Underwater Speleology

Journal of the Cave Diving Section of the National Speleological Society

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Volume 39 Number 4
October/November/December 2012

Do Extraordinary.

People do not decide to become extraordinary.
They decide to accomplish extraordinary things.

- Sir Edmund Hillary

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Underwater Speleology
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Cover Photo: Cumpleaños in Cuba
Photographer: Tom Feiden

Submission Deadlines

Issue	Deadline
Jan/Feb/Mar	December 1st
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Editor's Notes

How often we recall, with regret, that Napoleon once shot at a magazine editor and missed him and killed a publisher. But we remember with charity that his intentions were good.
~ Mark Twain

This issue we are offering a peek at cave diving in Cuba, some first hand cave history, midwest exploration and the effects of smoking and diving. I hope you enjoy.

We are back to the learning curve with the magazine, having changed to a new printer. I am pleased with the quality of the printing and delivery times, but this does require some adjustments on both our parts so please bear with us.

The NSS-CDS website (nsscds.org) is a truly under-used resource for CDS members and everyone should take the opportunity to check it once in a while.

Thank you for visiting the NSS-CDS web-version of the UWS. Congratulations to the winner of our last game, Dave Jones. Last issue the mystery diver was Jean Nelson. If you have ever dived with Jean you have heard her hum as she fins along!

This issue I am testing your "cave recognition" with some pictures on page 28, with a prize to the first CDS member to name all the sights correctly. Send your answers to:

uwseditor@nsscds.org.

Enjoy and Safe diving,

Cheryl

from the Chairman

gene melton

Honesty is the first chapter in the book of wisdom. ~ Thomas Jefferson

I am pleased to announce that the NSS-CDS Board of Directors has awarded Susan Gero the *NSS-CDS Outstanding Service Award* in recognition of all she has selflessly given to the Cave Diving Section. Over the years Susan has provided a tremendous amount of support to many functions and I can't recall exactly how many years her business, Exploration Design Studios (XDS), has produced magnificent jewelry for cave divers; but it has been quite a few. You can view her exquisite and creative art. at http://www.explorationdesign2.com/generic31.html. Thank you Susan for all of the support you have given to the NSS-CDS.

I am sad to report that recreational cave diving in Wakulla Springs has been denied by the Park Service. I am truly disappointed in this decision. Let us reconsider our approach and redouble our efforts to open the springs.

The Section attempted to have a social at Wakulla Springs on President's Day weekend, February 18th. We were invited to use the park facilities but not the swimming area for training and/or demonstrations. Even though the date is historically cold and no swimmers would be using the area, the answer was no to anything that involved the water other than swimming. Cherokee Sink was offered for use, but this site is not suitable for side mount or rebreather familiarization. We are in the process of exploring the logistics of planning the social at Indian Springs. Watch the NSS-CDS website for information as it develops..

The 2013 workshop is at Wakulla County High School. Chris Wickman (850-566-9026) is the workshop Chairman. There are rooms still available in the Wakulla Lodge, please contact me (gmelton@hs-eng.com) if you wish to add your name to the list.

There will be another vote on the constitution and by-law revisions as not enough votes were received to pass or reject the proposed changes. A bug in the voting program would not recognize some member registration numbers and James Garrett, our webmaster, is working on correcting the issue. In an effort to keep the expenses down, we will try to publish the voting information in the next issue of the UWS. If timing doesn't allow for this, our next effort will be an email notification, and failing that, we will send post cards which would cost nearly $1,000.00 (printing and mailing).

There are still advertising pages available in the revised Cave Diving Manual. Contact Cheryl Doran for details and pricing about advertising.

There are copies of the Management Plan at Dive Outpost. If you have not read the MP, it is available at http://nsscds.org/cathedralsink . Please read it. As an NSS-CDS member, it is your duty and responsibility to adhere to the plan and report members who abuse the privilege to dive NSS-CDS properties. I point this out because of a recent attempt by an NSS-CDS member to take a person, who did not have current membership, in upstream Cow.

Dive safely,

Gene

Diving Cuba

By Tom Feiden

Tanque Azul

El Baga

"Salado!"

Someone must have shouted the magic word that woke me up. Looking around, I realized it was still dark outside and I tried unsuccessfully to fall asleep again. One thought kept on running through my mind, "Salado would be different!"

It would be different from what we had done the last few days. Mapping *El Baga* is something we started last year. Arturo added more than 5000 feet of line to last year's EOL and there still was a lot to do. Taking pictures in *Tanque Azul*, where I flooded my camera last year, went without incident and the cave was as fantastic as I remembered. *C*umpleaños is a new cave Arturo and the team discovered in December 2011. It has huge stalactites hanging from the ceiling (some of them more than 50 feet long). While there we managed to lay some line to a separate room through a tight tunnel.

None of this brought as much of an adrenaline kick as this: Salado would be different.

A farmer, Romer, and his son, whose name was Romer too, had discovered the entrance to the dry part of the cave and told Arturo about the pools they found while climbing down. After he took a look, Arturo decided to give it a try. Two members of the *Grupo Carsico had* tried to lay some line there a couple of weeks ago, but after a silt out in the first restriction, right at the entrance, they called the dive. It still wasn´t clear if there was cave going at all, but we were going to find out soon.

The smell of hot coffee woke me up again a short time later. Nadja, Arturo´s wife, had already prepared breakfast and we were ready to go half an hour later when Jojanis arrived with the jeep. After the equipment was stowed, we drove to pick up Pino and the tanks he filled for us last night. It was important to leave early, as the temperature would exceed 40°C (104°F) by noon and there was a long way to go.

We headed to Gibara first, to pick up horses from a framer. We soon left the main paved road and followed a dirt road leading to the region called "*La Gegira*". The road narrowed until all the potholes and slopes made it impossible for an average car to get through. A horse drawn carriage full of wood and a tractor pulling a large tank with fresh water for the villagers were the only other vehicles on the road. It took

Cumpleaños

an hour to travel about 8 miles and when we reached a steep incline, I shouted “Stop. Time to take a picture!” I took my picture from the top of the hill and I waved Jojanis to join me, but nothing happened. I walked down again to find Jojanis still behind the wheel trying to get the jeep going. A strange sound came from the rear axle and the jeep didn´t move.

We unscrewed the nuts of the rear wheels and removed the full floating axles, but this was not the problem. It was a dislocated gearwheel of the rear axle differential and impossible to repair without spare parts. Jojanis called a friend for help and decided to stay with the broken car. But for the rest of us there was no other way...one of us had to walk to the farm and come back with the horses.

It was getting late and the temperature was far beyond 30°C (86°F) when they returned. It was now impossible for the two horses to carry all the gear the now much farther distance to the cave and we had to decide what to leave behind. As we didn´t know what to expect in the cave, and because of the problems that might occur in the restriction, I decided to leave the heavy under water camera equipment in the jeep. Still we had to carry parts of the equipment by ourselves to make it easier for the horses.

Off we were, following the dirt road. One hour later we arrived at the farm and took a short break before we went into the woods. From there we had to open some barb wire fences and follow a path, the farmer and his son guiding the way. The temperature was 40°C (104°F) and rising, no breeze cooling us down. Once in a while we rested beneath some shady trees, but all of us heard the cave calling like the sirens called Odysseus. We went on, sweating like hell. One hour later we stopped at another fence. We were almost there, but from here it was impossible for the horses to go on. We took the gear down a steep path and stood at the entrance of the dry cave. After all the equipment lay at the small plateau in front of the cave, we took a first look.

We climbed over some big stone blocks and it was possible to look down into the cave, but we still could not see any water. Arturo threw a rope and we managed to get down the slippery slope. Suddenly, a cloud of bats came out of the dark, stopping us for a moment until they disappeared back into another entrance. The first decorations we saw were red and brown curtains pointing deeper into the cave. The temperature was beginning to cool but the humidity was now 110% when we finally reached the last plateau, 120 feet below the entrance. From here we could see two crystal clear pools about six feet below us. Wow, what a sight. Stalactites, starting at the dry part of the ceiling, pointed the way, calling out “There you must go, it´s just a small step, come on!”

