluter Model AN 6004-1 gave valuable service in the skies above during war time and the seas below during peace time. Here Ed shows a selection of homemade and commercially produced Diluter regulators from his private collection.

Also in this issue Steve Barsky details one of our modern day "Can Do" divers, Karl Huggins, and his *Journey To The Edge*, the world's first commercially successful electronic dive computer. Abalone diving authority Scrap Lundy recalls his I.E.D. days in Vietnam, and Phil Nuytten records the story behind his exotic one-off Bat Hat.

Add to those our usual columns, and you will find that this issue contains another wide assortment of diving history from leading authorities in their historical fields.

I hope you enjoy them all.

—Leslie Leaney, Publisher

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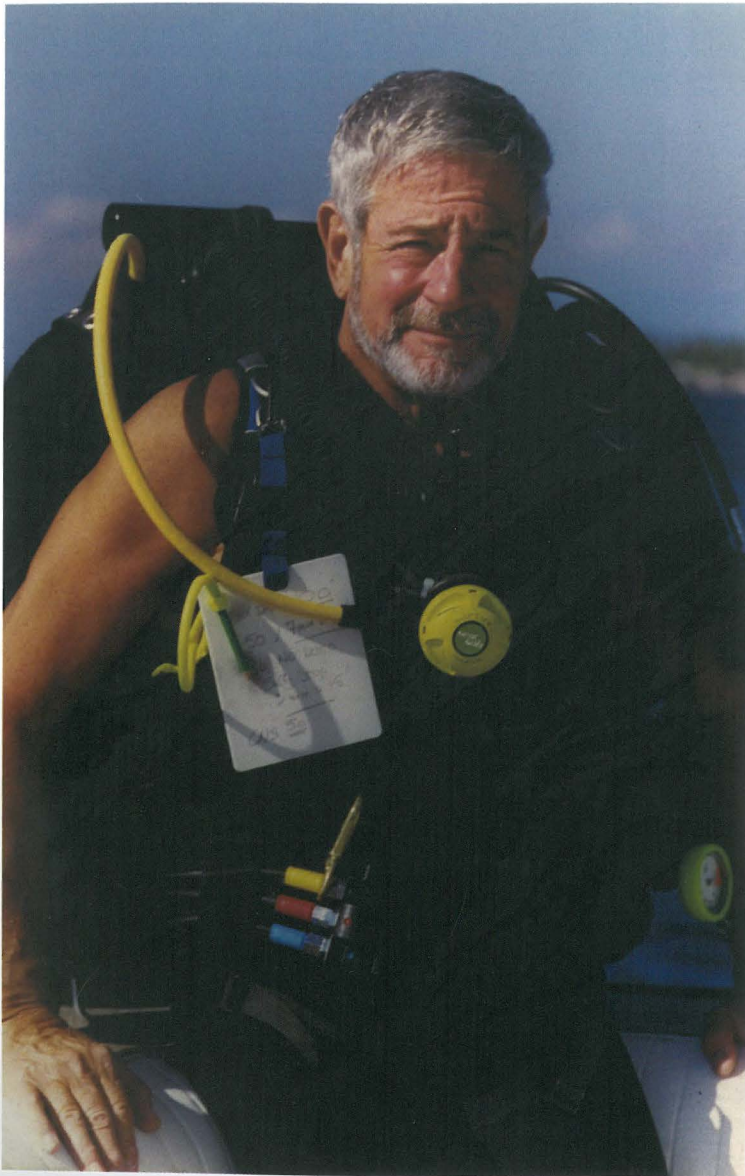
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Krov Menuhin Appointed to HDS Advisory Board



The HDS Board of Directors is pleased to announce the appointment of Krov Menuhin to the Society's Advisory Board. Krov has a long and accomplished career in diving, aviation and underwater filming, as well as serving in the U.S. military.

After leaving university in 1961, Krov served in the U.S. Army Special Forces (Green Beret) from 1961 to 1965 and became an instructor in guerrilla warfare. He was an Honor Graduate at the U.S. Navy Underwater Swimmers School, and became an instructor for underwater operations. He helped set up the lesson plans for Special Forces Combat Divers School and trained additionally at the HALO (High Altitude-Low Opening) school where he participated in high altitude parachuting from 30,000 feet, and served as an instructor in Advanced Training at the Special Warfare School.

After his military service he joined Ocean Systems as a diver and was a member of the team that made the world's first working dive using neon gas instead of helium. He holds an American Airline Transport Pilot's license with ratings in single and multi engine land, single and multi engine sea (amphibian), helicopter and rotorcraft, as well as a type rating in the Douglas D.C.3. He also holds an Australian Commercial Helicopter license, a French Glider pilot's license and a French Sports Parachuting license. He has worked for various airlines and was the Police Pilot for the Bahamas.

Krov also authored numerous maritime articles for various marine publications both in the United States and Europe, and with his wife Ann began making wildlife documentaries for the BBC and Channel 4.

While filming in the Sea of Cortez he became the first diver to film a blue whale underwater. The Menuhins also teamed up with Andres Pruna to film in Argentina, shooting the first film ever made at the Valdez Peninsula about the southern right whales. The BBC considered it to be the "world's first whale film."

Krov went on to produce or direct numerous documentary films for several international companies. Eight of these films reached an average world television audience of approximately 200 million people within two years from their first showings. He later joined French television's Ushuaia natural history series working as Director, Diving Supervisor, Pilot and underwater cameraman.

Krov's film work has received numerous international awards and he serves on the jury of the Rolex Awards for the Spirit of Enterprise. He is a Founding Benefactor of the Historical Diving Society and a Fellow of the Royal Geographic Society. 🌐

Dr. Sylvia Earle Honored with Hans Hass Award

The Hans Hass Award Committee is pleased to announce that the 2010 Hans Hass Diving To Adventure Award has been awarded to Advisory Board member Dr. Sylvia Earle. Dr. Earle has enjoyed a long professional relationship with Professor Hass, and has also been a staunch supporter of the HDS and its mission to preserve and record diving history.

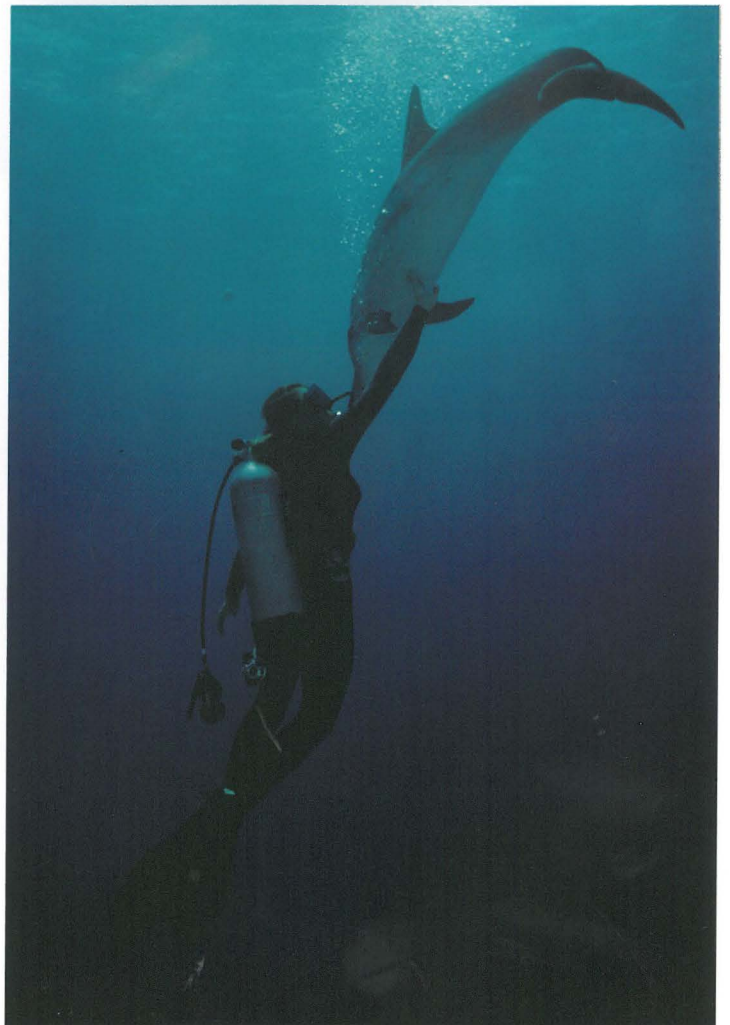
Sylvia A. Earle, called "Her Deepness" by the *New Yorker* and the *New York Times*, Living Legend by the Library of Congress, and first Hero for the Planet by *Time Magazine*, is an oceanographer, explorer, author and lecturer with experience as a field research scientist, government official, and director for corporate and non-profit organizations including the Kerr McGee Corporation, Dresser Industries, Oryx Energy, the Aspen Institute, the Conservation Fund, American Rivers, Mote Marine Laboratory, Duke University Marine Laboratory, Rutgers Institute for Marine Science, the Woods Hole Oceanographic Institution Research, National Marine Sanctuary Foundation, Ocean Futures, and Ocean Conservancy.

Formerly Chief Scientist of NOAA, Dr. Earle is a National Geographic Explorer in Residence, Founder of SEAlliance, Mission Blue, and Deep Ocean Exploration and Research, Inc., and chairs Advisory Councils for the Harte Research Institute for Gulf of Mexico Studies; the Ocean in Google Earth; the Marine Science and Technology Foundation and the Schmidt Research Vessel Institute.

She has a B.S. degree from Florida State University, M.S. and PhD. from Duke University, 19 honorary degrees, has lectured in more than 80 countries, appeared in hundreds of radio and television productions and has authored more than 175 scientific, technical and popular publications including *Exploring the Deep Frontier*, *Sea Change*, *Wild Ocean*, *Dive*, *The National Geographic Atlas of the Ocean* and *The World is Blue*.

Dr. Earle has led more than 100 expeditions and logged nearly 7,000 hours underwater with a record solo dive to 1,000 meters and nine saturation dives including leading the first team of women aquanauts during the Tektite Project. Her research concerns marine algae and deep water ecosystems with special reference to exploration, conservation and the development and use of new technologies for access and effective operations in the deep sea and other remote environments.

She has been awarded more than 100 national and international honors including the 2009 TED Prize, the Netherlands Order of the Golden Ark, the National Women's Hall of Fame, International Scuba Diving Hall of Fame, Academy of Achievement, and medals from the Explorers Club, the Philadelphia Academy of Sciences, Lindbergh Foundation, National Wildlife Federation, Sigma Xi, Barnard College, Society of Women Geographers, the National Parks Conservation Association, and the Natural Resources Council. She is Founder and Chair of The Sylvia Earle Alliance. Our congratulations to Sylvia on this significant recognition. 🐠



Stan Waterman and Dan Wilson Receive 2010 HDS Pioneer Awards

The Board of Directors of the Society is pleased to announce that Stan Waterman and Hugh "Dan" Wilson are recipients of the 2010 HDS Pioneer Awards. Previously a single award, it is now presented in two categories: one for recreational diving, the other for commercial diving.



STAN WATERMAN

Stan Waterman has been at the forefront of scuba diving since its inception as a recreational sport both in this country and throughout the world. His attraction to the underwater world began as a schoolboy in 1936 when he first dived with a Japanese Ama diver's mask in Florida. Inspired by Jacques Cousteau's revolutionary invention of the Aqua Lung, Mr. Waterman acquired the first one in Maine and went on to pioneer scuba diving in that state.

Mr. Waterman graduated from Dartmouth College in 1946, where he studied with Robert Frost and earned a B.A. in English. He has maintained an appreciation of language and literature throughout his life.

Between 1954 and 1958 he operated a dive business in the Bahamas with a boat he had built specially for diving. His first 16mm film on diving was produced during those years. For the next 15 years, Mr. Waterman continued to record his worldwide journeys and exploits on film, and most were ultimately purchased as television documentaries. In 1965 he took his entire family - wife and three children - to Tahiti. Their careers as television stars were launched when National Geographic purchased the rights to air his film of that year-long experience.

In 1968 he collaborated with Peter Gimbel on the classic shark film, *Blue Water, White Death*. He was associate producer and underwater cameraman during the seven-month long production. He was co-director of underwater photography

and of the second unit in the production of *The Deep*, based on Peter Benchley's best-selling novel. In other collaborations with his close friend and neighbor Mr. Benchley he was responsible for ten years' worth of productions for ABC's *American Sportsman Show*. More recent productions include documentaries for ABC's *Spirit of Adventure* series and the *Expedition Earth* series on ESPN. The Discovery Channel produced and broadcast a two-hour biographical special about Mr. Waterman, *The Man Who Loves Sharks*. Mr. Waterman's recounts much of his distinguished career in his first book, *Sea Salt*, published in 2005 and now in its third printing.

Among Mr. Waterman's considerable achievements are five Emmys, two U.K. Underwater Film Festival Gold Medals, four Golden Eagles, the Boston Sea Rovers Lifetime Achievement Award, the Richard Hopper Day Memorial Medal from the Philadelphia Academy of Natural Sciences, the DEMA Reaching Out Award, the HDS Hans Hass Diving To Adventure Award, the 1968 AUAS NOGI Award for Arts, and

induction into The International Scuba Diving Hall of Fame. Additional information on his career can be found at www.stanwaterman.com.

HUGH "DAN" WILSON

Hugh "Dan" Wilson grew up near Los Angeles harbor. At the age of ten he built a diving helmet from an old hot water heater and showed it to Charlie Smale. Watched secretly by his mother he made his first dive at the launching ways of a shipyard, supplied with air by a friend on a large bicycle pump.

After service in the Marine Corps, Wilson enrolled at the Sparling School of Deep Sea Diving. On graduation, he set up a salvage company with two friends, only to find there was not enough work to keep them employed. He then turned to abalone diving, and in 1955 he moved to Santa Barbara. From 1948 through 1962 he logged over 10,000 hours in both light and heavy diving gear. Wilson transitioned to oilfield diving and in 1962 he constructed a demand helium helmet and made the first commercial helium test dive off Santa Barbara, reaching 400 feet.

This historic dive opened the door to Phillips Petroleum, who were dependent on one diving contractor, Associated Divers, who continued to dive on air. Phillips gave Wilson and his new company General Offshore Divers a chance. Against considerable odds, he and his team succeeded and within a year General Offshore had dethroned Associated. Wilson and his partners



Courtesy Christopher Swann

subsequently sold the company to Union Carbide and it was then rolled into Ocean Systems. There Wilson built the *Purissima*, the first commercial lock-out diving bell. The bell was tested off Santa Barbara in early 1965. Although unsuccessful, it marked the beginning of a new era in which deep-diving work would be done from bells rather than from the surface. Wilson later set up Sub Sea International with the Ocean Drilling and Exploration Company (ODECO). The central innovation of Wilson and his engineers was the modular diving system. He went on to further success in the North Sea.

As a prominent member of the ADC, Wilson was closely involved in the successful effort to fend off union control of commercial diving. He subsequently became the chairman of the legislative committee, assuming overall responsibility in the battle to prevent the Occupational, Safety and Health Administration (OSHA) from subjecting commercial diving to what the ADC regarded as unrealistic and uninformed standards. Wilson's career was recognized by his 2005 induction into The ADC Commercial Diving Hall of Fame. He passed away in 2007.

Further details on Dan Wilson's career can be found in *The History of Oilfield Diving*, by Christopher Swann, and in Wilson's obituary, from which this information is taken, also written by Swann, in issue 53 of *Historical Diver Magazine*.

Ryan Spence Earns HDS Nick Icorn Diving Heritage Award

The Board of Directors is pleased to announce that the 2010 HDS Nick Icorn Diving Heritage Award has been awarded to Ryan Spence for his work in preserving the equipment of Captain Jacques Yves Cousteau with his Flashback Scuba Project.

Jacques - Yves Cousteau was one of the greatest ocean explorers of the 20th century, and one of the two the men behind the Aqua Lung, the tool that introduced millions of people to the wonders of the underwater world.

Cousteau's equipment was constantly evolving and as items were retired from service they found their way into various private collections throughout the world. Using his own money and an international network of connections Ryan Spence has, with focus and determination, steadily assembled a wide representation of equipment used by the Cousteau team. It is possibly the best collection outside of what The Cousteau Society holds.

Although the collection is private, Ryan has funded its public display at Tacoma Scuba, in Tacoma, Washington, where a great many of his Cousteau, and other vintage scuba items, are exhibited. He has also developed a traveling section of the museum which he displayed at the HDS Conference 2010.

Cousteau's widow Francine, head of the Cousteau Society, recently described Ryan as "a treasure," which he undoubtedly is for all those interested in the Captain's legacy. Ryan's work was featured in the article "Collecting Cousteau," in issue 64 of the *Journal*, and details of his continuing work can be found at www.flashbackscuba.com. Our congratulations to Ryan on his Nick Icorn Diving Heritage Award!



Courtesy David Haas of www.haasimages.com



HDS CONFERENCE 2011

September 30 - October 1, 2011 • The Mariner's Museum • Newport News, Virginia

The Society's Premier Annual Event at an Exciting New Venue

This year the HDS will be holding its 2011 Conference at the world renowned Mariner's Museum in historic Newport News, Virginia. Not only will attendees have the opportunity to listen to informative presentations by diving authorities, but they will also be able to visit the country's leading maritime museum - the home of the recovered turret and guns of the Civil War's most famous vessel, the *U.S.S. Monitor*. With the opportunity to hear of its recovery from the professionals who carried it out, this is truly a once-in-a-lifetime event for attending members.

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Banquet speaker; Former Chief Scientist of NOAA
- **Capt. Bobbie Scholley**
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- **Pierre-Yves Cousteau**
Youngest son of famed diving pioneer Jacques-Yves Cousteau and President of Cousteau Divers
- **Capt. Steve Bielenda**
Renowned East Coast dive boat captain and wreck diver
- **Glenn Butler**
Life Support Technologies Group, a leader in the development of hyperbaric medical programs

Speakers subject to change. Visit www.hds.org for more on additional interesting guests, tours, and activities

Conference only - \$35 • Banquet - \$50 • Conference & Banquet - \$85
Get both Conference & Banquet (both October 1) for \$75 if purchased before September 15

Free admission to the Mariner's Museum is included

To purchase tickets, email GregP@hds.org or call (702) 485-5676



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The conference hotel will be Point Plaza Suites in Newport News, Virginia. A special rate of \$69 per night for Deluxe Guest Rooms or \$89 for 1 bedroom Executive Suites has been provided by the hotel. Reservations must be guaranteed by the individual's credit card by calling 800-841-1112 or 757-599-4460 prior to midnight Tuesday, August 30, 2011. In order to receive the special group rate, please mention the Historical Diving Society when making your reservations.

THE MARINERS' MUSEUM AND PARK
THE PENINSULA FINE ARTS CENTER



HDS Germany's Franz Rothbrust promotes Euro Zone harmony by wearing an HDS France hat. Photo by Horst Stulfauth.

HDS GERMANY

The recent surge of interest in vintage diving equipment, as reported in issue 65 article *European Vintage Scuba Event, Lake Marx, Germany*, has led to the re-establishing of HDS Germany. Organized by Franz Rothbrust and his colleagues, the inaugural meeting was held on Saturday, June 18, 2011, near Neustadt/Wstr. It was followed by a dinner welcoming divers from numerous countries who were visiting for the annual Lake Marx Vintage Dive which was held the next day. In addition to the new members of HDS Germany a very large contingent from HDS Czech Republic were present, plus members of the national HDS groups in France, UK, USA, Poland, and South-East Asia Pacific. A web site is currently being established for HDS Germany. In the meantime they can be contacted at Historische Tauchergesellschaft e.V. (HDS Germany), Villenstrasse 6, 67433 Neustadt/Wstr., Germany. Email: info@htg-ev.de. A fuller report will appear in the next issue of the *Journal*. Our congratulations to Franz and his team.



FOLCO QUILICI RECEIVES 2011 ARTIGLIO AWARD
Pioneer Italian diver, author, photographer and film maker, Folco Quilici, received the 2011 Artiglio Award in recognition of his lifelong contributions to diving and cultural research. His early diving film, *Blue Continent*, received the Venice Film Festival Special

Award in 1954. His book of the same title was one of the first scuba diving books, and was available in several languages. He received a 1971 Oscar nomination for his film *Tuscany*, and has spent his career actively engaged in cultural programs. Quilici is a founding member of HDS Italia and in 2006 *Forbes Magazine* named him as one of the 100 most influential writers in the world. He is shown on the right of the photo with Italian Admiral Florindo Cerri of Artiglio Europa Foundation, outside of the Viariggio Maritime Museum, prior to the award ceremony. ©2011 L. Leaney



FAKE SIEBE/HEINKE HELMETS IN EUROPE

Dutch member and *Journal* contributor David Dekker reports that a model of a Siebe/Heinke helmet is being reproduced in Europe. David reports that last year a German collector had part of his collection stolen. The thieves were captured but are now out of prison and peddling fake Siebe/Heinke helmets which are believed to have been manufactured in Poland. The helmet shown here is one of the reproductions, copied from a Siebe/Heinke stolen from the German collection. The breastplate plaque states Siebe Gorman. A plaque above the bonnet inlet elbow states Heinke London. We hope to have fuller details in the next issue. For images of the stolen helmets log onto www.hds.org/bulletins.

LOS ANGELES HELMET DIVE SEPTEMBER 3

The California Classic Equipment Divers will host a heavy gear demonstration dive at Los Angeles Maritime Museum in San Pedro, California, at 10 am Saturday, September 3, 2011. In addition to hosting the dive,



MARK V MONUMENT PROJECT

The HDS has long been a supporter of the Mark V Monument Project, a non-profit enterprise headed up by Advisory Board member Bob Barth and Dave Sullivan. The goal of the project is to erect a 10 foot tall bronze statue of a Mark V Diver at the Naval Diving and Salvage Training Center in Panama City. To assist in raising funds for the project HDS displays one of the 300 Mark V bronze statues at our exhibition booth. Visitors interested in purchasing the statues are directed to Bob and Dave, and this exposure by HDS has worked well, with several statues being sold. One was to HDS Sponsor company William J. Castle and Associates, who added it to their office display. Shown here with their authentic office USN Mark V helmet are staff members Melissa, Janet and William Castle. The pairing of the statue and an original Mark V makes for a stunning display.

the museum has exhibits on the diving history of Los Angeles harbor and associated heavy gear diving trades. The design and equipping of these exhibits was overseen by our Advisory Board member Torrance Parker. For more information contact Charlie Orr at charlesorr47@att.net.

HDS UK OPEN THE DIVING MUSEUM

The HDS UK has opened its own Diving Museum in Gosport, Hampshire. Located at No. 2 Battery in Stokes Bay, the museum features a wide array of historical equipment. We hope to publish a report on the museum in a future issue. For more information log on to www.divingmuseum.co.uk. Our congratulations to HDS UK for this significant achievement.



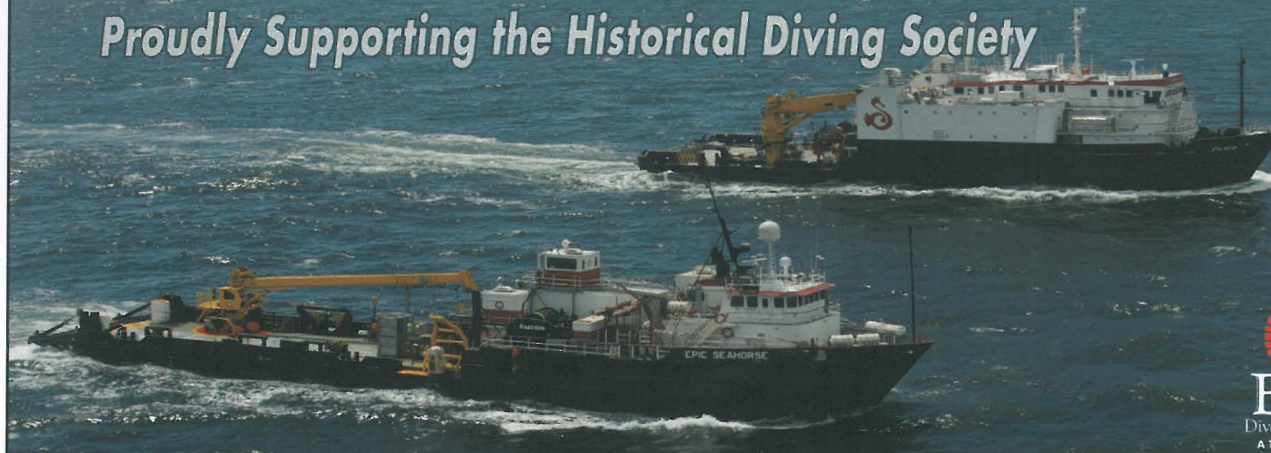
Sir John's coffin leaves the 13th century church of St. Mary the Virgin at Holne village on Dartmoor. Photo by Mike Fardell.

SIR JOHN RAWLINS PASSES

As we go to press we are informed that our Advisory Board member Surgeon-Vice Admiral Sir John Rawlins has passed away. Sir John was also President of the HDS UK. An obituary will be published in the next issue.

