

# SUBAQUA

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## JOURNAL

VOLUME 6, NUMBER 1



**Is Billy Deans  
the World's  
Best Diver?**

**10 Questions  
You Must Answer**

**The Selling  
of Tech Diving**

**Hamilton's  
Gas Basics**

**The Complete  
Edmund Fitzgerald**

**A Psychologist  
Looks at the  
tekkie Mind**

**Menduno on the  
"Ultra-Cooling"  
of Tech Diving**

**Rebreathers -  
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# ***Should You Dive Tech?***

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# SUBAQUA

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Volume 6, Number 1

# Should You Dive Tech?



**It's the question Barbie and GI-Joe are asking.** You might hear definitively "You should dive tech," or "You shouldn't dive tech." (Firm positions which are often reversed.) Forces are afoot which put technical tools into more hands, and industry dollars are poised behind making nitrox mainstream. Folks who a short few years ago were vehemently anti-mixed gas are now embracing, promoting, and marketing it. Is a "nitrox 101" course just the beginning? How do industry insiders feel about the rapid deployment of advanced technologies for the general dive population? How do those members of the "in-group" respond?

We want you to think of **SUB AQUA** as "dive gear for your brain." You spend a lot on your equipment and travel, but it's what you put into your head that makes you a good diver. We searched the industry to make the best minds in diving available to help you identify the key issues. Our objective is that sitting down with **SUB AQUA JOURNAL** will make you a better, more informed diver.

Fortunately, we believe there are no dark secrets about technical diving. Most of our writers and interviewees make their living from diving and hold high values of safety and health. We asked them to put it all into historical perspective.

If you've never tech-ed, and even if you do, pay particular attention to our "10 Questions You Must Answer." Some are tough, and you ignore them at your peril. We believe the dive industry could be entering a stage of "future shock." Technologies and methods not widely available in the first half of the nineties are here, dropping in cost, and becoming mainstream as we approach 2000. Are they for you? Perhaps not this minute, but remember the early eighties when you asked "What could I possibly use this PC for besides a spreadsheet?"

Joel Silverstein, Editor

# The Selling of Technical Diving



By Bill Bleyer



Jersey tech diver Bart Malone rigged to dive the U-Wno.

Don't hold your breath for the day when most divers will be wearing doubles and breathing trimix.

Technical diving is unlikely to ever become the mainstream of diving. But do expect the already fuzzy boundary between recreational diving and technical diving to become more blurred and more once-technical activities to cross the line into the recreational camp. Nitrox has already made the jump and planned decompression could be next.

But what exactly is technical diving? The answer is complicated because some of the people doing technical diving don't agree exactly about what constitutes a technical dive. PADI defines technical diving as diving beyond recreational limits — going deeper than 130 feet, doing planned decompression dives, etc. A non-decompression nitrox dive within recreational limits would be considered non-technical diving, said Karl Shreeves of PADI, which is developing an enriched air course. "We're finding that as an infrastructure for enriched air has developed, it is well within the norm of recreational diving."

Bret Gilliam, president of Technical Diving International, says: "We think the definition that works very nicely is greater than 130 feet, alternate gases, planned decompression, overhead environments or non-open circuit equipment like rebreathers."

Lamar Hires, vice president of Dive Rite Manufacturing, which manufactures equipment for technical divers, has a narrower definition. "The difference between a recreational diver and a technical diver is gas management. If your dive doesn't start and end with the same regulator in your mouth, you just did a technical dive."

"The main thing that sets technical diving apart from all the other forms of diving is that it's the only one that doesn't have an outer limit," Shreeves says. "By its very nature it's exploratory, stretching the envelope, which is why there is a risk and a challenge."

"Technical diving per se has been around for almost 30 years," Gilliam says.

Bart Perry Lander

"It just didn't have a name. The name was really coined about 1990 and was borrowed from mountaineering." The origins were in commercial diving. The development of recreational technical diving has been driven by divers in colder climates who wanted to pursue wreck diving on a regular basis without having to wait for warm water vacations, says Shreeves.

How many people are doing it? Gilliam calculates that more than 600,000 people are being trained as entry-level divers every year and that about 10 to 12 percent eventually end up as technical divers. He said TDI's 1,200 instructors have taught 10,000 students since the firm began in 1994.

Bill Gleason, editor of *Skin Diver* magazine, says his publication doesn't write about technical diving because there are so few technical divers. "When you are the largest diving magazine in the world and are trying to go for a mainstream approach of recreational diving... it really doesn't make sense to cover stuff that only two percent of your potential readers might be interested in."

Even if technical diving is a small niche in the overall industry, it's become a significant niche. "It went from being a fringe activity to an industry now that supports several different trade shows and conferences and three full-time training agencies along with a few smaller ones," Gilliam says.

"In some places like the Northeast it's pretty prominent," Shreeves says. "But overall technical diving is an activity enjoyed by a very dedicated, small portion of the dive community and divers who are willing to go through the extra training and gain the extra experience required to invest in the significantly greater amount of hardware required and deal with the higher risk involved."

"I think technical diving will increase but a very small increase over time," says Sam Jackson, executive director of the Diving Equipment and Marketing Association. "I think what will happen and what is happening is that the definition of safe recreational diving will broaden and people will be using some of the techniques currently used in technical diving as part of their normal activities. Nitrox has already crossed the line into recreational diving. More people are using drysuits in cold water. People are doing planned stage decompression."

But Dr. Peter Bennett, executive director of Divers Alert Network, says, "I don't think it's a growth area because you have to be dedicated to it. I don't think everybody wants to be an explorer." He doesn't think most divers will want to spend the time and money to get into technical diving. He also thinks there's not that much to see that can't be seen within recreational limits.

"I don't think it's a fad," says Hires, who teaches cave diving and has been down to 285 feet on mixed gas. "People who are tired of just looking at fish, tired of just doing

single-tank diving, want to see some of the wrecks and other places that diving on single cylinders just does not allow. But technical diving will never be the mainstream. It takes too much commitment. A lot of people don't like to do decompression; a three-hour hang is very boring."

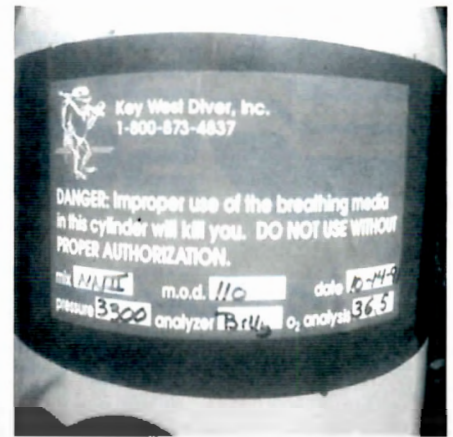
Many people shy away from technical diving because they are concerned about the safety of it. "While technical diving is fairly young, the statistics tell us that it is anywhere from eight to ten times more dangerous in potential for an accident or fatality than recreational diving," Gleason says. A diver who has gradually exceeded recreational limits over a number of years is unlikely to take a course to do technical diving more safely, adds Gleason, who describes himself as a commercial diver who often does deep decompression dives for photo assignments. He's been there, done that.

"On one hand we're standing up for a diver's right to go technical diving," *Skin Diver's* editor says. "On the other hand we do believe that it carries an inordinate amount of risk and if you're ever going to do it, not only seek the training but realize the training itself does not make technical diving safe. Individual susceptibility to things like narcosis changes on a day-to-day basis. Some days you dive to 200 feet and feel clear as a bell. On other days at 180, 160, you start feeling symptoms."

Several years ago *Skin Diver* magazine came out strongly against nitrox for recreational divers and deep diving. Part of the concern was that nitrox promoters were saying at the time that you didn't need special training to use the gas. "Since then the nitrox community has cleaned up its act. They are being real good about recommending to people that they seek additional training and certification."

Gleason's magazine still will not accept ads for deep diver training and it won't write about people setting depth records. "We think that is sending out a message that sets a bad example for new divers." Recently in an editorial they indicate they have changed their policy on nitrox and accepting advertisements about nitrox facilities and training. When asked about the coincidence of their policy change and PADI's introduction of a nitrox program Gleason added, "Oh sure, PADI embracing nitrox and developing a training program puts it into a different perspective."

Shreeves says PADI is trying to monitor injuries and fatalities in technical diving. "our preliminary findings are that there is a greater degree of risk, but the data is pretty loose. You get into situations where you have a diver who has exceeded the limits of recreational diving and has an accident but it wasn't necessarily a technical dive." Most of the accidents are untrained non-technical divers getting themselves into technical



[type] situations. "That's really reckless diving, not technical diving."

"Technical divers so far have a fairly good track record," Shreeves says, "but there have been incidents. You would expect incidents when you have a new mode of diving, even though we're borrowing from a lot of different fields. While the risk is greater and the accident rate appears somewhat higher, the people who are doing this so far are people with broad experience and are dealing with the risk appropriately to offset most of it."

Michael Menduno, editor of *aquaCorps Journal*, which sponsors technical diving conferences and chronicles technical diving fatalities, says that in the past year there's been about 10 fatalities compared to over 100 in recreational diving in the U.S. "Usually people die because they made one or more fatal mistakes. A guy who recently died didn't have his tanks marked. He was a real experienced diver and was doing a body recovery for a local sheriff's office. He grabbed a set of doubles which instead of containing air contained a high concentration nitrox mixture and went down to 200 feet. He had an oxygen toxicity hit and drowned."

"All diving today is risk," Bennett says. "Recreational divers have a risk of decompression illness of about 1 percent. If you get out beyond the recreational limits of 130 feet, you get to 3 percent. As you get to 160 feet, you're talking about 13 percent. If you go beyond that the risk gets proportionally greater still. I think it's safer than it was because you have training agencies training people how to be recreational technical divers."

However in the 1995 Bends Report, an annual study of decompression illness treatments conducted at the City Island Chamber in New York City, 66% of their diver patients had conducted less than 50 dives in their lifetime. None of the 44 divers treated for decompression illness over the past 18 months were breathing anything other than air at the time of the incident. In addition, seven divers who had completed dives be-



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low 130 feet were not trained technical divers, and none of the divers were conducting technical dives.

Says Gilliam: "Although you're not necessarily at any greater risk for things like embolism or bends, the fact of the matter is that if you're deeper or into program decompression or you're 250 feet back inside a wreck or cave the chances of a small mistake becoming a much larger mistake are very real. That's why so much emphasis is placed on actually learning to do this in actual dive situations." An extended range course or a trimix course requires at least six dives over a week, plus other training.

"For the amount of diving, and the type of diving that's going on, our safety record is improving because we've got more people doing it and less people dying," Hires says. "The training is working."

But there are some concerns voiced by industry leaders about training courses. One is that some divers rush into them without having enough recreational diving experience first.

"I think that so-called technical divers today for the most part don't have enough practical in-water diving experience," says Joel Silverstein, editor of *Sub Aqua Journal*. "It's easy to buy gear and a spot on a boat, but what happens when they get into trouble?"

"Dives that I wouldn't do for a couple of years of trying to gain experience I see people doing now with less than 12 months of diving," Hires says. "I think it's bad because it could increase our fatality rate."

"We don't want people coming out of some advanced scuba class and thinking they're ready to take an extended range program, because they're not," says Gilliam, who holds a world record for diving on air to almost 500 feet. "What they need to do is to do at least 100 hours of varied diving in different conditions and deep water and get used to handling the equipment before they start talking to us. Some of our programs are decidedly advanced — it's demanding stuff, all-day activities with briefings in the front and back — and we screen out people. I think the screening process has worked pretty well."

Another training worry is that as the market grows the instructors tend to have less and less experience. "Some of the new instructors are mostly taught out of books and don't have the technical diving experience," Menduno says.

Even if technical diving remains a fringe activity, Silverstein said its existence has made all divers more safety conscious. "Technical diving has made divers in general more aware that there's more to doing a dive than just strapping on a tank, that if you're going to be diving outside of the 60-foot, no-decompression dive limits you need to do some significant planning." ■



# 10 Questions You Must Answer

By Bill Bleyer

Thinking of getting into tech diving? Here's what the experts say you should ask yourself first.

## 1 - Are you getting into tech diving too soon?

"People should have a couple of years of experience under their belt before they start pushing the limit," says Lamar Hires of Dive Rite. "I'm talking a couple hundred dives with limited penetration, experiencing the currents, experiencing the caves before you start pushing the extremes in terms of deep or distance. You should be used to dealing with bottles and gas changes."

## 2 - Are you getting sufficient information ?

Get details on tech diving from certification agencies, manufacturers and dealers, and trade magazines before deciding if it's for you.

## 3 - What's your real motivation for tech?

"If it's sincere interest in a particular environment or a healthy interest in the challenge, that's okay," says PADI's Karl Shreeves. "If it's because 'I want to be known as a technical diver' or 'this is what I'm supposed to do as I grow as a diver,' those are not reasons to be technical divers."

## 4 - How big is your bank balance?

"Don't do it on a shoestring budget," says Hires. "You're talking about \$3,000 to

\$5,000 beyond what you started with for recreational diving because you're going to find that what you started with is not what you need now. You may have the drysuit but may not have the proper BC or the rigging for doubles. You've got to have three or four regulators." Training courses can run from \$600 to \$750 each.

## 5 - Are you physically strong enough?

"You've got to be physically fit," Hires says. "If not you're going to be a major candidate for DCI. You've got to be able to carry the stuff around and handle the swimming and the long hangs and getting caught in the strong currents."

## 6- Are you disciplined?

"Do you have the discipline to stay in the proper physical condition and to stay up on the current developing reading and practice that's necessary because the technology is changing every week?" asks TDI's Bret Gilliam.

## 7 - Do you understand your physiological limitations?

"There are some people who are going to hit a finite physiological wall when it comes to something like narcosis," Gilliam says. "There are some people who are not

going to be function well once the effects of nitrogen narcosis sets in. This one limitation could prove to be a big barrier."

## 8 - Do you understand your emotional limitations?

If you can't handle the mental stresses of diving deep, switching regulators or being in an enclosed environment, you have no business doing technical diving.

## 9 - Is it a deep or long dive that you want?

"If it's deep training in redundant systems, decompression management and helium mixes will be critical. If it's long and shallow, optimum nitrox mixes and appropriate supply quantities are appropriate. If it's deep *and* long you now enter into supply problems and significant risk areas. Appropriate use is the key here," says Silverstein.

## 10 - In what environment were you trained?

"If your base training was in warm clear water and now you want to dive in the challenging colder, lower visibility waters, there is an environmental learning curve," Silverstein adds. "Building sufficient experience in a new environment before taking on a technical dive is critical to survival."