By this time all of us were soaking wet, dirty and tired. Peter, who had just recovered from a bad infection, was exhausted and decided to call the dive. From the way Arturo looked at me, I knew he could hear the sirens too. Words were not necessary. Piece by piece, the heavy equipment was carried down. This wouldn´t be more than just a sneak dive even if we were able to make it through the first restriction. It would be impossible to do more without the help of our friends and the sherpas, Romer and Romer.

After gearing up, we slid into the water. While cooling down at the surface the final checks and preparations were made and Arturo took the lead with me following close behind. The entrance to the restriction was shallow and the floor was covered with fine silt at about a 30° angle. The stalactites on both sides were very fragile, their surface resembling cornflakes. Unfortunately, they didn´t just look like cornflakes, they broke and crumbled like them too. We had to be very careful.

Immediately after entering the restriction, percolation caused by our exhaust bubbles made sediment rain down on us through all the tight areas. We twisted and turned our bodies to negotiate the low profiles and tightly spaced

Tanque Azul

stalactites. It was almost impossible to make a tight wrap because the stalactites were so delicate and fragile. Even the lightest of touches could break pieces away. At that point I was really glad I didn´t have the camera with me to have to negotiate with everything else.

The cave was shallow, less than 20ft deep, and progress was slow. Colors changed from red to all shades of brown, and once again percolation and stirred-up silt turned the visability to a couple of inches . Suddenly I looked straight into Arturo´s eyes. What was happening? Did he call the dive? No, to my surprise he was in crystal-clear water again and a huge smile covered his face. The cave had opened up to a big tunnel. What a beautiful view! Air pockets dotted the ceiling, stalactites everywhere, and the tunnel seemed to extend with no end in sight. In what seemed like five minutes later, our 400 feet of exploration line was finished. Such a shame, but we were close to our turn pressure and so we made the final wrap, pointed our lights into the depths of the tunnel one last time and turned around.

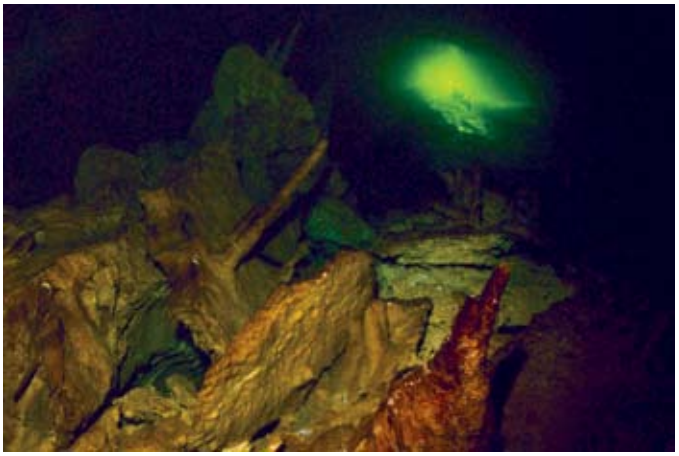
Breakdown

Cavern zone at Salado

Blood, sweat and tears

Going down

Job done



Hojo Verde

Exiting the entrance pool.

Halocline

In the woods.

From The Back Of The Cave.....

A Little Cave Diving History

by Jim Fishback
Photos © by Bill Downey, Downey Diving

How We Grated "Old Jenny" (Ginnie) Cave

In the 1970s, the Wray family purchased land then-known as Jenny or Ginnie Springs. Ginnie and Devil's Eye system were temporarily closed to divers while a a risk management plan was developed. Given the cave's hazards and easy access, the owners decided to close off the cave portion to prevent more deaths. ---Editor's note.

Before Mr. Wray bought Ginnie Springs, it was just a local swimming hole with a rope swing. There was a one-car dirt trail back to the spring, and there was no path over to Devil's Eye spring from Ginnie. You stopped on top of the hill and walked down to see if the ground could hold the weight of your car. Some divers ran a reel from their car to the cave to find their way back through the swamp or dark. You would get undressed out on the sand road. Some of those mosquitoes could get you through a 3/16 wet suit. Real torment is pulling on your hood and finding out you got a mosquito or other bug trapped in your ear.

Ike Ikehara and Wes Skiles enter Ginnie Cavern.

Tom Mount and Leon Morrison gear Ike Ikehara up for a dive.

In the summer of 1976, I was at Ginnie diving and ran into Tom Mount. He told me that Mr. Wray had considered closing both Ginnie and Devil's Eye because there had been too many open-water diver deaths in the caves. I think that the number was 26 at Ginnie. There was a quadruple fatality in the cave at Ginnie in the late 60s---four college students had gotten lost. There was also a double fatality there in 1973. Mr. Wray wanted to make Ginnie Cavern safe for open water divers and agreed to install the grate there and let cave divers dive at Devil's. He had gotten all the permits for the camp grounds. I got asked if we could come back down and help out. We did this over two weekends.

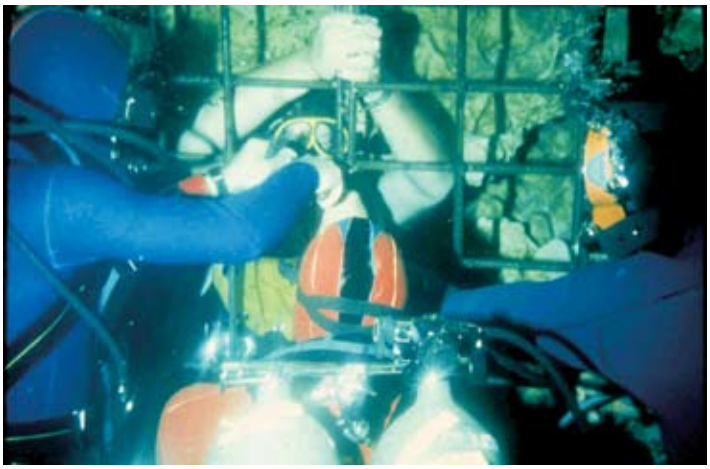
My log book shows that in early July, Jimmy Wyatt and I did a dive to get measurements of the opening where the grate would be. Two weeks later is when the grate got put in. We started on Saturday morning by drilling holes all the way around the mouth of the cave at the bottom of the ball room. It started with me, Tom Mount, Ike Ikehara, and Jim Nangle.

Tom Mount, wearing surface-supplied air mask, operating air hammer.

Tom Mount hammers rebar into place

Mr. Wray had a large air compressor for the air drill. Leon coated the welding rods with model car/plane glue so the outer coat would not come off underwater and sent them down in small bunches. Jeanne Downey ran all the welding rods down to Jim N. as he needed them.

Jim Nagle was a commercial diver and did all the welding. He had a tender and surface support named Leon Morrison. Other people who helped out were Jim Wyatt, Wes Skiles, Jeffrey Davis, Jack Banbury and Bill and Jeanne Downey from Pennsylvania.



Jim Fishback holds the grate in place while divers (left to right) Wes Skiles, Jack Banbury and Ike Ikehara wire tie it in preparation for welding.

Jim Fishback holds on to grate.

Ike and I worked as a team - we drilled a lot of the holes. I got to do the overhead drilling because I could stand up and muscle the drill in the ceiling (yes, the opening used to be better then six feet tall). Whenever the drill's exhaust opened and closed, you'd get a big thump. It turned you to jelly and killed your ears from the echo off the cave wall. We had to work against the current. It took a lot of team work. Once the drill bit was in the wall, you could lean on that, and it helped. We used heavy drop weights, which helped us stand up in the flow.

The grate was welded in three pieces, a big center section and two side wings. It was installed the next day. We took the pieces down and wire wrapped them in place. I held the center and right wing in place on the cave side so I was the last diver in the cave section. Then we put the left side on, and Jim N. welded everything in place. It took him over five hours, including deco.

Old warning sign in Ginnie Cavern near cave entrance.

Jeanne Downey free dives to new grate. Note welding marks.

When Jim N. was welding the grate together underwater, a local with his girlfriend came canoeing into the basin. We asked him to stay away from where we were working. Like many people on the internet now, he gave us a rash of crap that he could go anywhere on the water and there was nothing we could do about it. His girlfriend asked why, and we explained that there was a commercial diver welding underwater. We told him that if his aluminum canoe touched the cables, they could get fried. His girlfriend whacked him a good one with a paddle and told him they were leaving!