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While every effort is made to include all relevant details in correspondence some letters may have been edited.



WWW.MARKVMONUMENT.ORG

Dear Leslie and HDS members, Thanks for HDS's continuing support of our Mark V Monument project. A lot of folks have helped us and HDS has certainly done their share.

We have now received our Letter of Approval from the Secretary of the Navy to install the big MK V diver statue at the dive school. The engineering for the construction of the statue base has begun, so things are happening and starting to move fast.

We are now selling T shirts and Polo shirts showing the statue to help raise more funds for it. You showed a model of the statuette on page 53 of issue 66. We now have only 80 statues left from the original 300, so we are getting near to selling them all.

I encourage your readers to take a look at the website www.markvmonument.com which will tell you everything you need to know about how to buy a statuette or a shirt.

Many thanks,
Bob Barth
Panama City, Florida
bob.barth@att.net

THE CARRIERS

Dear Sid,
Reference your response to the letter by Charles Lumsden on page 7 of issue 66 regarding the Carriers. The Carriers were members of the Long Island Dolphins for a short time. "They asked a lot of questions, wrote a book and were never seen again," according to Graham Snadiker, one time president of the Dolphins back in the late 1950s and 1960s when I asked him the same question two years ago during a visit to him in Arizona.

Bernie Campoli
Panama City, Florida



CAST IRON SHALLOW WATER HELMET AND FRANZ CLOUTH HELMET

Dear Leslie,
I saw the photo's of the cast iron hat on page 6 of issue 65. I guess there are two variations with the bolts on the front port. Mine has four across the top and bottom, and six on each side. The one from Bob Harvey is a little different. Both have the same bolt pattern on the top port, but it is too bad that the top handle on Bob's has been broken off. It is still a nice hat though. I think you should mention in your next issue that the Clouth hat shown on page 51 of issue 66, was a mismatch. One can see right off the neck rings are different in size.

Leon Lyons
St. Augustine, Florida



DIVERS RING

Dear HDS,
I have an interesting nautical diver's ring. I do not know anything about it other than it's handmade 14K yellow gold and weighs 32.1 grams. I was told that it was an Underwater Demolition Team ring. It belonged to my uncle who has long since passed.

We would like to know what this ring represented and what era it came from. Any help your members could give us would be appreciated

Thank you for your time.
Jenny Terry
Sarasota, Florida
luvgwife@gmail.com

Editors note: If any members can assist Jenny please contact her directly.

JIM BOYD

Dear Leslie,
Thank you for publishing the tributes to Jim Boyd. Reading them, of course, made it all more real, but Jim being gone is an unfortunate reality, so I supposed I'd better to get used to it.

I very much enjoyed reading your tribute, which was both poignant and very funny and I got a great laugh from the Pentagon anecdote as well as the shoes part. Not to mention the "cure for AIDS" which

had a great punch-line. I liked how you tied it all in with Jim finally being comfortable in his usual attire, as well as being within close proximity to McDonald's. At the Beneath The Sea Show he was grateful for any of that over-priced, junky food I would bring him, after seating him in a chair we'd brought. I told my husband Gene had I known 2010 would be the last BTS where I'd see Jim, I'd have brought him more food.

My son, Jared, who is now 24, will be thrilled to see that his tribute is in there in its entirety, along with the picture of Jim and himself as a little guy, from all those years ago. Jim would be happy about that. I'll put the magazine right next to the railroad book that Jim wrote, which he gave us some years back.

Sincerely,
Beth J.P. Ritter
New York
PozyAquaGTR@aol.com

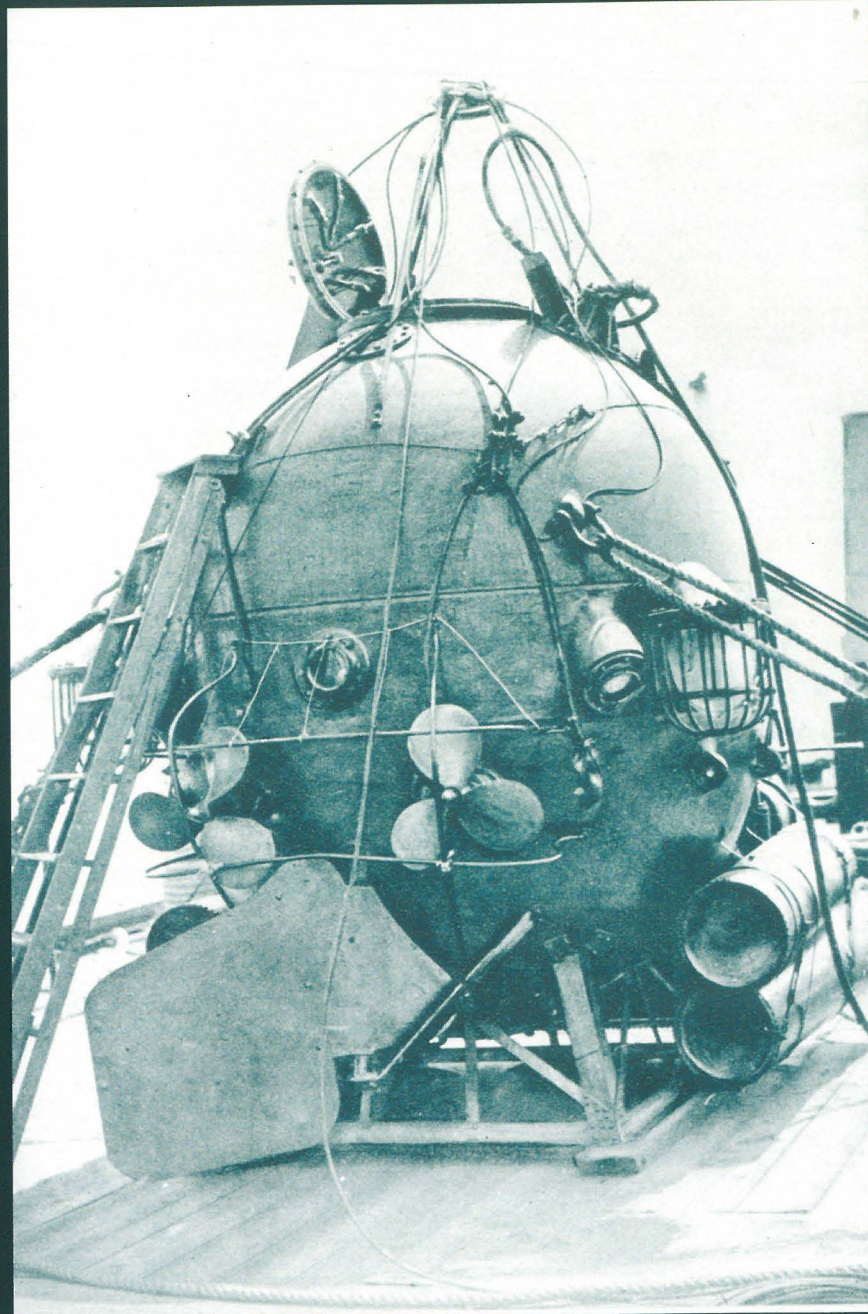
CONTENT OF ISSUE 66

Dear Leslie,
A line to say congratulations on the beautiful issue 66 of the *Journal of Diving History*. Bob Ramsay's group photo on page 54 is one of the best I have seen of members of the USA team. Sid Macken's informal snap shot of James Forte on page 45 was very relaxed. The one-atmosphere chamber from the *Artiglio* that was featured on page 6 brought back memories of when we called in at Viareggio in 1955. That was on my "Grand Tour" of Europe with two Aussies in our old 'bomb' CRS 7. See p.120 of my book *Fathomeering* for details. The windows into our diving history provided by the *Journal* are much appreciated down here in New Zealand.

Ivor Howitt
New Zealand
fathomeer@xtra.co.nz

ONE ATMOSPHERE DIVING

IN THE PACIFIC NORTHWEST



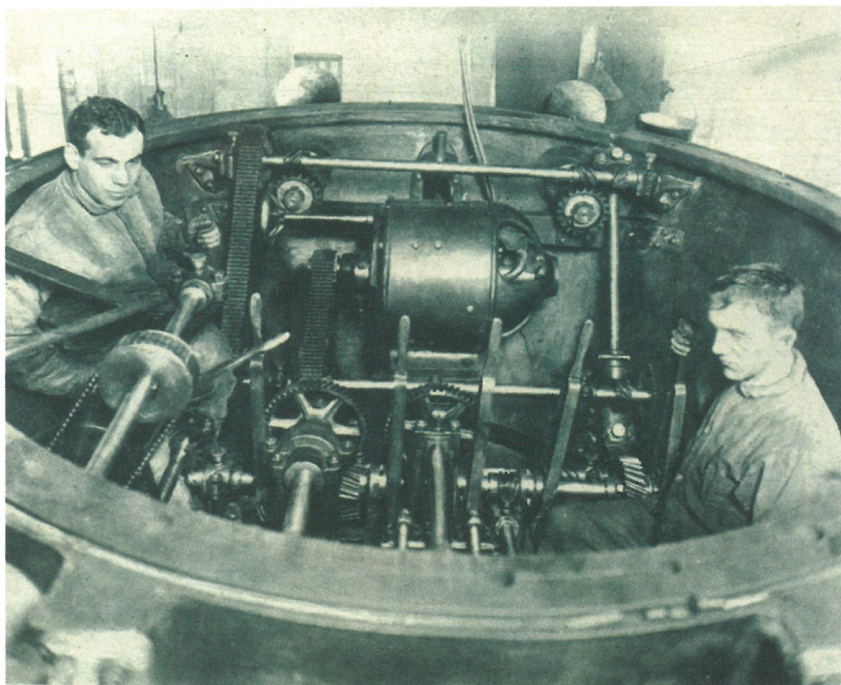
By Sid Macken

The Pacific Northwest region of the United States and Canada has a rich diving heritage that extends from the present back into the 1870s. Part of that heritage includes ship salvage, mystery, intrigue, and one-atmosphere diving machines. I say machines because, as you will see, they were more than simple diving bells. The introduction of one-atmosphere diving to the Northwest came with the sinking of the *S.S. Islander* in Alaska. The *Islander* was built for passenger service along the Inside Passage from Seattle to Alaska. It was, at the time, the most opulent and gracious liner serving the region, and carried miners north to the Alaskan gold fields. Important to our story, while the *Islander* carried many broke miners south, it also carried rich miners and their gold. On a southbound course, in August 1901, the *Islander* struck an underwater obstruction and sank, taking with it seventy odd passengers and crew members, and, it is rumored, a fortune in Alaskan gold. That gold spurred numerous salvage attempts on the *Islander*, the first commencing in 1902.

Henry Silas Finch had begun diving while serving with the Lifeboat Rescue Service in Michigan. In the 1890s, he struck out for Alaska, hoping like many others to strike it rich in the newly discovered goldfields. Luck wasn't with Henry, and he settled into a career of commercial diving in Seattle, Washington. However, he and his eldest son, Loren, continued to make annual excursions to Alaska. Henry's diving business caught the attention of the insurance underwriters of the *S. S. Islander* who entered into a contract with Finch to find and salvage the ship.

The 1902 and 1903 diving seasons brought little luck to the salvors. Finch recalled a diving bell from his diving days in the Great Lakes and had it shipped west. Not much is known about this bell other than it was known to be a man killer. A previous diver had drowned in the bell when one of the port lights (window) had shattered under pressure. When the bell reached Seattle, Finch had it repaired and tested, then took it North for the 1904 diving season. With the use of this bell, which may have been little more than an observation chamber, Finch was able to find the *Islander*, but only raised a couple of minor artifacts to prove the discovery. The 1904 season also brought the death of Finch's son, Loren. It was Henry S. Finch's last expedition to the *Islander*.

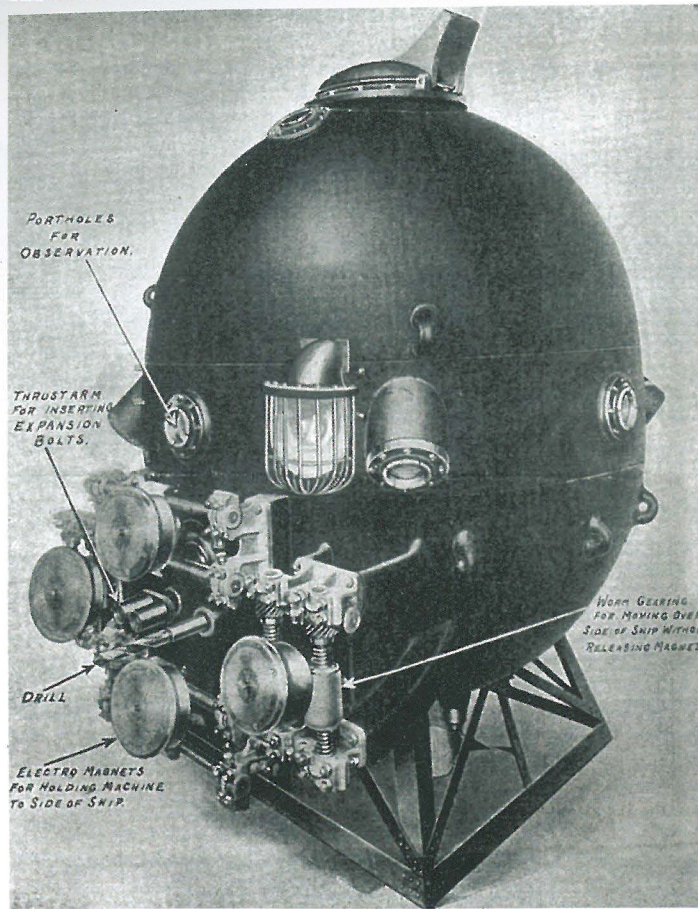
The first salvage expeditions to the *Islander* brought little gold but many newspaper articles. Newspaper reporters loved the story. They reported the comings and goings of the salvors, and embellished the details to make it more appealing to their readership. It was reported that the diving



(Above) Interior of the Sisson Deep Sea Diving Machine from the *Illustrated London News*.

(Opposite) The stern of the Sisson Deep Sea Diving Machine showing the propellers and rudder.

ONE ATMOSPHERE DIVING



The front of the Sisson Deep Sea Diving Machine showing the electro magnets, drill, and thrust arm.

depth was 324 feet, which for the time would have broken many records had it been true.

THE WILEY EXPEDITION

From its discovery in 1904 until a major expedition was mounted to recover the *Islander* in 1929, the shipwreck and its rumored golden cargo spurred many people to attempt its recovery. At least 12 expeditions ventured into Alaska's chilly waters to try to recover the treasure. All ended in failure, but they provided great fodder for the newspapers. One story in particular had Seattle diver Charlie Huckins fighting for his life, armed against a Giant Pacific Octopus with only a spear and a knife.

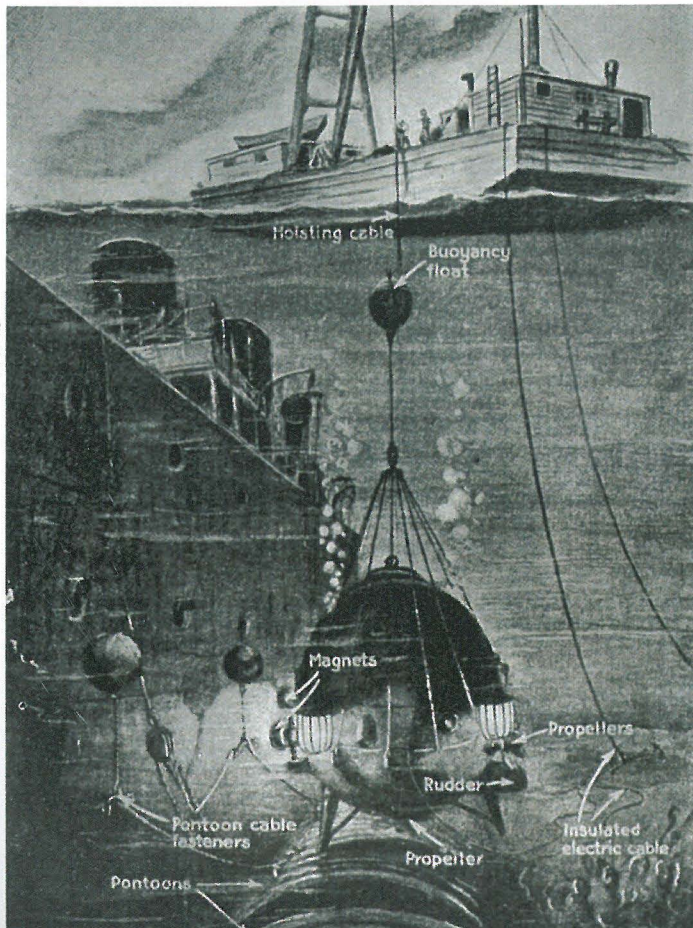
The ultimate diving venture on the *Islander* occurred between 1929 and 1934 when a Seattle house mover, Frank Curtis, teamed up with Elbert and Carl Wiley to again attempt recovery of the *Islander's* gold. Wiley was noted for being "a mover of things hard to move," and the Wileys had designed and built a diving machine. The fourth principal partner was Henry Finch, Jr., son and brother to the previous Finch divers who located the *Islander*.

The Wiley Diving Machine was key to this newest salvage attempt. With it, the team was able to relocate the wreck (the actual diving depth was 175 feet), recover artifacts, and sling cables under the hull and rig it for lifting.

The small egg shaped hull was topped with a cupola with four windows that also served as the entry hatch. It was equipped with an electric light and an arm with a mechanical claw (both items lacking from the 1904 bell). Internally, the machine contained an oxygen recirculating system, controls for the arm, a seat for the diver, and a hand powered, chain drive system of wheels which were to allow the diver to move the bell across the seabed. A very rudimentary machine at best, but it did its job well. Over the next five years, the company was able to raise the hulk of the *Islander* by slinging it between two floating ship hulls, lifting and moving it on successive tides until they finally beached the wreck on a large mud flat not far from where it had sunk.

For all their work, the salvors were rewarded with very little gold. The total cost of the five-year expedition was estimated at \$500,000. The recovered gold amounted to \$40,000. In 1952, the decayed and rusted hulk of the *Islander* was

A depiction of the Sisson Deep Sea Diving Machine in action.



recovered from the beach and shipped to a scrapyards on Seattle's Duwamish River. The purser's safe with all the gold was never found, and is believed to lie on the seabed in a portion of the hull that had broken off. After 108 years, the *Islander* still attracts treasure hunters.

THE SISSON DEEP SEA DIVING MACHINE

During the same era that divers were attempting to salvage the *SS Islander*, another deep diving system came into being. Larger and more complex, the Sisson Deep Sea Diving Machine was promoted around the country and overseas, but in all likelihood it was never used in an actual salvage operation. It had an uncertain connection to Portland, Oregon, but remains shrouded in mystery to this day.

William Sisson, based out of New York City and Los Angeles, designed and patented his diving machine for the sole purpose of salvaging steel hulled wrecks. A prospectus for the American Salvage Company, which promoted the Sisson machine, listed a comparison of the number of ships lost between 1912 and 1918 and the number of ships raised during the same period. According to the data presented, there was still plenty of wealth lying on the bottom of the sea which the revolutionary machine made accessible.

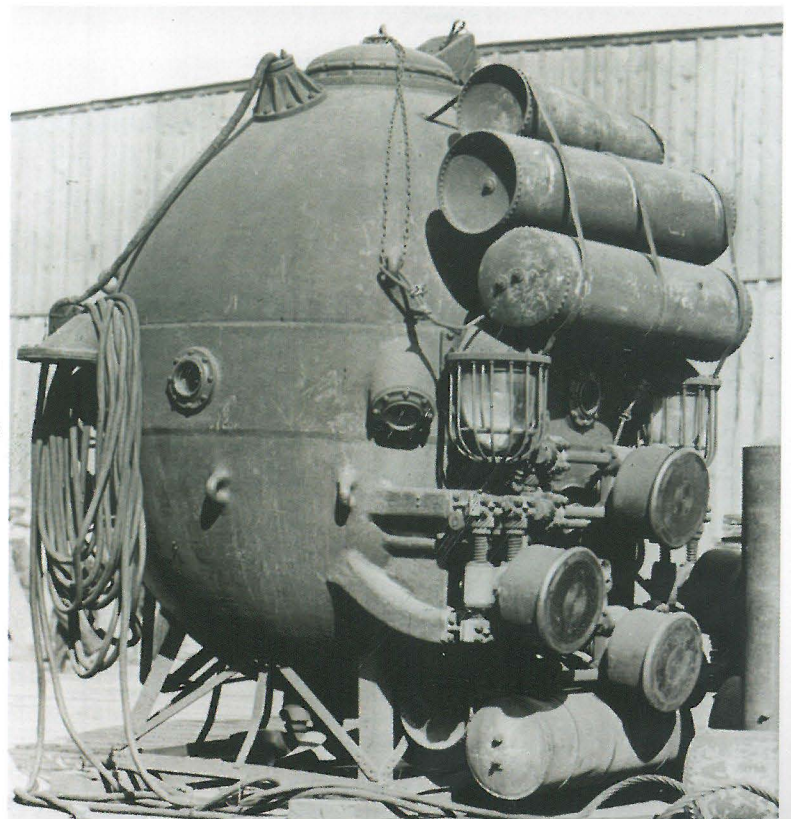
The Sisson machine was designed to attach large pontoons to the hulls of sunken ships. The pontoons would then be filled with air to raise the hulks to the surface.

Two unique features made the Sisson machine quite different from any bell system used previous to this time. First, at the rear and bottom of its egg shaped hull, the machine had propellers. Powered from the surface by an umbilical and driven by electric motors, the propellers provided forward and vertical thrust. Rudders, in conjunction with the twin rear thrusters, allowed for limited steering capability. The machine could be lowered from the surface close to a sunken ship, then driven to the wreck by the operators. The second feature, large electromagnets, when energized, held the machine tightly against the hull. Worm gears, controlled from inside the machine, moved the machine itself in relation to the magnets for precisely locating the hole for mounting the expansion bolts, and later the pontoons.

The machine was operated by a two-man crew working in a very cramped and, by today's standards, quite hazardous space.



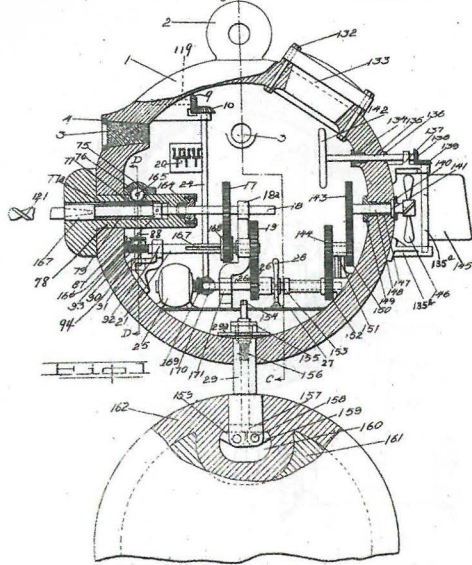
William Sisson and crew on the Diving Machine being hoisted out of the water after a test dive.



The Sisson Diving Machine on the docks in Portland, Oregon.

ONE ATMOSPHERE DIVING

W. D. SISSON.
DIVING BELL.
APPLICATION FILED OCT. 29, 1912. RENEWED JUNE 22, 1914.
1,134,963. Patented Apr. 8, 1915.
8 SHEETS-SHEET 1.



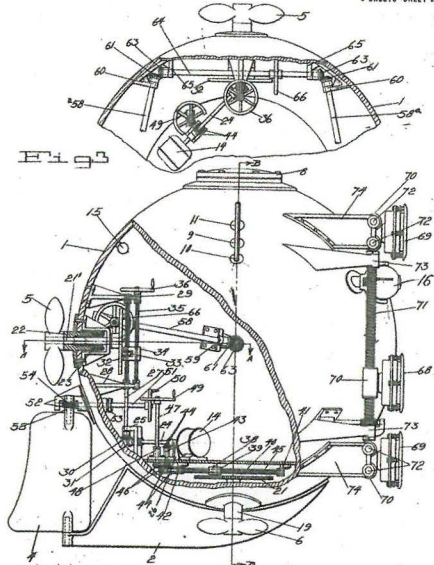
WITNESSES:
R. M. Matter
Sam Lauback

INVENTOR
William David Sisson

BY
J. B. Matter
ATTORNEY

Patent drawings. Note the signatures of witness and inventor on the three documents.