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**NITROX** or Enriched Air is any mixture of nitrogen and oxygen. The most commonly used mixtures were established by NOAA - National Oceanographic and Atmospheric Administration, they are referred to as NOAA I (68% N<sub>2</sub> / 32% O<sub>2</sub>) and NOAA II (64% N<sub>2</sub> / 36% O<sub>2</sub>). The decreased amount of nitrogen translates into longer bottom times than when diving air due to lower nitrogen absorption in body tissues. The increase in oxygen however, mandates specific depth limitations. NOAA I - 130 fsw and NOAA II - 110 fsw.

Other mixtures of enriched air are used to maximize no-decompression bottom times, and are mixed on a need-to-use basis. These custom blends require the use of formulas and computer software to generate tables. Another use of high oxygen mixtures is to accelerate decompression needed from dives which began with a lower oxygen content. For example on a 165 foot air dive the diver would consider decompressing on EAN 80 from 30 fsw to the surface, thereby minimizing the decompression time.

**TRIMIX** is a mixture of helium, nitrogen and oxygen, used primarily for deep dives from 180 fsw to 600 fsw. In deep diving it is the oxygen content that must be watched carefully to prevent oxygen toxicity problems. Usually the oxygen content will be below 20% with a helium component of as high as 50%. The helium eliminates the narcotic effects of nitrogen. A common mixture is Trimix 17/50 - 50% He/33% N<sub>2</sub> /17% O<sub>2</sub>. This mix will give a diver no narcotic effects as deep as 250 fsw. There is a price to pay for using helium and low oxygen mixes — divers must decompress on high oxygen content mixtures — typically switching to EAN 36 at 110 fsw and EAN 80 at 30 fsw. You may hear "da boys" call Trimix "girlie gas" because the helium raises the pitch of macho divers' voices.

**HELIOX** - like it sounds, a mix of helium and oxygen. It's primarily used for deep commercial and military dives. It's not used for open circuit diving, usually only in habitats and diving bells.

**OXYGEN** - The *only* time 100% oxygen is used for diving is for the last stages of decompression. Using oxygen below 20 fsw can kill you, hence the more forgiving EAN 80 for decompression. O<sub>2</sub> is also used to treat decompression illness. ■



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# Gas Basics

By R.W. Bill Hamilton, PhD



With the current high level of interest in alternative breathing gases for sport divers one occasionally sees reference to “breathing media.” The implication is that there may be “media” options other than gases. The concept of breathing liquid is real, but gases offer the only good choices. The main reasons for wanting an alternative breathing medium are to be able to control the oxygen level and to be able to change the inert gas.

The attributes of inert gases of greatest interest in diving are narcosis, decompression properties, density, thermal properties, and effect on speech. Density increases the work of breathing, causing a reduction of lung ventilation and CO<sub>2</sub> buildup, which can exacerbate both narcosis and oxygen toxicity while diving.

**ALWAYS OXYGEN** - Lest we take it for granted and forget to mention it, there is always an oxygen component, and the oxygen has to be within strict limits for safe diving. These limits are usually related to the duration of the exposure.

**INERT DILUENT GASES** - Because oxygen can be toxic we normally use as a “diluent” a metabolically inert gas, a gas that itself is not metabolized by the body. Of the few choices available, the best are those of low density. Density tends to be correlated with narcotic potency. Diatomic gases which have two atoms per gas molecule such as nitrogen (N<sub>2</sub>), hydrogen (H<sub>2</sub>), and oxygen (O<sub>2</sub>, which is by no means inert) are among the best choices. The “noble” gases are inherently inert and do not normally combine with other gases; these are helium, neon, argon, krypton, xenon, and radon, but the latter three are too dense, narcotic, and expensive to be useful. Some hydrocarbons and other compounds are inert enough to be breathed, including methane, acetylene, CF<sub>4</sub>, and sulfur hexafluoride. Nitrous oxide and other larger gas molecules can be so narcotic they may act as anesthetic gases.

**THE MATTER OF BEING “INERT”** - Nitrogen is the familiar inert diluent gas, the

inert gas in air. Nitrogen is frequently found in biologically important compounds such as proteins and their amino acid building blocks. It has recently been discovered also that nitric oxide (NO) acts as a cellular-level hormone that regulates, among other things, dilation of small blood vessels, including those controlling penile erection. Higher animals cannot utilize molecular nitrogen (N<sub>2</sub>); fortunately certain bacteria can perform nitrogen “fixation.” The action of a gas in causing narcosis, by the way, is not due to chemical combination in the traditional sense, but is a physical process; all of the gas taken up by the organism being narcotized can be recovered.

Hydrogen as H<sub>2</sub> also behaves as if it were totally inert. In addition to hydrogen’s role as a component of water, it is hydrogen ions formed from the breakdown of water that cause acidity. Hydrogen when added catalytically to unsaturated fats such as vegetable oil tends to harden them, increasing their level of “saturation.” Concerns about disturbing the acid-base balance or “hydrogenating” the lipid in nerve cells have not turned out to be valid. The possibility of decomposing hydrogen in the body using bacterial enzymes is being studied by the Navy.

Fuel gases such as methane and acetylene are inert as breathing gases, but most of these are too strongly narcotic to be useful (not to mention flammable). Fuel gases, including hydrogen, have to have a certain fraction of either the fuel gas or oxygen available in order to burn, so mixtures with only a few percent of the gas mixed with oxygen will not burn. At the other end of these mix ratios, it is possible to make mixtures with a low enough oxygen fraction (less than about 4%) that they will not burn, but at increased pressures can carry enough oxygen to provide a normoxic oxygen partial pressure, and meet respiratory requirements.

**PROPERTIES OF POSSIBLE DIVING GASES** - Any list of diving gases has to start with air. Despite its ubiquity and general suitability for breathing, there are good reasons for wanting an alternative to air and the ni-

trogen it contains. Overwhelmingly the problem with air as a diving gas is narcosis, but toxicity of its oxygen component and air’s density can be detrimental factors. Other diving mixtures are made up using one or more inert gases in combination with a fraction of oxygen that will give a suitable PO<sub>2</sub> at the depth it is to be used.

Here is a listing of the viable choices of component gases for diving, starting with oxygen and followed by the inert gases. Densities are expressed at 0°C and 1 atm.

**Oxygen:** Molecular weight 32, density 1.5 g/l. Oxygen is quite soluble in both water and fat, and is felt to be slightly more narcotic than nitrogen, but the exact amount present in a given tissue under different conditions is hard to predict. When present in excess oxygen can contribute to decompression bubble formation. Handling oxygen, at high pressure, requires special care because of its vigorous combustion properties.

**Nitrogen:** MW 28, density 1.3 g/l. Nitrogen makes up the better part of air; its narcotic potency dominates the need to find an alternative. It is also difficult to unload in decompression, but it may be preferred over helium for short dives where not so much gas is taken up.

**Helium:** MW 4, density 0.18 g/l. Helium is not narcotic at any pressure. Its low density makes it relatively easy to breathe at high pressures, such that it is beneficial for therapy in respiratory-compromised patients. Helium is relatively insoluble so is favorable for decompression except in short exposures where it may load up faster.

**Neon:** MW 20, density 0.9 g/l. Neon is not narcotic, but its density approaches that of nitrogen. Its solubility is low, close to that of helium. Its expense keeps neon from being used except in exceptional circumstances. Extracted from atmospheric air, it can be obtained in places where helium is not available. Neon would be the ideal inert gas for use in a space station atmosphere.



Science Fiction? Liquid rebreather from James Cameron's 1989 film *The Abyss*.

**Hydrogen:** MW 2, density 0.09 g/l. Hydrogen is being promoted as a diving gas for two main reasons. Its low density makes it favored over helium in very deep exposures; divers can do more work, and they can sleep without having to breathe by mouth. Hydrogen is narcotic, enough so that for use in the deepest range of human diving (say about 50 bars—500 msw or 1500 fsw—or more) it is necessary to replace some hydrogen with helium. Because molecular hydrogen can be metabolized by certain bacterial enzymes suggests that some decompression gas might be removed using in vivo biochemical techniques.

**Argon:** MW 40, density 1.8 g/l. Why would anyone want to breathe argon? It is much more soluble than nitrogen, denser, and more narcotic. There are reasons. First, it is used in underwater welding so may find its way into the diver via the welding chamber atmosphere. Further, some gas separation methods leave as much as 5% argon in the extracted oxygen. And, by gas manipulation techniques sometimes a benefit to decompression can be achieved; it is questionable whether this is really worthwhile.

**THERMAL EFFECTS** - Helium has a high thermal conductivity, so it feels cold to breathe. This property makes it virtually useless as an insulating gas in a dry suit (argon works better here). Heat loss via the respiratory tract can be debilitating at depths beyond about 150 msw (500 fsw). This is blamed on helium because heliox is the breathing mix used at that depth and deeper, and because helium feels so cold. However, since respiratory heat loss may be predominately due to convective heat transfer, not conductive, air or nitrogen-based mixes are

likely to cause greater heat loss than heliox. Definitive experiments to sort this out have not yet been done.

**EFFECTS ON SPEECH** - Helium's "chipmunk" speech is a serious problem with this gas, but helium speech "unscramblers" can achieve a satisfactory level of intelligibility to the trained ear. Hydrogen is also destructive to clear speech, and it can confuse an unscrambler tuned to helium. Neon causes much less distortion, as do helium-nitrogen-oxygen trimixes.

**LIQUID BREATHING** - Using a liquid breathing medium as seen in the movie *The Abyss* or that was the central theme in Scott Carpenter's *The Steel Albatross* (NY: Pocket Star, 1991) makes good sci-fi, where it eliminates the need for decompression and makes narcosis a non-problem.

Liquid breathing does not appear to be a likely prospect for real-world diving. The reason is straightforward, and is due to the high density and viscosity of a liquid breathing medium. It is possible to deliver enough oxygen using hyperoxygenated saline solution at pressures greater than about 3 bars, and even at sea level using fluorocarbon fluids that readily dissolve and therefore transport large quantities of oxygen. But the only way that CO<sub>2</sub> can be removed from the lungs is to flush it out (we call this "ventilation" when we do it with gas). The effective rate of CO<sub>2</sub> removal using a liquid medium is about enough to sustain normal basal metabolism, but not enough to deal with even low levels of exercise. If the right kind of buffer solution could be found that would grab the CO<sub>2</sub> and carry it out, this may be feasible, but for now the viable breathing media are all gases. ■

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# Rutkowski on Nitrox

A mini-interview by Joel Silverstein



IANTD founder Dick Rutkowski was instrumental in introducing nitrox to the sport diver. Former Director of NOAA Hyperbaric and Diver Training, Rutkowski probably has more nitrox experience than anyone alive today.

**Do you believe that an under 130 foot nitrox dive should be considered non-technical?** Well definitely. Yeah - cause it's actually safer than air. It definitely is a non-technical program, especially for the basic user - that's an individual who's not mixing or blending - just a user. And if I was diving anywhere between 80 and 130 feet I would use the mix as if it's air - I would use my air tables and my air computers, because any time you put a little more oxygen than what your decompression table calls for, physiologically you're much safer - you get to the surface with less inert gas on this dive and you make your repetitive group letter more conservative on the next dive.

**What do you consider the advantages of nitrox at the basic sport diver level?** If the basic sport diver would use his air table and his air computer and put a little bit of oxygen in his mix, more oxygen than what the table calls for, he's going to have a hell of a physiological advantage. You could really reduce the problems of decompression sickness. It's already been accepted by NAUI. They've had a specialty course now for a couple of years. I really see no problems with PADI doing it either. It's not that everybody's gonna do it. Air is still gonna be around. But for certain instances, where people have need for it, it should be used, cause it's much better physiology.

**What would you consider a good basic background for someone to begin considering deep trimix dives?** Before anyone would be accepted into the IANTD trimix courses they'd first have to go all the way through the NAUI/PADI or other national certification basic courses. Basic, open water, advanced, then the basic nitrox, then the deep air, technical nitrox, before they would even be considered. When they get into the deep air and technical nitrox they would have to do that with the instructor they intend to take the trimix course with - so that instructor will have a good feeling for this individual's psychology, his reasoning for wanting to do it, and his abilities.

**Are there any emotional issues a prospective technical diver should be aware of?** Basically, that's the same as for other divers. Even at the basic entry level you've got emotional issues you should be aware of. There's a lot of people that are claustrophobic, have other emotional problems, are on [anti] depressants, and things like that - these people have no business diving - even basic air dives. That's the reason the trimix technical program is so critical - so we can weed these people out. You got to make sure he's squared away and all that kind of stuff.

**How many trimix divers are actively diving in the country?** IANTD's got 75 trimix instructors, and 675 trimix divers. We've got 1100 basic nitrox instructors, and we have about 13,200 nitrox divers.

**Any questions a diver should ask before diving tech?** Number one is "Does he really need it or is it just a form of 'emblem-ism'?" Most divers take a technical course and then they really never use it. Technical diving would be for those people diving wrecks deeper than 130 feet, or diving caves. Our training (IANTD) is not so much to bring new people in to take trimix courses, but to try to get the people who are using air way beyond the physiology of it onto the correct physiology and some correct training. ■



*Nitrox and mixed gas blending panel at High Tech Divers Inc. in Gloucester, NJ*

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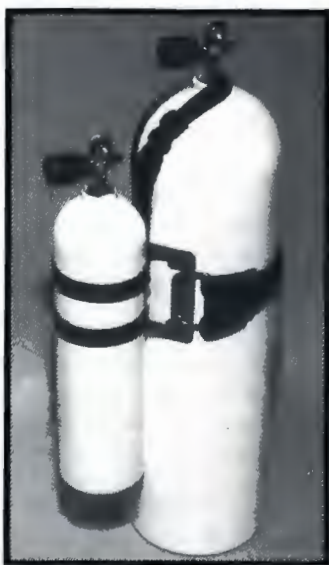
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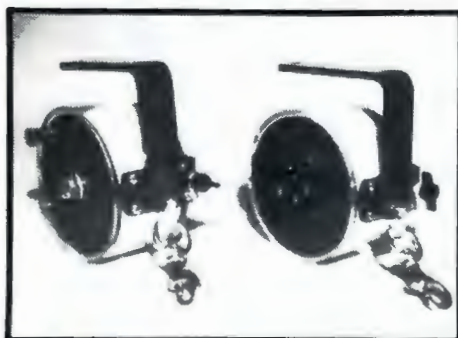
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## The Hang Line

### TODAY WAS THE DAY!



We had scheduled an updated interview with the legendary Mel Fisher, to be run in SUB AQUA's upcoming **Treasure Issue**. Little did we expect, upon landing in Fisher's self-proclaimed monarchy (Mel's now the *King of the Conch Republic* of Key West), that very day his ships were unloading a brand new multi-million dollar strike. Fisher feels his new find, fifteen miles away from his first ATOCHA finds, points to that galleon's long-missing stern section.