Jack Banbury driving rebar. Note the horseshoe collar, large heavy drop weights at his waist and plexiglas light head to the right. The large metal battery pack sits on the diver's hip.

Look at the dive equipment we were using back then. Horse collar BC, the original Sherwood manifolds with one reg on the center and one on the right post with the on-off valve controlling both. We had plexiglas lights with 30-watt heads and with home-made battery packs. Tom's dry suit was two pieces, a top and bottom that overlapped in the center and rolled up together to make a seal. We had deco drop weights and odd ball back up lights. And so on.

I think it was Ike and me who put in the stake and put in the big guide rope. We had the guide rope wrapped around the big rock in the entrance (which gives you the right and left opening). I was using a come-a-long to tighten up the guide rope when Ike came over and had me stop. I was dragging the rock into the cave. Up to that time I did not think it would move!

Divers setting the grate.

Ginnie was temporarily closed while a risk management plan was developed.

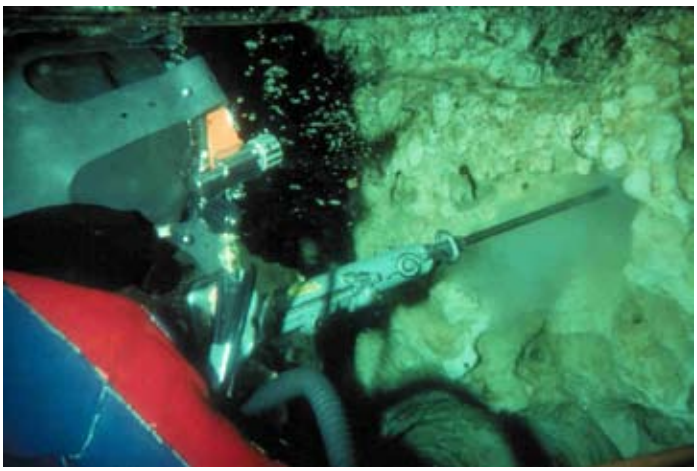
The grate was not popular with the cave divers at the time. People said they'd sneak in and cut it out and that there should have been a door in the grate. But I stood on the ceiling and shoved ten-foot lengths of rod into the mud at the bottom. No one is going to tunnel under the grate!

Ginny Spring

Tenders

Devil's Eye and Devil's Ear

Jack Banbury setting rebar



Tom Mount on the air hammer

Skills, Tips & Techniques

By Jim Wyatt

Photo: Gene Page

Mentors and Mentoring

Today's NSS-CDS cave diver training programs are designed to adequately prepare cave divers, who complete their training, to cave dive safely. In order to complete cave diver training, the diver must log a minimum of 510 minutes, or 8.5 hours over a minimum of sixteen dives in the caves and caverns at five different sites.

This training is designed to instruct cave diver students to deal with a variety of "Emergency" or "Action" procedures such as zero visibility, gas sharing, lost buddy, lost line, and a variety of other events that can negatively impact the cave diver.

The divers are exposed to several different caves and caverns to help them be better prepared for and conduct dive planning in caves of different depths, flow, bottom composition and general cave configuration.

They are also trained to navigate in the caves using the system of arrows and various other line marker configurations that is fairly standardized across the cave diving community.

In other words, the cave diver is given a license to learn when s/he earns their cave diver certification card. This card is evidence that once the student completed the class, s/he was competent to conduct safe cave dives at the level of training prescribed by the training standards.

If this cave diver waits a few months to dive again s/he is probably not as ready to safely cave dive as they were upon graduation day. Like any other activity, you must practice the learned skills in order to maintain them.

Now enter the mentor; defined by Webster's Dictionary as *a trusted counselor or guide.* A mentor can be a cave instructor or a very experienced cave diver with a proper attitude toward safety. This mentor should be diving at the level of the new cave diver, or just a small notch above.

The new cave diver should not be making "trust-me" dives with the mentor. They should be diving at least at the level where s/he was trained for the first few dives – then a notch above in subsequent dives.

Showing the new cave diver new parts of the cave is an important task for a mentor. However, seeing new parts of the cave while doing visual jumps or violating gas management rules must not be how it is done.

Assisting the new cave diver in tweaking their gear configuration is a role for the mentor – but taking that diver on their first DPV cave dive is not.

We encourage very experienced cave divers to volunteer to be mentors to new cave divers and dive with them at their level to help them gain experience and more confidence. Go with them on longer dives and more complex dives and have them do the planning, lead the dive, run the reels and set the pace. Assist and guide them through the process, but insist they don't just sit back and watch.

If they are just following the mentor around the cave, they won't benefit from each dive as much as if they are the dive leader.

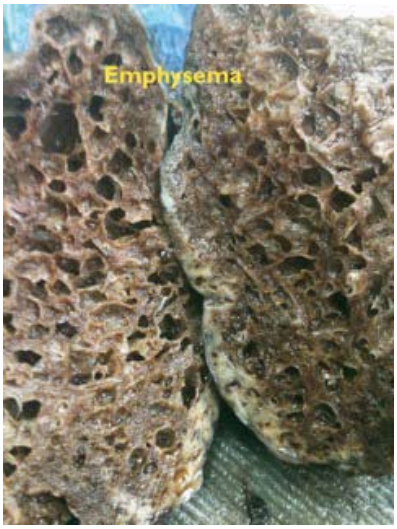
I see many mentoring teams around the caves in North Florida and it always makes me proud to see a group of cave divers working together.

Why Smoking And Diving Are Incompatible

By: Claudia L Roussos MD

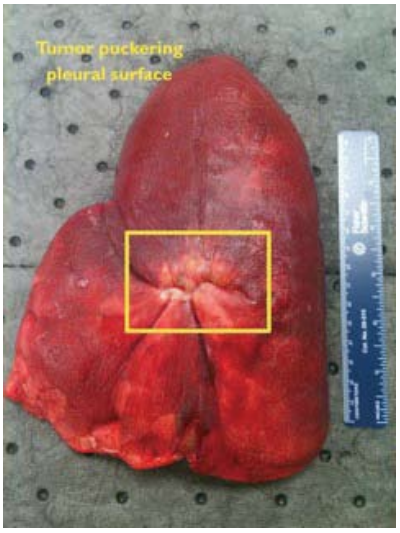
There are many reasons why one ought to quit smoking. But for all you smoking divers, I want to give you even more convincing arguments. None of this is new information. However, some smokers have either never read it or are in denial. Incidentally, non-smoking divers who want to skip this might want to reconsider unless your personal policy is not to dive with tobacco users.

So what's the hype? Smoking is one of the most damaging behaviors and the biggest preventable cause of death in the world. Here's the take-home message for divers:



Smoking damages your lungs.

Emphysema and tumors are two of smoking's long-term effects on lung tissue (see Photos 1 and 2). But smoking even one cigarette causes immediate injury and decreases one's ability to ventilate (take up oxygen and give up carbon dioxide).



The respiratory tract is lined with cilia, which look like tiny hairs when viewed under a microscope. Their function is to clean the respiratory tract by transporting mucous and debris. Smoking destroys cilia and paves the way for respiratory infections. Not only does smoking decrease ability to clear mucous, but it increases mucous production. Importantly for divers, mucous can block eustachian tubes and prevent equalization. Mucous plugs can trap air in the lungs and set you up for a pneumothorax (a type of lung overinflation injury). Smoking-caused emphysema is another risk factor for developing lung overinflation syndrome as well as arterial gas embolism.

Long-term smoking causes carbon dioxide retention.

Smoke-damaged lungs ventilate poorly and unevenly. Some areas of the lung get the blood necessary for gas exchange to take place, but are not being ventilated (don't "see" gas). In that case, no exchange of oxygen for CO_2 occurs. The end result is a person who is hypoxic and retains CO_2.

Let's talk about CO2 production for a minute.