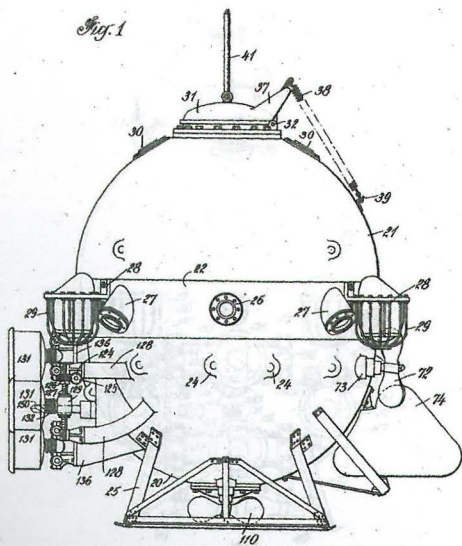
A. J. MATTER.
SUBMARINE SALVAGE VESSEL.
APPLICATION FILED OCT. 19, 1914.
1,321,383. Patented Nov. 11, 1919.
9 SHEETS-SHEET 2.



WITNESSES:
A. Matter
J. B. Matter

INVENTOR
Albert J. Matter

W. D. SISSON.
SUBMARINE VESSEL.
APPLICATION FILED JUNE 25, 1916. RENEWED OCT. 19, 1918.
1,321,562. Patented Nov. 11, 1919.
6 SHEETS-SHEET 1.



W. D. Sisson, Inventor
By *L. S. Attorneys*
Benjamin Davis, Marvin & Deland

The tiny interior was filled with electric motors, rotating shafts, open belts and un-shielded gears. An OSHA nightmare! Inside the machine, the operators remained at atmospheric pressure and could view the surrounding area through small viewports. The area around the machine was illuminated by large incandescent lights.

Widely promoted, the Sisson machine was tested on both the east and west coasts of the United States, and appeared in many magazine articles including a 1919 edition of the *Illustrated London News*. Stock in the American Salvage Company was sold around the world; however, it does not appear that the machine was ever used in actual salvage operations.

THE PORTLAND CONNECTION

The Sisson machine ended up in Portland, Oregon, and remained there for many years. I've often wondered what was the connection with Portland. Two patents, filed on the same day and awarded on the same day in 1918, offer a clue. The original 1912 patent was filed by Sisson and witnessed by Albert Matter. The 1918 patents, for virtually the same design, were filed separately by Sisson and Matter. Albert Matter was an engineer from Portland, and it appears that he may have been awarded possession of the machine. How, when, or why is unknown.

There was a demonstration dive made by the Sisson Deep Sea Diving Machine in the Willamette River in downtown Portland, Oregon. The actual date of the dive is obscure, but a vague reference is made to 1910. An article in a Portland newspaper recounts the story as told by crane operator Red Hirte. Red described raising the machine from the Albina dock, lowering it

into the river, then slacking the cable so the machine could be driven around by its crew.

After the demonstration dive, the Sisson machine went into storage at the Union Pacific Warehouse on the Albina docks. It remained there until 1954. During that time, it was visited only by warehouse watchmen, and on one occasion by a solitary female. The storage bill was kept paid up. Occasionally, a letter would inquire about its condition, but only the one visit by the female.

Many stories were told about the machine. Possibly, the inventor made a fortune with it but died of a strange disease in a far-off land (the female was his grieving lover, or widow, depending on who was telling the story). Or, the inventor went broke trying to promote the machine. Or, business partners had a falling out, and lawyers beached the machine. In retrospect, it appears the latter may be closer to fact.

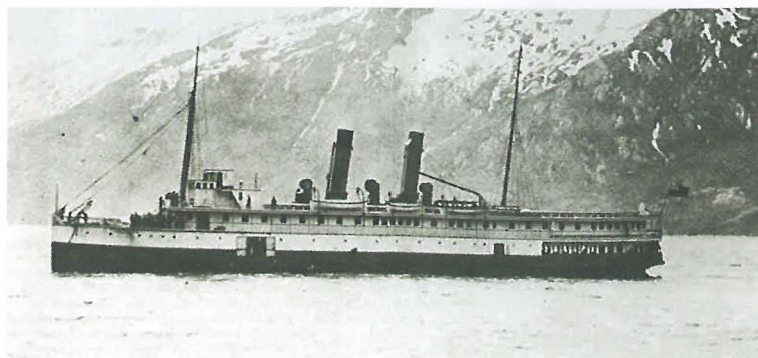
At any rate, the machine remained in storage from about 1911 until 1954 when it was donated to the newly formed Oregon Museum of Science and Industry (OMSI). Located adjacent to the Portland Zoo, OMSI overlooked the highway below and the large, orange painted Sisson machine was clearly visible to passersby.

In the 1970s, OMSI moved to a new location in downtown Portland, and the Sisson machine was again donated—this time to the Mark O. Hatfield Marine Science Center in Newport, on Oregon's central coast. There the trail ends, and the Sisson Deep Sea Diving Machine, all ten tons and 14 feet of orange painted steel, disappeared.

Thirty years have passed and the present staff at both OMSI and the Hatfield Marine Science Center have little recollection of the machine. Records from both organizations are inconclusive as to the fate of this magnificent diving machine. It is the fervent hope of the author that someone reading this article may be able to fill in the final chapter and tell us the fate of the Sisson Deep Sea Diving Machine. 🐠

THE AUTHOR

A diver for over 50 years, Sid Macken has pursued a lifelong interest in underwater photography. He owns Mocean Video, which has produced several projects for commercial diving companies. Sid feels fortunate to have begun his diving career during the early years of American sport diving, an exciting time full of innovation, experimentation, and discovery. He is an early graduate of the Santa Barbara City College Marine Diving Technology Program, an ADCI certified diver, PADI Divemaster, a former public safety diver and instructor, and a freelance underwater videographer. With his introduction to the Historical Diving Society, USA, in 1994, Sid began to study the history of underwater photography. He presently contributes *The Submarine Lens* column to the *Journal of Diving History*, and is also an HDS Director. He is the recipient of the 2000 HDS E.R. Cross Award.



The steam ship *Islander* in Alaskan waters.



The *Islander* beached in 1934.



The *Seattle Sunday Times* headline illustrating the Wiley diving machine and salvage operation. Henry Finch is the diver shown at the right.

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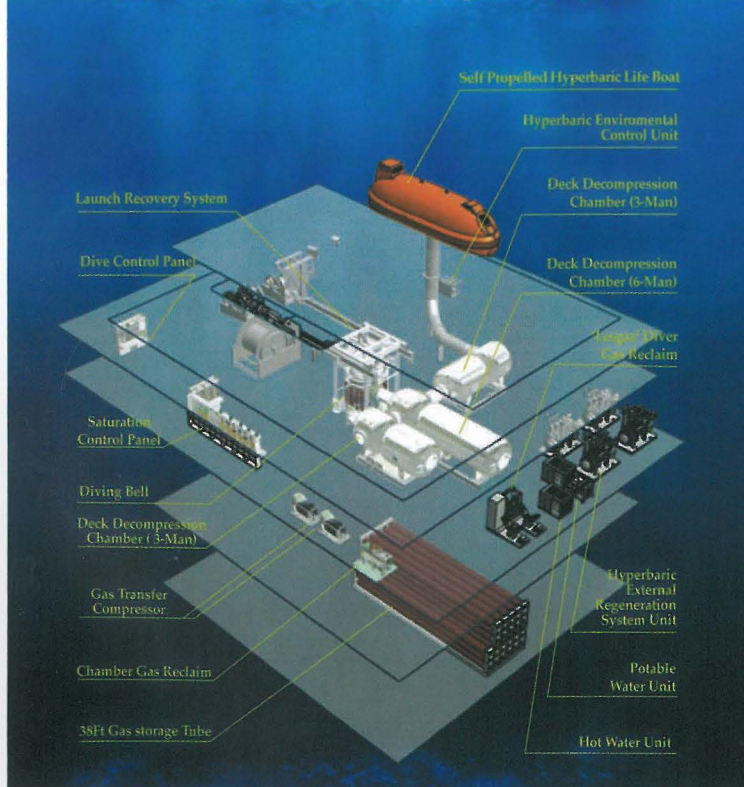
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Karl Huggins' Journey to the Edge

The Development of the World's First Commercially Successful Electronic Dive Computer

The Edge dive computer was the first commercially successful electronic dive computer that was based on microprocessor technology and used a decompression algorithm (mathematical model) rather than tables.



There are many famous people in diving who have developed marvelous inventions that have changed the way we dive. However, unless you are interested in diving history, you probably haven't heard of most of them, except perhaps for Jacques Cousteau, who is widely reported as the inventor of the AquaLung, but that's another story....

Words and Images by
Steven M. Barsky

For most divers today, one person who helped change the way we dive is a guy by the name of Karl Huggins, who saw the future of decompression theory and helped develop the Edge, the first modern commercially successful microprocessor-based electronic dive computer. Without the development of the Edge, we might all still be using paper based decompression tables to compute our dive times.

Huggins today runs the University of Southern California's Catalina Hyperbaric Chamber on Catalina Island, a long way from his home state of Michigan. He first became captivated with the underwater world watching the Cousteau specials on television and seeing the undulating beauty of a Red Sea nudibranch, the "Spanish Dancer," in an eighth grade science course.

HUGGINS LEARNS TO DIVE

Karl remembers receiving a pair of Jet Fins in junior high and being amazed at their speed and power, when he unexpectedly ran into the side of the pool. He loved the water and took courses in lifeguarding. In high school, along with other lifeguards, he found a full-face mask and compressor and tried it out cleaning the bottom of the pool; but as he puts it, "There weren't many opportunities in the area for a person to learn to dive at that time." However, it was his involvement in the attempted resuscitation of a man who had a massive coronary in Karl's high school pool that left an indelible mark on Karl's psyche. Although Karl and the others who made the rescue did their best, the man could not be revived. His memories of this rescue and the concern for others instilled into him by his parents were markers that changed his life.

For college, Karl enrolled in the University of Michigan in biological oceanography and took courses in aquatic leadership. Following an introductory orientation to the use of scuba, Karl enrolled in a scuba course in 1976 under the tutelage of Dr. Lee Somers, a legendary educator in the diving field. He went on to take further courses in underwater technology and chamber operations from Somers, and began to assist with scuba classes.

While taking the underwater technology course, Karl got interested in the concept of decompression tables and how they were calculated. Encouraged by Somers, who gave him several papers on decompression theory by Dr. Bruce Bassett, a diving physiologist, Karl spent his afternoons at the local bookstore, programming their HP67 calculator to run decompression tables. As Karl admits, "I used the display calculator in the store, because I couldn't afford to buy my own \$700.00 calculator at that time. Using Bassett's ideas and the U.S. Navy diving medical officer's handbook, I just started playing with decompression calculations." When his father got a new calculator he gave Karl his HP55 calculator which could be programmed to do dive tables. Although it was less powerful, and had no print-out capability, it did the job.

GETTING CLOSE TO THE EDGE

In 1979, Karl took a trip with the other scuba class assistants and instructors from the University of Michigan to San Salvador, in the Bahamas. While on this trip, he met diving instructor Dee Scarr, who introduced him to the concept of multi-level diving, similar to a practice widely used in the commercial diving field known as "repet-ups."

At that time, divers were trained to perform calculations for "square profile" dives, where no matter what your profile was you computed your whole dive as if it took place at the deepest depth you explored. This procedure "penalized" the diver for the maximum depth he reached.

Scarr and other people, however, were using paper-based U.S. Navy decompression tables to calculate and perform extended dives by working their way "up" through the no-decompression tables to progressively shallower depths. Just as a modern dive computer will allow you to make a multi-level dive for a longer time than what you could spend at your maximum depth, a similar profile could be calculated using the tables. With their method, you could extend your bottom time and calculate what's known as a "repetitive group" while theoretically taking into account the additional nitrogen you absorbed as you stopped at different depths as you worked your way to the surface.

The concept of a multi-level dive intrigued Karl, but there were things that bothered him about it. Specifically, the Navy tables were based on six different theoretical tissue groups (compartments), while the calculations for repetitive groups were only based on one compartment. (For simplicity, you can think of a compartment like a particular type of body tissue, although it does not represent any specific tissue in the body.) When Karl returned to the States, he began running various dive profiles on his HP calculator to see what was happening mathematically in the other five compartments of the US Navy model. Based on his calculations, he found that in some cases using the multi-level dive procedure, you violated the Navy model, which could place you at higher risk for decompression sickness.

In his reading on decompression theory, Karl was given the work of Dr. Merrill Spencer, who had used a "Doppler meter" to detect bubbles in the bloodstream of divers, even those without decompression sickness. Karl began working on various ideas on how to put together a no-decompression table that would not cause the violations he found in the Navy tables when they were used for multi-



Karl Huggins, with an early Edge, inside the USC Catalina Hyperbaric Chamber where the testing for the dive computer took place.

level diving. Eventually, he developed a table with repetitive group designators that represented all six compartments. Based upon Spencer's Doppler limits and the work of Bassett, Karl developed a set of tables that was published by the University of Michigan's Sea Grant program. The publication was entitled "New No-Decompression Tables Based on No-Decompression Limits Determined by Doppler Ultrasonic Bubble Detection." (You can still download the paper off the Internet.)

After graduating cum laude with his bachelor's degree in 1979, Karl took a year off before starting graduate school in bioengineering. During that year Karl went through scuba instructor training at the University of Michigan with Dr. Somers and got to know Dan Orr (currently president of DAN and Chairman of HDS) who, at the time, was running the scuba program at Wright State University in Ohio.

GOING OVER THE EDGE

The following year Karl assisted Dr. Somers and Dan Orr with a scuba instructor's course that Orr was running at Wright State University. Karl gave a lecture on decompression models and early dive computers. Taking the course was a divemaster from St. John in the Virgin Islands by the name of Craig Barshinger, who had started a company named "Orca" to develop a new dive computer based on a microprocessor. Barshinger had the vision, but had no theoretical background of how to build

the device or what program it should run.

Following his lecture, Craig approached Karl and engaged him in a discussion on dive computers and what he thought might be possible. Another student in the course was a software engineer, and the three of them speculated about what a theoretical computer might look like, what software language it should use, and how it should be programmed. They were at the right place, at the right time, when sport diving was growing rapidly and microprocessors were becoming smaller, cheaper and more powerful. Although nothing happened immediately, Craig and Karl kept in touch.

Meanwhile, Barshinger moved to Pennsylvania and began to raise some capital for the project. In late 1982, he managed to convince Karl to move to Pennsylvania to work on the project full-time, with him and his partner, Jim Fulton. The three of them worked out of Barshinger's grandfather's office, which was in an entirely unrelated business.

"In a manner so typical of projects like this, we didn't know that it couldn't be done," recalls Karl. When the first prototype was built, it looked nothing like today's dive computers. It was housed in a large Plexiglas Ikelite case, that protected the electronics and screen. Barshinger tested the prototype off St. John. Subsequently, when a pre-production prototype was assembled Karl tested its response to cold water with a dive in a Pennsylvania quarry.

Dan Orr ended up being the person responsible for naming the Edge. He suggested the name Electronic Dive

GuidE, and it stuck. What made the Edge unique in its time was that it was not based on a set of decompression tables, but rather on an “algorithm,” a mathematical model designed to approximate what was happening inside the human body. This is how virtually all dive computers work today. The Edge also had a graphical display which represented the saturation of the model’s compartments with nitrogen. The longer you dived, the more pixels appeared on the screen, gradually creeping down towards the curve on the screen that represented the limit for nitrogen absorption before decompression was required. With the Edge, you could watch the pixels approaching the curve, and ascend shallower to pull them back up. Divers who tried it loved the concept.

“I didn’t think we needed the graphical display, but Craig did,” confesses Karl. “I thought we only needed numbers, but it became apparent that I was wrong and that the graph was its biggest selling point.”

Karl took the working prototype back to the University of Michigan and ran dives on himself with the Edge in the chamber. Although they were confident in their work, Karl and Barshinger knew they had to do more extensive testing before they could go into production and sell the product. At the DEMA show in January 1983, the Edge was introduced to the diving industry, despite the fact that human testing of the product had not been completed. They told visitors to the Orca booth at the show that the product would be shipping in the spring. The original product had a brushed aluminum case and weighed slightly less than two pounds. It had a user replaceable battery and had straps for mounting it on your forearm. Although some people were skeptical about the product, and others thought it was dangerous, there were many people who were enthusiastic about the invention. Underwater photographers like Marjorie Bank and Stan Waterman were especially enthusiastic.

The only product that was even close to being in the same league at that time was another dive computer called the “Decobrain,” from Lichtenstein in Europe. The device, however, was based on tables and was not running a model. The Decobrain did not have the flexibility of a model-based computer and although it did allow multi-level diving, it would lock-up during certain dive profiles. The following year, when the Decobrain II was introduced, it used a model, but no testing has been done on it with human subjects. Reports were that there was a high incidence of decompression sickness associated with the initial Decobrain II as it was released. The decompression model had to be made more conservative to solve this problem.

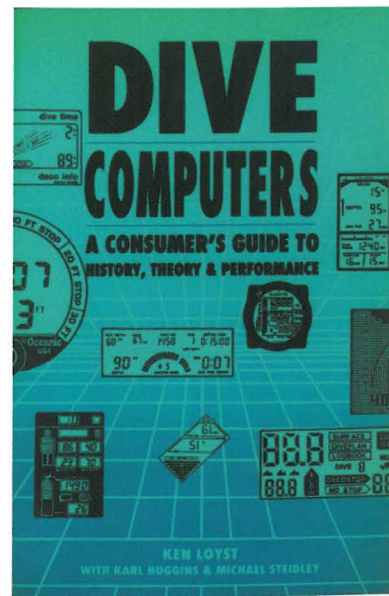
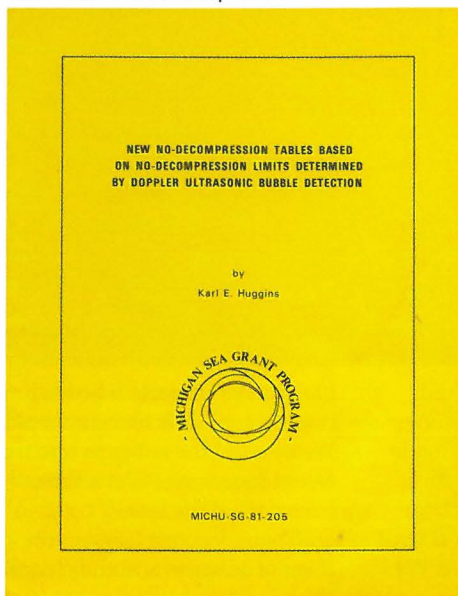
In May of 1983, Huggins came to the USC Catalina Hyperbaric chamber to work with a group of Chamber Volunteers who agreed to participate in the human testing for the Edge. The tests were set up to simulate three days of multi-level repetitive dives. The profiles included



(Above) Karl regularly tests dive computers so that he understands how each one works. Note the two different computers he is wearing while diving off the coast of California. Copyright Doug Kesling. All rights reserved.

(Below left) Huggins’ first publication on decompression tables was, *New No-Decompression Tables Based on No-Decompression Limits Determined by Doppler Ultrasonic Bubble Detection*.

(Below right) Karl was a co-author on the first widely published book on dive computers. To most people at that time, dive computers were a mystery and view with some suspicion.



Danger! Read Warnings and Instructions below before using these Tables

▶ These tables were developed mathematically and have not been subjected to testing to validate them. They are more conservative than the US Navy No-Decompression tables. If these tables are used in the same manner as the USN tables you will have less allowable dive time.

▶ The maximum recommended ascent rate is 40 fsw/min. between 130 and 20 fsw, and 20 fsw/min. from 20 fsw to the surface. You should make at least a 3-5 minute safety stop at 10-30 fsw at the end of each dive. If you are within the no-decompression time limit when reaching the safety stop, and the 3-5 minutes causes you to exceed the no-decompression limit, your End-of-Dive Letter Group will be "N."

▶ Wait 24 hours after diving before ascending over 2000 feet in altitude.

▶ If these or any other dive tables are used incorrectly, it is possible to develop decompression sickness (DCS), which may result in severe injury or death. Although statistically less likely, it is possible to develop DCS even if dive tables are used correctly.

▶ In the event of a diving accident or illness, contact the Divers Alert Network (DAN) at their 24-hour emergency line (919) 684-8111.

USC Catalina Hyperbaric Chamber, P.O. Box 5069, Two Harbors, CA 90704, (310) 510-4020, <http://wrigley.usc.edu/hyperbaric/chamber>

Revised October 15, 2001 ©2001 USC Catalina Hyperbaric Chamber

Maximum Depth of Repetitive Dive (fsw)

	20	30	35	40	50	60	70	80	90	100	110	120	130
--	225	165	135	75	53	41	31	26	21	16	13	11	
∞	0	0	0	0	0	0	0	0	0	0	0	0	0
--	207	158	128	71	52	40	30	25	20	15	12	10	
∞	18	7	7	4	0	0	0	0	0	0	0	0	0
569	178	139	109	64	47	37	28	23	18	13	11	9	
∞	47	26	26	11	3	3	2	2	2	2	0	0	0
369	154	122	92	57	43	33	26	21	16	12	10	8	
∞	71	43	43	18	7	7	4	4	4	3	0	0	0
279	132	103	75	51	38	29	23	18	13	11			
∞	93	62	60	24	12	11	7	7	7	4			
219	113	86	65	45	34	26	21	16	12				
∞	112	79	70	30	16	14	9	9	8				
175	96	73	57	40	30	24	19	14	11				
∞	129	92	78	35	20	16	11	11					
140	80	62	49	36	27	22	17	12					
∞	145	103	86	39	23	18	13	13					
111	66	53	43	32	24	19	14	11					
∞	159	112	92	43	26	21	16						
86	53	44	37	28	22	17	12						
∞	172	121	98	47	28	23	18						
65	41	34	30	23	19	15	10						
∞	184	131	105	52	31	25	20						
45	29	24	21	17	14	12	9	8					
∞	196	141	114	58	36	28	21						
28	18	16	14	11	9	8	7	6					
∞	207	149	121	64	41	32	23						
12	8	7	6	5	4	4	3	3					
∞	217	158	129	70	46	36	27						

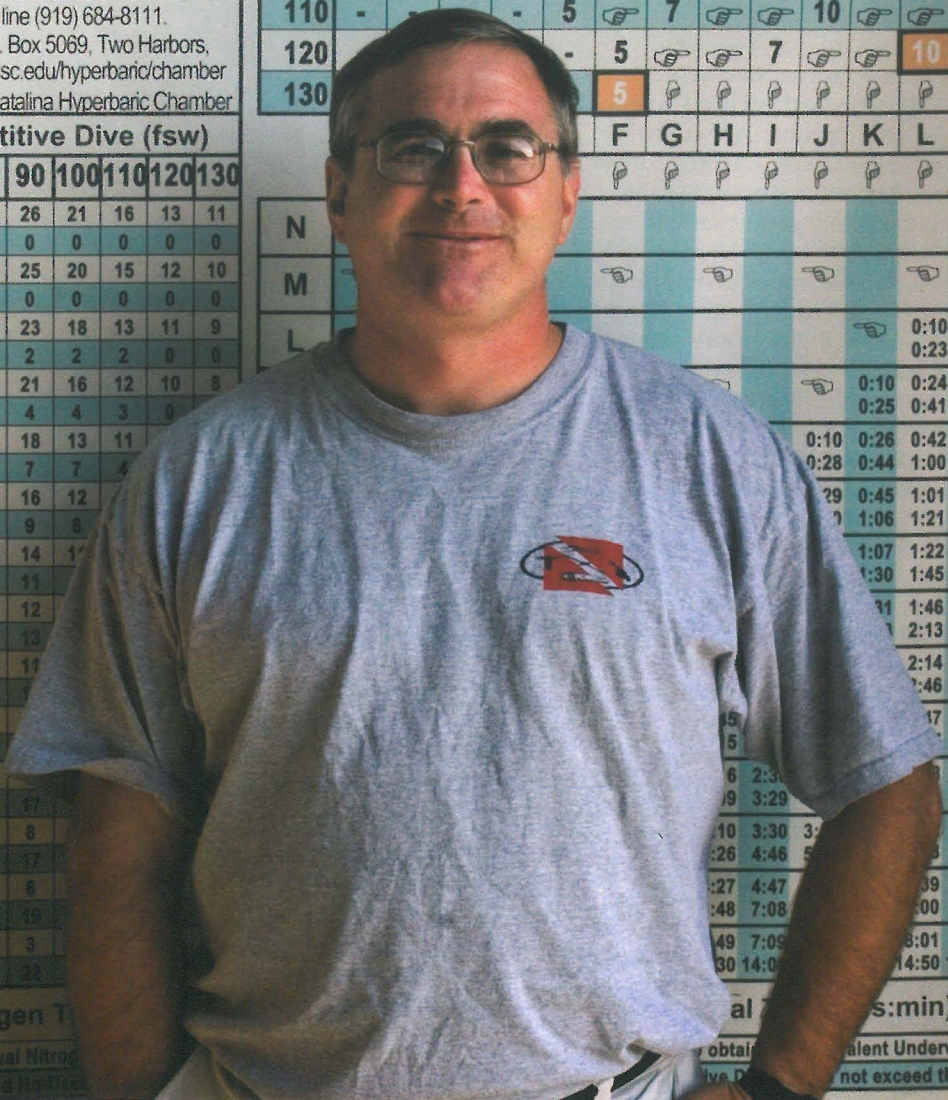
Table 3 – Residual Nitrogen

000 Numbers in White Boxes are Residual Nitrogen

000 Numbers in Blue Boxes are Adjusted

Table 1 – End-of-Dive Letter Group
Total (or Equivalent) Underwater Time (min.)