According to Fisher's Director of Communications, Pat Clyne "It's the most significant new find since the heyday of the motherlode in the mid-Eighties." A mix of silver coins, gold, and a rare silver chess piece were discovered.

Behind closed doors, the king of the treasure hunters held forth on his new finds, and brought us up to date on his activities since we last visited him over two years ago. We can hardly wait to fill you in on the quest he first revealed to the world in our original SUBAQUA interview - a serious effort, with claims of success, to find the Lost Continent of Atlantis. Stay tuned.

### Want to Find Atlantis?

Start doing your homework. Here are just four of the scores of books on the subject. Some very prestigious people have been on the hunt. Can we add your name?

**Atlantis The Eighth Continent**, Charles Berlitz. G.P. Putnam's Sons, 1984.

**Unearthing Atlantis**, Charles Pellegrino, Vintage Books, 1991.

**Edgar Cayce on Atlantis**, Edgar Cayce, Warner Books, 1968.

**Atlantis, the Antediluvian World**, Ignatius Donnelly, 1882 (Dover has reprinted it). ■



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# West Coast Tech



By Steven M. Barsky

Talk to anyone active in extended range (technical) diving today and what you usually hear about are wreck dives on the East coast and in Europe and cave dives in Florida or other exotic locales. You rarely seem to hear about the deeper dives that occur on the West Coast, particularly in California. In reality, there is a small, but dedicated number of technical divers exploring the deep wrecks and offshore pinnacles found in the cold, blue waters of the West Coast.

Technical diving isn't any more new to California than it is anywhere else. The opportunity to make deep dives has always been readily available to California divers. Besides the dramatic offshore pinnacles that surround the islands of Southern California, there are several deep canyons within swimming distance of popular dive sites. La Jolla Canyon, near San Diego, comes to within a few hundred feet of the beach, and quickly plunges to depths in excess of 400 feet. Redondo Canyon is less than an hour's drive from LA and Monterey Canyon is within an easy drive of San Francisco.

Both deep and shallow wrecks have also lured California divers over the years. While most shallow California wrecks are quite broken up, the deeper wrecks tend to be more intact. Without a doubt, the deep wrecks here are every bit as challenging as many of the wrecks found off the East Coast.

Before anyone had heard the term technical diving, there was a small group of wreck divers in California who had developed their own style and equipment for the waters of the Pacific. They also adapted many of the techniques and much of the gear that had proven itself in the East.

Bill Wilson was one of the pioneer wreck divers in California and a charter member of the California Wreck Divers Club, formed in 1970. In the early days, the club members used the gear that was available at that time including AT Pacs, the predecessor of today's back-mounted BC's, and SOS analog dive computers. Although most of the divers wore doubles, their diving was typically limited to 150 feet or less, with most of their diving above 100 feet.



**Jim Baden using the Aga full face mask with diver to diver communications.**

By the late 70's and early 80's the California Wreck Divers were performing planned decompression dives on a regular basis. On deeper wrecks, some club members began to use oxygen decompression, while others experimented with heliox.

The California Wreck Divers club used nowhere near the level of redundancy of today's extended range diver. However, their philosophy of self reliance for every diver was identical to the principles taught to technical divers today. There has never been a fatality during an organized club dive in the thousands of dives that have taken place over the 25 years of the club's existence.

Despite the methods and experiences of

the California Wreck Divers, today's technical divers on the West Coast have relied more on the procedures and systems developed on the East Coast by divers like Billy Deans and Tom Mount. Their direction has been toward the deeper wrecks and the deepest offshore pinnacles found on the West Coast.

While there are no exact statistics, there are undoubtedly far fewer technical divers in California than there are on the East Coast or in Florida. The new generation of West Coast technical divers include people like Frans Vandermolten, Wings Stocks, and Jim Baden, all of California.

Although Frans Vandermolten started diving in Holland in 1963, he didn't start

technical diving, or what he calls "closet diving," until 1990 when he came out of the closet and took a cave diving course from Steve Gerrard. By 1991 he was helping to put together the training standard for the International Association of Nitrox and Technical Divers (IANTD). Today he teaches cave diving, deep air, and trimix.

According to Vandermollen, the techniques between the East and West Coasts aren't very different, although many more divers in the East use dry suits. His experience is that more people are beginning to ask him what's available in training for extended range dives.

"In my mind, every dive is a technical dive. It's just a question of degree," says Frans. His favorite California technical diving sites are the ROCKWELL TOWER that was used for the BEAVER submersible at Catalina (205 FSW), the TUNA CLIPPER off Catalina (180 FSW), and the wreck of the TRIPLE CROWN, off Santa Barbara (260 FSW).

Vandermollen's personal philosophy for extended range diving is expressed by his motto, "I will dive tomorrow." By this he means that no dive is so important that it cannot be cut short if continuing means jeopardizing someone's life or health.

Wings Stocks, owner of Ocean Odyssey dive shop in Santa Cruz, California, started diving in 1969 while in the Marine Corps in Okinawa. A licensed Coast Guard skipper, Stocks started teaching sport diving in 1977 in Monterey. He found himself gradually drawn towards the more technical side and in 1987 took a cavern diving course, followed by full cave certification in 1988.

Stocks pursued further training in oxygen decompression and nitrox and took a trimix course from Billy Deans in 1991. He also made the pilgrimage to the ANDREA DORIA in July 1991, an eventful trip in which he saw the difference between how cave divers and wreck divers approached identical situations with different techniques.

Stocks estimates that he trains no more than eight individuals in trimix techniques in an average year and up to 35 deep air divers. "I typically refuse far more people than I accept for training," notes Stocks.

Environmental differences between the coasts seem to have the greatest impact on the popularity of technical diving. While nitrox is in fairly common use in the warm, relatively shallow waters off Florida, in California it's impossible to take advantage of the extended bottom times that nitrox offers without wearing a dry suit. Yet, only a small percentage of California divers dive dry, wetsuits are still the norm. For this reason nitrox and other mixed gases can only be found in a limited number of dive stores.

In California there are extensive rock

reefs in waters shallower than 60 feet. These reefs provide game to hunt, sites to explore, and numerous subjects and vistas for underwater photography.

Jim Baden, diving instructor and owner of Scuba Adventures Unlimited, is another avid technical diver who was on the same trip to the DORIA with Wings Stocks in 1991. Baden, who got his start in deep air diving through self-training, quickly realized his own limitations during a trip to the U.S.S. MOODY, a deep wreck near Los Angeles. When a crew member almost died trying to recover a decompression hang bottle during his first trip to the MOODY, Baden recognized that he needed better training, preparation, and equipment if he planned to dive deep.

Baden, with the help of Randy Bohrer, a serious cave diver based in New Hampshire, prepared for the DORIA trip for six months. During the trip Baden had watched two extremely experienced cave divers make penetration dives to places that some wreck divers had spent years exploring. This experience, and additional training, helped Baden to combine the best techniques of both types of diving.

Today, Baden teaches nitrox, trimix, deep air, and wreck diving to about 10 people a year. Although Baden screens all of his students, he notes that it's never possible to be as "demanding as mother nature."

"If you want to dive deep wrecks in California, you can count the number of sites on one hand," notes Baden. "However, we do have some outstanding deep pinnacles that are absolutely covered with marine life and visited by large pelagic fish. These sites include Farnsworth Bank, Cortes Bank, Osborne Bank, and the Matterhorn."

Baden feels that the small number of technical divers in California is directly proportional to the limited number of deeper dive sites. "It's hard for people justify spending big bucks for tons of equipment when there are so few places to do this type of diving. On the other hand, you could spend your entire life diving to 60 feet or less in California and never see everything there is to see," says Baden.

Baden also recognizes that there are few boats or skippers that are oriented towards technical diving and feel comfortable providing support for these types of operations. "You don't have boats waiting to take divers out to technical dive sites like you do on the East Coast," observes Jim.

Technical diving will certainly continue to grow in California, although at the moment, the Pacific Coast remains an uncharted frontier. It's difficult to know exactly where new diving technology will take things in the next few years, but it's easy to see that there is plenty of room for growth. ■



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# Into The Mind of the Tech Diver

## A session with Dr. Jennifer Hunt

Now that nitrox is getting the industry's "Good Housekeeping Seal of Approval," do you anticipate any effects on the diving community at large? My main worry would be that standards are maintained in terms of the adequacy of the training, and that divers trained in "recreational nitrox" will also be familiar with some of its technical use... it's my belief that the more you know the less likely you are to put yourself at risk.

**Is it possible that peer pressure to do more advanced dives will increase?** For those people who are vulnerable to peer pressure, and have the money to put into mixed gas it is possible, but I think that people that are prone to take risks will do it in their own way. For example, diving the maximum number of dives a day every day on a live aboard, regardless of their state of fatigue.

**How is macho an emotional issue in sport diving, and might the trend towards mixed gas usage promote more macho posturing and hero worship of the techies?** People that are vulnerable to hero worship will identify with people who take risk beyond what is defined as normal, within either recreational or technical diving. But not every diver in the technical community is macho in how they present technical diving. Certainly there are some very safe technical divers who are in leadership roles. The problem is that certain individuals will tend to align themselves with people who do not maintain the safety standards that are advocated among the major technical leaders.

**Are there any emotional issues that a prospective technical diver should be aware of?** Yes. There are emotional issues to be alert to, they're not [necessarily] a contraindication to diving. Number one, *feeling annoyed*, is usually an indication that something's going on. If there's a shift in what I would view as their normal mood. If they *don't feel fear* - I don't mean panic, I mean a signal of anxiety

at appropriate junctures when they should - that's a real danger signal because anxiety is there for a reason - to alert someone not to do something that they're not able to do. If they find themselves *feeling excessively anxious or overly confident* - what I'm looking at is emotions in extremes, or emotions that should be there in a particular context but are absent. Although many technical divers will describe a *special feeling of "aliveness"* when they're pushing the edge, divers should look at that and check what it's about - is it maintaining their survival or just pushing them too close to the edge? A *sense of total invulnerability*, which is a feeling that one can have underwater, is a questionable feeling.

Those would be the major kinds of feelings I would check out before delving too deep into technical diving. Also, perhaps, *too much excitement*. If divers are using positive visualization techniques it would be useful if they were aware that these techniques can function as maladaptive defenses which dismiss anxiety or other uncomfortable feelings prematurely. Divers may then go ahead and dive a dive which is not well thought out and put themselves at unnecessary risk.

**Anything else?** This is not a feeling, but if divers find themselves *forgetting pieces of equipment*, or other important things, although everyone does this sometimes, but if you find yourself suddenly in the water without the appropriate equipment several times then you might wonder what the omission is about. Are they really ambivalent about the dive? Or is it just simply that they're a little anxious? Accidents of omission sometimes, not always, have other meanings. That's a behavioral rather than an emotional thing.

**In your research have you developed a typical emotional profile of a tech diver?** There appear to be some similarities in family background among technical divers, rather than character structure or personal-

ity. Many have had to survive as children in difficult family environments and may through diving partly relive and attempt to master those experiences underwater. There are certain psychological conflicts that some divers share revolving around issues of control, being in control, controlling the edge. I'm talking about divers who like pushing the limits.

I'm talking about the good ones who like pushing the limits - which artists also do, but in a slightly different way. Divers differ from most athletes because the risks they take involve issues of death rather than injury. And that's an interesting kind of dynamic. I don't know why someone chooses deep diving in general. I know why specific people do - usually they have some childhood history of association with the water or something to do with the diving activity. But other than that kind of thing I don't know why one would choose a high-injury sport.

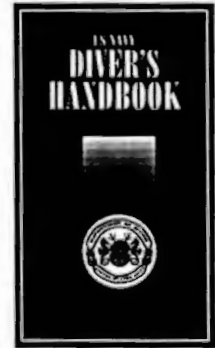
**How should a diver know emotionally that they're ready to begin tech diving?** That's a tough one. I really cannot tell you that because I'm afraid that some people who think they've reached their comfort level may be deluding themselves and beginning technical diving for unconscious reasons that are self destructive. I could suggest that certain people who are skilled teachers have an acute recognition of the signs and the personality and the characteristics of what makes someone competent to pursue deep diving. Some of these teachers, like Tom Mount or Billy Deans, because they've observed so much, have a pretty good reading of where a student is. They may not always be able to control what the student ultimately does, but they could tell what makes a competent diver.

Subjectively, at least the person has to be comfortable, and they have to be doing it for themselves and not someone else. That's not just about women, because it's often perceived that women do things because of their boyfriend or husband's pressure - and that

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Joel Silverstein

That's not arrogance. I think self-confidence is very important. But I do have to say that anybody new, and sensible, is not going to be too self-confident, because they're learning. You really have to talk in extremes - too much confidence, over-confidence which borders on arrogance, versus too little.

**Lots of folks say technical divers are nuts. How do they really stack up?** If you are asking me if they're psychotic - no. Although there are some psychotic technical divers, I'm sure, because they're represented equally in that population as in any other, just like there are some homosexual technical divers, football players etc. The technical divers I have interviewed are not psychotic, they do not confuse, any more than what you would find in your average population, reality with fantasy. They do have a variety of different psychological conflicts. But you would also see these conflicts among members of the general population.

**Do you have any problem with the potential expansion of nitrox - that it may push some divers who are not ready towards the more "glamorous" dives?** I don't think nitrox is gonna do it. The problem with nitrox is that a recreational diver who screws around with nitrox is gonna get himself killed, versus the recreational diver who screws around with diving reverse profiles or too many dives and gets himself bent, and maybe crippled. That's the issue with nitrox. I don't think nitrox makes anybody do anything. You can't say a drug makes someone do something - people are responsible for their own acts. Nitrox is not gonna make anybody do anything. The problem is not the gas for people who are going to do "things" anyway - things about which they should know better. Nitrox isn't going to make people go into technical diving that wouldn't. I do not believe that. ■

*Dr. Hunt is a social psychologist and diver who has conducted a field work in interview study of risk in injury in diving. She is an Associate Professor of Sociology at Montclair State University, a graduate of the Psychoanalytic Institute, NYU Medical Center and has a private practice in psychotherapy and psychoanalysis. Her office is in New York City.*

happens with some women, not all. But with men sometimes there's an unconscious wish to please someone else who they view as important to them - and I think sometimes it's not always someone they're aware of - possibly their father or brother.