Increased aerobic physical activity increases CO_2 production, which remains linear to O_2 consumption. If we compare identical twins with the same exercise habits and weight, the smoker is generally less fit. An unfit diver begins producing lactic acid (anaerobic metabolism) more quickly than does a fit diver. Once anaerobic metabolism begins, CO_2 production sharply increases as the body buffers the lactic acid produced in an effort to maintain its normal pH. The end product is additional CO_2.[2]

Your CO_2 production may even be higher when diving deep because:

1. increased gas density causes increased work of breathing, and

2. increased ambient pressure causes less efficient gas mixing, resulting in increased dead space ventilation.

Elevated levels of CO_2 in diving can kill. Here's what increased CO_2 does at the surface:

- Mild elevations may cause headache, confusion, decreased reaction time, and increased respirations.

- Mild to moderate levels can increase blood pressure, heart rate, and the risk of dysrhythmias.

- Levels ≥ 75 mm Hg are associated with profound confusion, somnolence, panic, convulsions, loss of consciousness, and finally death.

Just because you haven't yet had a problem does not mean you're safe. Cave divers who smoke are playing Russian

roulette, given that alertness, awareness, and ability to solve problems quickly underwater are absolute requirements on all dives. Increased workload, long and/or deep diving, and cold exposure stack the odds further.

Smoking and Carbon Monoxide

Another deadly cigarette-generated gas is carbon monoxide (CO). Carbon monoxide competes with O_2 for transport sites on the hemoglobin molecule. It binds about 240 times more readily than does O_2. If the hemoglobin is studded with CO (carboxyhemoglobin) rather than O_2, it cannot oxygenate end organs and ultimately their cells.

So we check and analyze our tanks. We want our tanks filled from reliable sources to avoid contamination. Many cave divers analyze their breathing gas for the presence of CO. So why would anyone light up before diving, impairing the body's oxygen-carrying ability? Heavy smokers have up to 15% of their hemoglobin replaced with carboxyhemoglobin. The half-life of CO is about 4-6 hrs. If you are smoke free for about 12-18 hrs, your CO normalizes but accumulates if you smoke more. Do you really want to waste 15% of your oxygen-carrying capacity before undertaking a cave dive?

Carboxyhemoglobin is even more of a consideration for closed-circuit rebreather (CCR) divers. Open circuit divers exhale the CO that dissociates from hemoglobin. Divers using CCR simply rebreathe it.

Smoking damages your heart and blood vessels.

Smoking constricts blood vessels. Over the long term, plaque forms inside the blood vessels. More immediately, nicotine causes chemically mediated vasoconstriction that results in increased blood pressure. The end result is insufficient blood flow to vital organs. This is particularly harmful during increased physical activity, which diving typically demands. If the heart does not get enough oxygen, it starts to die. Most people experience chest pain and seek treatment, but some die suddenly due to dysrhythmias.

Constricted blood vessels also inhibit off gassing, theoretically making you more susceptible to decompression Illness (DCI). Most cave divers are careful about dive and decompression planning, but ironically some ignore the obvious danger of lighting up.

Smoking is associated with more severe DCI symptoms

A 2003 study[3] linked heavily smoking divers to more severe DCI symptoms (compared to lighter smokers who developed less severe symptoms). This study did not prove that smoking causes DCI. But it demonstrated that smokers suffered more severe symptoms than did non-smokers.

The more seriously you dive, the more fit you need to be. Cave diving is serious business. Ignoring its fitness requirements increases your risk of a bad outcome in addition to the risks inherent in the dive itself. For all the logistical and gas planning cave diving requires, all of the contingency plans and redundant equipment, continuing to smoke just does not make sense. If you don't want to quit smoking, you might want to consider quitting diving.

Strategies for Quitting

Some people can quit more easily than others. Make the decision and stick with it. Hopefully your passion for diving and your desire to take it further is more than enough to get you through the hard part. Generally, the "hard part" lasts for the first two weeks. It takes time for the nicotine (which causes the physical craving) to disappear, and then you need to reset your psyche to stop craving it out of habit.

Quitting cold turkey may be more successful because your will power is the strongest then.
Weaning off may work to decrease your overall nicotine load and craving. But don't kid yourself. Weaning yourself by one less cigarette per week is meaningless. And while weaning, you need to keep your end goal firmly in mind.

While quitting, avoid smokers. Even smelling smoke on someone's clothing may make you want to light up again.

Don't go out drinking with your buddies for the first three weeks or longer. Alcohol will lower your will power and before you know it, you light up again!

Even if you relapse, get off it ASAP and continue with being smoke free.

Using a patch or gum or other nicotine containing compounds may help reduce the craving, but eventually you'll need to get off this, too. Nicotine is bad news. It hardens your arteries and decreases blood flow throughout your entire body. Using it is not compatible with doing any serious diving. (This goes for snuff and chewing tobacco, as well).

To divers who are battling to stop, you have my sincerest best wishes for success. If you still smoke and have not made the decision to stop, I hope that my arguments will give you the insight from which determination is born to help you decide to quit.

Claudia L Roussos, MD
Diplomate, American Board of Anesthesiology
Member, Add HeliumDive Team

1. There is an interesting write-up on CO_2 retainers and the Navy. Check out this link: http://www.anaspides.net/documents/scuba_diving_documents. The Story of CO2 Build Up by Lapheir.pdf.
2. .The hydrogen atom (H+) on the lactic acid combines as follows to ultimately increase water and CO_2:2H+ plus HCO_3- = H2CO_3 = H_2O plus CO_2.
3. Effect of cigarette smoking on the severity of decompression illness (DCI) symptoms. Buch DA, Dovenbarger JA, Uguccioni DM et al: Aviat Space Environ Med. 2003 Dec; 74(12): 1271-4.

Visit With A Cave

Looking over the basin and down the Mill Pond

Jackson Blue Spring is located at Blue Spring Recreation Area, Marianna, Florida. The main spring vent is located approximately 15 to 20 feet below the recreation area diving platform. Pumping an average of 77 million gallons of water a day into Merritt's Mill Pond, it is home to two rare cave dwellers, the Georgia blind salamander and the Dougherty Plain cave crayfish. The cave entrance's amazingly blue water is credited to magnesium from the spring, and the cave itself offers over 5000 feet of gold line and thousands more of side passages.

Before arriving at the park, there is a necessary stop at Cave Adventurers, 5211 Limestone Lane, Marianna, FL, to sign in and pay the $25 entrance fee. Additional continuous diving days are $10 each and fills are available here also.

King's Canyon

View just after exiting the Chimney and swimming upstream

Cave diving is available year 'round, but signing in at the shop is only available during shop hours from 8am to 6pm central time.

From here you drive to the park where divers will find parking, pavilions (one specifically designated for handicapped visitors and cave divers), bathrooms and a cement retaining wall to gear up from.

The flow from the cave can be

Jackson Blue Spring

Photographer: Ben Martinez

Article: Cheryl Doran

strong at times and scooters are permitted.

Slipping below the water beneath the diving platform, you will find the clear blue water of the spring. Entering the cavern, you can travel back about 110 feet before locating the gold main line. As you move along the line, you will travel down the Chimney and settle into passage averaging about 95 feet where you will experience a variety

Second breakdown heading upstream

Stratosphere

of features, side passages and circuits. These circuits include one between the first and second T's, another between the third and fourth T's, the Queen's Bypass, and King's Canyon; all in the first 2000 feet of cave.

The Trash Room was a sink hole once opened to the surface where locals would toss their trash. It now litters the cave floor at about 2300 feet. This feature is far from the most interesting or enjoyable part of the cave.

With more cave beyond this point, (The Banana Room and Stratosphere pictured herein are at about 4200 feet) and the variety of passages within, you will have to decide for yourself which parts are the caves best offerings.

Located close to several other Mill Pond caves, Jackson Blue Spring is well worth the trip.

Looking out from the cavern

Diver swimming down the Chimney

Banana Room

Midwest Underground

By: Chris Hill

Roubidoux Spring Exploration Progress

Missouri's Roubidoux Spring has a long history of exploration, and progress has been made by many different people and groups over the years. As the penetration distances have increased, the complexity and effort to push further increases substantially, thus making progress slow.