Depth in fsw	10	25	40	60	85	110	135	170	215	275	325	569	∞		
20	10	25	40	60	85	110	135	170	215	275	325	569	∞		
30	5	15	25	40	50	65	75	95	110	130	150	175	205	225	
35	5	15	20	30	40	50	60	70	85	100	120	135	155	165	
40	5	10	20	25	35	40	45	55	60	70	85	100	120	135	
50	-	10	15	20	25	30	35	37	40	50	55	60	70	75	
60	-	5	10	15	20	23	25	27	30	35	40	45	47	50	
70	-	5	10	13	15	17	20	23	25	27	30	33	35	40	
80	-	5	7	10	13	15	17	20	23	25	27	30	33	35	
90	-	-	5	7	10	13	15	17	20	23	25	27	30	33	
100	-	-	-	5	7	10	13	15	17	20	23	25	27	30	
110	-	-	-	-	5	7	10	13	15	17	20	23	25	27	
120	-	-	-	-	-	5	7	10	13	15	17	20	23	25	
130	-	-	-	-	-	-	5	7	10	13	15	17	20	23	
							F	G	H	I	J	K	L	M	N
N															0:10 0:17
M															0:10 0:18 0:23 0:32
L															0:10 0:24 0:33 0:23 0:39 0:48
K															0:10 0:24 0:40 0:49 0:25 0:41 0:57 1:06
J															0:10 0:26 0:42 0:58 1:07 0:28 0:44 1:00 1:16 1:25
I															0:29 0:45 1:01 1:17 1:26 0:37 1:06 1:21 1:38 1:47
H															1:07 1:22 1:39 1:48 1:30 1:45 2:02 2:11
G															1:31 1:46 2:03 2:12 1:49 2:13 2:30 2:39
F															2:14 2:31 2:40 2:46 3:03 3:12
E															2:57 3:14 3:23 3:30 3:46 3:55
D															3:45 3:54 4:01 4:17 4:26
C															4:27 4:36 4:45 4:51 5:07 5:16
B															5:27 5:36 5:45 5:51 6:07 6:16
A															6:27 6:36 6:45 6:51 7:07 7:16
∞															7:49 7:58 8:07 8:13 8:29 8:38
∞															9:00 9:09 9:18 9:24 9:40 9:49



a deep to shallow multi-level dive, followed by a shallow dive, followed by an afternoon or night dive. On the fourth day, the divers made a single deep decompression dive. According to Karl, "The tests were designed to check for any 'hot spots' in the model and to push at least one compartment to its limit on each dive. We

had twelve subjects who each went through nine dives; while eleven people made ten dives. We divided the subjects into three groups, and tested four subjects at a time. It took two weeks to run all of the tests."

There was one Edge in the chamber for each team of subjects and the chamber was operated

Karl poses in front of a giant set of the multi-level dive tables he developed for recreational diving.



Karl at the controls of the USC Catalina Hyperbaric Chamber.

to follow the profile dictated by the dive computer. Following each dive, Karl conducted Doppler monitoring of each of the subjects to listen for nitrogen bubbles in their blood. At the end of the tests, there were no cases of decompression sickness in the test subjects and low-grade bubbles were only detected in one subject following their final dive in the series.

Full production of the Edge started in 1983, but things went very slowly because the company was undercapitalized. The Edge had a suggested retail price of \$675.00 when it was first introduced. Orca was sold several times and by the time the product was discontinued, just over 10,000 of the units had been manufactured. Of course, other competing products became available within a few years that were smaller, lighter, and had more features.

LEAVING THE EDGE BEHIND

Karl left the company late in 1983 to go back to complete graduate school, although he still consulted to the company from time to time. He still has a pre-production prototype in his collection, as well as production unit number 002. They probably would be worth quite a bit on Ebay today!

It took time for the other diving equipment manufacturers to catch up to what Orca had done, with almost no money and only a handful of people. In 1988, the American Academy of Underwater Sciences held a dive computer workshop at Catalina that brought together physiologists, engineers, manufacturers, and training agency leaders to discuss and formalize many of the procedures we use for diving with computers today. Karl was

one of the participants in this program.

"A lot of the features that are in dive computers today were envisioned then, but we didn't have the computer memory or battery technology to make the kinds of products we use today," remembers Karl. In 1992, when the former director of the USC Catalina Hyperbaric Chamber was about to leave, he contacted Karl and suggested that he apply for the position. Huggins got the position and sometimes thinks that perhaps this is his "penance for his participation in the development and popularization of dive computers and the people who may have gotten bent using one."

Through his work at Catalina, Karl has had the chance to observe and treat many cases of decompression sickness and air embolism. He has continued his work on Doppler monitoring, taking readings of divers on DAN Doppler trips and recently worked with members of the U.S. and Canadian Free Diving teams. He puts in long hours, way beyond those for which he is paid. His dry wit, his year-round attire of shorts rather than pants, and his addiction to Peanut (or Almond) M&M's candies are his trademarks.

For his work on diving safety, Karl has received the Leonard Greenstone Diving Safety Award, the DAN Rolex Diver of the Year award, and the AAUS Conrad Limbaugh Award for Scientific Diving Leadership. He was also nominated for the DEMA Reaching Out Award. He sees dive computers moving towards two-phase (bubble based) models, as opposed to solely dissolved gas models, because they probably represent a better approximation of what's going on in the body.

"I don't think we will ever have computers that will tell you exactly what's happening in your body. There have been people who have thought of developing computers which monitor bubble formation with Doppler, but because of the lag in the development of the bubbles they would not be very effective in calculating required decompression because by the time the bubbles are detected it is too late," observes Huggins. "No computer, no matter what you have been told, is telling you what's going on inside your body. Sure, you can make adjustments to make a computer more conservative, and it might make adjustments based on water temperature or your breathing rate, but it still doesn't know what's happening inside you." His advice to divers when using a dive computer or any device or tables used to calculate decompression is

to, "Stay back away from the limits, ascend slowly, extend your safety stops, and if you think you have a problem, don't ignore it."

Karl takes his greatest satisfaction in participating in the treatment of divers who arrive at the chamber with a definite diving related malady who eventually walk out of the chamber under their own power, free and clear of symptoms. But, in the back of his mind, he still remembers the day he was unable to save the man who had a heart attack in his high school pool back in Michigan. Memories of that day still surface every time a victim arrives at the Chamber in full arrest.

"Perhaps I'll be able to leave this island if we ever get a full arrest victim that we are able to revive," admits Karl. For those of us who know and love who Karl Huggins is and what he does, and who would hate to see him leave, we almost hope that day never comes. 🍪

THE AUTHOR

Steve Barsky is a former Director of the HDS, a DAN member, and a full-time professional in the diving industry. He works as a volunteer at the Catalina Hyperbaric Chamber. His books include *The Simple Guide to Commercial Diving* (with Bob Christensen), *Investigating Recreational and Commercial Diving Accidents* (with Dr. Tom Neuman), and *Underwater Digital Video Made Easy* (with Lance Milbrand and Mark Thurlow). Visit www.hammerheadpress.com.



The Bat Hat



By Phil Nuytten

All photos Courtesy the Author



(Above) The plan view shows the venturi jet system plumbed between the scrubber canister's fill caps. 1995.

(Top) Front view of Bat Hat. The Oceaneering sticker and the top handle were later additions. 1995 Vancouver, BC

One of the more interesting byways of collecting vintage dive gear and studying the minutiae of diving history is the occasional exposure to one-offs: the prototypes and one-of-a-kind designs. By the very nature of their rarity they are hard to find but often well worth the hunt and the recording of their back-story, to the extent that it can be discovered. Pre-production prototypes are usually easy to recognize, since they are the final stage of a piece of equipment that may have been successful and sold in the thousands of units and were widely known. Other designs were unsuccessful for a variety of reasons and sank like the *Titanic!*

In North America, the 1960s was a decade of major change in the commercial diving industry as lightweight, low volume fibreglass helmets replaced 'heavy gear,' or traditional helmet diving equipment. As oxy-helium and bell diving became standard oilfield techniques by the end of that decade, lightweight helmets and full face masks became increasingly popular. One of the best of these helmets was the 'Rat Hat', developed by Cal-Dive's Bob Ratcliffe and well reported in the *Journal of Diving History*, Volume 18, Issue 4, Fall 2010.

One example of a 'Titanic' prototype is a unique variant of the Rat Hat, called the Bat Hat: a lightweight fibreglass recirculator helmet set up on a Rat Hat shell. It was designed and built by myself, who at that time was president of Cal-Dive's sister company, Can-Dive.

The Rat Hat was designed as a replacement of a Dan Wilson-style copper helmet (equipped with a modified scuba demand regulator for deep HeO₂ diving) by a close-fitting lightweight, fibreglass helmet with a similar demand system. The Bat Hat was designed with the same sort of rationale: in this case, as a direct, lightweight replacement of the Bob Kirby/Bev Morgan 'Gas Hat,' which (by that time) was a Yokohama helmet modified to accept a full recirculator system. That system comprised a CO₂ absorbent canister, and a gas circulation system provided by a venturi jet that could be manually controlled separately from the free-flow system. This Kirby-designed recirculator was originally designed as a lighter-weight replacement of the very heavy (93lb) and bulky US Navy Mark V helium helmet.

The Bat Hat uses the same venturi jet size (drill #72/0.250") as the Kirby and the same venturi discharge nozzle ('horn') configuration - again, filched from the USN Mark V Gas-Hat. The venturi jet is fed with oxy-helium by a standard scuba first-stage regulator set at 110 PSI over bottom pressure. As the venturi jet blows fresh HeO₂ into the starboard canister, the vacuum caused by the expanding gas sucks CO₂-contaminated gas through the port canister and back into the venturi flow to join the fresh gas. The Kirby Gas-Hat uses a standard 'Sodasorb' pre-pack scrubber cartridge developed for hospital anaesthesia systems. If the diver works hard, the helmet CO₂ level will slowly increase on 'recirculate' because of the fast pass-through in the short canister (4"/112mm). To reduce CO₂ levels, the surface tender will instruct the diver to 'ventilate' or go onto free-flow for a few minutes at regular intervals, or more frequently as determined by the diver or his work rate. The thought behind the long double-pass side canisters on the Bat Hat was to minimize the 'ventilation' periods. The double canisters give a longer travel through the soda-lime bed and ensure that CO₂-free gas re-enters the helmet along with the fresh supply gas.

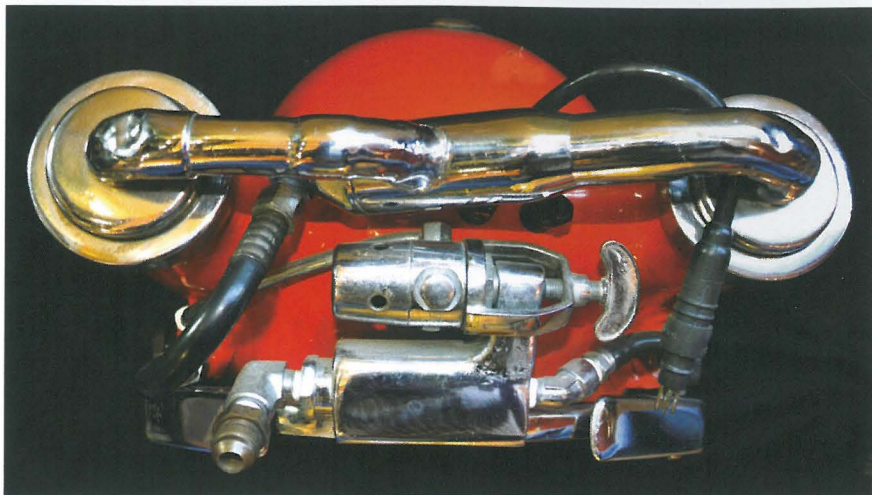
The Bat Hat was built as a working test helmet to allow a

comparison of gas utilization between the Rat Hat demand system and a similar-sized helmet with a recirculator system.

The Bat Hat was tested in Vancouver, BC, Canada, to depths between 200 and 250 feet (the deepest depth in the test area) and found to perform acceptably. Cal-Dive's John Boyce did some further shallow testing in Santa Barbara, California, and later the helmet was shipped to Long Beach to become part of a Cousteau 'Undersea World' exhibit aboard the dockside vessel *Queen Mary*.

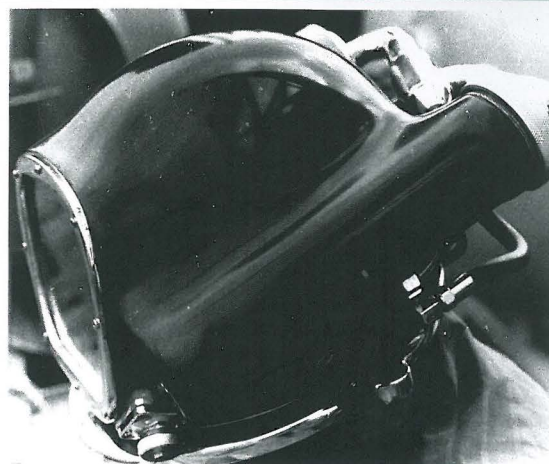
So why was the Bat Hat never put into production? Around this time, the U.S. Navy's experimental diving unit had expressed an interest in the Rat Hat (and other demand system helmets) but were concerned that the gas consumption would be significantly higher than a recirculator system. Subsequent tests and detailed calculations, as well as anecdotal information from experienced HeO₂ divers and rig Hev dive sheets all bore out the original Cal-Dive contention that HeO₂ demand systems used little, if any, more gas than recirculator systems. That information, plus the fact that the Cal-Divers and Can-Divers (including the 'Bat Hat' designer and builder) all preferred the demand system, relegated the Bat Hat to a career in a glass collection cabinet.

And the name? At the time it was built, the *Batman* TV series had just started on television and I thought the original black helmet resembled the sleek, black Batmobile and the helmet started out on a Rat Hat shell, so...Bat Hat! 🐱



Back view shows the supply gas hose inlet elbow, non-return valve block and a Scubapro 'piston' reduction regulator and its outlet line that leads to the recirc on/off valve below the port canister. This valve feeds the venturi jet when opened. The non-return valve block outlet elbow and hose leads to a free-flow valve under the starboard canister. 1995

Bob Ratcliffe models the original Bat Hat at Stearns Wharf, Santa Barbara, outside Cal-Dive's shop, 1967. Note recirc on/off valve under port canister.



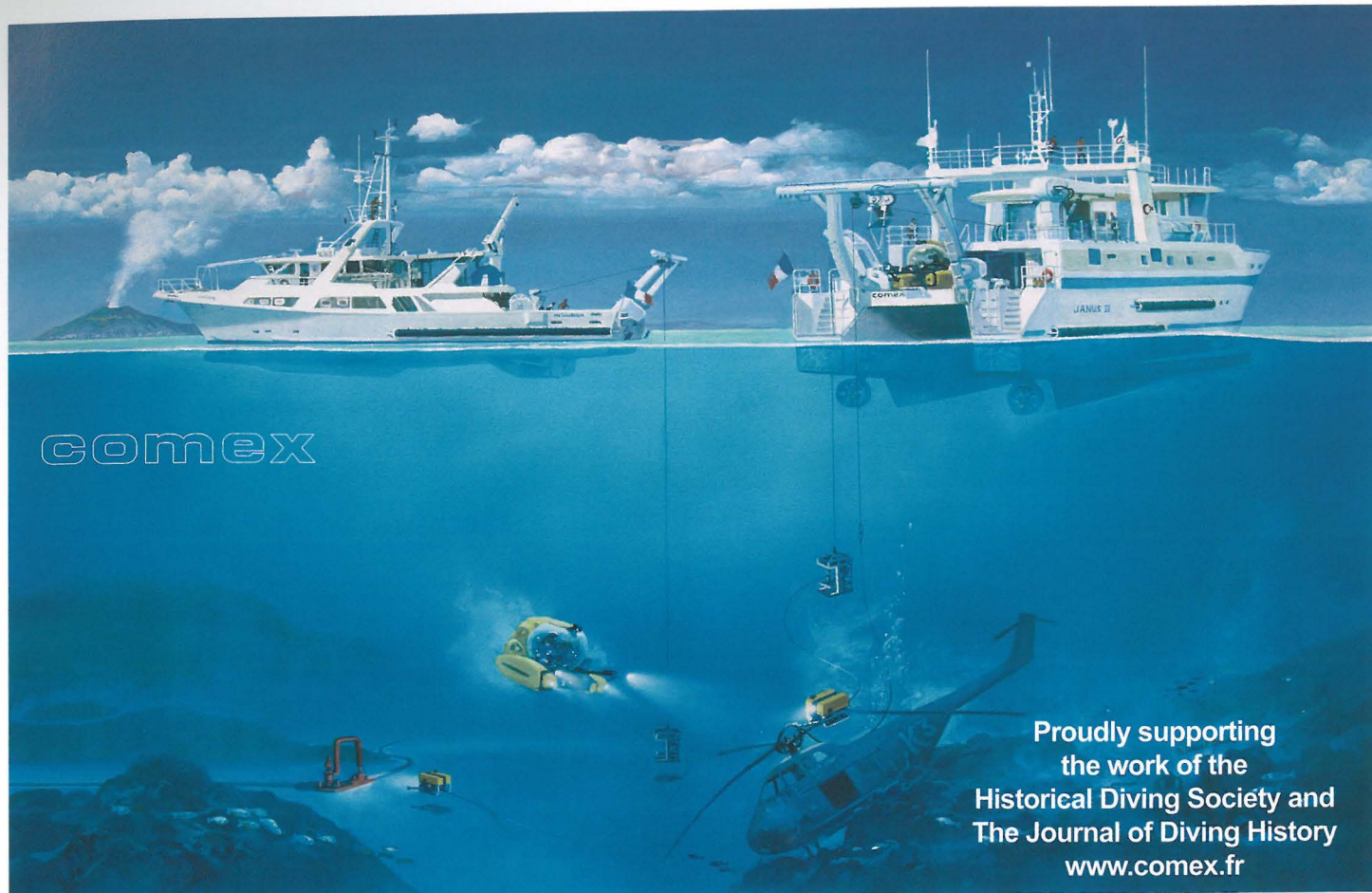
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(L to R) Scrap Lundy and Dahmer inspect a mine they recovered, showing two cans of explosives, flotation bladders. The empty space between the explosives contained the firing device. Unit dive gear can be seen to the right of the mine.

UNDERWATER IEDS IN VIETNAM

BY A.L. "SCRAP" LUNDY

All photos USN, courtesy of the author

I cannot help but be interested when I hear the term IED (Improvised Explosive Device) on the TV news outlining their use in Afghanistan and Iraq. My interest in the topic stems from the fact that I had been an E.O.D. (Explosive Ordnance Disposal) U.S. naval officer from 1963 to 1966. My last year of service was spent in Vietnam where IEDs were very prevalent. In those days they were called mines or booby traps. IEDs have been used for many years, especially by local forces who were fighting a well equipped military power. Because the local forces usually lacked

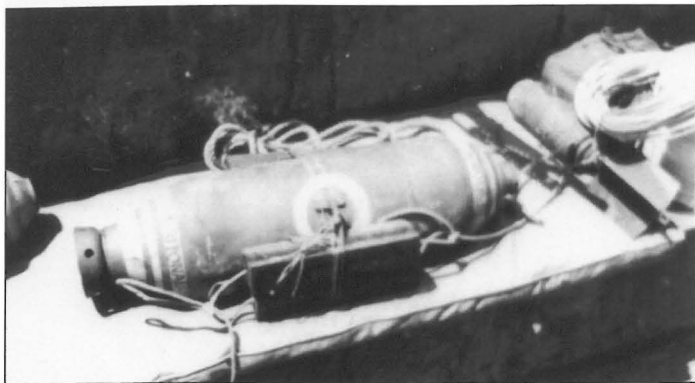
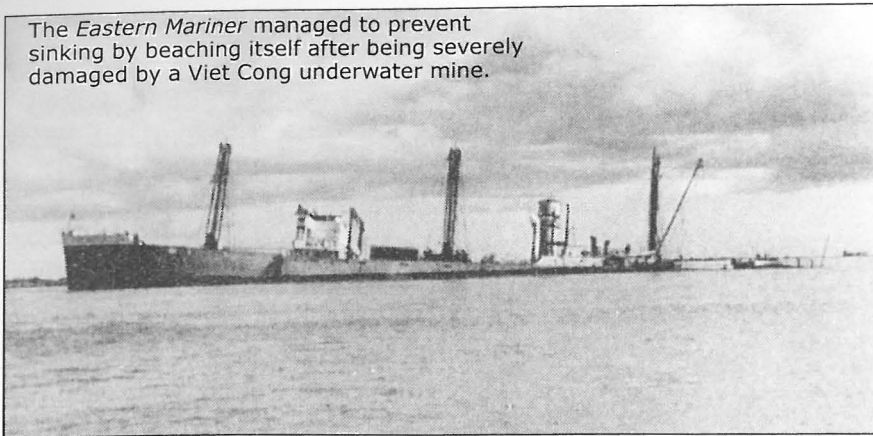
the heavy firepower of their foes, IEDs were/ are used to help even the odds. In combatting these in-water mines our dive gear consisted of double U.S. Divers 72 cubic feet tanks, U.S. Divers double hose regulators, swim suits, Duck Feet fins, an inflatable life jacket, a knife and a safety lifeline.

The Viet Cong (VC) were very good at building IEDs for general use such as tripwire devices, claymore mines and roadside bombs, and they were particularly ingenious in creating new devices when a new situation presented itself. In the case that I recall

here, they developed a method to sink our ammunition ships that anchored in a special anchorage on the Saigon River about 25 miles down from Saigon. The anchorage was near a very small village called Nha Be.

The VC's underwater device was homemade, very simple to build and highly effective. We knew that the Saigon River had a tidal current of 3 to 4 knots so that precluded diving in all but the slack water between the tide changes. It also contained very dirty water. Someone determined that the VC must have figured out a way to attach

The *Eastern Mariner* managed to prevent sinking by beaching itself after being severely damaged by a Viet Cong underwater mine.



The author's mine on board a boat ready to be taken ashore.



(Above) The author mounting a trip-wire firing device.



(Right) The author placing a self-constructed bomb where the VC boats would hopefully land. (USN photo)



(Left) The author with a C-4 and white phosphorous present for the VC.



(Right) The author preparing a 23lb bomb with C-4 and a trip-wire. Note the Nikonos 1 camera in the foreground.

a mine to the ship's anchor chain with enough line that would allow the tidal current to keep the mine under the ship no matter which direction the current faced the ship. This method was very simple yet very effective. After the *Eastern Mariner* incident, the E.O.D. personnel were tasked with diving on as many anchor chains as possible between the tide changes.

Our method was to pull ourselves down the anchor chain and to feel for a line with a metal hook that attached it to the anchor chain. If such a set-up was found, the diver was to pull in the line and feel for what was attached. I say "feel for what was attached" as all diving deeper than 2 feet under water was in total blackness due to the extremely dirty water. We did not have depth gauges, which we could not have seen anyway, but we calculated the water depth to be about 50 feet. Fortunately, some of our Navy dive training had been in the Potomac River where conditions were very similar to the Saigon River.

In order to attach the mine to the anchor chain, we figured that the VC secured the mine to the outboard side of one of the many local sampans and towed something like parachute shroud line, with a metal hook attached, across the bow of a U.S. ship. When they felt that the hook had caught the anchor chain, they cut the mine loose from the sampan and kept going. It was a method that was all but impossible to detect. After the hook caught the anchor chain, the current kept the neutrally buoyant mine under the ship. But this was only conjecture. We would have to wait until we found a mine in place to better understand how the VC's system really worked.

We did not have long to wait. During a routine dive, one of our divers found a VC's line extending from our anchor chain. He surfaced telling us what he had found and asked how he should deal with it. I told him to take some line down with him, pull in whatever was attached to it and tie our line to it. He did so, then cut the line from the object to the anchor chain and surfaced. We all hauled our "catch" up and discovered the mine.

After getting it in the boat, the first order of business was to disarm it. We determined that the arming apparatus was most likely in a sealed hot water bottle between the explosives. After carefully cutting it open, we found a U.S. made alarm clock, wiring and blasting caps that led to a detonating cord. We cut and taped the wires that went from the clock to the detonators. There was a small metal pin through the front glass that, when the clock's hands touched the pin, completed the firing circuit and caused it to detonate. There was one hour and twenty minutes to go prior to going off. The explosive element was in two metal cans, each of which contained 60 lbs. of TNT.

