UNDERWATER SPELEOLOGY

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NEW SIGNS AT PEACOCK SPRINGS - *see page 3*

(L to R) Lloyd Bailey, Lamar Hires, Joe McGrath (Park Ranger), Dustin Clesi, Steve Gerrard and Arwyn Carr. (Not pictured: Pete Butt, Paul Heinerth, and Mark Leonard.) Photo by Richard Frantz.

PREVENT

NO DIVE SITES!

the Scourge that afflicts us all . . .

Idea for a new Bumper Sticker - by Dustin Clesi

Underwater Speleology is the official newsletter of the
CAVE DIVING SECTION OF THE
NATIONAL SPELEOLOGICAL SOCIETY, INC.
P.O. Box 950, Branford, Florida 32008-0950

RESCUE/RECOVERY TEAM MEMBERS -

Should immediately report any change of address or telephone to their Rescue/Recovery Team Area Coordinator(s).

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THE NSS AND CAVE DIVING. Founded in 1941, the National Speleological Society joins together thousands of individuals dedicated to the safe study, exploration, and conservation of caves. The first cave-diving information ever published in the U.S. was in a 1947 *NSS Bulletin*. In 1948, NSS divers were responsible for the first cave dives in the U.S. using scuba. Prior to 1973, cave diving within the NSS was on a purely local level. That year saw the creation of the NSS Cave Diving Section to provide a vehicle for information exchange. Today, with over 400 members, the Cave Diving Section promotes safe cave diving through semi-annual workshops; cavern- and cave-diving training programs; warning-sign installation; search, rescue, and recovery through the National Cave Rescue Commission; cave exploration and mapping; several texts and publications on cave diving; and the bi-monthly newsletter-journal, *Underwater Speleology*, that you are presently reading.

MEMBERSHIP. The National Speleological Society welcomes the interest of anyone who has a sincere concern in the safe study, exploration, and conservation of caves, wet or dry. You may join the NSS either by writing to the NSS main office directly (National Speleological Society, Inc., Cave Avenue, Huntsville, AL 35810) or to the Cave Diving Section (NSS Cave Diving Section, P.O. Box 950, Branford, FL 32008-0950). Regular NSS Membership is now $25.00 per year, and entitles the member to monthly issues of *NSS News* and a semi-annual technical journal on speleology, voting privileges, and discounts on publications, convention fees, etc.

As a sub-organization or "section" of the NSS, the Cave Diving Section is subject to the by-laws and ethics of the NSS. Membership in the Cave Diving Section is open to anyone who is a member in good standing of the NSS. Regular membership is $5.00 per year, and we also offer a CDS Family Membership for $1.00 for family members (who are also NSS members) of regular CDS members. Membership in the Cave Diving Section includes subscription to our bi-monthly (6 issues/year) newsletter, *Underwater Speleology*, voting privileges, discounts on publications items, workshop registration fees, etc.

NEWSLETTER SUBSCRIPTION. If you do not wish to join the Cave Diving Section, but would like to keep current on cave-diving events, exploration, and technology, you are invited to subscribe to *Underwater Speleology* for $15.00 per year.

WHAT THE NSS-CDS HAS TO OFFER. The NSS Cave Diving Section sponsors two Safety and Information Exchange Workshops each year, traditionally held in Branford, Florida over the Memorial Day and New Year's Day weekends, although exact dates and formats vary. This year's WINTER WORKSHOP will be held at the Branford High School on Dec. 30-31, 1989. The SPRING WORKSHOP will be conducted on May 26-27, 1990. Information and pre-registration materials are published in the newsletter and can be obtained by writing to the NSS Cave Diving Section (P.O. Box 950, Branford, FL 32008-0950).

Information on cave-diving books, back issues of *Underwater Speleology*, T-shirts, Maps (available only to people with a cave-diving certification from an accredited agency such as NSS-CDS, NACD, YMCA, or NAUI), and free safety brochures may be obtained by writing to NSS-CDS Publications Coordinator (NSS Cave Diving Section, P.O. Box 950, Branford, FL 32008-0950).

Information on cavern- and cave-diving training can be obtained by writing to the NSS-CDS Training Director (NSS Cave Diving Section, P.O. Box 950, Branford, FL 32008-0950).