**Contraindications to technical diving?** *Not feeling anxiety or fear* at appropriate junctures. Not panic - we're talking about a signal that helps one to make decisions - and there are a lot of people underwater who don't feel fear, anxiety would be a better word, and that's really a bad, bad sign. Another thing, I don't know quite what to call this, *a tendency to think that the rules don't apply to you* - they apply to other people. *Grandiosity.*

Also *a tendency to rush into situations* and get into a panic. *Lack of emotional control within the water* environment. I say within the water environment because there are some good divers who lack control of their anger but if it doesn't express itself underwater it's not a contraindication. The lack of control comes out in their relationships. You can be a good diver and be a lousy lover. *Arrogance* would be another sign.

**But aren't all good technical divers arrogant?** They may have big egos but they're not all arrogant. I think the humility idea - recognition that you're not more powerful than the ocean and that some people know more than you - is an important characteristic. You have to believe in your own ability to accomplish something. But believing in your own ability to win is self-confidence.

# The Wreck of The Edmund Fitzgerald

The legend lives on  
From the Chippewa on down  
At the big lake they call "Gitch Gumee"

The lake it is said  
Never gives up her dead  
When the skies of November turn gloomy

With a load of iron ore  
Twenty-six thousand tons more  
Than the Edmund Fitzgerald weighed empty

That good ship and true  
Was a bone to be chewed  
When the "gales of November" came early

The ship was the pride  
Of the American side  
Comin' back from some mill in Wisconsin

As the big freighters go  
It was bigger than most  
With the crew and good captain well seasoned

Concluding some terms  
With a couple a steel firms  
When they left fully loaded for Cleveland

And later that night  
When the ship's bell rang  
Could it be the North Wind they'd bin feelin'?

The wind in the wires  
Made a tattletale sound  
When a wave broke over the railing

And ev'ry man knew  
As the captain did too  
'Twas the Witch of November come stealin'

The dawn came late  
And the breakfast had to wait  
When the gales of November came slashin'

When afternoon came  
It was freezin' rain  
In the face of a hurricane West Wind

When supper time came  
The old cook came on deck  
Sayin' 'Fellas it's too rough t'feed ya.'

At seven P.M.  
A main hatchway caved in  
He said 'Fellas it's bin good t'know ya!'

The captain wired in  
He had water comin' in  
And the good ship and crew was in peril

And later that night  
When 'is lights went out of sight  
Came the wreck of the Edmund Fitzgerald

Does anyone know  
Where the love of God goes  
When the waves turn the minutes to hours?

The searchers all say  
They'd have made Whitefish Bay  
If they'd put fifteen more miles behind 'er

They might have split up  
Or they might have capsized  
They may have broke deep and took water

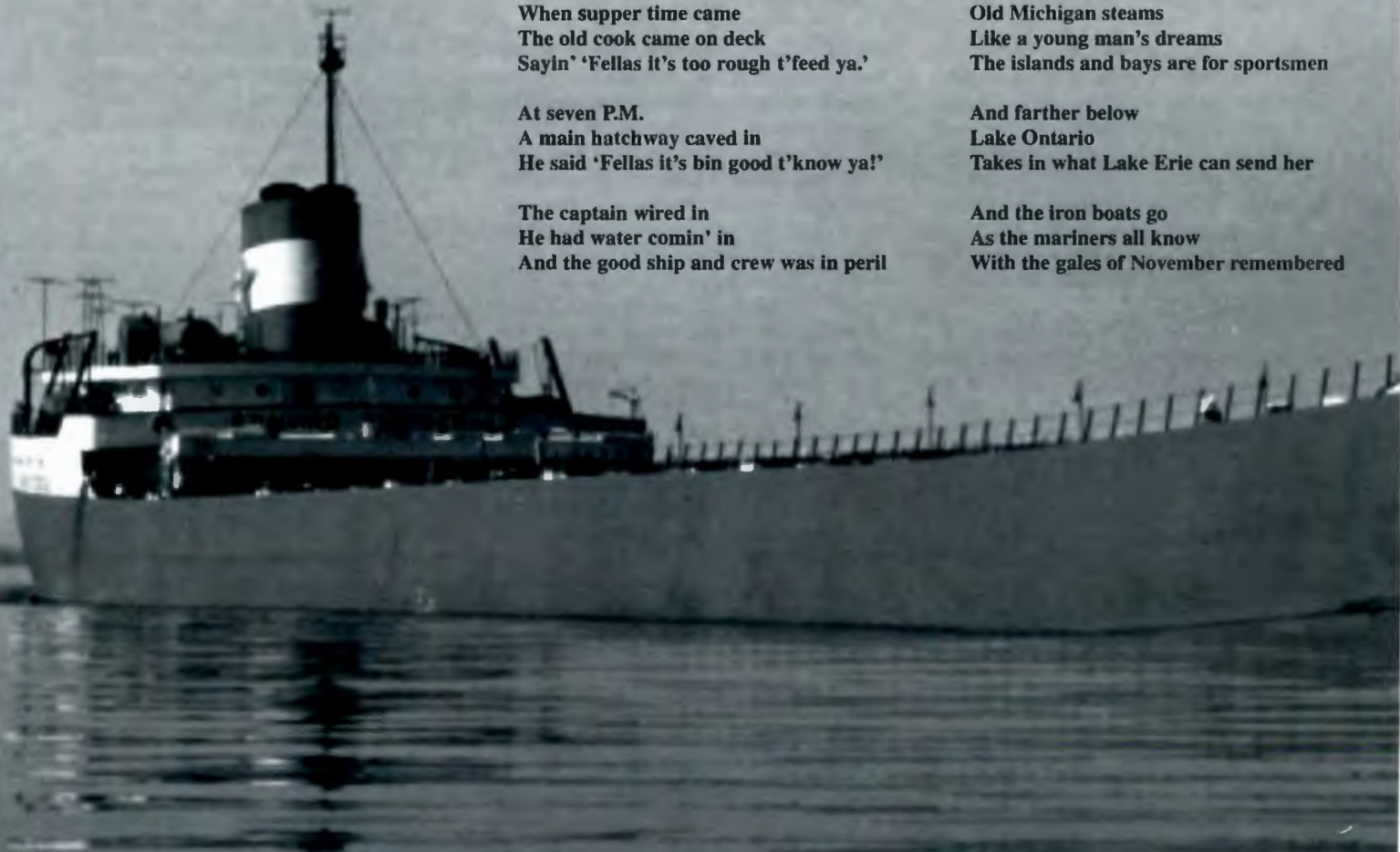
And all that remains  
Is the faces and the names  
Of the wives and the sons and the daughters

Lake Huron rolls  
Superior sings  
In the rooms of her ice water mansion

Old Michigan steams  
Like a young man's dreams  
The islands and bays are for sportsmen

And farther below  
Lake Ontario  
Takes in what Lake Erie can send her

And the iron boats go  
As the mariners all know  
With the gales of November remembered



# By Gordon Lightfoot

In a musty old hall  
In Detroit they prayed  
In the maritime Sailors' Cathedral

The church bell chimed til  
It rang twenty nine times  
For each man on the Edmund Fitzgerald

The legend lives on  
From the Chippewa on down  
Of the big lake they call "Gitch Gumee"

Superior they said  
Never gives up her dead  
When the gales of November come early.



# The Big Fitz



By Kevin McMurray

Ships lost at sea are invariably spoken and thought of in mythic terms. The EDMUND FITZGERALD is no different. But other famous shipwrecks such as the ANDREA DORIA, or the TITANIC were not memorialized in a hit pop recording. Perhaps it was the fact that all 29 hands went down with the EDMUND FITZGERALD, that there were no witnesses, and that no bodies were ever recovered that inspired singer/songwriter Gordon Lightfoot to pen and record the song "*The Wreck of the Edmund Fitzgerald.*"

The haunting ballad has continued to keep the tragic sinking, which happened 20 years ago, strong in the public consciousness. There have also been six highly publicized explorations of the wreck. They were no small feats since the EDMUND FITZGERALD rests in over 500 feet of water. None too surprisingly one expedition was a much ballyhooed National Geographic exploration this past July where submersibles manned by scholars and techno-wizards succeeded in raising the ship's bell. Another was a dangerous trail-blazing open circuit descent by two wreck divers.

The EDMUND FITZGERALD was a 729-foot iron-ore freighter that plied the waters of the Great Lakes. On the morning of November 9, 1975 the ship left the port of Superior, Wisconsin bound for distant Detroit. Weather forecasts were not good and winds out of the Northwest were already picking up when she weighed anchor. Captain Ernest McSorley, having spent 44 of his 62 years at sea, had seen his share of storms. Steaming out of port with a load of 26,000 tons of taconite iron pellets, this voyage was to be one of his last commands. Captain McSorley was only one month away from retirement.

The 41,000 ton ship was met by increasingly stiff winds on the early evening of November 10. Captain McSorley radioed a following tanker that his radar was not functioning. The master of the following ship, Captain J.B. Cooper of the ARTHUR M. ANDERSON, radioed back he would guide the FITZGERALD. As dust gave way to dark the waters of Lake Superior were being whipped by 75 mph gale force winds. At 7:10 P.M.

Cooper asked McSorley how they were doing. McSorley reported that 25-foot waves were washing over his decks and he was taking in water but he added, "We're holding our own." Those were to be the last words heard from the doomed ship.

At about that time a deckhand, Bill Maki, on watch aboard the ANDERSON, lost sight of the FITZGERALD. When the weather cleared at 7:30 P.M. there was no sign of her. Captain Cooper immediately contacted the U.S. Coast Guard where he estimated the last known position of the FITZGERALD as 14 miles southwest of Cooper Mine Point, Ontario, and 15 miles northwest of Whitefish Point, Michigan. The Coast Guard launched a massive search and rescue effort but after just a few hours of searching the relatively small area, Commander Charles Millradt uttered prophetic words when he said that the chances of finding survivors in the 50 degree waters were "pretty hopeless."

Over the next few days lifeboats, liferings, and other debris were found. It became apparent that the EDMUND FITZGERALD had become the worst shipping disaster in the Great Lakes since the BRADLEY went down with 33 lives on November 19, 1958.

Tom Farnquist, Executive Director of the Great Lakes Historical Shipwreck Society, along with Emory Kristof of The National Geographic Society organized the successful July 1995 expedition. A 14 page story will appear in the January edition of National Geographic as well as a video on the Discovery Channel. Farnquist says families of those lost aboard the FITZGERALD had approached the historical society about establishing a permanent memorial to the victims at their museum in Whitefish Point, 17 miles from the wreck site. With the help of National Geographic they were able to fund and equip the ambitious expedition. A 245-foot submarine, two small submersibles, and a one atmosphere Neut suit were used to film and survey the wreck for 8 days. The bell was lifted on July 4th, and replaced with replica with crew members' names inscribed.

Farnquist relates that putting together the expedition was a logistical challenge.

Permission from all the victims' families, the Canadian Government (the wreck lies 750 feet within Canadian waters), Northwestern Mutual Life Insurance Co. (the owners of the ship), and the three insurance companies that insured the FITZGERALD had to be obtained. Farnquist adds that it took letters from President Clinton and the Michigan Governor to persuade the Canadian Government to grant them permission to raise the bell. It was the first time ever the Canadian Government allowed such an operation on a grave site.

Farnquist has made four submarine dives on the wreck. He has seen all of the wreck in great detail. "It is obvious," says Farnquist, "that the ship went down bow first, plowed into the bottom and accordioned on itself destroying 200 feet of the center section. The stern twisted off landing upside down and the bow came to rest right-side up. Nothing new was learned to indicate why the vessel sank."

A popular theory is that the ship took on water when she accidentally brushed against a shoal shortly before sinking. Reportedly Captain Cooper on board the ANDERSON had said the FITZGERALD, "...was a lot closer to that shoal than I would want my vessel to be." But since the center section was ripped to pieces and the bow is upright and the stern shows no evidence of bottoming the shoal theory can never be proved.

All involved in the July expedition made an unusual pact. In deference to the victims' families there was to be no mentioning or filming of any human remains. If any inadvertent filming was done the film containing it was to be destroyed.

Fred Shannon and his expedition in July of '94 made no such pact. To the dismay of the victims' families Shannon is releasing a book and a video to coincide with the 20th anniversary of the sinking which will contain photos and video footage of human remains. In his three day submarine exploration of the wreck Shannon came across a body on the bottom in the bow area. Due to the fact that the extremely cold fresh water, unlike sea water at those depths acts as a preservative, the remains he came across



were in remarkably good condition.

Shannon points out that the two photos in his 256-page book and the one minute of the video showed only a glimpse of the body and that identification is impossible. That was little solace to Beth Blasucci, the daughter of John McCarthy who was the FITZGERALD's First Mate. In an Associated Press report she said: "Personally, I feel the man is morally bankrupt. He must have known the emotional turmoil he has put people (victims' families) through."

Cheryl Rozman, daughter of FITZGERALD watchman Ray Cundy, added: "You don't go digging up graves on land here, looking for bodies, taking pictures. There's laws against that and there should be laws protecting an underwater grave site."

Shannon, however, sees nothing irregular about his photos and video but empathizes with the families. He justifies his actions because the photos and the video of the remains may help explain how the ship sank. Since the body's torso is partially covered with what appears to be a lifejacket it could be deduced that the crew had some warning before the ship went down. This theory goes against the generally held theories that purport that the ship went down quickly with little warning.

On September 1, 1995 two open circuit divers explored the same area of the ship where Shannon discovered the body. They claim they had no knowledge of the body, never saw it, and would not have filmed it if they had come across it.

Mike Zee of Chicago and Terry Tysal from Orlando, Florida made their trek to the Michigan Upper Peninsula after almost two years of planning and commenced their dive operations in Whitefish Bay on the FITZGERALD.

Tysal and Zee both wore the same tank configurations. A double set of double 104's which carried a trimix blend (9.6% oxygen/62%helium) with a 120 mounted on back filled with air for travel and deep decompression. A stage bottle carried an interim decompression mix, (16% oxygen/35% helium) which was used as a transitional mix coming off the deep mixes to prevent counter diffusion problems. It took both divers six minutes to reach 515 feet. Since it had taken them longer than planned, only six more minutes were allotted for bottom time.

The two did not hook to the wreck, but slid down a camera umbilical cable. Tysal related that at the bottom, "It was real dark." The estimated visibility was around 50 feet. Bottom temperature was 34 degrees.

Both men hovered near a railing on the port side bow at 515'. The white hull was covered with a thick layer of white silt, probably a result of the bow plowing into the bottom. Tangled pieces of metal and the cargo of taconite were liberally spread all over the bottom. The two divers did not see any evi-

dence of the crew since the crew quarters were in the stern area of the vessel and the broken off bow was several hundred feet from the stern. They decided on the bow since it laid upright and they had hopes of filming the ship's name which they were unable to accomplish because of time constraints. No sealife was observed. Tysal admits that after the six minutes on the bottom just laying their hands on the wreck was enough. They had accomplished what they had set out to do.