After the VC discovered what we were doing to thwart their mining efforts, they employed a very simple anti-swimmer device that consisted of a thin line attached to the anchor chain that had many barbed fish hooks in it. I had personal experience with that device as on my way down the anchor chain, I felt the small line. I thought, great we have another mine. I pulled the line in and was quickly caught in 4 or 5 fish hooks in my hands and arms. In order to come up, I had to jerk and tear the hooks out of my hands and arm. That hurt a lot but it was better than staying there permanently. I thought of cutting the fish hook line but

that would probably have gotten me hooked some more while trying to deal with something I could not see.

The mine itself was a very simple device made from four bamboo poles about four to five feet long. The cans of explosives were secured to the end of the poles with the clock and detonators in the middle. Neutral buoyancy was achieved by small floats and air filled hot water bottles attached to the framework. Since turn about is fair play, I came up with several devices that the Navy felt would be useful in interdicting the VC use of waterways to move munitions via sampans.

To that end, the Navy wanted my ideas tested under field conditions, so I and about 12 SEALs were sent into the Rung Sat Special Zone to conduct the tests. We knew the Navy were serious because a Navy photographer's mate was sent to record the events. The Rung Sat Special Zone was a huge swampy area consisting of waterways of every description which were used by the VC to move munitions and rice principally at night.

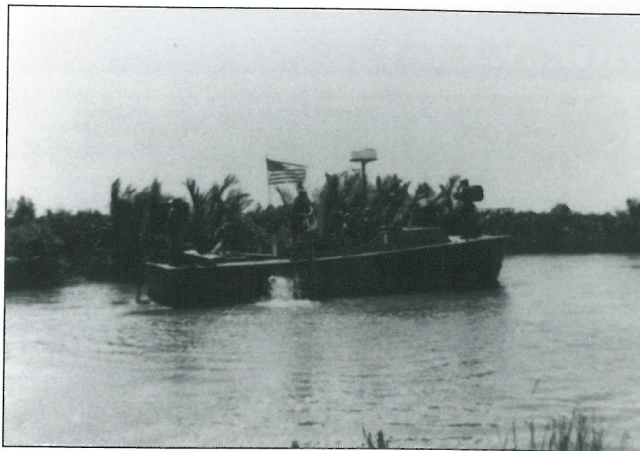
My devices were designed to slow down their night time traffic. My most useful device consisted of 100 lb. aircraft bombs that were placed in the waterways most likely to be used by the VC. The beauty of these bombs was that they were rigged to go off at different times, which would be a complete surprise to the VC as no Americans or airplanes were around. I determined an effective way to do this was to fuse the tail of the bomb with a chemical delay fuse to detonate the bomb. The fuse was activated by a small propeller-driven shaft that would break a vial of acid which would eat through a wire that held back the spring-loaded detonator. The fuse's instructions said that the hotter the temperature, the more quickly the acid worked. Since the temperature was around 95°-100°, I was curious as to how long it would take to fire. If you want a real thrill, spin the propeller on such a fuse until you feel the acid vial break. You could not change your mind and unscrew the fuse as it had an anti-removal device which would detonate the bomb if the fuse was partially unscrewed.

The VC had a grenade making operation nearby. We found a trail that led to the water's edge that we assumed they used to load the grenades onto their sampans. To inhibit foot traffic, I came up with a tripwire activated device that was attached to a 23 lb. anti-personnel bomb. I also made up a small bomb that we placed in shallow water out from the trail's end. It consisted of C-4 and white phosphorous and it was fired by a tripwire concealed near the water's edge.

The Navy had an outboard boat that had a beam of about six to seven feet and was about 16 feet long. We built an A-frame on the boat that held six 100 lb. bombs, three on each side. The boat would go up a suspected waterway, reverse course, and the bombs would be armed and cut loose every 100-200 yards or so. Naturally, we never knew whether a bomb took out a sampan. However, the intent, by having explosions occur with no apparent cause, was to keep the VC from using the waterways. These methods were very enjoyable for me to put into effect and I hoped they aided the war effort. 🍷

THE AUTHOR

A.L. "Scrap" Lundy is the author of *The California Abalone Industry: A Pictorial History*, and a Founding Director of HDS. In addition to his military diving service he worked in commercial oilfield diving for Reading & Bates and Cal Dive. His recreational diving certifications are in Nitrox, Enriched Nitrox, Deep Air, and Tri-Mix.



Members of the author's unit placing a 100lb bomb in the water to determine how long it would take to detonate.

USN SEALs with the author moving a bomb to the test area.



A SEAL in action tossing a grenade.

(L-R) The author, LCdr. Barnes, and two unknown team members take a well-deserved break.





The Many Faces of the Diluter Oxygen Regulator

A Collector's View

By Ed LaRochelle

All photos ©2011 Ed LaRochelle. All equipment courtesy of the Ed LaRochelle Collection, except where noted.



Sea Horse



Diluter O₂



DiveMaster MKI

Prior to the wide availability of the Cousteau & Gagnan Aqua Lung in the United States, budding scuba divers visited WWII military surplus stores searching for the Diluter model AN 6004-1 oxygen high pressure regulator. Many individuals pursued the idea of converting this piece of aviation breathing apparatus into a scuba diving demand regulator. Interest was such that surplus stores could not keep them on the shelf.

One of America's leading diving authorities of the time was future HDS Advisory Board member E. R. Cross, who was gaining an international reputation for his work. Cross encountered his first Diluter in the form of a single hose regulator which he saw attached to a diving cylinder and harness on a beach in Los Angeles in early 1947. When the owner turned up he explained to Cross that he had built the rig from military surplus parts. Cross was allowed to test dive it, and once back on the beach immediately bought it for \$50. Cross later combined a Diluter with a WWII surplus USN gas mask and continued to experiment with the regulator. By 1949 he had developed and marketed his own single hose regulator, the Sport Diver. E.R. Cross wrote about his developments of these regulators in his article, *The Evolution of the Single Hose Scuba Regulator*, in issue 10, Winter 1997, *Historical Diver Magazine*.

During the early 1950s dive clubs and spearfishing clubs were starting to form, and their activities were reported in the sport's first national magazine *The Skin Diver*. During this period the purchase of an Aqua Lung set was quiet expensive. In the general exchange of money-saving equipment ideas that took place, club members started helping each other to modifying the Diluter O₂ regulator.

However, when *Popular Science* published a cover story titled "*Build Your Own Diving Lung*" in its July 1953 issue, it accelerated the craze for customizing the Diluter. It also prompted companies to tool up and start producing Diluter based scuba units on a commercial level for the exploding market.

Herb Pfister authored the article which was titled *How to Build and Use a Diving Lung*. It contained over 20 step-by-step photographs of how to complete the task and ended with an underwater photo of a diver using the diving lung. Early HDS member Bill Watson undertook "to relive my youth" and constructed a working rig from information in the article. Jeff Dennis wrote about Bill's project in his article titled *Young William Watson and His Amazing Sub-Aqueous Breathing Machine*, which was published in issue 9, Fall 1996, of *Historical Diver Magazine*. A reprint of Pfister's article can be found in the article *The D.I.Y. Diver*, by Peter Jackson, in issue 21, Fall 1999, *Historical Diver Magazine*.

In this issue of the *Journal of Diving History* I will show examples of converted Diluter demand oxygen regulators, both homemade and commercially made.



PHOTO 4: The regulator in photo 4 has a flapper valve on the end of a long exhaust hose designed to keep the exhaust bubbles away from the diver's view. The unit could be fitted with an attachment for mounting on a single tank, or onto a manifold for dual surplus oxygen tanks to be used as air tanks for diving (Leslie Leaney Collection).



PHOTO 5: This regulator features inhalation and exhalation (from and to) the same demand air chamber in the regulator. A relief valve was placed on one side of the demand air chamber for exhaust, but frequent water contamination of the demand air chamber made it high maintenance and risky for failure. This particular regulator was made to the specifications and instructions found in *Popular Science*, July 1953. It was designed to attach to a surplus single oxygen tank used as an air supply tank for diving (Leslie Leaney Collection).

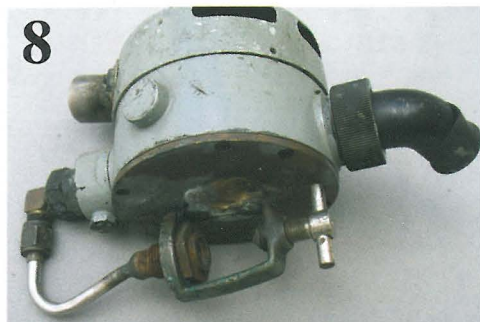


PHOTO 8: This Diluter was being altered to fit onto a (K) valve for scuba.



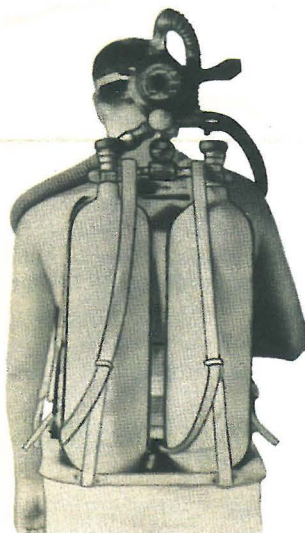
PHOTO 9: Homemade rules! A Valvoline oil can used in an attempt to fit a cover for the Diluter.

6 EDWARD AGUADO TRADING COMPANY

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We are pleased to offer a full line of materials suitable for making your own Diving Lung as shown in the July, 1953, issue of *POPULAR SCIENCE*.

Experience the thrill of exploring, spear-fishing and other under-water adventures now enjoyed by thousands throughout the world in the fast growing sport of using a Diving Lung.

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YOU, TOO . . . can now become an explorer and adventurer in the vast hidden world beneath the waters of the world by assembling YOUR OWN DIVING LUNG. We have spent months gathering together from many sources the right kind of materials to help you build your Diving Lung, such as:

1. AN-6004-1 Diluter Demand High Pressure Regulators.
2. Especially constructed fittings for properly connecting to one or two tanks.
3. High Pressure fittings made of high pressure materials.
4. Air Cylinders of 22 cubic foot capacity, each fitted with high pressure shut-off valves.
5. All the hose, clamps and flutter valves to finish your unit.

Instructions and helpful hints to assist you in assembling your diving unit.

All these components of the Diving Lung Assembly are now available to you at the very low price of \$39.95 and \$49.95, F.O.B. St. Louis., U.S.A., ready for immediate assembly and use.

ORDER YOUR DIVING LUNG ASS

(See description and pictures on the fol

PHOTOS 6 & 7: A Diluter regulator set up on twin tanks similar to that shown in the 1954 flyer from Edward Aguado Trading Company St. Louis, Missouri. It advertises all the components needed to build your own diving lung.



10



PHOTOS 10 & 11: I do not know who manufactured this system, but it was pretty well thought out. The materials and design of the pack and harness are from the instructions in Pfister's July 1953 *Popular Science* article.

The regulator, however, has several differences. The builder made a custom cover for the regulator and added more holes to insure no trapped air would remain under the cover. He also moved the flapper valve to a new location, outside of the regulator's demand air chamber. The valve is well secured, reduces contamination issues, and is behind the diver's head so there are no exhaust bubbles in front of the diver's mask.

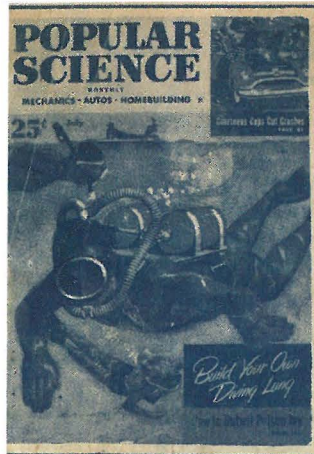
The only bad thing I see with the location of the flapper valve is that it is exposed and increases the risk of potentially being torn, or ripped off the regulator. If this were to happen the diver would get only water during inhalation.

Next, the builder removed the red EMERGENCY knob on the Diluter regulator (see photo #2) and replaced it with a lever and rod on that valve, allowing the diver to more easily access and activate the feature of a free-flow for more air if needed to help clear water from the hoses, or if the diver just needed more air.

Lastly, he attached a pressure gauge with a custom made dial to the manifold. This system may have been sold through the Palley's catalog but I haven't confirmed it.



11



Complete reprint of "POPULAR SCIENCE" article is shown on the following pages

12

BUILD YOUR OWN **DIVING LUNG**

as published in **POPULAR SCIENCE**

July 1953

SAVE ON
new and surplus equipment for
DEEP or SHALLOW DIVING

PALLEY'S
GLENDALE, CAL. and LOS ANGELES, CAL.
Headquarters for
**FAMOUS "AQUA-LUNG"
& "CRESSI" PRODUCTS**

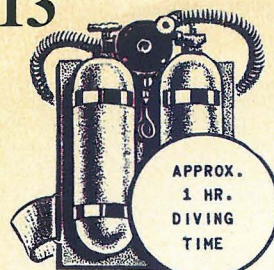
PHOTOS 12 & 13: Advertising material from California based Palley's of Glendale and Los Angeles, featuring one- and two-tank diving units with Diluter regulators.

13

NEW & SURPLUS PARTS & EQUIPMENT FOR
TWO-TANK DIVING UNIT

CONSISTING OF:

- 2- 22 cu. ft. tested tanks. 2- Shut-off valves. 2- 12x16 aluminum sheets. 2- 2Ft. air hoses. 4-Metal straps 24" long. 5- Hose clamps
- 1-Surplus 6004-1 regulator. 1-Double tank connector. 1-1/8" Brass pipe plug. 1-1/8" Brass hex nipple. 2-Thin flutter valves. 1-Mouth piece. 1- Safety belt. 1-Shoulder harness. 1-Cartridge belt for weights. 1 Sweat tee **45⁹⁵**



PSD-1

NEW & SURPLUS PARTS FOR **ONE-TANK DIVING UNIT**

CONSISTING OF:

- 1- Tested & dated tank complete with shut-off valve. 1- Web tank cradle & harness assembly. 2- 2 Ft. Air hoses. 1- Surplus diluter demand regulator. 1- Single tank connector assembly. 2- Flutter valves. 1- Mouth piece. 1- Cartridge belt [for weights]. 5- Hose clamps. 1- Sweat tee.



PSD-2

38Cu.ft. Tank approx. 45 min. diving time **39⁹⁵**

COMMERCIALLY CONVERTED DILUTERS

SEA BREATHER SD-5

A self contained breathing unit with 30 minute air supply. Depths: over 100 ft. Designed for sport and commercial use. This unit is equipped with demand regulator. Sug. Retail 100.00

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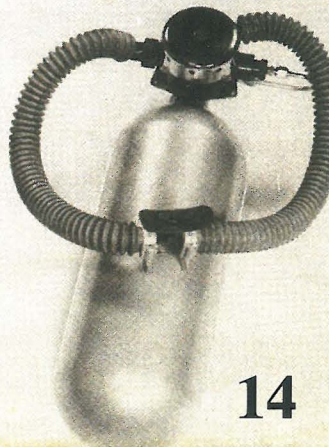
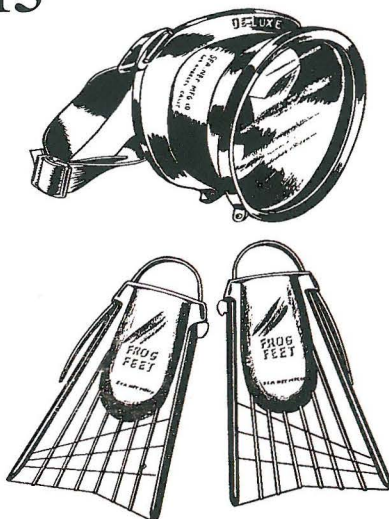


PHOTO 14: An Advert for the Sea Breather SD-5 from the Sea Net Company. This was their first advertisement for the unit and appeared in the second issue of *The Skin Diver* magazine in January 1952.

PHOTOS 15 & 16: Another Sea Breather SD-5 Sea Net Diluter unit. Notice the exhaust flapper valve is located inside the custom cap where it is protected. I am sure they got the idea from the design of the Aqua Lung. In any case, it is a very handsome looking converted Diluter regulator. It comes with a military surplus oxygen tank and canvas harness. This particular regulator has a sticker on it saying "University of California."

15



SEA - NET'S NEW 1952 LINE OF SKIN DIVING AND AQUATIC EQUIPMENT NOW BEING INTRODUCED

Our latest developments in Spearfishing include:

The "TARPON" SPEAR GUN, powered by specially compounded Neoprene slings — effective underwater shooting range more than twenty feet. The most efficient and simply operated Spear Gun made. Easy to cock, and lightweight. The Gun every Skin Diver has been waiting for is now available at \$25.00.

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Also our new SEA BREATHER. Thirty minute air supply.

Many other new items. Write for 1952 catalog and information on our Frog Man Club.



Join our National Frogman Club. Membership includes booklet on Spearfishing and Underwater Swimming compiled by Frank Rodecker, an original Frogman and Skin Diver. Write for details now.

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16



PHOTOS 17 & 18: A circa early 1950s model scuba set from Supreme Divers of Buffalo, New York, and Toronto, Canada. Supreme also made a custom cover for the Diluter regulator and incorporated the flapper exhaust valve within the cover. Also notice the lever between the tanks where a rod attaches for activating the free-flow feature of the regulator. Supreme had what I think is the nicest decal I have ever seen placed on a scuba tank, using multiple colors on great graphics. A well made reproduction decal, a cooperative effort by William Picque and myself, is shown here to provide better detail. For more information about Supreme Divers and availability of the decal, please visit Cyndy and William Picque's website at vintagedivertreasures.com.



17



18

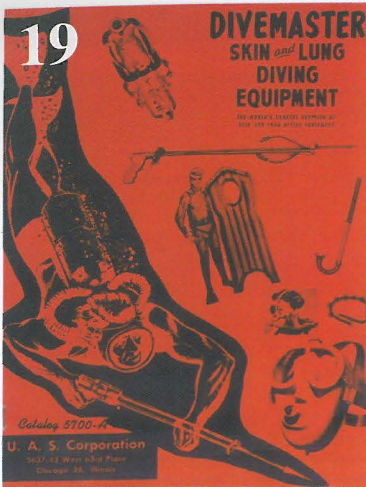


PHOTO 19: The cover of an early U.A.S. catalog.



PHOTO 20: The U.A.S. Corporation of Chicago made a custom label for their converted Diluter and called it the MK-I Divemaster. The company painted them with their trade-mark color orange and serialized them as well. This one is serial number 251, circa early 1950s. A photograph of the complete regulator can be seen in photo 3 of this article.

PHOTO 21: A brochure from Dive-Craft Industries of Pittsburgh, PA, marketing their Diluters as "Sea Horse Diving Lungs" with single and twin tanks. Dive-Craft later became Diving Industries, of Pittsburgh, PA. It established itself in 1952 as probably the most successful company manufacturing and selling a converted oxygen regulator for SCUBA. The Sea Horse regulator, harnesses and 42 cubic foot single or twin tank assembly was marketed directly to the public all over the world, and successfully competed with Aqua Lung, Desco, Scott Aviation, and others well into 1957. I have not seen any brochures or advertisement for the Sea Horse after that date. Diving Industries did not serialize their regulator or sets, so sadly we will never know how many were produced.

PHOTO 22: A pair of Sea Horse regulators still in reasonable condition. The black is from my collection and the silver from Leslie Leaney's Collection.

21 Harness of the most comfortable design. 1 1/2" heavy weight webbing, there is an extra stretch strap which keeps the tank from rising up or falling on the back. All straps are fully adjustable to fit any physique. Webbing hardware is brass. Buckets and eye bolts are stainless steel.

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Tank Shut-Off Valve.....	2.00
42 cu. ft. Tank - current test date.....	19.50
27" Corrugated Rubber Breathing Hose.....	1.50
Stainless Steel Bracket complete with stainless steel eye bolts & wing nuts.....	3.50
For Double Tank.....	4.95
Harness (single or double).....	3.50
Reverser Control Stud.....	1.00
Right Angle Manifold-for 2-tank unit or for filler attachment.....	10.00
All Prices F.O.B. Pittsburgh	

Use Our Conventional Lap-Along Plan
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SEA HORSE
 Single Tank Unit Complete \$75.00
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DILUTER PIONEERS

During the 19 years of its existence, *The Journal of Historical Diving*, and its forerunner *Historical Diver Magazine*, has published many articles about the war-surplus Diluter oxygen regulator. The stories of the pioneers using this type of "do it yourself" equipment during the 1940s and 1950s are some of the cornerstone adventures of our sport.

In 2005 a pioneer diver named Wayne Miller visited the HDS booth at The Scuba Show in Long Beach, California. He had with him a photo of the Diluter diving rig that E.R. Cross had seen and bought way back in the late 1940s. Wayne was the diver who built the rig and dove it, and it was he who sold it to Cross. He was surprised to learn that the HDS booth staff knew about the rig and he agreed to write an article about his early diving career.

Wayne's subsequent article indicated that Cross may have been a year early in stating that he encountered the rig in 1947, but it is a fascinating personal account of scuba diving in the 1940s. Check out *California Scuba. I Did It My Way*, by Wayne Miller, *Historical Diver Magazine* issue 46, Winter 2006. An additional photo of Wayne and two dive buddies wearing Diluter rigs appeared on page 25 of issue 47.

An "Information Wanted" item on a photo of a Diluter rig submitted by Jeff Dennis was published on page 28 of *Historical Diver Magazine* issue 14, Winter 1998. Sam Miller's response was published on page 28 of issue 16. Don Slack described his Diluter diving adventures in *The D.I.Y. Diver: How a Couple of Teenagers Got Under the Detroit River 45 Years Ago*, on page 30 of Volume 8, issue 1, Winter 2000.

The unregulated and uncertified days of Diluter diving are all now part of our collective diving history and I am pleased to be able to share my research into these regulators with all HDS members.

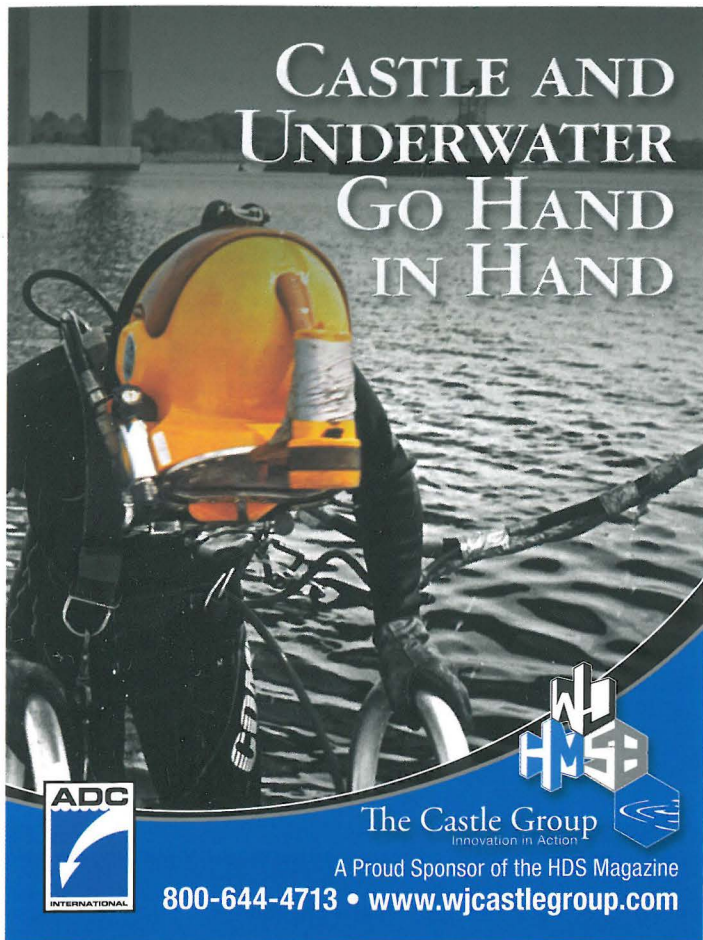
Diluter regulators have earned their place in any early scuba diving display, whether a private collection or a public museum. They are a reminder to us of the dawn of the scuba industry and of the first generation of American scuba divers who led the way.

NOTE ON BACK ISSUES



Back issues of *Historical Diver* magazine are now searchable at www.hds.org. They are available from HDS. To ensure space for this article we have used the page that would normally feature Scuba Auctions, which will return next issue.