CHANGES OF ADDRESS. Members and subscribers are urged to report any change of address or address corrections in writing immediately to the Secretary-Treasurer in order to insure continuity of newsletter receipt. (The Newsletter Editor does not handle the mailing list, thank God!) Membership/subscription status, applications, and general information may be obtained by writing to the Secretary-Treasurer c/o the Section's permanent address:

NSS Cave Diving Section
P.O. Box 950
Branford, FL 32008-0950

NEWSLETTER SUBMISSIONS. We welcome all current news items, reports, articles, photographs, negatives, slides, cartoons, notices for gear wanted/for sale (individuals only), letters to the Editor, or other submissions of relevance or potential interest for publication in this newsletter. We can now accept textual information on computer diskette if it is on an IBM-XT-compatible 5-1/4" 360K floppy in standard ASCII text format, WordStar version 3.0 - 5.0, Wordperfect up through 5.0, Multimate, MS-Word, and probably a bunch of other junk I haven't tried yet (no one ever reads this fine print!); however, all computer diskettes must be accompanied by a complete paper printout. For a small fee we can also receive FAX transmissions at the printers [FAX only (813) 484-6665 (8am-5pm M-F)]. All submissions become the property of the NSS-CDS.

All articles and letters to the Editor should include the author's name (even if he wishes to be printed as anonymous), return address, and NSS # (if any). If the subject matter refers to advanced exploration dives or techniques, or controversial topics such as deep diving, solo diving, questionable practices or safety infractions, please also include relevant biographical information such as professional qualifications (e.g., if your job is relevant or you have a doctoral degree - specify field), number of years cave diving, number of cave dives, level of certification, instructor status (if any, and number of students trained), exploration and survey projects participated in, cave-diving or NSS awards, etc. (modesty shall not be tolerated, but approximates are acceptable), so that readers may reflect upon the subject matter in the context of the author's experience or lack thereof. (Newly certified divers or non-divers are more than welcome to express their opinions; however, the advocacy of advanced techniques by unqualified divers—or manifestly unsafe practices by any diver—may be subject to review and/or censure.) All newsletter submissions should be sent in directly to the Editor:

H. V. Grey, Editor, UWS
P.O. Box 575
Venice, FL 34284-0575

CALENDAR

Sept. 2, 1989 - NACD Seminar on Decompression, Tallahassee, Florida. Contact John Crea, POB 1906, Bainbridge, GA 31717.

Sept. 29 - Oct. 1, 1989 - Catalina Hyperbaric Chamber "Chamber Encounter," Santa Catalina Island, California. (Contact Editor.)

Nov. 17-19, 1989 - NSS-CDS Instructor Institute. For additional information, contact the Training Chairman.

Dec. 30-31, 1989 - NSS-CDS Winter Cave Diving Workshop. Branford High School, Branford, Florida.

JILL YAGER AWARDED DOCTORATE IN BIOLOGY FOR CAVE-DIVING STUDIES

On June 21, 1989, veteran cave explorer Jill Yager (NSS #19089) passed her doctoral dissertation defense and received her Ph.D. in Biology from Old Dominion University in Norfolk, Virginia. This marks the first Ph.D. earned by cave diving. Dr. Yager is now an Assistant Professor of Biology and Environmental Science at Antioch College in Yellow Springs, Ohio, outside of Dayton.

While exploring in Lucayan Caverns on Grand Bahama Island in November of 1979, Jill discovered what turned out not only to be a new species, genus, family and order of crustacean, but an entirely new class. She named this first tiny animal *Speleonectes lucayensis*. This exciting biological discovery was beautifully documented in the 1980 hour-long documentary film, "Descent Into Darkness," which Jill helped to produce. Since that time, a total of nine different species have been identified and studied. Jill and her scientific discoveries have also been featured in the 1985 Smithsonian documentary, "Where None Has Gone Before," and an episode for the Public Television children's science program, *1-2-3 Contact*. Jill intends to continue her study of remipedes and plans to attend the 10th International Congress of Speleology in Budapest in August.

THE REMIPEDIA (CRUSTACEA): A STUDY OF THEIR REPRODUCTION AND ECOLOGY - *A Doctoral Dissertation Defense by Jill Yager, Presented in Partial Fulfillment of the Requirements for the Degree of Doctor of Philosophy in Biology.*

A BRIEF SUMMARY:

Remipedes are an unusual group of crustaceans that live exclusively in submerged caves. Since their discovery in 1979, nine species have been described, seven of which are found in caves in the West Indies, one in the Yucatan Peninsula of Mexico and one in the Canary Islands. Most of what is known about these animals has come mainly from taxonomic descriptions. Little has been published about their reproductive biology or ecology. The objectives of this research were to investigate the reproductive biology and ecology of the remipedes inhabiting Sagittarius Cave on Grand Bahama Island, Bahamas.