Their first decompression stop was at 310 feet. From there they switched to the transitional mix which took them to 210 where they switched to air. The air took them up to 100 feet, where they switched to a stage bottle of nitrox, then up to surface supplied oxygen at 20 and 10 feet. Their total decompression time was 180 minutes.

Farnquist says that Tysal and Zee, unlike Fred Shannon, were unaware of the victims' families' feelings about more dives on the wreck. The families felt the Geographic expedition would serve as closure for them. Farnquist called Tysal and Zee's dive "a demonstration of accomplishment and self-aggrandizement and a gross oversight of family sentiment."

Tysal states: "We didn't want people to think we were there to loot the wreck or violate it. The only time Mike and I had any contact with the wreck was right before our ascent when we looked at each other and we both just gently laid our hands on the railing." The two divers did not retrieve any artifacts nor did they take intrusive photos.

Tysal says his reasons for diving the FITZGERALD were two fold. One was as a research project for an oceanography degree. His research revolves around isobaric inert gas counter diffusion, which according to Tysal is a fancy name for another kind of DCS that can afflict a diver when different gases of different densities are used. His second reason, he admits, was that, "It's always fun to be the first person on a wreck. It was a logistics and physical challenge."

Both Tysal and Zee were saddened by the victims' family reaction but feel that their intentions were misunderstood. Tysal says he contacted some of the families to explain and says they were not happy with their dive but at least understand their rationale. "Obviously what we did brought this story to the forefront again for the victims' families wanting closure and for that we apologize." ■

*Kevin McMurray is a journalist specializing in travel, sports and lifestyle issues. His works have appeared in Sports Illustrated, Outside, and a host of European publications. An accomplished scuba diver, he resides in Westchester, NY.*

*Photograph of the EDMUND FITZGERALD on previous page is Courtesy of Great Lakes Historical Shipwreck Society.*



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# Billy Deans

An exclusive interview by Jeffrey J. Silverstein

Is Billy Deans the world's best diver? Such distinctions aren't important to him. But there are many very respected experts who think so. And divers who have seen him in the water know so. At his Key West Diver facility on Stock Island, Florida, Deans is the "diver's diver." At the ripe old age of forty years, over thirty of which have been spent on and in the ocean, Billy Deans is undisputedly one of the most influential trainers, innovators and developers of technical diving techniques. 'Course, Billy will probably get pissed off at us for telling you...



Joel Silverstein

**Our readers want to know - Should they dive tech?** Last year at DEMA, Bill Gleason, [editor of *Skin Diver*] came up to me — he introduced himself. He had heard all about the WILKES BARRE and he wanted to come down and dive it. The editor of the largest mainstream recreational dive magazine wants to dive the WILKES BARRE at 250 feet on gas. So, what does that tell you?

I don't think it's a question of diving tech or not. I think it's a question of getting the right education and experience in paying your dues to get there, and seeking out the right people to do it with.

**For better or worse, you've become one of the most prominent figures in the world of technical diving.** Let's start with for worse. Before the appearance of *SUBAQUA Journal* and *aquaCorps* magazines we were doing our own thing. We were diving for almost three years using gas before the proliferation of this information and nobody bothered us. We had a group... a little cadre of divers and we were happy. I mean, we were going out and seeing the wrecks and learning the information.

...with the magazines you guys print, now everybody wants *all* the information.

Everybody was calling us and it came to a point where it became extremely exhausting. Sometimes I curse you guys for putting us out there on the market. In this type of diving you really have to dot all your i's and cross your t's and it's got to be done the right way. If it's not, people are going to get killed. For better, notoriety has allowed us to make a reasonable living.

**Define technical diving.** Technical diving is really managing oxygen exposure — and it incorporates a gas switch. Anytime you start switching gases or adjusting the oxygen content, whether it be for open circuit or closed circuit, *that's* a technical dive. Now you have to start watching your physiological limits. If it's got a theoretical or a real overhead environment, I'd consider that a technical dive. To me that's a definition of a technical dive cause if you don't know what you're doing, you'll get killed from an oxygen standpoint.

**Isn't technical diving expensive?** We charge what I consider to be a fair price for a superior education to do this. You have to do it the right way and to do it the right way you've got to have the right people, the right equipment, and the right boat. It takes money to get all of that. I have seen some problems occurring when divers start cutting corners from a financial standpoint. You've got to ante up and you can't be a cheapskate because if you do, ultimately it will cost you your life.

**But if you do it right...** One of the greatest rewards I have in this business, especially teaching special mixed diving is diving with experienced divers who have been to depths on air — they've been down there and they've been scared. As our friend Zero [Capt. Joe Terzuoli] would say, "I've seen Jesus and he does have blue eyes." They've had the fear of God put into them and they come and they dive on gas and they see the total difference.

Jim Coke, an explorer, once said, "Enjoy this moment because you very rarely get these types of moments in your life." And we get these moments *all* the time when we're diving with people on the different wrecks. You get it when the porthole comes off or you happen to be where a rare fish migrates through a ship or when you come in on closed circuit, next to a shark or a whale. Certain moments are very few and far between but they are so... awesome.

**What about the "recreational" use of nitrox — is that technical?** I knew you were going to ask me that. Anytime that you teach oxygen exposure management, it is technical, because now you are going to be limited by a specific depth. For instance on NOAA Nitrox I you are not supposed to go



Joel Silverstein

below 130 feet. They tell you it's because of the oxygen exposure but again, it's a no-stop dive. From that standpoint it's technical but recreational. Let me make one thing perfectly clear, it's *all* recreational.

**What about rebreather technology?** Rebreathers are really nothing new. What is exciting is that there will be a rebreather on the market that not only uses the old world technology, but it will incorporate new technology. I'm really happy to be involved with the people who are building these units. However, there's more smoke and mirrors in rebreathers today than you can imagine. You got to not only look at the units, but you've got to look at the company developing them. Because you can have an absolutely superlative piece of machinery, but if it's being made in back of somebody's garage and you have a problem, you're S.O.L.

But they're not like open circuit. You really have to have it together when you're diving a rebreather. It is an extension of your pulmonary system. And people are going to have a lot of problems. There's a lot of intricacies involved in the use of rebreathers.

**There are a lot of self-proclaimed "tech-sports" these days.** That's one of my biggest peeves. There are people that are perceived as "experts" and they are not. There was a woman at the **tek conference** last year, who stood up and asked, "How do we know you're experts? Just because somebody says you are and puts you on a panel and you wear a polyester coat and tie, how do we know you're experts? How do we know where you're getting your information?" There's guys that are giving information that don't dive *and* they don't practice what they

preach, that's absolutely ludicrous.

... Now, like Jimmy Durante said "Everybody wants to get into the act." I'm upset about some of these guys that are out there. They might be doing it for ego, or for hero worship, but what they're doing is leading people on — and they're not teaching them the right way. I see these people that are "certified." I see some of these "leaders" — they have no business in technical diving. I am upset about it, cause I don't like to see people get killed. I won't mention who they are here but when they get up on a panel, I get up and walk out because I'd rather go find the guys who *are* the experts.

**How can a diver determine if the "expert" is expert enough to advise them?** The first question to ask is, "How many dives have you made in the last month?" Anyone can pick up a magazine. You can read and get on the Net, and you can memorize it. And you can fake it. But the guys that are out there swimming and doing it, they understand it, they've made the mistakes. It's like building blocks in a house — you have to put them together with cement, and the cement is the experience. You might be an extremely bright individual, but you can't do one or two dives and be considered an expert. You gotta do it over and over and over again. I look at a guy's equipment, it tells me where he's been.

The late Parker Turner used to say, "When somebody's got the experience and they start talking, I take the cotton out of my ears and I put it in my mouth." Guys like Captain Steve Bielenda of the WAHOO, he's been out there doing it for thirty years. He says "You gotta fill up your knapsack, then when you need to draw on that experience you already have it."



Joel Silverstein

**So Billy, how many dives did you do in the last two weeks?** I've been diving every day. In the last fourteen days, we have done twelve dives, and all of those dives have been decompression dives. The two most significant dives were a 190 foot dive for sixty minutes and today's dive in which for the first time we linked two wrecks (a half mile apart) together by propulsion vehicles. It was a ninety minute dive starting in 110 feet in the open ocean. The rest of the dives were gas dives in the 200-250 foot range for 20 minutes, plus decompression.

**Any other things to look out for?** There's people out there who are getting fleeced. A lot of people have paid good money for technical courses. Yet they sit around at a coffee table and get a nitrox gas blender's course in two hours. Or they get a deep air certification — only doing the dives to the shallowest part of the dive. Or their nitrox instructor teaches gas analysis without an analyzer. That makes me crazy.

I've never had an interview like this. You've given me a chance to speak my mind.

The industry has got to make sure that the people spreading this information are the professional people, that they're giving out the right information, and it's coming from the heart as opposed to from the wallet.

Look for a guy who's got a dive center, who has a financial investment and say, twenty sets of doubles, and a compressor

with good filtration, a Haskell gas booster, and many analyzers, along these lines, he will give you good information.

**When mixed gas eases into the general public will all the instructors who are going to be teaching have enough of the in-water experience to handle it?** No. Not at all. The forecast is there's going to be "wannabe tech divers." And I think it's a good idea because one of our caveats is improving diving safety and performance. If you can increase your safety, I'm all for it. And in performance, I mean, you're getting more bang for your dollar.

In the beginning the people that took the gas classes were experienced air divers that had a *need* to solve problems on their dives. Then it filtered down into the next generation. Now I think we're in the third or maybe even the fourth generation of technical divers. These are people that want to do this type of diving but they don't have the experience, we have to train them.

One of the things that I would like to see is that mixed gas certification cards have expiration dates. As a pilot, you have to do so many "touch and goes." I think that's the way it's got to be with instructors too.

**There's been controversy about deep air divers...** This extreme deep air diving is absolutely ludicrous. If you're a public figure, and you magazine guys made us public fig-

ures, you have to lead by example. All right? Case in point - recently there was a person that was killed diving below 250 feet on air who was trained by one of the experts who has been termed a "wah-wah" diver. The instructor "covered his ass" — it was done outside the United States. Tough to get sued out there. But that deep air diving... that's bad stuff.

**Our readers might not know what a "wah wah" is.** The terminology "wah wah" comes from diving to great depths on air, it's probably an oxygen toxicity problem. You have an audible disturbance, and it's usually in the form of an in and out sound like "wah, wah, wah." It's the ringing effect which means, you *ain't* supposed to be there.

There are some individuals who do that out there, and I don't know if they have specialized techniques to do it, but I don't consider that technical diving. Then people read about that stuff and the uninitiated thinks, "Well, I'd like to try that."

**Where does air stop?** I would like air to stop at 165 feet / 50 meters. At IANTD we have a program called Technical Deep Air, it trains divers in proper procedures, including nitrox decompression, to dive on air to 190 fsw. After 190 fsw I like a gas switch to trimix. When we do the WILKES BARRE grand tour we could do it around the tops of the guns at between 185 and 195 fsw.

What's the first question somebody asks you when they know you're a certified diver? They don't ask "How long you been diving?" or "Where have you been diving?" They always ask you, "How *deep* have you been?" I don't care if I dive below 250 again. Below that maybe a few jumps. I have no desire to go to 500 feet and see the EDMUND FITZGERALD. I've learned that to dive to that kind of depth you go with robotics, you go in a NEWT suit. You send the ROV.

**How many dives have you made in your lifetime?** Hundred thousand. No, I'm just joking. I just turned 40. I've been diving since 1960. I was certified, as a YMCA skin diver, but we were not on scuba gear at that point, so it's been since '68 that I've been scuba diving.

But in November 1992 I started keeping a real specific log book, and up to today I've logged, 598 dives. 200 dives a year plus all the support dives and shallow training dives. Every now and then I'll do the support work because I want to train a new guy. I like to fly beside him, make sure he does it the right way. Sometimes I'll dive every day for a couple of weeks, and then not dive for a week because of a conference.

**That's a long time and a lot of hours in the water.** Yeah, probably in the 10,000 dive range. They say that Tom Mount has 25,000

dives. He's got a load of diving, man. I'll never catch up with him. He's got a lot of diving experience.

**Tell us about the first time you ever went diving.** Herb's Dive Shop, Daytona Beach, 1968. I was 12 or 13. I said: "Man this is cool." It was great. I was diving with my father. Learning together was really neat. I still have photographs of that day and I'll always remember that. I can see my chubby little face and my old man standing up there and... I look back at a photo I have and it reminds me of the past and helps mold me a little bit.

**Tell us about safety procedures.** We do a lot of gas diving, man we smoke a lot of helium. I say that not to sound like I'm king of the hill, but I'd like to meet another guy who's working as hard as we are to maintain safety in their operation. We come in, straighten all the bottles before we leave, all the gases are tagged, all the tanks are analyzed with multiple units. That's the way it's got to be. It's my commitment to safety to do this, and I will not slack off, cause I want to go to bed at night knowing that I have done all I can to make sure that people in my charge — I have given them everything that I have in my knapsack.

**When did you develop that attitude?** There were two big points in my life. The first time was when we started diving the WILKES BARRE and we were diving on air and everybody was getting fatigued. So we started mixing compressed air and oxygen, called it CA-Ox. Then NOAA came out with nitrox. The second big turning point was in 1985 when John Ormsby was killed on the DORIA. I said I'll never do anything again to let this type of situation occur if it's within my power. John was tangled inside what is called Gimbel's Hole. I guess the classic phrase is, "There's old pilots and bold pilots, but no old, bold pilots." He was a very natural person in the water. He was very fearless, and it was always me that was holding us back, especially in our spear fishing days. But he got in the water that day and he got killed.

**John was your dive buddy?** He was more than my buddy. We had grown up together, and losing him was like... my life changed quite a bit since that day, you know. Ever since then, I'll always do what it takes to make the dive. But I'll speak up too. If it ain't right, you ain't going to do that — "Get off my boat." If the current is too strong, I ain't going to do it. I could use the money on a charter. But, hey, man, nothing's worth it. Period.

**Was that the first time you lost anyone in diving?** That is the first time and that is the only time. Knock on wood. It's like decompression illness — it's the statistical part of



Joel Silverstein

diving. But by god, I'm going to do everything I can to make sure that doesn't happen when I'm on the boat. I've been called a prick, that I have a Napoleon complex. I'm a pretty easy-going guy, but when we get out there in the ocean it's serious stuff.