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210 Ft. Caisson Dive, 1959



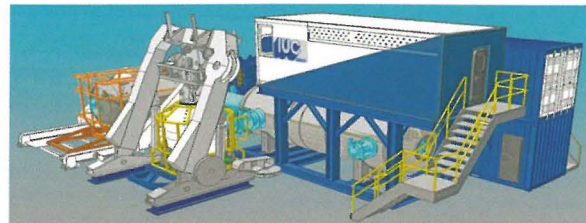
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AIRCO Experimental Unit



SAT-5 aboard the *Normand Clipper*



SAT-6

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Diving History



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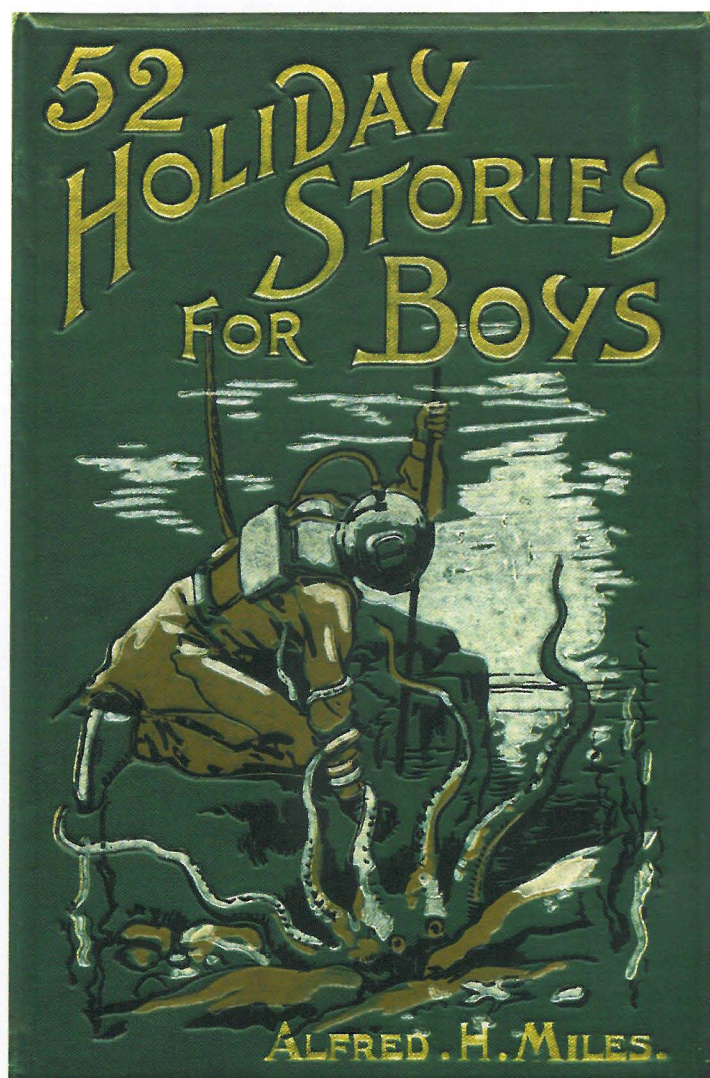
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The Octopus

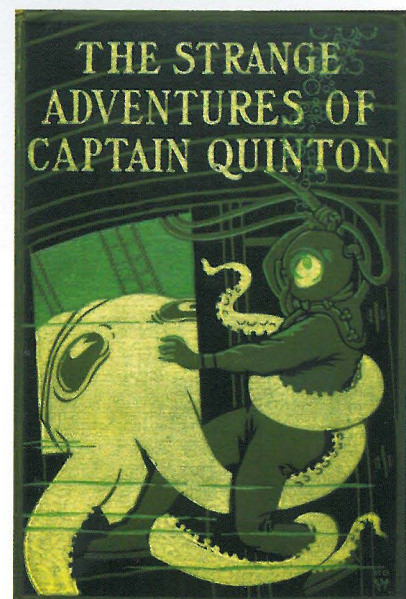
A Miscast Villain

By Peter Jackson

No story of adventure under the sea would be complete without our hero being engaged in a battle with a giant octopus. Second only to the shark, the octopus was often portrayed as one of the most aggressive and certainly the most loathsome “Monster of the Deep.” It seems that wherever there was sunken treasure to be recovered, it would be guarded by a giant octopus determined not to give up its secrets without a fight. If the villains of the plot got to the treasure first, their efforts would be thwarted by the octopus but inevitably, of course, our hero would win the day. If only things were that simple now! 🐙



(Above) *Holiday Stories for Boys*, edited by Alfred H. Miles. Hutchinson & Co, London 1898



(Right) *The Strange Adventures of Captain Quinton*, by Robert Quinton. The Christian Herald, New York 1912



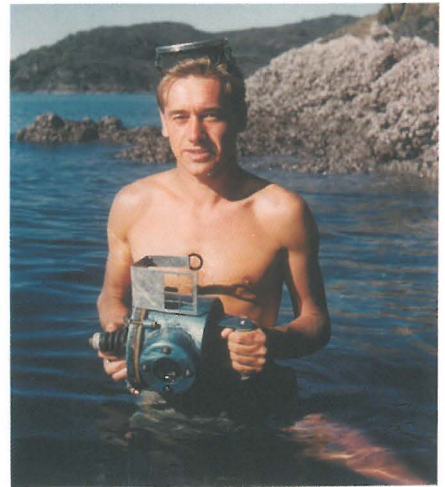
(Left) *Les Chercheurs D'Épaves*, by Maurice Champagne. Librairie Delagrave, Paris 1933



presents
THE SUBMARINE LENS

Ivor Howitt's Viewfinder

By Sid Macken



(Above) Howitt framing a shot with the new viewfinder.

(Right) Collecting crayfish by hand. Photo taken with Ivor's 1953 housing with new viewfinder.

(Top right) Ivor with his "cooking Pot" housing and large frame-type viewfinder. Photo from *Fathomeering*, courtesy of Ivor Howitt.



The early years of recreational diving saw many innovations in equipment design. These were the years when commercially made equipment was either very expensive or unavailable. Unless divers had the resources to purchase equipment, or the skill to build or modify equipment (re-purposing in today's jargon) to fit their needs, they went without. The same was true for the growing field of underwater photography. These years, generally speaking the 1930's through the mid 1950's, were in many ways blessed with the fruits of inquisitive minds and tradesmen's skills. Over time, we tend to forget the early innovators and their contributions to our sport.

Ivor Howitt, the subject of this issue's *Submarine Lens* and author of *Fathomeering*, *an Amphibians Tale*, was one of those early innovators. Inspired by J. E. Williamson's book *Twenty Years Under the Sea*, and the writings of William Beebe, Ivor, along with friend Hamish Gavin, made his first dive in a cold Scottish stream in 1945 using a converted gas mask. His continued interest in diving resulted in improved helmets, and in 1948, the first undersea recreational dive club in the UK, the Amphibians of Aberdeen, Scotland. In 1950, after viewing Jacques-Yves Cousteau's black and white film, *Epaves*, 23 year old Howitt emigrated to Australia in search of clear, warm water.

In Australia, Ivor soon developed an interest in underwater photography. His first home-built housing was for an 8mm movie camera and was made out of plexiglass (or perspex if you're from the UK as he was). Not entirely happy with the resulting images, the next year Ivor built a housing for his Voigtlander still camera out of a couple of aluminum cooking pots. He got results but the housing was bulky. As he puts it, "The unwieldy viewfinder on the 'cooking pot' housing led me to invent the compact 'Robot' housing viewfinder which makes use of the air space within the face mask."

Ivor had purchased a German Robot camera

from a Czechoslovakian refugee in Australia. The camera had a spring motor which advanced the film with each click of the shutter making it ideal for underwater photography. His housing was beautifully created, compact, and the viewfinder on it was unique.

"In 'digs' at the time my only tools were a small hand drill, a file and a metal saw blade. My dive buddy Bill Young brazed all the bits together in his workshop. My brass materials were all purchased from a plumber's supply shop and electro plated after brazing."

Typically, underwater camera housings have a post or peep sight at the rear of the housing (to center the subject) and a large frame at the front (to indicate the boundaries of the photo). Not liking the large frame, Ivor reversed the configuration."The one inch square sight opening sits against the face mask glass and the front ring sight is lined up as a centering guide. This system seems primitive but it worked perfectly for our purpose."

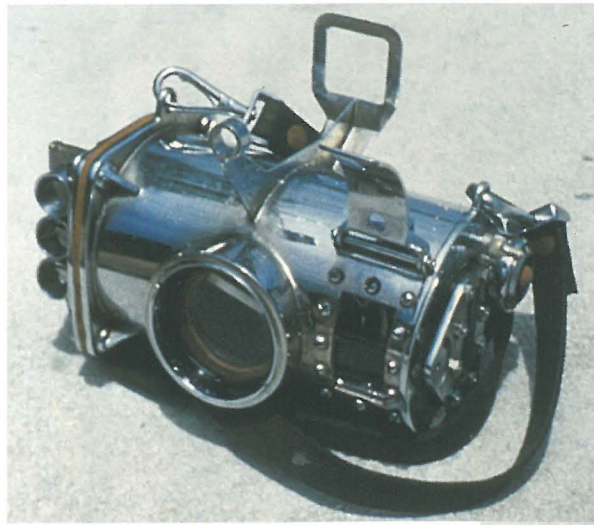
The resulting design provided very accurate framing of photo subjects. It was successful, and Ivor's diving buddy, Bill Young, adapted the same system to his housing for a Univex Mercury half frame camera. Both Bill and Ivor used the housings on vacation to the Great Barrier Reef in 1953. Ivor still has his housing, and Bill's is on display at the Queenscliffe Maritime Centre in Queenscliffe, Australia.

"...without Bill's help it would never have happened. I had the ideas but Bill with his workshop, brazing expertise and enthusiasm enabled construction of our camera housings."

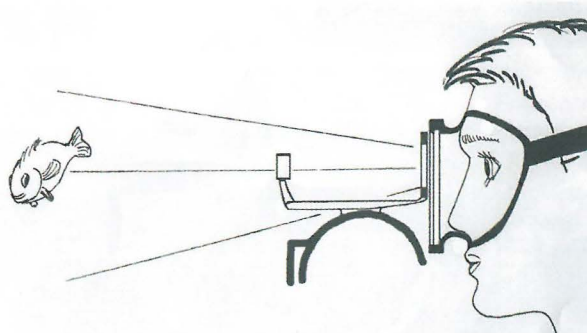
In the modern era of LCD touchscreen monitors, the significance of this seemingly minor modification may be lost. Ivor's viewfinder did not receive wide spread use among underwater photographers, but then he did not pursue it in that regard. The design, however, is another testament to the innovations that took place during the infancy of underwater photography, and to the skills of the pioneering diver-photographers that produced them.

Part of the fun of historical research is discovering, not only information about the subject of study, but little tidbits of that add to the knowledge of the characters involved. Ivor received the HDS UK Reg Vallintine Achievement Award for Diving History in 2010 for his publication of *Fathomeering*. Bill Young was made a Fellow of the Royal Geographical Society and awarded the Imperial Antarctic Medal for his work in the Antarctic.

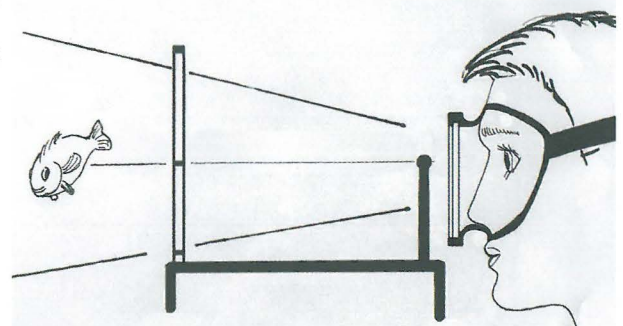
For further reading on early UK and Australian diving read *Fathomeering, an Amphibians Tale*, by Ivor Howitt and published by Mountain Ocean & Travel Publications, Melbourne, Australia, in support of the Historical Diving Society South East Asia-Pacific, and available through the HDS USA. 📌



(Above and right) Ivor's viewfinder. The square frame is held up to the diver's face mask. Note the push-pull controls and scales on the right side plate of the housing.



(Above) A diagram of Ivor's viewfinder in use as compared to a standard viewfinder arrangement (right).




A more traditional viewfinder on a homemade housing.

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Foreman's Diving Bell

By James Vorosmarti, MD

On August 23, 1853, Edgar W. Foreman was issued Patent Number 9,965 for this diving bell design. Before it was actually patented Edgar died, and his brother Jonathan Foreman took over the ownership and assigned it to Henry B. Sears, who had worked with Edgar on the design.

The bell is in the shape of two truncated cones joined at their bases. Two hatches are provided, one at the top and one at the bottom, both of which can be closed from inside the bell. Around the bottom hatch is a rim labeled (c), which served as a seat for the divers and as a place to put ballast, tools or other objects. Around the sides of the bell are a series of tanks (a) which are the air or water reservoirs for regulating the buoyancy of the bell. These tanks are connected to each other by two sets of pipes, one at the top (e) and one at the bottom (f). The purpose of the upper pipe is to supply air to the tanks; the bottom pipe is for water. The patent states that the design could be modified to provide separate pipes to each tank if one wishes to have finer control over the buoyancy and the trim of the bell. Air is supplied to the bell from a large compressed air tank on the surface through hose (g). Air from the tank enters the hollow shaft reel so the hose can be paid out or taken up without interrupting the air supply to the bell. Inside the bell (g) is connected to two valves, one leading to the ballast tanks and one for supplying air to the bell interior. The hose connection also extends to the bottom of the bell to serve as a supply for a diver in armor working outside the bell. Appropriate valves and piping are provided for emptying the tanks of water or air.

A system for anchoring the bell to the bottom and for acting as a pivot point for the bell to move around is provided. This is a standard anchor with a cable leading to a block on the exterior of the bell and then into the bell to a windlass (not shown). The exterior block is tied to an endless chain which goes over two rollers, one near the middle of the bell and the other near the bottom of the bell. The upper roller is turned by a crank inside the bell. As the block moves up and down with the chain it changes the angle of the pull on the anchor cable to affect the degree of force keeping the bell on the bottom. Attached to the opposite side of the bell is

a propeller operated by a crank on the inside of the bell. The hull penetration for this is a ball and socket joint so that the propeller can be operated in various directions, enabling the bell to be moved in an arc around the anchor.

The combination of the simplicity of the design, large quantity of compressed air and the ability to

also the first to call the bell the "Nautilus" and gave Sears the credit for inventing it. In the *New York Times* of 12/30/1854, Sears, in a letter to the editor, refuted the statement, saying that the inventor was E.W. Foreman, but that he had helped in the design. Unfortunately, Sears continued to be known as the inventor. He spent time extolling the invention and the *New York Times* of 12/21/1854 reported that he gave a presentation on it at a meeting of the Geographic Society, stating that the "Nautilus" was "adequate to the requirements of successful pearl fishing, coral gathering, and building breakwater and docks."

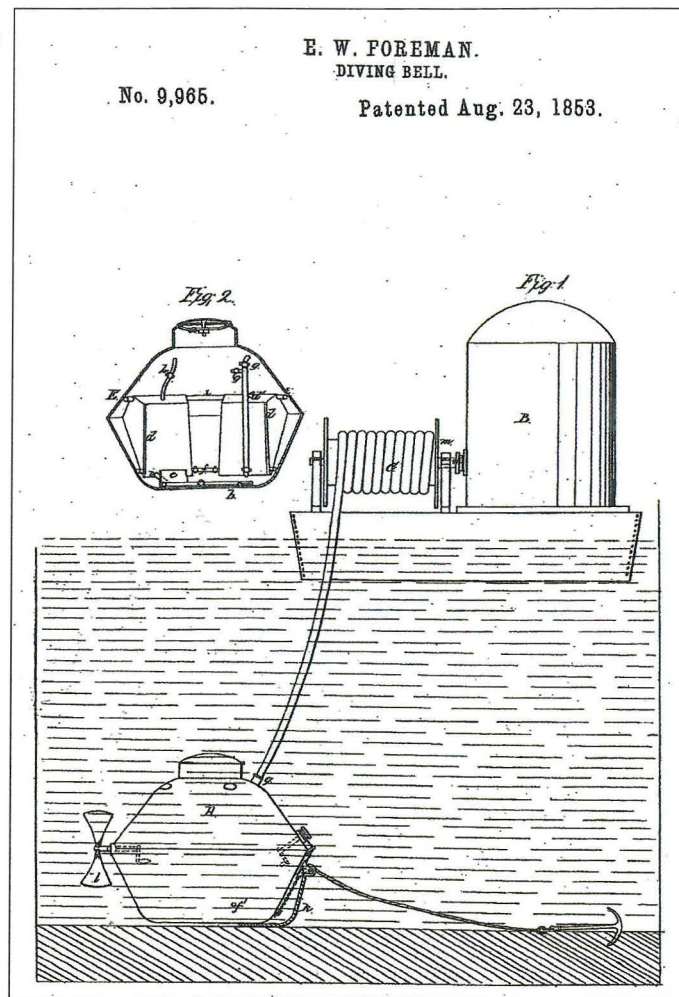
In March of 1857 he addressed the Society of Arts in London on "Appliances for Facilitating Submarine Engineering and Exploration." A discussion following the speech included Heinke and Bethell. *The Engineer* of 13 March 1857 published a detailed description of the bell and its operations.

The Morning Post, Morning Chronicle and Daily News (all of London) on 10 June 1857 published basically the same article, which was a description of the use of the bell in picking up stones up to 4 tons in weight, moving them 30 feet, placing them on the bottom and surfacing, all in 8 minutes. This took place in the Victoria Dock. The dock supervisor, a Mr. Bidder, stated that the same amount of work previous to the use of the "Nautilus" that had taken three weeks and four days, had been got through by the "Nautilus" in two days and two hours with the same number of men employed. *The Scientific American* of 7/4/1857 printed the same

information and continued the practice of calling the bell "The Nautilus" and giving Sears the credit for its invention.

Sears was President of the Nautilus Diving Bell Company from 1854 to 1857. He was appointed Superintendent of the alterations of the Victoria Docks in 1857. In 1860 he moved to Liverpool to become a merchant, and died there in 1880. ●

Note: My thanks to Mike Fardell of the HDS (UK) for copies of the London newspaper stories.



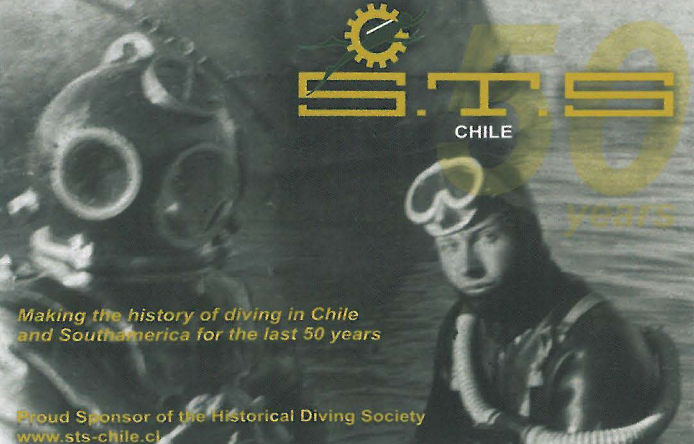
quickly change the weight of the bell by flooding or blowing the tanks gave this bell a distinct advantage over other designs.

The *New York Times* of 12/27/1854 reported a demonstration dive at the Atlantic Dock in Brooklyn. The writer stated that the bell was about 10 to 12 feet interior diameter and had five circular windows to provide light to the bell. He writes that the bell was easily manageable by operating a few valves and that the vessel *Emily Banting* on which the bell was based would shortly be sailing to the Pacific to engage in the pearl fisheries. This reporter was



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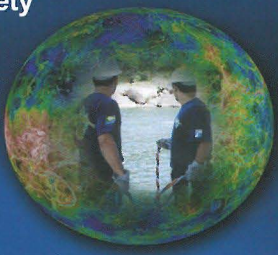
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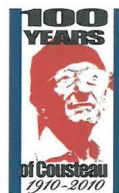
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Jacques Yves Cousteau and Emile Gagnan Inducted into National Inventors Hall of Fame

By Leslie Leaney

Photos ©2010 Invent Now/National Inventors Hall of Fame



Aqua Lung inventors Jacques Yves Cousteau and Emile Gagnan joined a stellar group of inductees into the National Inventors Hall of Fame in March 2010. Receiving the awards on their behalf were Emile's daughter, Michele Gagnan, and Jacques-Yves grandson, Fabien Cousteau.

Joining them in the Hall were: video game system engineer Ralph Baer, rocket propulsion innovator Yvonne Brill, TIMATION Satellite Navigation System developer Roger Easton, Post-it Notes inventors Art Fry and Spencer Silver, Glass ceramics inventor S. Donald Stookey, cancer treatment researcher M. Judah Folkman (1933-2008), Polymer Cable Sheath inventors W. Lincoln Hawkins (1911-1992), Vincent Lanza (1922-1972), Field Winslow (1916-2009) and synthetic diamond inventors Francis Bundy (1910-2008), H. Tracy Hall (1919-2008), Herbert Strong (1908-2002), Robert Wentorf, Jr. (1926-1997).

The induction was hosted by Undersecretary of Commerce for Intellectual Property and Director of the United States Patent and Trademark Office, David Kappos. The ceremony was sponsored in part by the United States Patent and Trademark Office and the Kauffman Foundation, and took place at the United States Department of Commerce in Washington, D.C.

"We at the National Inventors Hall of Fame are proud of our 38-year history of drawing much deserved attention to the remarkable people who exemplify the key role that innovation plays in America's free enterprise system," said Edward Gray, President of the Board of Directors of the National



Michele Gagnan and Fabien Cousteau are interviewed by gala dinner emcee Neal Conan from NPR.

(L to R) David Kappos, Director of the U.S. Patent and Trademark Office and Under Secretary of Commerce for Intellectual Property, Michele Gagnan, Fabien Cousteau, Edward Gray, Chairman of the National Inventors Hall of Fame Board of Directors.



Inventors Hall of Fame, "The individuals of this year's class of outstanding inventors have shaped our future and their remarkable achievements will surely inspire a whole new generation of like-minded dreamers to see the worth of hard work and passion."

"These brilliant inventors truly illustrate the important impact of our intellectual property protection system," said David Kappos Under Secretary of Commerce for Intellectual Property and Director of the USPTO. "The groundbreaking patents behind these inventions provided the foundations for numerous corporations, life-saving therapies, and everyday devices that have improved all of our lives. The USPTO is pleased to join in recognizing these 16 pioneers."

The National Inventors Hall of Fame is the premier non-profit organization in America dedicated to honoring legends whose innovations and entrepreneurial endeavors changed the world. Founded in 1973 by the United States Patent and Trademark Office and the National Council of Intellectual Property Law Association, the Hall has inducted 421 inventors to date. For more information, visit them online at www.invent.org.



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Corvette and Submarine

Written by **Max Shean**

Reviewed by **Nyle C. Monday**

Back in the *Journal of Diving History* No. 61 (Fall 2009) I noted the passing of Lt. Cmdr. Max Shean, one of the heroes of the X-Craft raids of WWII. In that article I remarked that it was fortunate that Shean left a record of his exploits in a book, *Corvette and Submarine*, which I had heard of but never actually seen myself.

A short time later a package arrived from one of our Australian members, Mike Cooke. Upon opening it I found a copy of Shean's volume actually signed by Shean himself, as well as a good deal of other related material. To say I was excited is an understatement, and the book proved to be just as interesting as the man

himself. I am indebted to Mike for finding and sending me the book.

The book begins in the year 1939, when Shean was in his second year as an engineering student at the University of Western Australia. Like many young men at that time, he was torn between completing his education and enlisting. After several false starts, he was eventually selected for a commission in the Anti-Submarine Branch of the Royal Australian Naval Volunteer Reserve.

The reader is taken through Shean's training period, which included everything from "square bashing" to the use of weapons and other specialized equipment, much of which will be at least somewhat familiar to anyone who has been in the military. It was interesting to learn that Shean was prone to seasickness, a problem he never completely conquered. One can only imagine how difficult that must have

made serving in an X-Craft, little more than a sealed pipe under the sea.

Shean eventually was sent to England where he was initially assigned to *HMS Bluebell*, a *Flower* class corvette. A good portion of the book is dedicated to this

phase of his naval career, in which he was involved in anti-submarine duties on many convoys. Although this may not have been very glamorous work, it was essential to the survival of Britain and the carrying of the war to the enemy. Shean tells his tale the way he experienced it, and so the account is fascinating to read and rings true in a way fiction seldom can.

It was not until 1942 that Shean ignored the standard Naval advice of "keep your mouth shut, your bowels open, and never volunteer" and answered a call for unmarried men for "special and hazardous duty." After passing the initial selection process, he reported to *HMS Dolphin*, which was the Royal Navy's submarine school, on September 14th of that year.

At this point the book will be of special interest to HDS members. During his first day at that school he was introduced to the Davis Submarine Escape Apparatus (DSEA). After a week of practice with this equipment, during which the number of volunteers dwindled, the candidates were finally briefed on the actual nature of their mission. They were to attack the German battleship *Tirpitz*, which had sought safety in a remote Norwegian fjord.