Exploration of Roubidoux Spring started in 1969 and continues to this day. The first 28 years were spent exploring the first 3000' or so of passage, and a map was made toward the end of that period. In 1998 the Ozark Cave Diving Alliance (OCDA) was formed, and Roubidoux became an official exploration project the next year. By the end of 2002, the team had pushed, surveyed and mapped the system out to 5500' with a max depth of 260' at the end of the line. Between 2001 & 2002, the OCDA conducted 121 dives with dive times totaling 312 hours. A map was produced at the end with an overlay of the city of Waynesville, MO and presented to the City.

Roubidoux Spring - entrance at the base of the retaining wall.
Photographer: Lori Bennett

Following the success in 2002, several factors diverted the OCDA's attention. Project logistics and coordination were taking significant amounts of time, and other projects with "lower-hanging" fruit needed attention. So no new progress was made in Roubidoux Spring over the last 10 years. Until now...

One of the challenges with pushing "Roub," as it's affectionately referred to by Midwest cave divers, is cold temperatures. Suit heaters have been implemented by team members, and in 2007 an aluminum habitat was built in the system. At that point, we were ready to push the system, but as things work in the Midwest, the weather didn't cooperate.

Gear for a mid-range dive to the Shantytown Door (3200')
Photographer: Joan Marshall

For the next four years, until 2011, conditions in the system just would not hold out long enough to plan, coordinate, and conduct a major exploration push. Finally in Oct 2011, conditions cleared enough to inspect and repair the line out to the end (remember it had been almost 10 years since the last 3000' or so of line had been examined). During the inspection, 100' of new line was added in an effort to take a peek at what the on-going passage might have in store for us on a push dive. Although it was only 100', you can imagine the excitement! To top it off, for the past 10 years the assumption was that the passage at the EOL, which was at 260' deep, was headed deeper. We were further excited to learn that the new 100' feet of passage was trending upward. The team was excited and ready to come back to push the system to new distances. Then the rains came again. Ugh!

Finally, in the midst of a drought of a magnitude not seen in this area in nearly 80 years, conditions have improved to exploration quality and are holding. Summertime is not a normal time for us to be exploring, but we weren't going to pass any opportunity. Schedules were coordinated, detailed plans were laid out, and on the weekend of Aug 11, 2012, the OCDA assembled on the

Gear ready for a dive.
Photographer Unknown
Opposite page: Roubidoux 2002 Map published by the OCDA - Updated map comoing soon!

Roubidoux Spring

Waynesville Missouri

Map and survey by the

OCDA © 2000-2003

N

W E

S

Roubidoux Spring - Waynesville Missouri

Current survey by the OCDA to over 5,000 feet

Survey Station

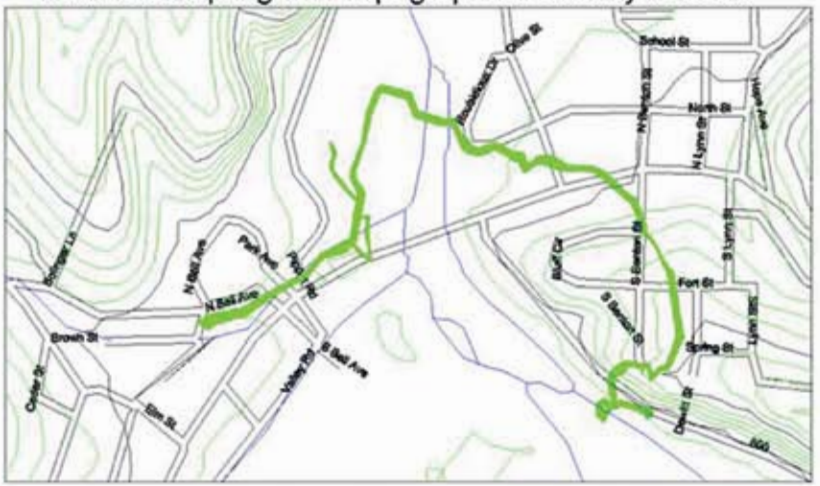
Depth and Distance

Guide Line

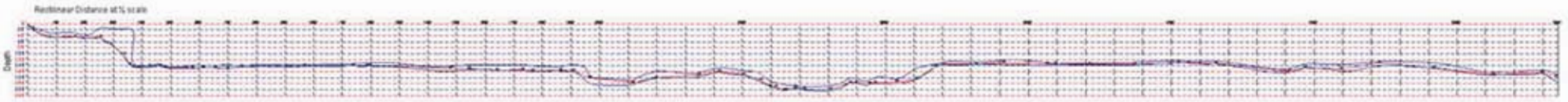
Scale in Feet

Lithuania

Roubidoux Spring with Topographical Overlay ¼ Scale



Roubidoux Spring 3D View



Long range diver finally exits after 9.5 hrs. Photographer: Chris Hill

rocky shore of Roubidoux Spring to attempt a push.

Given the magnitude of this attempt, we opted for a two day event. Saturday, Aug 11, would be dedicated to setting up the system with safety tanks and scooters, deco tanks, heater battery packs and hydration packs. Even setting up the system required a team of divers making a dive that required significant decompression, thus you get an idea of the logistics involved to setup the system for a team to push the cave.

Finally, the big day arrived. On Sunday, Aug 12, at 6:30 am, we assembled on that rocky shore once more to send off the long distance team in hopes of seeing new territory at the end of the line. Coordination was very detailed and a time limit set for the long distance dive team. Once underway, those left on the surface set about occupying their wait time with various activities.

The OCDA Aug 12, 2012 Roubidoux Push Team. Photographer: Joan Marshall

At the appointed time, a set of support divers was sent in to meet the long distance team who would be decompressing somewhere between 120' and 70' depending on how things went. As always, we were delighted to find they had used their full allotted bottom time and were doing well.

From this point activities for support divers went into full swing retrieving many tanks, scooters, etc. from 120' on up. Eventually, the long distance team was ready to climb into the habitat, which requires close attention and assistance from support divers. From here things settled down for a few hours while the long distance team decompressed. During this time support divers were checking on them occasionally, bringing in food, drink, etc and talking about the dive.

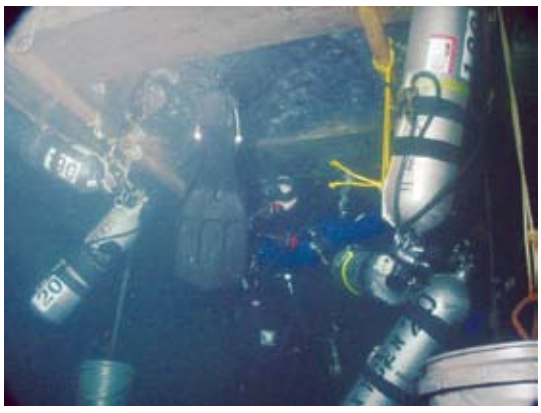
The challenges leading up to this point were numerous. Helium is in short supply and its cost has risen significantly. There were 12 divers involved in this project from Missouri, Oklahoma, Kansas, and Texas (10 hr drive for those guys), so coordinating schedules was tough. The topside temperatures had been running in the upper 90's, but we did get a break those couple of days and it only was in the 80's – got lucky on that one. One interesting danger to diving this system is the local swimmers who like to jump from the walkway and even the top of the retaining wall. Their landing area is directly over the spring entrance, but luckily no one was jumped on.

So, after 9.5 hours in the system, our long range divers finally emerged from Roubidoux Spring victorious in having explored where no one has ever been before. The following day, after survey notes were examined and the exploration reel double checked, we learned that 650' of new line had been reeled out. The end of the line is now at 150' deep and the passage is trending slightly upward and headed south.

Some very rough team statistical estimates are: 17 scooters, 70 stage, deco and safety tanks, $250,000 total worth of gear, 3900 total miles traveled by team members to participate, $1000 in gasoline, $750 in motel stays, $3000 in breathing gases. All to put 650' of nylon braided line in a cave passage where very few people will ever personally see it. But then who ever sees those little flags they put on top of Mount Everest?

Last minute update: On Aug 25, the team assembled once again to do a formal survey of the new line. This was accomplished in similar fashion as the article written above. Updating the map is next on the list. The survey covered 1000'+ of line that included some unsurveyed line installed in 2002, as well as the line installed in 2011 and 2012.

Total surveyed length of system is now at 6500'. EOL depth is150'. Max depth is still 260'.