**What does it do emotionally to you to see how fragile we are in the water?** I guess the first thing that happens in any fatality is that you get angry at the person, and I'm always angry. Why did they do that? And then you look at the accident analysis, and then you usually say - well, that was a human error. That should not have happened, people need to learn from that.

I'm upset at any time to lose a human being. And it's also bad for the diving community in general because we're trying to get rid of this cowboy attitude and the only way we can do that is to make sure the example is set. I've made some very experienced divers cry. I asked, "Did you analyze that gas in your cylinder — write the contents down? No? How the f\*##% do you know what's in there?" Maybe I got a little bit too

brusque. It's like rubbing a dog's nose in poop. They might hate me for a few moments — but you know something, they'll analyze their gas and they'll make sure, damn sure, that they know what's in those cylinders.

**After John died did you go back diving quickly?** I took some time off. At that point, my business was diving, but I ran the boat. I did not do much decompression or deep sea diving after that. I took about a year off. I read about diving, and we did some dives... I was sad because I'm the kind of person that makes a bond with somebody. When you have a closeness with somebody like that, and that person is taken away from you, there's a black hole in your body. It's like somebody's cut your arm off and the nerves are raw, and it just takes... it takes time to heal the wounds. I still think about him all the time and I have the photographs that were shot. But, you know, I just... I'm still saddened by it, it's definitely affected me.

**Most recreational divers don't have anything like that kind of experience... Well, I**



Joel Silverstein

lot of harassment skills for their open circuit divers, and it makes them competent — ripping their mask off, and simulating pounding surf coming in under combat fire. We have gas shut down drills. I'll just come up to somebody and I'll rip the regulator out of their mouth and while they're working on their valve, I'll take the regulator and purge it right in front of their mask, and it goes wussssh. I love watching how these guys work well under extreme stress.

**Do you do that kind of training with your crew?** Starting to. We've done some SWUFO drills. Blacked out mask on the CAYMAN and some really intensive situations. The SWUFO boys also helped me streamline my operations. The military is well known for checklists.

One guy can pull the checklist out and go right down the list boom, boom, boom, prep the boat, prep the equipment. You have a personal checklist. The students get there in the morning and they know exactly what they need to do. They need to analyze their gas. They need to set their equipment up and they run their personal checklist and while they are doing that we set the boat up, we get the support crew together. We get on the boat and go have everybody run their check list again. We then make sure that everything's squared away and we're out and by god, we're off the dock on time!

**You like diving in places other than Key West?** I tell you what really turns me on is not specific dive sites but it's getting with a group of individuals that are experienced and having a good time. It's the people that I meet and watching them, helping them successfully conduct a dive operation cause there are *so* many wrecks. You can O.D. on wrecks. It's a good thing we don't win the Lotto because we would be diving fools. I'd get a submarine and a lock out.

**How do you manage a student's motives if they don't match with yours?** I had a young woman who wanted to set a deep gas record. That was her only motive. It pissed me off. I said: "Okay, I'll do it, we'll run the tables, I'll put support crew in the water. But when we do this there'll be no fanfare. We won't have anybody writing up an article, no one taking pictures, not even SUBAQUA. We'll do it for your own personal enrichment." She says, "No I don't want to do that." She wanted the notoriety right away. She had the wrong motive.

I don't have a problem with collecting artifacts. You want to collect fish, you want to go sight seeing, I have no problem with any of that. The thing I have a problem with is record setting and just like *that* you can tell a guy's motive. Usually a "badge hunter" doesn't have the number or dives or experience to do this type of diving.

have a video that I show in my mixed gas classes. You see a body coming up and it's embolized, it's bleeding from the ears, the nose, the mouth. The eyes are bulging out.

The first thing we talk about is diver responsibility and no matter how well trained you are you could still get killed doing this. It's as if *you* don't sign the waiver. Think about getting your next of kin to sign the waiver. You get your wife or your significant other to sign off cause *they* are the ones we will have to console when you expire.

**Have you been frightened underwater?** You know, I'm frightened every time I get into water. I hear guys say that it's old hat that I dive to 200 feet. Man, nothing is further from the truth. I approach every dive as if it's... well, it *is* a major dive. You're going into an alien environment, an inhospitable environment. You can't breathe water, so every time my head goes below the water, I'm in injun territory. I don't want to use the word scared or frightened, but I have an extremely high state of awareness, and that's the only way you can be, because if you get complacent about this, it will turn around and bite you in the butt. It will kill you just like that.

Even on a 30 foot reef dive I maintain a heightened state of awareness. I'm constantly checking - Where's the boat, watching my gas, watching the people, monitoring the environmental surroundings because

as Dr. Bill Hamilton says, "Shit Happens" — and it happens real quick.

**So, how does someone who doesn't do 200 dives a year stay sharp?** Read responsible magazines, okay? There's a lot of magazines. But, I tell you, the interviews you guys have are really good. I read SUBAQUA Journal. I dig the pictures in aquaCorps. The first thing is education. If you had a small pool you could do blacked out mask drills. You can go through the mechanics of setting the regulator up, turning it on, staging yourself in the water, doing gas switches, practicing stuff, and playing the what-if game. I'll be driving home, I'll think — "What happens if this happens? What if that happens?" Those are the little mind games you have to play. Granted, sometimes you can't do a lot of diving when it gets cold, but when spring arrives you recreate your experience base up slowly. But, you *got* to get in the water, you got to swim with your equipment. You got to constantly feel your equipment, know where it is. It's not difficult to do.

**Do you have a military background?** No. But I've been fortunate recently to be involved with two extremely bright instructors over at the Special Warfare Under Water Forces Operation (SWUFO.) It's U.S. Army, and they are extremely intelligent in their closed and open circuit training. They do a

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Is there anything underwater that you would like to see? I'd like to see the cubera snapper spawn because it's an amazing sight. The cuberas are very, very skittish. You very rarely see them but when they breed it's like they have nothing else on their mind. I've seen them on the WILKES BARRE — they are big fish, very muscular and they've got big dog teeth. The males have been fighting and they are circling and they are getting ready to breed. If you go down on open circuit you might see them. But on a closed circuit rebreather, that would be a sight.

I'd like to see the warsaw grouper spawn because they live in 400 to 600 feet of water and every now and then you'll see 'em up in the shallower wrecks. I've seen them, the shallowest is 180. I've never seen them in any shallower.

I would like to go back but I don't want to disturb it, to a destroyer the Navy sank. It's in extremely deep water. We did a 15 minute bottom time on it once, but on the lee side of the wreck there is a whole marine eco system. It blew me away. I'd thought it would have been totally devoid of life. But it's teeming. I would like to go in a sub. When I was down there I didn't want to screw the environment up so now we won't swim over there. Other than those things I guess like Dorothy says "There's no place like home."

**Did you have any mentors along the way?** There's no one specific person that I could put my finger on. I owe a lot to Dr. Bill Hamilton cause he helped me out quite a bit with questions on physiology. There was a gentlemen who's dead now, Parker Turner. But I didn't have any single mentor per se. It would have been nice to have something like that. I learned along the way from the best and the worst out there. There is an Italian free diver Alberto Pelizari, he says: "It's better from an educational standpoint to get structured education as opposed to go out and learn it by yourself." But sometimes you've got to go out and learn it by yourself.

**Where do you think you'll be when you're Cousteau's age?** Still diving. I'm 40 now and I feel alive and I feel young because it's an exciting time in the history of diving and it's great to be there and help people in their discovery of diving.

**What do you think diving is going to be like 50 years from now?** I would like to think that it would be to a point where we have almost eliminated any problem. I'd like to look on the horizon and say there's a pill that you could take to totally obviate oxygen toxicity problems. Who knows, biochemical engineering. That would be phenomenal cause that would, just overnight make all equipment obsolete. I can't just click on the crystal ball — I just want to see diving get safer and safer. ■

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# Tech Diving In Europe

By Rob Palmer

Much of the diving that would be regarded as technical in North America would be regarded as relatively commonplace recreational diving in Europe. Air dives to 50-60 meters have been done for many years, frequently made in both northern European and Mediterranean waters. The British Sub Aqua Club, one of Europe's oldest training organizations, has a 50 meter (160 feet) recreational depth limit for experienced divers. The British Cave Diving Group is one of the oldest, if not the oldest technical training organization, and was an advocate of solo diving, redundancy and line skills long before the technical training agencies appeared.

Much of the original work on nitrox was done by the British Royal Navy in the 1940's, and British and French cave divers were using nitrox, trimix and heliox in the early 1980's. British cave divers had used nitrox rebreathers up to the mid-1950's, so mixed gas was nothing particularly new. Jochen Hasenmayer of Germany made several ultra-deep cave dives in France using home made rebreathers and open-circuit mixed gas, including a 200 meter drop in the Fontaine de Vaucluse in 1983. Oliver Isler made long duration cave dives with his home made rebreather in the late 80's and early 90's, including multi-kilometer penetration into Lanzarote's Jameos del Agua, and France's Doux de Coly. The British-lead Andros Project in the summer of 1987 was probably the first major use of mixed gas in both open and closed circuit systems on a complex exploratory project. The project included making several dozen man-dives in excess of 300 feet with a perfect safety record in a very remote location, exploring deep cave systems below Bahamian reefs and forests before either of the famous American cave projects, Wakulla and The Woodville Plains Karst Project took place.

All of this was paralleled to some degree in other countries, and on other continents, often by relatively small groups. Then in about 1990, the concept of "technical diving" was discovered, packaged, marketed and promoted to the general diving public.



**Rob Palmer and Stuart Clough conduct an equipment check inside a cave.**

Courtesy Rob Palmer Collection.

Closet doors creaked open all over the place, and a variety of divers stood blinking in the spotlight. There was a general recognition that the newly labeled discipline was a fairly acceptable concept, having been around in a less formal state for some time, and that it would be politically appropriate to develop a general set of standards.

The birth was by no means an easy one. Some groups, concerned about perceived risks retreated from the spotlight. Their place was taken by the "Tekkie," a breed of diver who saw a novel and exciting niche to be filled and glory to be gained at a new and exciting frontier. Some of the established specialists accepted the change from closet to camera, and worked with the various training organizations to develop training materials and standards, sacrificing time, effort and, to a degree, their own priorities, to the benefit of the wider technical community. General consensus agreed on both sides of the Atlantic that oxygen limits for nitrox and

trimix diving should be in the region of 1.4 - 1.6 ATA, that general deep air diving should have a limit of 160-200 feet, and that specific skills, such as cave diving, should be left to the regional specialists to teach.

Despite a fair amount of bickering and ego-flashing the broad concept of technical diving seemed to be fairly well established by mid-1995. One of the basic concepts was that, like sailing, hang-gliding, mountaineering and other perceived "high risk" activities, diving had come of age, and the limits of what could be done underwater might now be established by personal experience and individual motivation. If someone wanted to dive to 100 feet or 1000, that was up to them.

In Europe, the UK was at the forefront of technical diving as an activity in its own right. From a core of existing expertise in cave diving, mixed gas diving, rebreather technology and computer applications, the



# R/V WAHOO

European Association for Technical Diving was formed in 1992 in an attempt to co-ordinate the growth of the activity in Europe. Though short lived, its merger with IANTD a year later still enabled a European-based attitude to training to develop, and when TDI formed in 1994, its European division further developed training programs.

The growth of both the major technical agencies has centered on the UK, spreading outwards throughout Europe to cover nearly every major European country to some degree. The recent decision of both CMAS (The World Underwater Federation) and the British Sub Aqua Club to recognize nitrox has helped "legitimize" the technical community, as has the consistent relationship the agencies have had with the UK's Health and Safety Executive (the UK equivalent of OSHA).

Trimix is actively taught in several countries, and depth limits are generally regarded as being in the 75-85 meter range in temperate waters, and around the 100 meter mark in warmer locations such as the Red Sea. There has not been the proliferation of either instructors or students that North America has seen, and the use of mixed gas is still regarded as a very serious option indeed.

European designers and manufacturers have long been involved in the development of rebreathers, and it is no accident that three of the four serious contenders for the rebreather market have their origins in European diving circles. The Dräger/Uwatec Atlantis I is the first serious rebreather to actually make it to the recreational market place, an offering from the oldest active manufacturer of rebreathing systems. Cochran's Prism and Oceanic's Phibian both grew from British system designers involved with Carmellan Research, despite currently undergoing their final stages of development in the USA. Several North Sea diving companies (like Divex and Comex) have developed bail out rebreathers for saturation operations, other manufacturers (Aga, Spiro, etc.) have commercial or military sets. This sort of advanced diving technology is soundly rooted in Northern Europe.

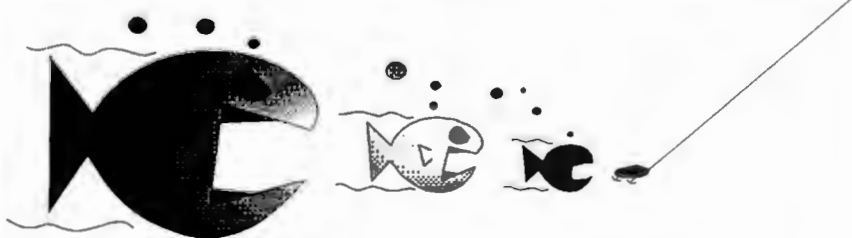
With wreck projects such as the recent dives to the LUSITANIA and HMS HAMPSHIRE, cave dives like the Keld Head explorations, Wookey Hole and the "Lost Cave" of Cheddar, and major forthcoming projects such as the 1997 Royal Geographical Society Marine Expedition to the Mascarene Plateau intending to use mixed gas and technical diving techniques, Europe is very firmly established as one of the most exciting places on the technical globe. ■



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## a candid conversation with dive publishers Michael Menduno, Jeff Silverstein and Joel Silverstein

Often credited with the “invention” and selling of technical diving, **aquaCorps** publisher Michael Menduno is as controversial as he’s talented. His **tek** conferences have provided a venue to share ideas, and his innovative journal is always a source of heated conversation. In a very rare, unprecedented glimpse at the inner workings of dive publishing, **SUBAQUA** editors got together with Mike under the noonday Key West sun to ponder what all the fuss is about.

Jeff: If tech diving as a business didn’t exist before, you as a marketer and publisher invented it.

Michael: Interestingly enough, PADI was the first one to really give it credibility... in ’91 or ’92 they had their article - “Technical Diving - Does PADI Have Its Head in the Sand?” They were the first big, establishment group to use the word “technical diving,” so by doing that it kind of put tech diving on the map. So, it’s interesting that three years later now, that they’re...getting their toe hold in tech.