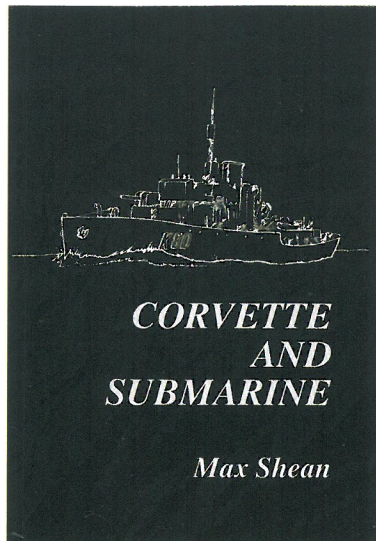
The story of that attack, and the later

attacks such as Operation Guidance and Operation Sabre, makes a fascinating read. The candidates had to be both submariners and divers, as the X-Craft had lock-out capabilities and it was the diver who carried out the actual attack. Besides the DSEA, the sailors also trained with traditional Siebe Gorman heavy gear to help them become accustomed to working underwater. The temperamental nature of the X-Craft itself also made training both exhilarating and terrifying in equal measure. Shean gives the reader a real feel for what it was to have been one of these brave volunteers. It was certainly because of men such as these – the legendary "heart of oak" – that England was able to survive.

Shean had the experience of working both in the European and Far Eastern theaters, and his book details all of these. Along the way he earned the Distinguished Service Order (DSO), twice, and the American Bronze Star for valor. His final mission was one of singular importance, but I will leave the reader to discover the impact that a handful of young men in a unlikely craft could ultimately have on the outcome of World War II.

Corvette and Submarine is a wonderful book. It is hard to put down once started, and the time spent reading it frankly seems to go by too fast. One often hears the phrase "the greatest generation" applied to the now disappearing body of men and women who struggled and served during the Second World War, and when one reads a book like this that title seems fully justified. We would all like to aspire to be heroes like the men who live on in its pages, but few have the nerve and the opportunity. Max Shean certainly had both. ●

Corvette and Submarine. 1992. Self-published. Claremont, Australia. ISBN 0646091719. Available through Amazon.com and used booksellers.





Internet auctions and sales during recent months. Prices are rounded to the nearest highest dollar. The content of this column is provided in good faith by members for general interest and is not a definitive guide. Vendors' opinions of what items are, and what condition is, are not consistent. The HDS USA and JDH are not responsible for any errors in descriptions, listings or prices. Items that failed to meet their reserve have their highest bids listed.

AMERICA



DESCO 60th Anniversary HDS Commemorative Abalone Helmet. Number 13 of a Limited Edition of 20. The helmet appeared to be complete and in unused condition. These helmets we commissioned in 1997 by the HDS USA to commemorate the 60th Anniversary of the founding of DESCO Corporation in 1937. They are stock Abalone models, but double tinned, individually numbered, and with custom limited edition sterling silver fittings designed by Ron Karlsson of Torgny Company of 1000 Oaks, California. They were the second HDS Limited Edition Commemorative helmet, the first being the DESCO USN Mark V in 1995. These Abalone helmets were functional diving helmets, and were all sold at \$3,500 each. To my knowledge, this was the first of the 20 to become available on the market. Listed by the seller as a "Great rare collectors piece," it sold swiftly for its Buy It Now price of \$5,600.



Andrew J. Morse & Son Inc. 3 light commercial, serial number 2152, matching. Appeared in very good overall condition, complete, with a good amount of tinning remaining.



There was minor denting to the bonnet but no significant damage. This helmet was manufactured during the 19-teens so is now approaching antique status. A good looking standard Morse helmet that sold for \$5,655.

Craftsweld 3 light commercial, serial number 1736. Fully tinned in what appeared to be unused condition with some staining to the tinning at the back of the bonnet. The brass components showed a dark patina and all port guards were secured with stainless steel screws, which seems to be a feature unique to Craftsweld among American manufacturers. The communications wire was still attached to the helmet. There was little in the way of a description but the photographs were strong enough on their own. Craftsweld took over the production of Schrader helmets when they acquired the company. This was just a few years before the lightweight swim-gear helmets of Savoie, Kirby Morgan, Miller, Swindell etc. started to come on the market. With long time competitor Morse of Boston already in production, plus cheaper Japanese imports from TOA and Yokohama starting to get a foothold in California, and the technological leap forward in equipment that swim-gear brought, not many Craftsweld helmets appear to have been made. The auction of Craftsweld helmet serial number 1692, which was identical to this model in condition, was covered in this column in issue 62. That helmet was located in Taiwan, and came with a dress, belt, boots and cable and fetched \$9,500. This one was located in Florida and attracted 24 bids, the winning one of which was for \$6,550.



Miller Dunn Style 2 Divinhood. This helmet appeared to have been well used and had a broken port glass. The back of the crown piece appeared to have been cleaned and showed a clear patina whereas the rest of the helmet appeared to be untouched. Hopefully the photos will show that. This was the model with the wider shoulder wings. It was very well photographed and accurately described, selling for a final bid of \$6,778.



Morse Diving Equipment Company Inc. 3 light commercial, serial number 5786. Appeared in very good original condition with almost all of its tinning. The bonnet had a few working dents and the lot

came with a Certificate of Authenticity from Morse Diving Inc. The listing stated,

"Manufactured by Morse Diving in Boston, August 10, 1944. Originally sold to the Port Transportation Office, Seattle, Washington." A very good looking WWII commercial helmet, with a little history, that sold for its opening bid of \$6,500.



UNITED KINGDOM



C.E. Heinke & Co. Ltd. 6 bolt, serial number 290. matching.

This helmet appeared in good, complete, condition but without its tinning. There might have been some repaired damage behind the left port but it was difficult to tell. All three port glasses appeared to be opaque, (which could have been the result of cleaning the outer surface of the helmet by sand blasting) but again, it was difficult to tell. It may just have been the angle that the photos were taken from. Although manufactured towards the end of the company's life, this model is considered uncommon, as Heinke made primarily 12 bolt helmets. Its design was based upon the successful 6 bolt design that Siebe Gorman introduced very early in the 20th century. It was part of the Carlos Dominguez collection that was featured in last issue's column. The helmet was well photographed and received 19 bids, selling for a respectable \$8,440.

Northeast Working Equipment Group Update

By Janice Raber



(Above) Richard Welk in a 4 light Russian 12 bolt/ 3 bolt helmet rig preparing to dive at Brownstone Quarry.

(Below) Jan Raber with Linda Gotti after Linda's MKV dive in the Atlantis Marine Aquarium.



The Northeast Working Equipment Group (NEWEG) has been busy during the last year and what follows will encapsulate what we on Long Island have been up to recently in the world of classic equipment diving.

In May of 2010 Bob Rusnak and I revamped the display window of Diving Memorabilia at the Atlantis Marine World Aquarium in Riverhead, Long Island, New York, in preparation for their summer visitors. We focused on items connected to the *Sea Hunt* show knowing that many of the baby boomers would be bringing their grandchildren to the Aquarium and could identify with that era of diving history. In addition we had some items from pioneers in Long Island diving, June and Roy Kieser, and, of course, a U.S. Navy Mark V.

June found NEWEG back for our fourth year at Brownstone Park Quarry, Portland, Connecticut. Bob supervised and assisted as nineteen divers were dressed in the Mark V rig as well as the Russian Navy Baltic Helmet. This rig is provided by our big supporter Fred Barthes, who travels all the way from New Jersey to work with us on this event. Without the help of volunteers like Fred, John Chominsky also from New Jersey, Delores Rogers, Pat and Vic Madeiras from Massachusetts, Luis Heros from Maine, Richard Welk from Connecticut, and Bob Auteri, Linda Brown, Steve Burke, Kathy Cascarella, Bill Pfeiffer, Pete Quatrale, and Chris Skirbe from the Long Island Divers Association, this event could not take place. These dedicated people give their time and effort, at their own expense.

Readers may remember Richard Welk from his letter to HDS (Fall 2009, Volume 17, Issue 4, Number 61) about not fitting in the Mark V and Fred bringing the Russian helmet for him the next year. Now Richard is a "regular" and helps us teach new people the ways of hard hat diving. We had many returnees this year. People come back to try out the different equipment they didn't get to try the year before. There were also many new faces, and I am happy to say there were many women who wanted to dive in the Mark V. Without exception, the divers comment that this experience is one of the major highlights of their diving lives. "Awesome" is a word we hear often. Those of us who make this happen find our gratification in the smiling faces of those divers. It is this kind of operation that brings diving history alive to the new generation of divers and we are grateful to Brownstone for their generosity in giving us the opportunity and freedom to do this. For more information on Brownstone Park visit www.brownstonepark.com

In July we were at the Atlantis Marine World Aquarium again, but this time we had the spectacular opportunity to take the Mark V on exhibition dives

in their fantastic 120,000 gallon Shark Tank. The aquarium televised the dives live on closed circuit TV throughout the aquarium so visitors were able to see the whole dressing process and watch the diver enter the cage to submerge into the tank. Once submerged, the Mark V diver exited the cage and walked to the window where there was voice communication to the viewers. Sharks, sea turtles, moray eels and stingrays swam around while the "diver in the fish tank" came to life for the children. They were mesmerized.

The excitement wasn't limited to indoors. Outside in Shark Reef Tropical Lagoon, HDS members Brett and Kathy Curlew, along with Garrett Boyce, Jim Brett and Carl Storm, assisted by Kathy Cascarella and Joe Lemaire, were putting interested divers in a shallow water diving helmet and taking them on a tour of the "reef" viewing stingrays and exotic fish. Once again, members of the Long Island Divers Association were there to help us with this entire project. For more information on Atlantis Marine World visit www.atlantismarineworld.com

January 2011 started off with a huge splash at the Living Seas Aquarium with Nemo and Friends at Epcot at Disney World in Orlando, Florida. By special invitation through Bob Rusnak we were able to do exhibition diving in the Mark V and the Japanese Yokohama in the fabulous six million gallon, 72°F aquarium with 40-50 feet of visibility. Several of Disney's interns welcomed the break from feeding fish and scrubbing algae off aquarium decor to take a turn in the hard hat diving equipment. They had the time



Jan Raber testing com box at Brownstone.

of their lives, waving to viewers on the tour and those seated eating dinner in the Coral Reef Restaurant. The camera flashes started as soon as a Mark V diver approached the aquarium window, making him feel like an instant celebrity. Tropical fish, sharks and rays made their rounds while the divers waved to the crowds. Our support divers in the Kirby Morgan Superlite and on scuba, when they were not busy keeping umbilicals from tangling in Disney's "coral" and guiding the hard hat diver around, spent their down time playing pat-a-cake with children through the six inch thick aquarium viewing windows. We were treated to an exceptional and very unique surprise this year when we all had a special photo opportunity and

private dive session with Mickey Mouse himself on scuba!

Although Disney provided the water and the scuba equipment, our "group" provided the communication equipment, dive dresses and helmets, umbilicals, and the indispensable expertise. We are grateful for the help from professional commercial divers Rich Riley, Alex Riley, Jack Vilas, Jon Hazelbaker, Mark Butler and Bob Shema. It wouldn't have been as successful without them. Rick Ford, and Lou Guardino also joined our team for the first time this year and our usual dependable group of Ray Tucker, Fred Barthes, John Chominsky, Kathy Cascarella and myself were also there.

For those interested, Disney has a scuba diving program that is available to the public called Epcot Dive Quest. There is more to come from NEWEG in 2011. ●

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Tenth Anniversary for the DWEG

By Kees De Jong

Photos courtesy of the author



In 2001 a few enthusiast helmet divers in the Netherlands formed the Dutch Working Equipment Group (DWEG). Their goal was to meet other helmet divers, share information and dive with each other's equipment. During the intervening years several meetings were held, shows were attended and diving demonstrations were given. To celebrate their 10th anniversary, the DWEG organized a two-day event from May 14-15 2011 with a group of international guests.

For this 10th anniversary event we choose Lake Galder, which has very good visibility, at least by Dutch standards. On Saturday 14 we received the guests with coffee and cake in our celebration tent. Kees introduced all the guests and after the safety briefing, the helmet diving started. Several divers brought their own helmet diving equipment making for an impressive gathering of traditional equipment. In total the participants brought one complete Siebe Gorman diving set, one Dutch Diving Helmet diving set, two complete Russian air diving sets, one complete Russian helium helmet diving set, two complete Draeger air diving sets and even a complete Draeger DM-40. Beside these complete diving outfits, participants also brought some Miller Dunn helmets, diving pumps, and more Draeger and Siebe helmets. A total of 25 divers participated in the event and 27 dives were made.

The dives were a great success and we shall be organizing the same event again in 2012. HDS members who are interested are welcome to join us and to bring their gear. We all look forward to meeting more HDS members and to dive with them. Contact: Kees de Jonge at info@dehelmduiker.com, or call (+) 31 492 511795. 📞



(Above) Thomas Muller in a Draeger DM40 and Kees de Jong in Siebe Gorman 6 bolt.



(Left) Self-contained DM40 underwater.

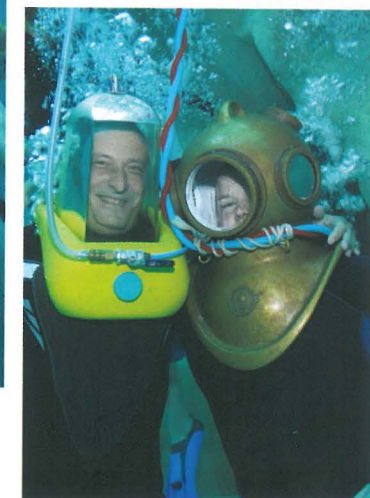
International Shallow Water Helmet Diving Event 2010

By Kees De Jong

During the weekend of September 25th and 26th 2010, the third International Shallow Water Helmet Diving Event took place at the Monte Mare indoor diving center in Rheinbach, Germany. This meeting brought together collectors of diving helmets, especially shallow water helmets. The goal of the event was to give collectors a chance to use several different diving helmets and to help each other with tips and advice. Another goal is to keep the helmet diving history alive.

Unfortunately, there are not many shallow water helmets in Europe. Nevertheless, I managed to bring an American Snead, a modified American Aqua Bell, two Dutch diving helmets and a complete Siebe Gorman deep water suit. During the event seven divers attended the PADI Brass Helmet Diver specialty class for the closed diving suit and PADI's Underwater Walk for the shallow water helmets. The combination of the 33-foot-deep indoor diving center at Monte Mare and the opportunity to conduct the PADI specialty class is ideal. In this way diving knowledge is combined with actual diving and it all takes place in a diving pool that can be described as an underwater paradise for (helmet) divers. Images of the event can be seen on the You Tube channel "dehelmduiker1".

The next shallow water helmet dive will take place in 2012. The goal is to bring three hard hat suits and at least five different shallow water helmets together. If you are interested in this sort of diving and would like to join us, contact me at info@dutchdivinghelmets.com.



*U.S. Navy Mark V
Diving Helmet*

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By Steve Kushmer, HDS President

“Historical Diving Society? What’s that?”

As you can imagine, I hear this quite often. (Especially when I’m proudly wearing my favorite HDS shirt.) My answer varies a little bit each time and eventually I get the HDS’s message across. Usually the reply I get is, “I never thought about the history of diving; it sounds very interesting.”

I have to keep my explanation brief since as time goes by I am constantly reminded of how much goes on, and went on, under the water-covered surface of our great planet. During my explanation I am also reminded that not everyone spends much time (most, none at all) thinking about how the human race has advanced since we have found ways to work, play, observe and record what goes on under the earth’s water-covered surfaces.

OK, so I live in the desert in southern Nevada and have learned that I really can’t expect too many locals to spend a lot of time thinking about this, but as soon as I say, “Someone has to inspect the bottom of the Hoover Dam,” that strikes a chord. That’s when I mention that humans have been fascinated by what may be under the surface of the water since day one. Early on it was just seeing these natural wonders for the first time, then seeing, drawing sketches of what early divers saw and then raising items to the surface such as new animal species, geological wonders, shipwrecks and their treasure after they were supposed to be gone forever. Within the past one hundred years diving equipment technology,

photographs and videos of what is below have shown us more than ever before.

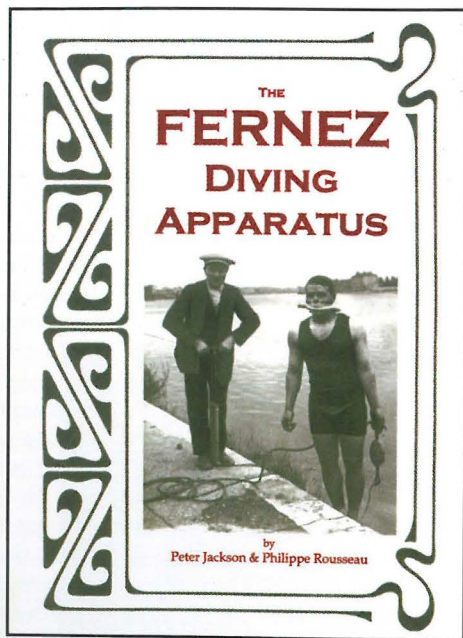
Then I get to the answer to the original question: Historical Diving Society? What’s that?

As our Mission Statement states, “To Preserve, Study, Compile, Archive and Disseminate Information Relating to the History of Man’s Underwater Activities and to Promote Public Awareness of and Participation in Underwater Activities,” we strive to preserve the human race’s relationship with the underwater world. We do this by documenting information in the magazine you are holding in your hands right now, holding annual conferences in locations that associate with the history of humans on and under their “blue planet” and by supporting and exhibiting at various underwater events, whether they involve antique diving equipment, underwater photography - or are consumer or trade diving shows.

I usually end my explanation with, “Someone’s got to do it.” The history of humans underwater is very important, just as all history is. Whether it is about the development or invention of the equipment that allows us to go below the waterline, the history of what is (or was) below the waterline, or of those who go below and bring back items, photographs or videos. It all needs to be documented for future generations.

That’s what the Historical Diving Society is... 🐬

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Ernest H. Brooks II

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The Spirit of Calypso

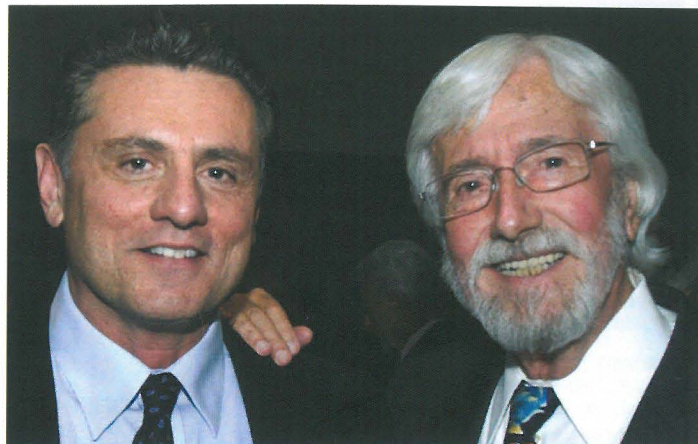
Beneath The Sea Celebrates 100 Years of Cousteau



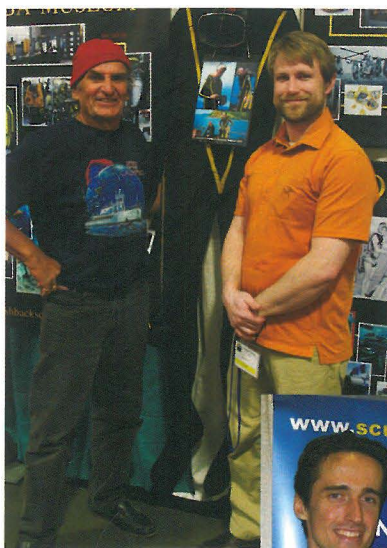
The Beneath The Sea Show in New Jersey celebrated its 35th birthday in March 2011, with a salute to the 100th Anniversary of Jacques Yves Cousteau's birth. The show brought together a gathering of Cousteau family members, including Cousteau's sons Jean - Michel and Pierre - Yves, his widow Francine, his granddaughter Celine and grandson Fabien. The late Captain was honored with The Legend of the Sea Award at a private reception for the family and attended by several HDS members and prominent divers. The show was themed as *The Spirit of Calypso*, and a painting by former *Calypso* crew member Dominic Serafini was used as the logo for the event.

As usual the show attracted thousands of divers with all booth spaces sold out, and standing room only for the seminars featuring the members of the Cousteau family. BTS President JoAnn Zigahn, Executive Director Armand Zigahan and their large volunteer staff are to be congratulated on achieving an event that several industry insiders felt would be doomed from the start. It was a fitting tribute to the iconic Captain Cousteau and provided, most probably, a once-in-a-lifetime opportunity for American divers to meet members of his family. For more information on BTS visit them online at www.beneaththesea.org.

— Leslie Leaney



The Captain's eldest son, Jean-Michel Cousteau, President of Ocean Futures Society, attended with his daughter Celine and son Fabien. He is shown here with Lionel Galerne, the eldest son of another legendary French diver, André Galerne, at the private reception. Captain Cousteau served as a Director for André's commercial diving company International Underwater Contractors (I.U.C). With André's passing Lionel is now the President of I.U.C., which is based in New York, and is a corporate sponsor of *The Journal of Diving History*. Courtesy of Beneath the Sea.



The theme of the show was the *The Spirit of the Calypso* and former crew member and current diving artist Dominic Serafini travelled over from Europe to display some of his work. Dominic is a regular exhibitor at the Marseille Film Festival where he first met Flashback Scuba's Ryan Spence. The two of them are shown here either side of one of Jacques Yves Cousteau's wetsuits at the Flashback Scuba booth. Photo courtesy Flashback Scuba.

The Captain's youngest son, Pierre - Yves Cousteau, President of Cousteau Divers, attended with his mother Francine, and Cousteau Society Vice President Robert Steele. Pierre - Yves is shown visiting with DEMA Executive Director Tom Ingram at the Cayman Islands International Scuba Diving Hall of Fame booth. ©2011 L. Leaney



The Diving History Library

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SUBMARINE RESEARCHES ON THE WRECKS OF HIS MAJESTY'S LATE SHIPS ROYAL GEORGE, BOYNE AND OTHERS, BY C.A. DEANE



This book was originally published in England in 1835, and is the first book about diving using the "open" diving helmet and dress, with air pumped down from the surface. This apparatus invented by brothers Charles and John Deane soon developed into the familiar "hard-hat" or standard heavy gear diving equipment. The Deane brothers

successfully carried out naval and commercial salvage, launching the trade of the diver. *Submarine Researches* was published principally to promote a diving and artifact exhibition, and provides us now with a valuable record of the first years of the diving industry. Hard bound, b&w illustrations. \$35.00, plus \$9.50 domestic p&p.

DESCRIPTION OF A DIVING MACHINE, BY KARL HEINRICH KLINGERT

This publication represents the first time that the complete text and illustrations of Klingert's two books, *Description of a Diving Machine suitable for use in rivers (1797)* and *A Brief Supplement to the History and Description of a Diving Machine, together with the explanation of a lantern or lamp which burns in any vitiated air, and in water (1822)*, which describe in detail his pioneering equipment, are published in English. There is also

an authoritative 11 page introduction written by the Journal of Diving History's contributor, Michael Jung. Limited to 500 copies. Case bound with dust jacket, 51 pages, with illustrations. \$30.00, plus \$9.50 domestic p&p.

HARD HAT DIVERS WEAR DRESSES, BY BOB KIRBY

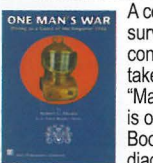
Bob Kirby's autobiography covering his development of Kirby Morgan dive equipment and his work in commercial military and Hollywood diving.



Contains numerous unique photos from Kirby's career including some of his helmets. As the story of one of diving's few living legends, it will stand as a personal record of one man's unique journey through an industry at its prime. Self published by Kirby, with warts and all. Limited to only 1,000 copies. Perfect bound

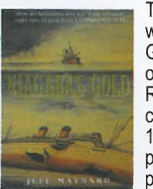
volume, 262 pages, b&w photos, \$40.00, plus \$12.50 domestic p&p.

ONE MAN'S WAR, BY USN MASTER DIVER ROBERT C. SHEATS



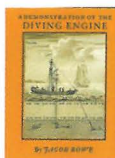
A compelling story of diving and survival under extreme Japanese POW conditions. An incredible accounting taken from the POW diaries of America's "Master of Master Divers." This book is often referred to as the "Dive or Die Book." Soft bound, 94 pages, photos, diagrams, maps. \$15.00, plus \$6.50 domestic p&p.

NIAGARA'S GOLD, BY JEFF MAYNARD



The true story of how eight tons of gold was salvaged from 400 feet beneath a German minefield during WWII. One of the greatest salvage feats in history. Reviewed in HDM #8, with further contributions in HDM #10. Soft bound, 160 pages, plus 8 pages of B&W photos. \$20.00 plus \$6.50 domestic p&p.

A DEMONSTRATION OF THE DIVING ENGINE, BY JACOB ROWE



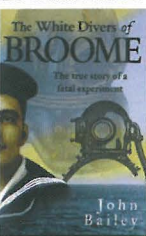
The first known English language monograph on diving covering Rowe's equipment and successful salvage methods. Rowe's manuscript is accompanied by an accounting of his life and work by Mike Fardell and Nigel Phillips. Published by the HDS-UK in association with The National Maritime Museum, Greenwich, England. 30 pages, facsimile manuscript and illustrations, hard bound in dust jacket. Limited First Edition of 750 numbered copies. \$30.00 plus \$9.50 domestic p&p.