Support diver preparing to assist long range diver out of habitat. Photographer: Chris Hill

Spring and stream.

Topside Shot
Photographer: Joan Marshall

Dirl and Steve at deco stop.
Photographer: Chris Hill

Composite of Dirk and Steve in the habitat
Photographer: Chris Hill

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A

NAME THE SITE

How well do you know your caves? A prize will be awarded to the first CDS member to correctly identify these dive sites.

Send your answers to:
uwseditor@nsscds.org.

Thanks to the photographers who will be named in the next issue so as not to give away any clues.

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Cave Diving Milestones

By Shirley Kasser

Hearing from divers as they celebrate important milestones in their cave diving careers is so much fun. The achievement is not only a milestone for the diver, but a way to highlight to the world that cave divers are diving often and diving safely.

Jeff Hawes shared this great report on his special milestone:

My 100th cave dive…

To understand what my 100th dive means to me requires a bit of a rewind.

I started diving back in the early 70's, so I figure that means I've been diving longer then some, and not quite as long as others. I have worked in the dive industry off and on, and have made quite a few dives. Once again, more than some, but not as many as others. I'd been fortunate enough to have dived all over the world. However, it was not until I got infected with a severe case of "cave-dive-itus" during a "cavern dive" at Dos Ojos when the next scuba journey came clearly into focus. Cave diving!

Two years ago, after attaining my full cave certification, I decided to commit a weekend a month to the journey of reaching 100 cave dives post Full Cave. Each dive and each diver I met along the way has provided opportunities to enrich my experience.

During the second weekend of January 2012, I met up with Tom and Clay at Ginnie Springs for a couple days of diving. On Saturday, we executed a wonderful swim up to Sherwood Split as a warm up for Sunday. That evening we planned for Madison Blue the following day. My 100th dive.

On Sunday, we arrived at Madison Blue just as the park opened and checked in. After depositing our deco bottles in the basin, we headed up to Martz sink to gear up. The air was a bit on the crisp side, which made gearing up rather comfortable. We also reviewed the plan again and confirmed the team order. I opted for the number two spot to afford more of an opportunity to sight see. Loading my two sidemount bottles and a stage on my trusty two-wheeler, I was full of anticipation as I headed down the path to Martz Sink to drop them off.

During the walk, I recalled my first sidemount entrance at Martz, and how I attempted to don my tanks above the water. 'Never claimed to be the brightest bulb, but I knew there had to be a better way. After that dive, I ran into a camera-toting gal named Jill, who seemed to know a thing or two about sidemount diving. After a brief discussion, she strongly suggested I don my tanks in the water next time. DOH! At least she didn't laugh in my face, and that's the way I have done it at Martz ever since.

Back to the present, as Tom and Clay were gearing up their backmount rigs in the parking lot, I headed down the stairs. Dropping into the water, I waited on the surface for the boys to start down the seemingly endless flight of stairs. While hooking my tanks in place, I recalled Diverlee showing me her sidemount bungee loops one day. (With a copy of those loops now in place on my Nomad, attaching the tanks has become so much easier). With Tom and Clay nearing the bottom of the stairs, I dropped below the surface to retrieve my stage hanging from the line under the steps. (Thanks to Michael Angelo for helping with Clay's light). With the three of us good to go, Clay headed out followed closely by me then Tom.

We reached the mainline and headed to the right. This is the first act that will play out. The cave is dark and

fairly open. The water was a bit murky, and the low flow delivered the promise of an easy swim. The slow steady pace soon brought us to Half Hitch. Every time passing through here, I recall my first experience with Half Hitch. I smile inwardly how the passage of this feature has become smoother over time, how apprehension has again been replaced by anticipation. From there, the dive continued until we tied off our stages a bit short of the Mount Offshoot.

Clay installed a gap reel and we pushed on through Potter's Delight. Still thankful for the low flow, we swam onward at a relaxed pace preparing for the next act of this dive at Madison Blue.

Several years ago, I first viewed the NCDivers' video on YouTube of the Rocky Horror passage. Since then my approach to Rocky Horror has changed from "'Never going to do it," to "Someday maybe," to "Now I'm loving it!" In the video, they took it slow and clean, no reason for me not to do the same. I worked on skills to allow me to execute the dive in a similar fashion…prior to actually going there. I am totally into the moment. The phrase "Slow is Pro" echoes in my brain. The cave changes here and really closes in. There is the sign declaring the passage too tight for opposing teams to pass. We mark our entry, temporarily reserving what lies ahead as our own. The turns are so closely spaced and sharp, and the cave wall so irregular, one often loses sight of the diver ahead, even if trailing by only a few feet. With carefully placed, gentle finger pulls, I am enjoying an intimate dance with the cave. Execute this challenge well and be prepared to reap the rewards. We exit this passage, and the stage changes yet again.

No longer are we in the confines of the Rocky Horror passage. The cave opens up and soon we begin our descent into the pit, and I stare in awe. The water is suddenly clear as gin. There are other lines going in several directions. The cave beckons me in each of these directions all at the same time. For today, I can only wonder where the other lines go as we continue following the line through the Gallery. Amazing how one dive continues to change before my eyes, from tight twisty turns to wide open areas with massive pieces of rock strewn about. The cave seemingly unhappy to continue at a constant level or direction, the passage undulates first down, and then up, and then down again as the line continues on. We press on through a slight restriction. We are filled with wonder at what this dive has had to offer. The line continues and beckons us to do the same, but all too soon we must turn the dive, leaving what lies ahead for another day, another dive.

The exit was quite smooth (even through the slight dusty patch that somehow appeared in Rocky Horror).

Exiting the water, I threw my arms in the air and leapt for joy with an ear-to-ear grin on my face. My 100th dive was one of the best I have ever experienced. Clay said, "It continues to play in my mind like a wonderful video," and I have to agree with him.

My journey to 100 cave dives is surely about my dives. But even more so, it is about the wonderful community of cave divers who have continued to pass on what was freely passed to them and allowing me to grow in ways I could never have imagined. Even though I mentioned but a few of them in this narrative, I am constantly reminded of the influences on my journey in so many ways. When I tie a certain knot, dip a tank, curl out of the flow, route a hose a certain way. The list goes on and on. To put it simply, "Thanks to everyone."

Thank you, Jeff, for taking the time to share your story, and thank you for being a great example for our sport.

What's your story? Email your milestone stories and photographs to me at abedavis@nsscds.org, or snail mail them to me at 1228 Gina Court, Apopka, FL 32703.

Shirley Kasser

2013 NSS-CDS WORKSHOP

Training

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See the
NSS-CDS Website
for more details
nsscds.org

May 24-25

Wakulla County High School, Crawfordville, Florida

Photographer: Ben Martinez

A Few Words About Our Properties

By: Frank Ohidy, Director, NSS-CDS

First, let me introduce myself to those that do not know who I am. I serve on the NSS-CDS board as a director responsible for the management of the properties with dive sites owned or managed by the Cave Diving Section.

Jim Wyatt (NSS-CDS Safety Coordinator) recently brought to my attention an incident at Cow Spring that concerns me enough to write about it here.

In the early part of May, two female cave divers, one being a Cave Diver and the other Intro-certified, went to Dive Outpost and signed in to dive Cow Spring. The Intro diver had never been to Cow previously, so the more experienced of the two led the dive and the plan was to dive the downstream passage. The dive itself was described to me as uneventful. It was discovered by the Intro-diver that they had dove the upstream passage in Cow on that dive several days later. This in itself is a violation of the NSS-CDS Property Management Plan rules and also represents some rather poor decisions by both divers that day. A few days earlier, they also had an incident at the Peacock Springs system that left them both disoriented and low enough on air to force them to exit at Challenge and take a walk in the woods.

What I would like to stress about these incidents is two-fold regarding diving at NSS-CDS properties. I would like each and every member to read and fully understand the Property Management Plan and the rules for each site before they go diving there. The plan is published on the NSS-CDS website and can be obtained from any board member. If there are any questions, email or call me personally to discuss the question. Secondly, while many including myself do not advocate "trust me" dives, they do happen once in a while by design and sometimes inadvertently.