Jeff: At the time they might have used that expression to say - “this is not us.”

Michael: But by doing so, they acknowledged that it was important. And to say where does PADI stand on technical diving? The whole world had to suddenly define itself in terms of technical diving. So in that move they kind of assisted it, as did *Skin Diver* by banning nitrox. I think the big news this year, is that tech has kind of gone mainstream. With PADI and BSAC moving into nitrox, and all the recreational people, now everybody is entering tech.

Jeff: Is recreational nitrox technical?

Michael: I think the boundaries are shifting. At one point... it was really important to put a hard, big fat line down. It was like “this is recreation diving,” and “this is technical diving,” and I think that was needed to get people’s attention so they wouldn’t run out and kill themselves. But now that line is becoming a little grayer. Nitrox in the tech community - that was *old* a couple of years ago. “Of course you breathe nitrox, plop, plop.” But that line between “technical” and “recreational” is diminishing.

Jeff: When did you start *aquaCorps* and what was your background?

Michael: Six years ago. I had been in the computer industry in strategic planning, all in the high tech industry, computer software and hardware, emerging new technologies.

Jeff: So, you’d seen the various cycles of technology adaptation?

Michael: What’s happening in diving has happened in a lot of other markets. It’s a common thing in technology, where you build up a critical mass that allows the new technology to come in. So it’s the PC revolution in diving. If you look at most technology markets, they’re all driven by the consumer. Look at the computer business. It’s the end users and that’s what’s happening in diving, the consumer market, the sport market is driving the whole diving industry.

Jeff: Because there’s the safety/health aspect of diving, it falls into a different category. If it’s marketed like computers, it’s fair for critics to question it.

Michael: And I agree with that 100%. Particularly as a sport activity, consumer activity. It’s no fun if you get hurt or if you don’t come back. So that’s really got to temper everything. We’ve really gone past, the point where... tech divers were viewed as the cowboys. I think the tech community worked

hard to say, “we’re not the cowboys,” and even now, cowboyism is just not in. They’re working to be the more responsible, and to be safe. Anybody can do a deep dive, it’s coming back in one piece, you know, that’s the trick.

Jeff: If the average sport diver has access to technical tools do you think people are going to be pushed to more macho posturing?

Michael: I think people who have ego and security problems will always look for ways to differentiate themselves and puff themselves up, but I think it’s moving more to a place where there’s all these different cool activities you can do underwater... and we’re coming to a place where the technology and training is available to say - hey this is what I want to go do. The divers I look up to seem to be the ones with less ego. The people who are really pushing boundaries... they’re doing it because they’re getting off on doing it, not cause they’re getting off on people telling them how great they are.

Jeff: How much is hero worship a part of dive publishing?

Michael: For a long time in diving, we took away heroes. Everything was bland. You read the magazines and there were no personalities, just pictures of “happy” divers. And so, in a way by having heroes, you give people someone to emulate, someone to look up to, and really it was hero worship that brought many of us into diving - Jacques Cousteau, Lloyd Bridges. “God, I want to be a diver.” So, that was there to begin with. I think the good thing that is happening is that it’s being de-mystified.

Five years ago to be a deep wreck diver, it was kind of arcane art, and there was no way to get there. You just had to be in the right group. And there’s still some of that bullshit in technical diving. Part of everybody’s shtick is that they want to keep a little, that’s the personal ego part... But as the courses go on, it becomes less mystical. Yeah, you can climb K-2, maybe, if you can



M<sup>2</sup>

last. But there's a *process* to get there. The same in diving now.

It's more than a card because of peer pressure. You really have to work to do it. If you saw someone buy a bunch of new gear and jump over the side, everyone would say - "you're an asshole, you don't have any training." So I think we've created a desire by having heroes, but I think we've ameliorated that by de-mystifying the process by which you get to be a tech diver, cave diver or wreck diver. So, I think it's good for that.

Joel: Both our magazines have given readers back the heroes. But are we making the heroes more attractive than they really are? Do we give some guy who's in his Open Water II class too much of a desire to get there fast? In the old days, if you wanted to do the challenging dives, you worked towards it. Today, it's so much easier to get the tools.

Michael: It's true. But, isn't that the case in all sports? Take climbing. Once the rating of a 10 or 11 was the top, and now they're up to 12 or 13, and in other sports too. So, now doing a dive on the WILKES BARRE you do a couple of courses. It's not to say you have the same experience, but people are getting to the place quickly, which is a question mark.

Jeff: Some magazines have a vested interest in saying - "Hey, this is cool." Is the "ultra-cooling" of tech a potential problem?

Michael: Right, but we have to make it a little mystical, cause otherwise they won't read the magazine. We're trying to make underwater stuff cool. But we do try to focus on the ultra cool part. I guess the way I balance that in my brain is to really hammer on the safety side. Like you can die doing this. At the same time we try to make it cool. Cause I think it *is* ultra cool... we're into it.

I find that a lot of people do like the incident reports and how people die, it is fascinating reading. It's glueing, it's gripping, you know. It's morbid. You think, oh my



JJS

God! It's good reading. ... it sells magazines.

For us, doing incidents and writing that up, is a really important section of the magazine, cause people read it, and I figure if one person reads this and thinks a little more, boy, it's worth it. It's like the warning on the cover, which we've both done. "Warning - Diving is Dangerous." It's responsible cause you say, hey this is dangerous, but also it draws people to read it. It's two edged.

Joel: We've taken a stand at **SUBAQUA** that we'll show you where you can go diving, we'll tell you that you need to get trained for it, but we're not going to tell you *how* to do it. We have a hard line about not publishing specific techniques and dive schedules. I saw a 300 foot heliox table in your last issue. Why did you print the schedule?

Michael: We thought about that, cause in the older *aquaCorps*, we'd blank out sections [of a table]. It's finally gotten to the point where I think, well they can just go out and buy the software program and run it themselves, so.... put in the magazine.

Joel: But isn't that different? When they go out and buy it, they've taken the active step to get the information.

Michael: True. It's kind of evolving. We had an article on this extreme air diving stuff. We went back and forth a lot about should we run this story? Cause we if don't run it, it won't encourage people to do it, cause they won't have heard about it, whereas if we run it, someone is going to read it and say "God, I want to do that." And they're going to run out and do it.

Jeff: So, did you run the story?

Michael: We did the story, it was about the "wah wah." And I think we did because we felt that it needed to be said, cause the danger of not saying it was worse than the danger of saying it. Because, I think people don't want to be in the closet anymore. Tech diving started all in the closet... all hush,



JDS

hush... And no one benefited from that. I think now nobody wants to go back in the closet. It's like if you're going to do something, you got to be up front about it.

Joel: Deep, extended range diving was not in the closet. It was only being done by a small group of people... And because it was (a) dangerous; (b) arduous; and (c) expensive there was only a small group of people doing it, who had the need to see things down there. It became an in-club and you couldn't get on that expedition or trip unless you were blessed three steps down....

Michael: The select, yeah... talk about making it mystical. You talk about mysticism, you know, a 300 foot, 400 foot club, wow!

Jeff: There is the Beavis and Butt-Head fire argument - when you put potentially dangerous tools in the hands of the public, some percentage of them are going to screw around and are going to have gotten the idea from there. Now that *aquaCorps* is on some consumer newsstands your material is no longer only in a dive environment.

Michael: That reminds me of the Jacques Cousteaus of the world. Jacques was living in habitats, breathing heliox and all of that, then it got a whole lot of people to start diving. I don't think a lot of people said - "God, I could go live in that habitat on heliox at 180 feet." But it got them at least to take a scuba course and some went on from there. I think a big part of the market, in a good way, is the wannabe market. Really to be the top dog you got to just dive every day, and you got to be a Billy Deans. Who's got time to do that? Or maybe even the desire? So, really the masses just want to participate a little, kind of vicariously.

Jeff: When you glamorize stuff, isn't it the case that the "kids don't try this at home" disclaimer must be big enough to counteract the loudness of - "It's really cool!"

Michael: Ohhh. I guess we try to... we're an

adult magazine, we try to be real candid and up front and say this person died, or this is stupid, and then just hope that people kinda choose, and the ones who don't... The kind of people that are going to go hurt themselves, they're going to find a way to do it, with or without us.

Joel: Now that journalists have brought tech "out of the closet" what do you think should be the stance on privacy? Will people be able to dive on their own and experiment without everyone reading about it?

Michael: The whole privacy issue is interesting. You're right, they're on their own, but now when we live in the age of heroes, these guys are big name public figures in our little world. They're the Axl Roses of diving. So, now do they lose their privacy? Well, kind of. It's hard to cut it both ways. You can't be a dive hero, or a dive god - Billy Deans can't - he doesn't have his privacy. And if he did some stupid thing, everyone would be on his ass.

Jeff: Interest in advanced diving means the market for both of our magazines is growing.

Michael: You know, PADI said they certified 625,000 people last year - if 10 %

of those are in the nitrox class.... they should read *aquaCorps* [and SUB AQUA]. It's been interesting, because SUB AQUA and *aquaCorps* both have, as the new wave magazines versus the old guard, both been there from the beginning of technical diving. We've covered issues like safety, and accidents, we've been right up front on that, and *that* allows us to talk to everyone about this stuff, by setting up a framework to say, "Hey I'm going to tell you all about this stuff, but before you do anything you got to live. You got to survive it, and safety is paramount."

Joel: Both our magazines get an opportunity to balance the marketplace. We give the reader journalism, as opposed to advertorials and the Cayman Cowboy kind of crap... But we both know that cute phrase *Cayman Cowboy* has been said more in the past three months than any other term in diving.

Michael: Right... That was a lame article. *Rodale's Scuba Diving* succeeded in getting people to talk about them, but only because it was so lame.

I just think it didn't go far enough. I mean here they have a story about sex in the Caymans. They didn't even say the word "f#\*\*%" once. Lame, lame. I "dated" two women last week? "Dated?" ... Lame.

Jeff: Well, tabloid journalism has never done badly financially. One point is that the consumer dive magazine business really hasn't been pure journalism, it's been the trade magazine business - advertorials.

Jeff: So where is dive publishing going to be in five years?

Joel: I think in five years two of the top five magazines will be out, some of the new ones at the bottom will have folded and there will be some start-ups - that's just part of the publishing business. What we will see is more expanded coverage of the underwater world and electronic magazine spin-offs. We will still need *Skin Diver*, and photo/travel magazines. You need those for the new diver. If not there's no learning curve.

Michael: It's going to grow, and I think there's going to be a lot of replacements in magazines. I think the old guard magazines, unless they find new niches are going to be out. If five years ago you said you were going to do a technical diving mag, people would have and did say "What the hell is that?" Now we have two new magazines just starting up exclusively devoted to technical diving. From our point of view technical diving alone cannot support a glossy magazine. It'll be interesting to see. ■

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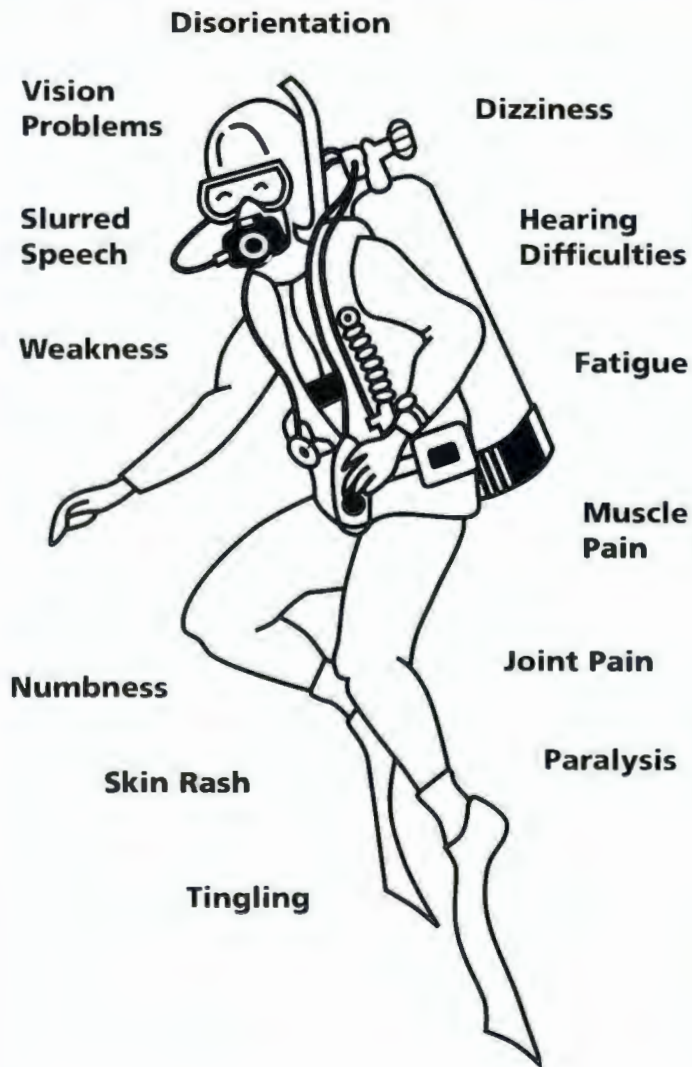
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# The Lowdown on Rebreathers



By Bret Gilliam

Rebreathers by assorted manufacturers have set recent records in the *vaporware* category. Various models have been promised at tek and DEMA for the last four years with little in the way of an actual model finding its way to consumers. Those that did had a tendency to bear an unnerving resemblance to school shop projects or garage mechanic editions. As Joe Odem, a rebreather instructor trainer, recalls ruefully, "One manufacturer had a demo unit that must have had a hundred dollars in tie wraps and exterior plumbing on it. Another had divers passing out during pool demonstrations in shallow water. Not a major confidence builder."

The release of rebreathers into the sport diving community has necessitated the development of entirely new training curricula for consumers. Although some of the operation of modern rebreathers is similar to that of conventional open circuit scuba, the systems actually deliver the breathing gas to divers via recycled loops and what looks like *Sea Hunt*-era double house mouthpieces.

The operation, daily servicing, and maintenance is very different and requires learning some new skills as well as disciplines not generally associated with "off the rack" scuba. While rebreathers may look a bit intimidating to the uninitiated, the user will actually find current models to be easily understood and remarkably simple to use upon completing proper training.

The emphasis here is definitely on proper training. Traditional dive courses will not prepare either divers or instructors to safely use rebreathers. A background in nitrox training is desired but it can be incorporated in rebreather training if necessary. ANDI, IANTD and TDI have developed programs specifically to train instructors in various models and any divers wanting to get trained should seek out a course matched to the rebreather model they are interested in.