Sagittarius Cave was chosen as a study site because it is inhabited by several species of remipedes and because of its remote location and lack of disturbance by cave divers. The cave was sampled every three months for a year. The remipedes and other animals in the aphotic zone were collected, and physical factors such as salinity, dissolved oxygen, and temperature were measured. The water in Sagittarius Cave is marine throughout, but several distinct density interfaces are present. Water beneath the interface is very low in dissolved oxygen. Remipedes have never been found above the density interface and appear to be confined to this nearly anoxic habitat. Six species of remipedes were found in the cave along with a community of troglobitic organisms composed primarily of crustaceans. Two new remipede species were collected during the field research and their descriptions were completed.

The study of the reproductive biology was restricted to two species of remipede, *Speleonectes benjamini* and *Godzilliognomus frondosus*, because of their abundance in the cave. Remipedes are hermaphrodites, that is, both male and female reproductive systems are present in one animal. Emphasis was placed on the male reproductive system, and ultrastructural details of the sperm were given. The sperm is flagellated and packed into distinctly shaped spermatophores.

ACKNOWLEDGMENTS:

Field research was supported in part by grants from the National Speleological Society Cave Diving Section (NSS-CDS), the NSS Ralph W. Stone Award, Mark Leonard and Dive Rite Manufacturing Co. (for photons in the dark), Fathom Dive Suit Co., Sherwood Scuba Regulator Co., CHEMetrics, Inc., and substantial input from my parents.

None of this would have ever happened if I hadn't learned how to cave dive. There are many friends in the cave-diving community that deserve a special thank you. Some are no longer actively cave diving, but none the less were an inspiration in one way or another: George Benjamin (father of Bahamian blue-hole diving), Jeff Bozanic, Mary Brooks, Jim Coke, Howard Cosgrove, Dinah Drago, Mary Ellen Eckoff, Sandy and Bill Fehring, Steve Gerrard, H.V. Grey, Johanna de Groot, Paul Hobbs, Bill Horn, Tom Iliffe, Mark Leonard, Mike Madden (Captain of the Pede Patrol), Kathy McNally, Gene Melton (and the Blue Lady), Rob Palmer, Guiseppe Pompelini, Wes Skiles, Didi Nilson Taylor, Glenn Taylor, Parker Turner, and last but actually first for all of this, Dennis Williams.

CAVE SAFETY PROJECT A SUCCESS AT PEACOCK SPRINGS STATE PARK

- by Dustin M. Clesi (NSS #25585)

As you may recall in the Nov./Dec. 1988 issue of UWS (15:6), it was announced that a group has taken the initiative to install cave-diver safety messages at the popular dive sites within the Peacock Springs State Park in Luraville, Florida. After 11 months and a little patience, the endeavor became a reality during July, 1989.

It started with a concerned group of Cave Diver Instructors on August 19, 1988, who rallied with several goals in mind concerning Peacock: 1) to effectively impact the visitor/diver with the need for specialized training and equipment before diving within underwater caverns and caves, 2) to set the stage for future cooperation between the State Park System and organized cave diving, and 3) to improve landowner relations in general at this particular dive site.

In an effort to reduce diver accidents at this location, the idea of a highly visible sign to be installed on the surface at the major cave entrances met instant approval at the group's initial meeting. Naturally, it was the sign's exact wordage that generated the most discussion, but after a few "heated" exchanges the message took form. (Actually, these guys worked together pretty well!) It was further agreed that all costs for fabrication and installation would be borne by the group. Bids for fabrication to Florida DNR (Dept. of Natural Resources) specifications were solicited and a proposal to the landowner was outlined on paper. The timing was ironic in that yet another diver fatality had occurred at Orange Grove Sink on September 5th . . . only two weeks after the project was conceived.

Initial contact was made during the last week of August between a representative of the group and the Chief, Bureau of State Park Operations in Tallahassee. The proposal was generously received . . . and welcomed by the State officials. It got even better when the project was formally presented and the Florida Department of Natural Resources agreed to cover the costs! After a few minor revisions by DNR sign fabricators, the NSS-CDS and the NACD both received honorable mention. Actual installation of the signs was completed in July at Orange Grove, Olsen and Peacock I. Transparent lucite sheets were donated to add a protective finish and a professional look.

Now that these 4' x 4' notices are in place, it is hoped that if only one untrained, improperly equipped diver heeds the warning that they portend . . . . . it will have all been worthwhile.