The thing to remember is that these "trust me" dives should be undertaken with someone you actually trust. A lot can be said for a careful evaluation of your own skills and those of your dive buddy prior to planning a dive that is unfamiliar, beyond your personal limits or outside the rules of the landowner.

To close, I would mention that the Property Management plan provides for enforcement of the rules up to and including a permanent ban from access to any NSS-CDS sites. I chose not to exercise that option in this case as one of the divers has moved away for other reasons and the other, less experienced diver, has convinced me she had no intention of breaking the rules and assured me that she would make herself completely familiar with the management plan before diving again at any NSS-CDS properties.

OFF to tHe Side.....

By Rob Neto

WHAT SIDEMOUNT SYSTEM SHOULD I CHOOSE?

This is one of the most common questions asked by divers considering sidemount diving. While it appears to be a simple question at first glance, it's not quite that easy to answer. In fact, whenever I get asked this question I respond with more questions. My initial response is always, "What type of diving do you plan on doing in sidemount?" No single system on the market, or even homemade, is perfect for every type of diving. While some divers who dive sidemount have been able to dive their sidemount system right out of the bag with no modifications, most systems will work better for different divers with some type of modification to be able to personalize it to the diver's body type and diving style.

Before we continue, this article will in no way cover all the possibilities or considerations when choosing a sidemount rig. I would need close to the entire journal to write an article that extensive. And Cheryl won't allow that! The best thing to do is get with an experienced diver who can give you non-biased opinions about the different sidemount systems available. That being said, let's continue.

The first thing a diver considering purchasing a sidemount system needs to do is think about the type of cylinders that will be used with the system. There are several commercial systems available. And while there are some similarities between most of the systems, there are also quite a few differences between them as well. Most sidemount systems can easily accommodate heavier steel cylinders, but there are some that cannot. My experience has been that any wing with less than 40 pounds of actual lift (not rated lift) can be problematic for divers using larger steel cylinders (larger meaning LP104s or bigger), especially for those who only dive wet. This isn't to say it's not possible, but a majority will have issues.

The sidemount wings available in commercial sidemount rigs have lift capacities that range from 22 pounds to 55 pounds. However, the 55 pound lift ratings are usually based on naked pre-production wings. Once a harness is attached to the wing, put on a diver, bungees added along with cylinders, the lift capacity can be quite less. If your cylinders of choice are LP104s or bigger then stick with the larger capacity wings. If you are okay with LP85s, LP95s or aluminum cylinders, then smaller capacity wings should be good enough. If you are planning on primarily diving aluminum or smaller steel cylinders, then the commercial lower lift capacity systems or simple harness systems with an air bladder as an addition should work fine.

Another consideration in choosing a sidemount rig is redundancy. The best measure of a successful dive is getting back to the surface, right? We employ redundancy in our lights, our cutting tools, and other gear we carry. Why wouldn't we do the same with lift? This may mean wearing a dry suit or using a dual bladder system for redundancy if diving steel cylinders. It may even mean just carrying a small lift bag in a pocket. But if you do that make sure you practice using it for buoyancy in open water first!

Okay, so you've decided on the type of cylinder you will be using. The next question you need to ask is what type of diving will you be doing in sidemount. As I pointed out in the last issue's column there are several reasons to dive sidemount:

- to get into smaller cave passages
- medical issues
- added redundancy of independent cylinders and the ability to see the valves and first stages
- the increased stability of moving the cylinders closer to the center of gravity of the body
- the peer factor

If it's for any of the last four reasons, then there's really no issue as to what system is purchased except for the comfort of the harness. If the reason for diving sidemount is to get into smaller cave passages, then the attributes that must be considered are the profile of the system and how streamlined it is.

The systems with less lift are usually the lowest profile and most streamlined systems available. But, with that you may be giving up the ability to use heavier cylinders. This is fine for some locations, but most of the cave systems in North Florida are in the 60-100' depth range, or deeper, and smaller cylinders may not allow for the types of dives you want to do. With heavier cylinders, the profile may end up being a little higher, but this is not the case with all of the commercial systems. So be careful and look at the profiles when shopping, not just on the rack, but in the water.

The comfort of the system also needs to be assessed. There are currently two different designs available in commercial rigs - shoulder straps that route to the rear of the system similar to the classic Hogarthian BP/W and shoulder straps that route directly down to the waist strap. Many divers choose to mount backup lights on their shoulder straps. When the shoulder straps route to the rear of the system, it makes it difficult to mount lights in this location because the lights would be positioned under the cylinders and a little more difficult to deploy. Again, this doesn't mean it can't be done. Just keep it in mind.

Finally, divers may also consider building their own sidemount system. These systems are simple enough, and with the minimal amount of lift needed, allow for a wide variety of choice for air bladders. While building a system can be done by most anyone, building a good system requires some knowledge of sidemount diving or conferring with an experienced sidemount diver.

Whatever choice a diver makes when it comes to a sidemount rig, something to keep in mind is there is not a single system available that works for everyone. There are also lots of modifications that are being done to sidemount systems all over the world (that's the subject of another article). Most sidemount divers have modified their rigs in one way or another. The best modifications are the ones that are personalized to the diver. Getting with an experienced sidemount diver or instructor who can explain the various methods of rigging and modifications and why those methods and modifications are used is the best option for someone just starting out in sidemount.

.....something to keep in mind is there is not a single system available that works for everyone.

The Loop

By Joe Citelli

Complacency Kills

While recently perusing several internet forums I stumbled upon a post which initially made me cringe with disbelief and question the sanity of the posters. The topic was "My first Alpinist Dive," or something similar. My immediate thought was, "Why on earth would anyone consider diving a rebreather without bailout?"

For those of you not familiar with the term Alpinist, it is a term borrowed from mountain climbing aficionados who pursue their passion in a minimalist fashion, climbing without benefit of safety lines and whatever other equipment climbers typically employ to ensure their safe return to terra firma. Within the context of rebreather diving, Alpinism refers to diving a rebreather without benefit of bailout gas. It embraces the purist notion that any and all problems can be solved on the rebreather. Bailout bottles are considered cumbersome and unnecessary clutter for the competent rebreather diver, almost like a "One with your machine, here and now Zen sort of thing". And so, as I read on, the words from a Spanish disco song came to mind. "La gente esta muy loca," or, "These people are very crazy". Reading and following the thread, I reached a point at which one of the posters explained all of the reasons why this Alpinist diving thing might be a good idea, but then ultimately stated that they were not really diving Alpinist but rather, their purpose was to stir the pot a bit and get people to think.

Mission Accomplished

While I do not have any statistics, anecdotally I know that when one compares the number of rebreather dives executed to the number of times divers really had to bail out or get off the rebreather, the numbers are miniscule. I know of and have participated in dives during which divers have bailed out, but I personally cannot recall any bailout scenarios which could not have been managed by a competent diver choosing to stay on the loop. Any instances I've heard of where the diver opted to stay off the loop always hinted of poor maintenance, diver error or fear founded in a lack of experience. This is not to suggest that staying off the loop was incorrect for those divers, but rather, it supports the Alpinist notion that all problems can be solved while on the rebreather. In that vein, let us examine the reasons rebreather divers bail out:

1. Probably the number one reason rebreather divers go off the loop is to take a "sanity breath." That is, something just doesn't feel right so you take a few breaths from an alternate source to see if anything changes. This procedure is more often used by newer divers who are not yet thoroughly familiar with what it "feels like" to dive a rebreather and so they are extra cautious and suspect any unfamiliar feeling or sensations to be caused by a rebreather malfunction. This is a normal and reasonable response which abates with time and experience. Sanity breaths are also used by the more seasoned rebreather diver, even on a well maintained rig, albeit far less often. It is easy to see why the Alpinist might decide it is unnecessary and accomplish the same using an open loop technique. (Open loop uses the diluent add valve as an open circuit regulator by adding one burst of gas for each breath.)