DEEP DIVING AND SUBMARINE OPERATIONS, BY SIR ROBERT H. DAVIS



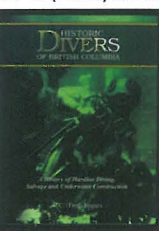
Referred to during last century as "The Bible of Diving," the first edition of this book appeared in 1909, as was gradually revised and expanded through the 20th century. This ninth edition was published in two parts to celebrate the 175th Anniversary of Siebe Gorman. Part One is essentially a diving manual and covers all aspects of diving technology, physics, physiology, gas mixtures, diving appliances, gas mixtures etc. Part Two contains accounts of notable diving operations, diver's yarns and a comprehensive history of all forms of diving apparatus. A magnificent two volume set bound in reflex blue embossed with gold text and with matching dust jackets. Both volumes come in a reflex blue presentation slip case. Probably the most famous diving book ever printed. "The best book on diving I have ever read," - Bev Morgan. Reviewed in HDM #6. 712 pages, over 650 b&w photographs, line drawings and illustrations, index. \$200.00, plus \$12.50 domestic p&p.

THE WHITE DIVERS OF BROOME, BY JOHN BAILEY



The extraordinary true story of the 12 Royal-Navy trained British divers sent to Australia as part of the White Australia Policy of the early 1900's. Set against the backdrop of Broome, the famous "Port of Pearls," it describes a world where pearl shell mattered more than human life. Reviewed in HDM # 29. Soft bound, 301 pages, b&w photos, endnote references. \$25.00, plus \$6.50 domestic p&p.

HISTORIC DIVERS OF BRITISH COLUMBIA. A HISTORY OF HARDHAT DIVING, SALVAGE AND UNDERWATER CONSTRUCTION, BY C. (FRED) ROGERS



Commercial salvage and diving in heavy gear from the late 1800's to the 1960's. The author previously wrote *Shipwrecks of B.C.* and recorded the names of many of the divers who had worked on early salvage. There are plenty of period photographs of vessels being salvaged and divers in commercial heavy gear. A full review appears in HDM issue 48. Each copy is signed by the author. 2004. 8 1/2" x 11." Soft bound, 232 pages. B&W photos, illustrations, newspaper cuttings. \$30.00 plus \$12.50 domestic p&p.

DESCENT. THE HEROIC DISCOVERY OF THE ABYSS, BY BRAD MATSEN

Brad Matsen brings to vivid life the famous deep sea expeditions of Otis Barton and William Beebe. At a time when no one had travelled deeper than a few hundred feet, they took the world to half a mile down. At the height



of the Depression, Beebe and Barton plumbed the depths of the ocean in nothing but a steel sphere, setting two records at once: it was also the first time a dramatic journey of discovery was broadcast live in America and Europe. But even as they achieved their greatest success, a bitter rift left the two explorers on barely more than speaking terms. 2005. Hard bound

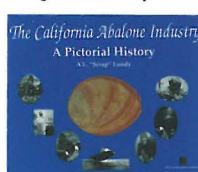
with color dj. 287 pages, b&w photos, maps, diagrams, illustrations. Notes, bibliography, index. \$25.00, plus \$6.50 domestic p&p.

DIVING PIONEERS AND INNOVATORS: A SERIES OF IN-DEPTH INTERVIEWS BY BRETT GILLIAM

A magnificent book recoding interviews with Zale Parry, Stan Waterman, Bev Morgan, Chuck Nicklin, Ron & Valerie Taylor, Peter Benchley, Dick Bonin, Wes Skiles, Bob Ballard, Mike DeGury, Michele Hall, Paul Humann, John Chatterton, Greg MacGillvray, Bob Hollis, Al Giddings, Ernie Brooks, Howard Hall and Bret Gilliam. Full review in HDM issue 53. 2007 First Edition. Hard bound 8" x 11 1/2", with dust jacket, 489 pages, color and b&w photos. \$60, plus \$12.50 p&p domestic p&p. CA residents add 7.75% sales tax. Contact HDS office for overseas p&p.

THE CALIFORNIA ABALONE INDUSTRY: A PICTORIAL HISTORY, BY A.L. "SCRAP" LUNDY

The definitive work on this historic American industry which involved Chinese and Japanese immigrants before being overtaken by caucasians at the outset of WWII.



Extensively researched with interviews from participating divers. An essential reference on fisheries diving and the divers who would migrate and form the early off-shore oil field diving companies. The book is an important companion to *The History of*

Oilfield Diving, describing the working environment and conditions that, in part, allowed the rapid growth of the oil field diving industry. HDS has the limited remaining stock. 1997 Soft bound, 223 pages, sepia tone and color photos, bibliography, tables, harts, glossary, index. \$25.00, plus \$12.50 domestic p&p.

SHARK MAN, BY RODNEY FOX SIGNED BY THE AUTHOR

As the world's most famous shark attack survivor, Rodney Fox describes his historic journey from Great White Shark victim to Great White Shark advocate and protector.

Starting with the details of his attack, Rodney leads the reader through his return to diving, his shark killing days around Australia, building the first shark cages and staging the first Great White Shark expedition. Blue sharks, hammerheads, chain mail suits, shark repellents, and his current Shark Research Foundation are all covered in this well illustrated book. We have a limited number of signed copies. "Jaws was fiction. Rodney Fox's story is real, and not only exciting

but fascinating and inspiring as well. From unimaginable horror and near-tragedy emerged a man whose life and work have been devoted to saving these magnificent predators." Peter Benchley. 2001. Soft bound, 8 1/2" x 11", 48 pages, color, index, glossary. \$20.00, plus \$6.50 domestic p&p.

Jesse L. Dean 1940-2010

Jesse L. Dean was born on September 30, 1940 in Fresno, California. He was the son of Henry and Lorraine Dean.

He graduated from Clovis High School in 1959. Jesse enjoyed his college years, which may have been a challenge with all of the academics, responsibilities, and the sudden freedom that accompanied them, but Jesse was able to manage the balancing act. He graduated from commercial diving school in 1963. On February 8, 1964 Jesse exchanged wedding vows with his sweetheart, Brenda Marie. Empathic and loyal, Jesse was committed to making his new family happy.

Fortunately, Jesse enjoyed accomplishing many different goals throughout his lifetime. He was a commercial diver for ten years and spent 35 years as the owner and operator of Aqua Tech Dive Center, which displayed a collection of commercial and recreational diving equipment. He contributed greatly to the diving industry by being the inventor and patent owner of commercial diving burning rods. Jesse was also a sprint car driver for 15 years and was the owner and designer of Perris Speedway in 1995. He was the owner and operator of Arco Am/Pm car wash in Modesto, California, and was also a private pilot, restaurant owner, World Series of Poker finalist, and an all around sportsman and competitor. His adventurous and outgoing personality allowed him to accomplish all of these exciting goals. Ultimately, Jesse would consider his biggest accomplishment during his lifetime to be the fact that he was a wonderful father to his children and an extraordinary husband to his wife of 46 years.

Sadly, Jesse passed away on July 29, 2010 at Kaiser Zion Hospital in San Diego, California. Jesse fought a brave one year battle against Lou Gehrig's disease. He is survived by his wife, Brenda Marie Dean; sons, Jesse Lee Jr., David Leon, and James Paul; as well as all of his grandchildren.

Simply stated, Jesse was a good and kind person, an individual who will be remembered as a caring and giving person, someone who was a vital part of their lives. Jesse leaves behind him a legacy of lifelong friendships and many cherished memories. Everyone whose life he touched will always remember Jesse L. Dean.

Edited from Dignity Memorial, Glen Abbey Mortuary.

Bob Mock 1940-2011

James Richard "Bob" Mock, 70, passed away January 30, 2011, at home with his wife Marilyn, daughters Michell and Bobbi, son-in-law Ronnie, and closest friend Buddy Ayers.

Bob was a veteran of the Vietnam War serving in the U.S. Navy. He was a member of the Special Warfare Unit Naval Seal Teams. He worked as a professional diver for J. Ray McDermott out of Louisiana until becoming disabled and retiring. Throughout his life he built homes, designed and created custom cabinetry and knives with carved handles, was a karate instructor, and mentor, to mention just a few of his many talents. Bob had an enormous love for dogs, cooking and trying new recipes, and had obtained a black belt in both karate and samurai swords. In the last few years, hunting and fishing with his grandkids became his favorite thing to do.

His life was an adventure, it seemed, and the stories will be told of those adventures for generations to come. He was sometimes bigger than life. He was a Master Mason. He was a quiet, strong, loving, unforgettable, and amazing man, husband, and most importantly devoted father.

Edited from The Rockport Pilot, Texas, submitted by Buddy Ayers.

Dan Wagner

On December 7, 2010, the creatures of the sea lost a great friend when the founder of the Mother Ocean Foundation passed away. Dan Wagner, who was more commonly known as "Fishy Dan" by area school children, was a legendary scuba diving pioneer and underwater photographer.

Dan started his career with Dan's Diving Den outside Chicago in 1958 where he also led the Cook County Underwater Search and Rescue Team. Longing to be closer to the wonders of the ocean, he moved his family to the Space Coast, Florida, in 1963, becoming a well-respected teacher/instructor of scuba diving for the YMCA.

His underwater movies and photographs are highly decorated, having been used by Real Eight, Mel Fisher, National Geographic, and the Cousteau Foundation. In 1974, Dan and a couple of close friends completed the construction of *The Impossible Dream*, a dive boat running dive trips to the Bahamas. Possessing a profound love for all sea life, Dan spent the final years of his life working to save their environment.

HDS Chairman Dan Orr commented, "Dan Wagner was one of the more unique personalities in our sport and someone who contributed significantly in the early years of diving. He will be greatly missed."

Edited in part from floridatoday.com.

David Gray Parrot

David Gray Parrot, 65, founder and former chief of Titan Salvage, passed away on 15 September 2010 after a long and courageous battle with cancer.

David Parrot was described by Tom Crowley Jr, chairman, president and CEO of Titan's parent company, the Crowley Maritime Corporation, in terms with which his many friends in the salvage industry will readily concur. 'He was a remarkable man who founded and helped build Titan into one of the premier marine salvage and wreck removal companies in the world today. He will be missed by many for his vision, determination and countless contributions, but most of all for his friendship.'

Founded in 1980 by Parrot, Titan started as an undercapitalised, one-tug towing firm struggling to expand and make a name for itself. In 1982, Titan's tug Nestor and her crew were hired as sub-contractors to assist one of the Dutch companies on a salvage/wreck removal in the Caribbean. When the job was no longer economically feasible for the Dutch firm, Titan successfully took over the operation. This achievement was a milestone for the company, marking the first of a long series of salvages and wreck removal jobs, which continues to this day. During the 1980s the company acquired more tugs, barges and cranes, enabling it to build a regional salvage and wreck removal business in the Caribbean.

Parrot's long time business partner Dick Fairbanks joined the company in 1988. He has also had a lifelong exposure to the sea and had made his living in the marine field for many years. He brought a high degree of technical and business expertise to Titan. In 1992 Fairbanks's vision and recognition of the realities of scale led Titan to sell its tugs and most of its floating plant. This strategy allowed the company to expand and operate worldwide using vessels of opportunity near the site of a casualty and by flying in Titan's own expert salvors and specialised equipment. This approach has proved to be the right one for Titan and its clients, namely owners, underwriters and P&I Clubs. Today the company has headquarters in Pompano Beach, Florida and offices in the UK, Singapore and Australia. Titan was acquired by Crowley in 2005.

David will be missed by all those whose lives he touched.

Edited from Jack Gaston, Maritime Journal.

Jean-Jacques Oyarsabal 1947-2010

By *Philippe Rousseau*

French diver and collector/historian Jean Jacques Oyarsabal passed away in Montmorency on October 19, 2010. Jean Jacques held the Distinguished Gold Medal of the Fédération Française d'Etudes et de Sports Sous-Marin (FFESSM), the Bronze Medal of the French Youth & Sports Ministry, and was a Citizen of Honor of the town of Espalion, Aveyron, France.

As a diver Jean Jacques was a member of the first group of French SCUBA Diving Instructors from FFESSM and gained a lot of experience diving the Atlantic and Mediterranean coasts of France. He was the instructor at the diving club of the city of Montmorency and it was in that capacity that I first met him in the mid 1970s. I was the instructor of Maisons-Laffitte diving club and we arranged a joint meeting of our clubs. We lived only 20 kilometers distance from each other and our friendship grew because we had a common passion for diving history and collecting old diving equipment.

For a diver, Jean Jacques was born in an unusual place - inside the French Air Ministry on Boulevard Victor in Paris. His grandfather was a pilot and in charge of the Ministry's security. He also had an apartment at the Ministry and Jean Jacques was born there.

During his education Jean Jacques developed a leaning towards scientific studies. After completing

his education he became a chemical engineer with Pechiney Ugine Kuhlman, and later with Elf Atochem. Jean Jacques was also very athletic and excelled in many fields. He became the French junior



400 meters track champion, and also participated in tennis, shooting and rowing. However, the lure of life under the sea captured him and he became a spearfisherman before graduating to recreational scuba diving and swapping his speargun for a camera. He also became interested in underwater archaeology.

Jean Jacques was the founder of the committee of the Val d'Oise department of the FFESSM and shared his passion for diving by teaching many young people the sport. One of his pupils was J.M.

Broner, the current Director of FFESSM. Like some other French divers, he started to collect old diving equipment, which was an interest we both shared. He built a very fine collection of helmets and

was known to many collectors in Europe. His interest in the history of diving eventually lead him south to Espalion in the Massif Central, and he became a great promoter of the Museum of Diving which is housed there.

We shared many adventures together above and below the surface, but unfortunately fate was to play Jean Jacques a very, very bad hand, which would eventually rob him of his life. He maintained a very hectic schedule of work and often pushed himself to the limit. In early 1995 we attended a meeting with Jacques-Yves Cousteau at the Oceanographic Institute in Paris. The following day Jean Jacques was

struck with a massive vascular cerebral stroke, which left him a tetraplegic for the rest of his life.

It was a tragic situation. Throughout his life Jean Jacques had always been talkative and engaging. Now he could not move any of his limbs and breathed only with the assistance of a tracheotomy through his wind pipe. He was fed solely by a gastric tube and could only communicate by blinking his eyes.

Although the life of his physical body had ended, his

mind was still active and his intellectual faculties were not diminished, and he could still hear. Once it was permitted to visit him, his devoted wife Marie Claire and I established communication with Jean Jacques by using the alphabet to spell the words he wanted to say to us. During my visits I would start with the letter "A" and when I got to the letter he wanted he would blink his eyes. This way I could build the sentence that Jean Jacques wanted and could communicate with him, and to anyone who was permitted to visit him with me.

After three years in hospital, Jean Jacques was moved back to his home where a complete medical support system had been installed. Marie Claire then cared for him with great devotion every day, 365 days a year, for the remaining 12 years of his life. He still wished to be engaged in diving and diving history and was pleased to be able to meet Peter Jackson, Leslie and Jill Leaney and his friend Jan de Groot, who I was able to bring to visit him.

Now that Jean Jacques has gone, I reflect on our long and great friendship. I recall our numerous dives at the Cergy-Pontoise lakes and the quarry of Beaumont-sur-Oise, and our competitive swim fin competitions in Enghien-les-Bains lake. We had great adventures and some success in searching for old books and diving gear on our weekly visits to the flea market at Porte de Clignancourt.

Our historical investigations took us to the Pierre Lachaise cemetery in Paris, in search of the tomb of helmet manufacturer Cabirol, who died in 1874. We knew that there were fantastic sculptures of divers in Cabirol helmets on the tomb and we wanted to inspect them. Eventually we found the tomb near the grave of American singer Jim Morrison, of The Doors, who died in Paris in 1971. Once there we saw

**Dr. Richard Cooper
1936-2011**

*By Ivar G. Babb
President, National Association of
Marine Laboratories (NAML)*

Dr. Richard "Dick" Cooper passed away suddenly at home on 28 January, 2011. He was a Professor Emeritus at the University of Connecticut.

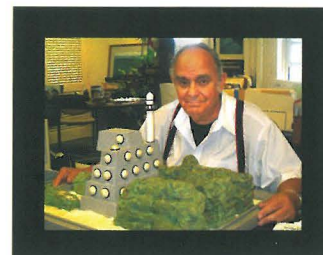
His accomplishments were many and he touched many lives both professionally and personally. Dick was the former Director of the National Undersea Research Center where he implemented research programs using underwater vehicles across New England, the Great Lakes, and in places around the world like the rift lakes of east Africa, Russia, Taiwan and Israel.

He also was a former Director of the Marine Sciences & Technology Center and was instrumental in acquiring the University's flagship research vessel, the *RV Connecticut* and new Marine Sciences Building.

His research focused on the use of research submersibles and he was an expert in the ecology of submarine canyons and the Gulf of Maine. Dick taught courses that culminated in taking students on research cruises using submersibles, giving them first-hand experience in the excitement of ocean research. He founded the High School Aquanaut Program that fostered interest in science and stewardship for the oceans for hundreds of high school teachers and students.

Prior to coming to UConn Dick was a biologist at the National Marine Fisheries Service Laboratory in Woods Hole where he led the Manned Undersea Science & Technology group. Early in his career he was involved in many of our nation's first experiments in saturation diving and undersea habitation, where he saw firsthand the potential for using this technology to advance science. He was an aquanaut on the Navy's Sealab III program off California, Tektite in the Virgin Islands, and Helgoland in the Gulf of Maine. Later in his career he returned to these roots, developing the concept of SeaBase, a modern undersea habitat that would promote awareness of ocean issues.

Dick inspired and fostered many careers in marine science and his legacy will live on through his students, former staff and colleagues. Dick was tremendously dedicated to his family and friends, where he also was willing to lend a sympathetic ear, a helping hand, and sometimes the shirt off his back. While many would be happy to sit and recount past accomplishments at the end of their career, Dick formed two foundations to promote the potential for educational and recreational use of saturation diving and was working on these projects to the end. He leaves his wife of 50 years Paddy Cooper, sons Chris and Jeff, and daughters Cathy and Wendy. His positive gung-ho outlook on life will be sorely missed.



that the sculptures were about four meters from the ground so we could not easily see them. To remedy this we went round and collected the garbage cans in the cemetery and stacked them one on top of the other, so we could climb on them up the front of the tomb to the sculptures. Once we scaled the tomb some people came by and were shocked to see two guys standing on garbage cans inspecting the top of someone's grave. Not tomb raiders! Just energetic diving historians!

I say farewell to Jean Jacques and thank him for staying with us a little while longer through his great suffering. He was a precious and attentive friend who gave me and many others good advice over the years. There remains with me the strongest part of his character: the valor of genuine unflinching friendship. *Merci mon ami.*

-Philippe Rousseau



(Above) Jean Jacques and Philippe Rousseau.

(Top) Jean Jacques at the tomb of Cabirol.



Goodbye Jane Russell

An Icon Above and Below the Water

By Dan Orr, HDS Chairman

Images Courtesy of Ed LaRochelle Collection



When you talk with divers in my age group and ask what first inspired them to get into diving, you are very likely to get a variety of answers. The majority will probably tell you that it was Lloyd Bridges, who played Mike Nelson in *Sea Hunt*, that brought diving to their black and white television sets each week in the late 1950s and early 1960s. You may also hear that it was *Captain Fathom* and his atomic submarine "Explorer," or *Diver Dan* in his hard hat diving helmet along with a host of undersea marionettes that inspired them to learn more and do more in the underwater world. Sometimes it was those big screen movies like *The Silent World* with Jacques-Yves Cousteau (1956), *Underwater Warriors* with Dan Dailey (1958) or *Up Periscope* with James Garner (1959).

What inspired me to become a diver was a movie that predated all of those, and to this day remains my personal favorite. In 1955, a year before *The Silent World*, I became enthralled with diving after watching *Underwater!* with Richard Egan, Gilbert Roland and Jane Russell.

Yes, *the* Jane Russell!

While I religiously watched each and every episode of *Sea Hunt*, it was the underwater world portrayed at the local drive-in theater that really left a lasting impression on me and helped me decide that my future must have something to do with the underwater world.

Almost every Saturday when we weren't trekking down old Highway 1 to Florida's Plantation Key, where my grandparents had an oceanside home, my parents would pack the family into our 1953 Pontiac coupe and head to the local drive-in theater. Since it was almost impossible for me to see from the back seat of the car, I would beg to take my little brother to the swings just back from the giant outdoor screen. My parents had the deluded notion that I really loved my little brother when, truth be known, it gave me an unobstructed view of the movie screen. (Author's note: I have since learned to love my brother!).

I didn't care that there were no outdoor speakers; I was transfixed on the fact that the action was going on underwater. It didn't matter that most of the underwater scenes, regardless of the story, looked a lot like Florida's Silver Springs or Catalina Island, California. None of that mattered, because it was all happening underwater.

I remember the night we all went to see *Underwater!* I sat on the ground with eyes transfixed on the huge outdoor screen



while my little brother was swinging back and forth oblivious to the fact that we were seeing cinematic history on that huge outdoor screen. In my mind's eye, I can still see the main characters finding a Spanish Galleon, nearly fully intact after over 300 years at the bottom of the sea, balancing on the edge of the abyss! After blasting the cargo door off its hinges, they found a solid gold Madonna and Child! For almost two hours I watched the screen, wide-eyed, mouth agape as Richard Egan, Gilbert Roland and Jane Russell, swam in and around the wreck underwater.

For Hollywood, the movie *Underwater!* was truly a unique undertaking. Besides being one of the first movie productions to involve extensive underwater footage, it was the first motion picture to actively promote the fledgling sport of scuba diving (known then as skin diving). This was actually one of the pet projects of producer, aviation pioneer and legendary recluse Howard Hughes. Hughes loved promoting new technology in his movies. He essentially based the movie around the new scuba equipment that allowed both men and women to enjoy this new and exciting sport. His interest in this new and exciting technology is reflected in the movie's tagline, "Skin Diver Action . . . Aqua-lung Thrills!"

One of the more unusual aspects surrounding the release of the film was the rather infamous publicity

stunt associated with the movie's premier. Over 200 journalists and movie celebrities were flown to Silver Springs, Florida, in January 1955 to participate in the world's first movie premier taking place entirely underwater. Each participant donned mask and fins and brand new scuba gear in order to view the movie 20 feet below

the surface. Those who couldn't dive, or were unwilling to use the scuba equipment, were allowed to watch the over-90 minute movie through portholes from six electrically powered submarines.

Although not a critical success, I loved that movie. Every time I went snorkeling, or even swimming, in the Keys, every bit of debris or rusting metal I found on the beach or on the bottom had to have been from a Spanish Galleon. Many of my dreams involved diving and finding sunken ships and pirate treasure just like Richard, Gilbert and Jane. Even today, I use a video clip in some of my safety lectures showing a scene where Gilbert Roland starts convulsing underwater while the narrator, Richard Egan, says "The dreaded bends . . . his diving days are numbered!" Jane Russell probably never fully realized that she was a pioneering woman in diving.

Unfortunately, Ernestine Jane Geraldine Russell, the legendary Jane Russell, passed away recently at her home in Santa Maria, California. She was 89 years old. During those 89 years, she had a significant impact on the film industry and was among the most desired women of the 20th century. When she was 19, Howard Hughes discovered her working in a doctor's office and cast her as the tempestuous Rio McDonald in a romantic rivalry between Doc Holliday and Billy the Kid in *The Outlaw*. As a result of this movie and her sultry image on associated movie posters,

she became a Hollywood star and one of the most popular pinups for soldiers during WWII. She went on to make more than two dozen movies and appeared on television, the Broadway stage, nightclubs and other live appearances. She was, indeed, a Hollywood icon to many of us who grew up in the Forties, Fifties and beyond.

I never had the opportunity to meet Miss Russell, but if I had, I would have personally thanked her for helping a young kid from West Miami and other young men and women realize that diving was much more than just a sport. Because of her and others like her, this new and exciting sport opened up a world of wonder and opportunity leading



to many exciting and rewarding vocations and avocations. Every time I see the word 'UNDERWATER' I thank her for showing me the way underwater.

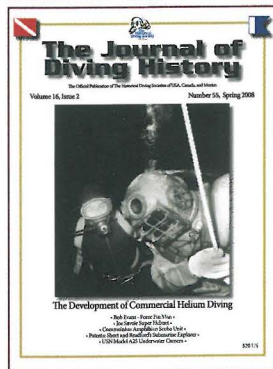
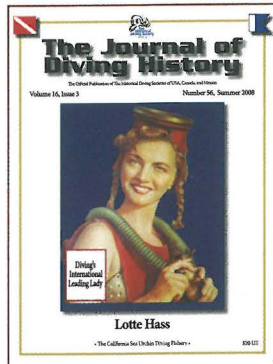
Goodbye Miss Russell, God bless you, Jane! All of our diving days are, indeed, numbered; but, as a wise man once said, "*The number of days spent underwater does not count against our allotted time on earth!*" For that reason, Jane Russell, we will be forever young and we have you to thank! 🐬

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