Special thanks to Cave Instructors Lloyd Bailey, Pete Butt, Steve Gerrard, Paul Heinerth, Lamar Hires, Mark Leonard, and Arwyn Carr at Spring Systems Dive Center for their unwavering dedication to cave-diving safety.

THE MEXICAN CONNECTION
- A Column by Jim Coke (NSS #26442)

On June 29, 1989 Mike Madden, Tom Young and I successfully connected the Naharon and Maya Blue Cave Systems, underwater. The first connection dive, made on February 23, 1987, connected the two cave systems through the Naharon Cenote. The second connection was made completely underwater beginning the dive through the Naharon upstream cave system. At a point 500' from the spring-side opening, a jump was made to a new section of the Naharon cave system where a distinct flow reversal was found; the flow was siphoning.

Following a complex route explored in June, 1989 by Paul Heinerth, Tom Young and myself, exploration was begun at a point 2000' into the cave where a river of fresh water was noticed to diverge from what appeared to be the main passage. The majority of the dive was conducted at 70', below the halocline and in the base saltwater. The divergence of the upper level of fresh water from the main cave passage, to an obscure side tunnel, brought our exploration team into huge cave. 450' later brought us to a line that had been laid by H. Hiler, Woody Jasper and myself on December 10, 1986.

At this point in time, the dive reaffirms that the Naharon-Maya Blue Cave System is still the largest underwater cave system in Mexico with more than 5 miles of explored cave to date. Further exploration of these caves will undoubtedly reveal more passage to explore, enlarging the system once again.

Exploration continues in other cenotes as well, notably Nohooh Nah Chich. As a large exploration dive will take place in this cenote soon, it will be brought to the 5-mile point and certainly beyond.

THE HAZARDS OF SOME CAVE DIVERS USING SCOOTERS
- by Frank Lavallee (NSS #27829)

During the NSS-CDS Spring Workshop recently in Branford, I sat in on Mark Leonard's Mini-Workshop lecture on Safety, which I have done in the past. During the class, the topic of scooters was brought up. I took the opportunity to relate to the class an incident that occurred to me last year in the Devil's Ear Cave System. I have decided to relate the incident in print to the cave-diving community, in hopes that it will not occur again.

I tied off my reel to the familiar tree in the Devil's Ear basin, then proceeded down into the cavern room with my partner, where I made a second tie-off to a projection near the first warning sign. I then had my partner run the reel to the permanent line past the "Lips" restriction, as he is a stronger swimmer than myself. At a point shortly past the "Cornflakes" restriction, we turned the dive. My partner proceeded out first while I followed him with the reel. As we neared the warning signs, I heard the whine of scooters. Within seconds, two cave divers were observed rounding the corner in the cavern room, and then they zipped by us. Neither diver was running a reel to the permanent line. No prior arrangement had been made for us to leave our reel in for these divers.

I continued on, taking up the line in my reel. Upon reaching the east section of the cavern room, I discovered the end of my line tied to a projection not previously used as my secondary tie-off. A pile of line was lying next to the original line from the tree, which had been removed and cut intentionally, then retied inside the cavern. It had already gotten somewhat dark, so the surface was not readily visible.

Fortunately, with our knowledge of the cavern layout, plus the flow of the water carrying us in the right direction, we had no problems in exiting. I have to admit, though, that I was a little upset over this. The two divers, who are Full-Cave certified, later explained to us that the line was in their way and that they had to remove it in order to get their scooters inside the restriction at the bottom of the basin. They stated that they did not run their own reel to the permanent line because they were very familiar with the passage and knew the way back out. (Mark, that brings back memories of a "no-lights, no-line" experiment you and Lamar conducted, that you usually discuss in safety lectures.) I shrugged the incident off, as there was no real harm done.

I later got to thinking about the incident and realized what could have occurred. What if we were two cave divers unfamiliar with the system, with no knowledge of the cavern layout, or if there was no strong flow to direct us back out? Picture two cave divers swimming around and running out of air before they made it out. The recovery divers would probably have concluded that we violated the guideline rule, not knowing what had really occurred.

ADDENDUM: To clarify the "no-lights, no-line" experiment mentioned above that Mark usually brings up during his safety seminars: On Rule Two of Accident Analysis, Mark explained the importance of using a guideline, no matter how well you know a cave system. He used himself and Lamar Hires as examples, since they have dived the Devil's Ear system so many times.

With other divers present, Mark and Lamar turned out their lights and closed their eyes to see how long it would take them to find their way back into the cavern from the permanent line. They were simulating a total lights-out or a total siltout situation without a guideline.