2. Hypoxia, or lack of a life sustaining partial pressure of oxygen (ppO2). It is the leading killer of rebreather divers. Its main causes are poor equipment maintenance, inattentiveness and/or a severe lack of understanding of how a rebreather functions and the laws of physics under which it operates. Other causes are a stuck-shut solenoid on a CCR (closed circuit rebreather) or a clogged valve or orifice on an mCCR (manual closed circuit rebreather) or SCR (semi-closed rebreather), all of which relate back to inattentiveness and poor maintenance. Hypoxia is highly avoidable by observing the cardinal rule of all rebreather diving: "ALWAYS KNOW YOUR ppO2".

3. Hyperoxia, or too high a ppO2. This will ultimately render the loop toxic and cause the diver to suffer a CNS (central nervous system) "hit" which ultimately manifests itself in the form of a seizure coming on with little or no warning, the result of which is usually death by drowning. The common causes for a loop becoming hyperoxic are a stuck open solenoid or manual add valve, both of which also relate back to poor maintenance and inattentiveness. It can be avoided by strict adherence to the cardinal rule of rebreather diving and can be easily managed by

shutting down the oxygen and flushing the loop with a diluent gas.

4. CO2. This is the big one that every rebreather diver fears. It is the invisible "elephant in the room" when discussing rebreathers and safety because it silently and unexpectedly occurs, often with little warning. It is also the one condition that mandates coming off the loop unless you are willing to risk managing it using open loop techniques. So how do we mitigate the CO2 risk? Actually, it is quite simple. Maintain your rig and the integrity of the internal o-rings which separate the inhale side from the exhale side of the loop. Pack your scrubber properly, paying close attention to anything that might cause "channeling" (pathways accidentally created within the scrubber chamber which allow the exhaled gas to circumvent passing through the scrubber material and being "scrubbed" of its CO2) and finally not being cheap with sorb. Don't push scrubber limits and when faced with the option of going a little over the limit or wasting a little sorb by changing it earlier than you'd like, opt for sooner rather than later.

5. Electronics failure. There are many options available to deal with this and it should not be an issue for a competent rebreather diver with a diluent gas breathable at depth. Assuming a total loss of electronics, the rebreather can be dived semi-closed by flushing the loop with fresh diluent every 3 to 8 breaths or so, depending upon the ppO2 and the depth. Of course this will change significantly when ascending, but will stretch the available gas to up to 8 times the tank volume so a 19 cu ft bottle can yield as much as the equivalent of 160 cu ft.

6. Loop flood. You should be able to recover a flooded loop in all but the most dire of circumstances, i.e. you tore the hoses off your rig. If you can't recover from all floods other than a catastrophic loop failure, you need to examine your training and/or your unit. Loop floods are almost totally avoidable by adhering to a strict maintenance program, changing out any suspect components before they fail, by being certain the mouth piece is closed when it is out of your mouth and by staying out of places where you could catch a hose and tear it.

Acceptable Risk

Eventually the discussion evolved into one of acceptable risk. How much trust is a rebreather diver willing to place in his skill and in his equipment? Considering the quality and reliability of the commercial units available today, and in light of the above mentioned scenarios, it would seem that for at least some highly skilled rebreather divers, diving without bailout, or "Alpinist" might be a prudent risk, right?

Wrong

A basic tenet for survival in any endeavor is to always have an alternate "out" whenever possible. Alpinism violates this basic rule. While I agree that except for the catastrophic loop failure scenario, which is highly avoidable as well as highly improbable, all of the aforementioned situations are easily manageable and survivable by a skilled rebreather diver. Nonetheless, it is still foolish not to avail oneself of all options for survival. A rebreather is a mechanical device which will eventually fail. How and where it fails can be controlled to a degree by preventive maintenance, but even new parts fail out of the box. To not acknowledge this is at best an exercise in naiveté, and at worst blatant stupidity.

Hubris

Wikipedia defines hubris as "a loss of contact with reality and an overestimation of one's own competence or capabilities." All of us who participate in extreme diving are guilty of this at least to some degree. We all like to think we are the best, or at least among the best at what we enjoy doing. "That guy died because he made a mistake I would never make. That can't happen to me because I know better" is what goes through most of our minds when we read about a fatality. I maintain my rig, change my scrubber and am attentive, so a CO2 hit (hypercapnia), hypoxia, hyperoxia or a loop flood can't happen to me and if it does, I can manage it.

Cascading events

Unfortunately, in the real world accidents rarely occur in the same fashion we practiced or rehearsed for. For some reason there is always a curve ball thrown at us, and the initial event or issue usually turns into a cascade of negative events which snowball into a far worse problem that we started out managing. By diving Alpinist we have discarded the best tool at our disposal for survival in an environment in which Mother Nature always reminds us we don't belong. Every time we venture beneath the surface we are gambling that we have the equipment and skills to successfully return alive and well.

A successful gambler hedges his bets. He bets the favorite horse to win but also bets it to show so if he loses the big bet he at least has a good chance of offsetting his loss with a small win. A successful diver should also hedge his bets. In this instance the win bet is that the rebreather will function as it is supposed to, but the show bet is that he has bailout if it doesn't. Be a successful gambler and hedge your bet. Don't become complacent and assume your machine won't fail because it hasn't as of yet. Eventually it will.

Current NSS-CDS Instructor Listing

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Conservation Corner

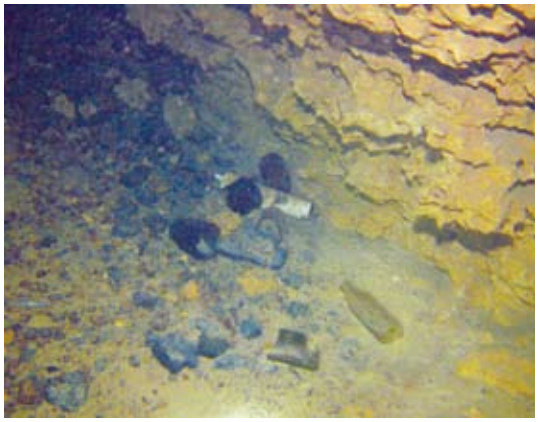
By: Kelly Jessop

Trash Or Is It Home?

Cave diving is such a visual sport, with us enjoying all of nature's features, that something out of place can become rather distracting. When I walk on a nature trail and there is a candy wrapper or soda can, I will pick it up to discard later. My point is to remove the eyesore that is distracting my interaction with nature.

Often, sinkholes become places where trash is disposed of. Or, when a spring reverses, trash that is picked up by flooding will enter the cave system. We, as cave divers, have been proactive in removing trash from the cave system, often for the same reason mentioned above. But,there are times when trash in the cave system needs to be left undisturbed because it has become habitat.

There are a few cave systems where a sink became choked out over time and, in its history of being open, it became a repository for trash. This trash almost becomes a history lesson because it shows old labeling, glass bottles (instead of aluminum or plastic) and even the era of pull tabs. To the troglobitic species that live in the cave, this trash has become a feature that provides habitat and protection from predators.



Overtime, this trash may become a vital part of their survivability, and removal could expose them to predators, such as roaming catfish.

It becomes a judgement call whether or not to remove trash that is an eyesore. If there has been recent flooding and I discover a soda can back in the cave that sits alone, then I will remove it. If I enter a sink and see a tire that was carelessly dropped in there, I will remove it, paying the disposal fee for this item. But if I enter and an area with a collection of trash that has an appearance of antiquity, plus is a suspected area of a choked out sink, I will leave it undisturbed.

NEWS REEL

CDS BY-LAWS AND CONSTITUTION VOTE

The recent on-line membership voting on changes to the NSS-CDS Constitution and By-Laws did not produce enough recorded ballots cast to accept or reject the proposed changes. The changes will come up for membership vote again at a later date.

The CDS Borard of Directors are currently working out the details for the new vote and will make an announcement when they have the specifics.

MILL SINK STEPS

The CDS Board of Directors is looking into the repair or replacement of the steps at Mill Sink.

BoD members Frank Ohidy and Forrest Wilson are currently researching options on how to proceed.

NEW GATE AT COW SPRING

Photographer: Cathy Lesch

The gate to Cow Spring has been replaced.

After unknown persons tried to pull the old gate off the post; a new gate was installed.

Please report any damage you find at Cow to The BoD.

EXPLORATION

The Mill Creek Exploration has been completed and we are awaiting survey data. A report will follow.

On another note, exploration line is available for those projects presented and accepted by the BoD.

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