A January 1995 meeting at DEMA brought TDI together with the manufacturers. TDI Europe Director Rob Palmer and I collaborated on the original course guidelines and produced a comprehensive manual for instructors and divers. In June, Dräger and



Uwatec's Frank Marshal with the Atlantis I rebreather unit.

Uwatec invited twenty of TDI's top instructors to Nassau, Bahama for an intensive week long workshop to put the final refinement on their joint rebreather training and to certify the first instructor trainers. Representation included professionals from England, Australia, Germany, Switzerland, Hawaii, Guam, Egypt, the Virgin Islands, Canada and the United States.

The standard training course for instructors is approximately one week in length with both pool and ocean diving. The curriculum covers a generic overview of rebreather technology for both closed and semi-closed models, an historical overview, practical elements of operation and maintenance of the specific model in use, trouble shooting in the field, contingency awareness, and nitrox gas mixing and matching to the desired operating depth for the diver. The course is heavy on academics and hands-on diving. The training manual is available in both metric and

U.S. units. A consumer course to train the individual diver is designed for four to five days. The Atlantis I model used for this course is a premixed nitrox semi-closed circuit rebreather aimed at traditional sport divers. The unit is capable of supporting a diver to a maximum depth of approximately 165 fsw and for up to two hours on a single dive depending on depth. The Atlantis I is designed to operate on four nitrox mixtures: 60%, 50%, 40% and 32% oxygen. The unit is the end product of Dräger's long track record with rebreather technology dating back to the 1890's. Uwatec is distributing the models in the U.S. mated with their nitrox dive computer.

IASTD is expecting to offer training for Cochran's Prism II unit. ANDI has been working on a program for the Oceanic Phibian, as yet still unreleased. And there lies the rub with the consumer's current ability to make direct comparisons. Although sev-

## Who Makes Rebreathers?

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**Carlton Technologies**  
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**Cochran Undersea Development**  
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**Dräger/UWATEC**  
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\$6,000 803-281-1010

**Oceanic**  
Closed circuit nitrox and other gases  
\$10,000 510-556-0500  
Not available

**RBC**  
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\$8,500 407-697-0132

eral manufacturers have trumpeted their intent to release production model rebreathers to the general diving public, as yet only Uwatec/Dräger has a working unit for sale. Peter Readey, the inventor of the Prism, announced in an October dive show in England that he did not expect Cochran to have his redesigned Prism II ready to go until the end of 1996. And there appears to be little movement from Oceanic in getting the Phibian farther along than a few prototypes.

When seeking out the purchase of and training for a rebreather be certain of the qualifications of your instructor. A rating on one unit may not qualify them to train you on another. Ask to see the training materials in advance and be prepared to inquire about their specific experience with the model you wish to purchase. Properly trained instructors have made significant commitment to exacting academics, manufacturer's operation guidelines and many hours of practical diving in a variety of conditions. There's no substitute for experience with rebreathers. Don't cut corners.

But is a rebreather the answer to all your diving dreams? Uwatec is careful to caution tech divers not to place unreasonable expect-

tations on semi-closed circuit models. Frank Marshall, the national sales manager, explains, "There's been so much hype about what rebreathers can do for you and a lot of the information put out there has not been generated by people who really understood what this technology was capable of. Our unit is not going to put you to 300 feet for six hours and let you come out with some easy decompression. I know that sounds obvious but we're still getting inquiries from people who want to go dive the DORIA with our product. What it will do is let you drop more than half the weight and drag of scuba while increasing your no-decompression profiles tremendously. And for photographers, interactions with marine life without normal bubble exhaust will open a whole new chapter in photo opportunities."

Marshall, in a burst of refreshing candor from a salesman, has cut right to the heart of the rebreather issue for most divers. Like the modern multi-level dive computer, semi-closed circuit models will appeal to some divers who like the fact that efficiency underwater is dramatically improved while simplifying the overall gear package. But those expecting a breakthrough with applications for deep technical dives are going to have to wait a while longer. It is very unlikely that a tech mission oriented closed circuit model will find its way to market in 1996.

Should you wait? It will depend on what you want to do with your diving. For photographers, semi-closed models will more than do the job and they're available now. If most of your diving is done within a window of 165 fsw and the surface, these units will lessen your gear load and extend your life support with all the advantages of breathing nitrox as well.

The down side is a bit more commitment to maintenance and dive planning with a clear understanding that failure to use the unit properly can result in hypoxia or hypercapnia. All this is extensively covered in training, but rebreathers will be a little less forgiving of errors as a trade off for their operational efficiency.

I've had a chance to dive just about every unit out there and had a lot of background on military models dating back to the late 1960's. I'm impressed with the modern editions both in simplicity and in price, under \$6,000. After racking up several hundred hours on rebreathers, I've got to admit that I'm a fan. I doubt if a rebreather will replace conventional scuba for all my diving but there are so many applications for these super light, quiet units that I'll be using them a lot.

Try one out in a demo dive or pool session. I think you'll be pleasantly surprised at how the technology has matured. And, of course, you'll look sharper than a Jedi Knight from Star Wars! That alone will get you noticed on the dive boat. ■

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# Diving the Curb



By Joseph Weatherby

It you like diving with fish, I'm not talking about pretty fishic-macro stuff, but big and I mean big, throw a saddle on and ride'em, twice as big as you are stuff, then have I got a dive for you.

The CURB was sunk near Key West, Florida as an artificial reef on November 24, 1983, and is virtually overloaded with marine life. On a recent dive the visibility was well over 100 feet, but I could not see down the descent line far enough to make out the mooring drum at 30 feet, until I dropped through the jumbo barracudas massed under the boat. Between the mooring drum and the top of the mast at 120 feet a huge school of tarpon, none under 60 pounds, literally swirled around us, close enough to touch. From the top of the mast you can make out most of the wreck as she begins to loom up out of the blue. She is intact and sits on her keel in 190 fsw. The wheel house and masts are still aboard and the wreck affords a towering 70 feet of relief off the bottom.

On reaching the main deck at 165 fsw I was awed at the collection of marine life present around the ship. Schools of full grown amber jack swam up for a close look at us and then swam away without hesitating. Trophy snook leisurely perused the deck. Mutton snapper with the distinguishing black spot on their lateral line almost the size of golf balls, were everywhere. Any direction I looked in had a panoramic display of spade fish, yellow tail snapper, blue runners and swarm after swarm of different species of the baitfish that keep the whole area churning. I even saw a couple of specimens of the rarely seen cubera snapper (they look like dog snappers only 50 pounds heavier and with fangs). All this was wonderful but I was still unprepared as I came around the main deck structure and met two giant jewfish face to face.

I've done a lot of diving in the Keys but close interaction with these behemoths of the deep never ceases to amaze me. They were around for the rest of the dive, curious about us, yet unconcerned for their safety, probably aware of their protected status. At 600+ pounds they looked like underwater Volkswagens. On the ascent and while ful-



*The Gulf Stream usually brings over 100 feet of visibility on the CURB.*

filling my decompression obligation the parade continued... What a dive!

The U.S.S. CURB was built in Napa, California and launched on April 24, 1943 by the Basalt Rock company. She was commissioned on May 12, 1943. She is 213' 6" in length and 39' on the beam and while floating, she drew 14' 5". Her original ship's complement was 120 men and carried two 40 mm guns. She did salvage work and towing duty between the Panama Canal and Washington on the West Coast and between Argentina and Newfoundland on the East Coast.

After being decommissioned on December 20, 1946 she was loaned to the old time salvage firm Mary Chapman Scott with Navy salvage contracts her first priority but also doing private salvage work. Mary Chapman Scott and the CURB's contract was subsequently bought by Murphy Pacific Marine and she continued in the same line of

work, operating between South America and Nantucket. Captain "Bubber" Sweeting, who sailed on the CURB and her sister ship the CABLE as ship's master and salvage master for over 30 years, remembers the CURB as a "comfortable ship that took heavy work and heavy weather well, but no air conditioning." He recounts, "Once we left the Gulf Coast, Orange, Texas I believe, towing 300 foot sections of what later became a tunnel under the Charles River on the East Coast. Well that piece broke loose in a hurricane and although we were safe, we'd lost our tow. We looked for quite awhile, deciding that it couldn't have sunk because it was put together so well. What we'd judged from a distance to be a motel on the beach near Galveston, Texas turned out to be our cargo. We delivered it safe and sound." He remembers, "We'd pump them out, patch holes, put out fires, pull 'em off the reef, whatever it took." By the early Eighties the vessel was

William K. Deans - Key West Diver Inc.



very tired. She'd been involved in the salvaging of hundreds of large ships over 400 feet in length and she herself was to be readied as an artificial reef.


The salvors involved in sinking the CURB in Key West are legend. Chet Alexander sank many of the diveable structures in the lower keys he was the salvage master. Richard Deeble, veteran Key West salvor, directed the day to day operations of the four month scrapping project. "The ship sat at the Navy pier prior to our stripping her so over a period of time the more visible souvenirs disappeared. We didn't recover any portholes, the telegraphs, or the binnacle. All these had already been taken. We just emptied the fuel tanks, filled them with soap and fresh water and welded them shut. The ship was all electric so there were no hydraulic lines to be dealt with." The Key West crew removed all salable scrap including a six ton brass desalinization plant. The CURB was towed by Alexander to the reef site and three nine pound dynamite charges were set.

The actual sinking of the wreck, an inexact science at best, proved to be exactly that in the case of the CURB. "I opened the sea cocks in the engine room to start her sinking," says Deeble "and then we met in the deckhouse to blow the dynamite." Captain Kathy O'Connell, a salvor on the project, recalls "Chet set off the first two charges, the one in the bow went off with a muffled boom, the second was a dud. Chet let me set off the stern charge and when I did we all got knocked on our butts by the concussion." "Chet was almost killed," says Deeble.


As the CURB began to settle, stern first, the salvors jumped to other vessels. Alexander's tugboat SALVOR I backed in to take him off the CURB and fouled the tow line in her propeller in the process. The 213 foot CURB's stern rested on the bottom in 190 feet of water. She stood vertically and began a slow fall to the sea floor, starting to take the SALVOR I with her. SALVOR I's mate jumped ship as a frantic search for a knife ensued. Alexander was thrown a knife and cut the tow line just as the tugboat was to be dragged under with wreck.

Diving the CURB today is definitely an advanced undertaking. Captain Michel Appellis of Seaclype Divers in Key West, one of the handful of people who regularly dive the wreck, says "It's a phenomenal deep air training wreck, especially as preparation for diving the U.S.S. WILKES BARRE." He suggests diving it on air with EAN 36 for ascent from 110 feet and then oxygen for the 20 and 10 foot stops. "For safety, divers should also carry a reel and lift bag for personal ascent in case they get blown off the wreck as the current is occasionally quite strong."

The U.S.S. CURB, with all of its big fish and challenging depth is one of the real power dives of the lower Florida Keys, one you won't want to miss. ■



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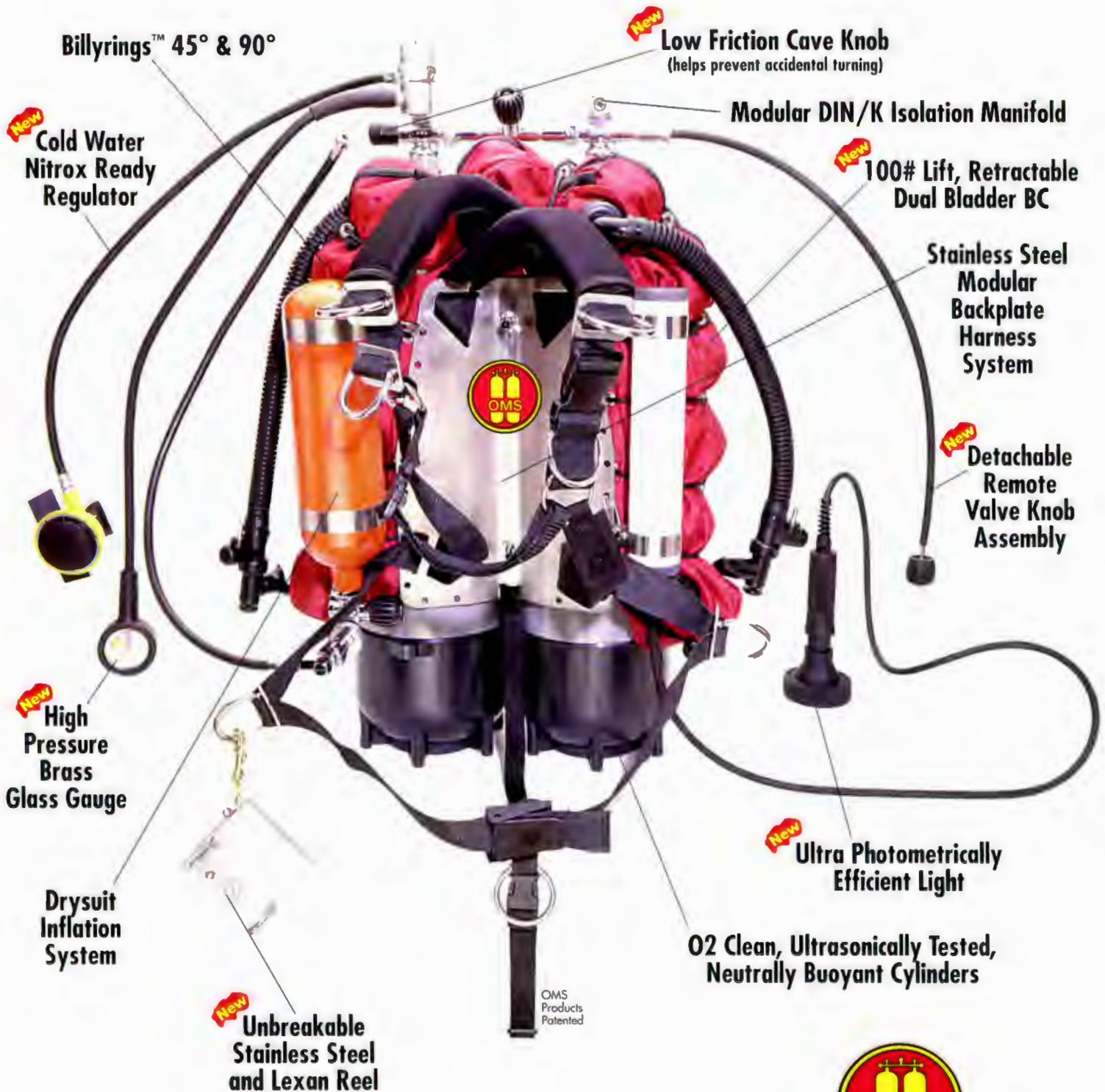
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