According to Mark, it took him 17 minutes. Lamar took 30 minutes to get almost nowhere. Normally, the run could have been made in about 4 minutes.

The point was brought across quite nicely. Without a guideline in a total lights-out or total siltout situation, no matter how well you know a system, you're in trouble.

This pretty well paralleled the situation with the two scootered divers who decided that running a guideline to the permanent line wasn't necessary, since they knew the system so well. (And they cut our line, on top of that!)

ORDER OF HOGARTH INDUCTS SIX
- by Milledge Murphey, Ph.D. (NSS #24433)

On Saturday, April 8, 1989, Chi Delta Sigma, the Order of Hogarth, formally recognized founding members of the society. The site was the Ginnie Springs board room (upstairs). Those

(L to R) Bill Main, Jane Gray, and Lamar English immediately following Bill's receipt of the award. Photo by the author.

receiving the coveted certificate and emblem of membership included: William Hogarth Main, William A. Gavin, Jr., Milledge Murphey, Lamar English, and Steve Gerrard.

The only founding member not present was E. Vaughn Maxwell, who was out of the State of Florida on a business trip. His recognition will be presented at a later date.

Two associate members were recognized on April 17, 1989, these being persons who have fifty or more caves dives, meet the explicit Hogarthian Standards, and are acceptable to the membership via unanimous vote. The nominees for associate member are E. Eugene Page and David Fine.

The Order of Hogarth solicits inquiry and/or membership from the cave-diving community at any time. Letters of invitation to membership are sent out periodically as the society membership identifies persons who are candidates for such membership. These letters are sent to an individual only once and if no response is received within two weeks (14 days), no future membership is possible. Inquiries regarding the society may be addressed to: Milledge Murphey, Ph.D., Order of Hogarth, 309-B FLG, University of Florida, Gainesville, FL 32611.

GAP AND SNAP!
- by Steve Gerrard (NSS #26640)

[ABOUT THE AUTHOR: Steve Gerrard is one of our most active cave-diving instructors, certifying through the NSS-CDS, NACD, and NAUI, and teaching for Spring Systems Dive Center in Luraville, Florida. He has been cave diving since 1975 and has trained over 600 divers in cavern and cave diving. He is currently President of the National Association for Cave Diving (NACD) and Editor of its newsletter, The NACD Journal. *He was involved with finding the first remipede in Mexico, along with the first "live" species of two troglobitic snails in northern Mexico, and has done extensive exploration of underwater caves in Belize, the Bahamas, Mexico, Missouri and Florida.]*

For safe cavern and cave diving, we use the theme of "Accident Analysis" for training and for guidance with our diving. It is a philosophy that, if followed properly, almost works flawlessly. With the #1 rule of Training, we learn to follow a continuous guideline, allow 2/3's of our starting air to exit, avoid deep diving, and use a minimum of three lights, all of which serve us safely.

Always be sure of your EXIT! This is a sacred law for safe cave diving. The continuous guideline is the primary navigational tool for maintaining a successful dive from start to finish. We, as a growing population of cave divers, are a diverse group with a variety of habits. Overall, we follow our rules faithfully, but we can tend to stray away from them because of personal philosophies, certain situations, and/or bad habits established from the beginning or developed during a cave-diving career. A good example involves the gap or jump to another permanent or offshoot guideline. Ideally, the gap between the lines should usually be 10' to 20'. But, of course, no two cave passageways are alike and <u>all</u> cave divers have an opinion as to what is best. The purpose of the gap is to make the safe cave diver "think" and reference the location to hopefully insure a successful exit from the cave system.

Each gap is dictated by the cave explorer when initially laying the permanent guideline by instinct or personal reasoning, <u>or</u> by a cave diver(s) when replacing old guideline or surveying. Each gap location is determined by the cave configuration. We, as divers or cavers, have our reasons for cave diving, whether it be for exploration, teaching, science, mapping, or pleasure. No matter how proficient we may be, using the gap reel does take up valuable time away from our purpose or goal for the specific dive. Because of the human factor, we can have a tendency to take short cuts by simply <u>not</u> using a gap reel to maintain the continuous guideline. If you are scootering, going for distance, or just purely lazy, why use or waste precious time! Also, if you are completing a circuit or traverse dive (unless you are doing many set-up dives), would you want to sacrifice your $40 gap reel? In many cave systems, you will find gaps 5' or less from the main permanent guideline. When gaps are this short or less, this further teases the cave diver in deciding to use a gap reel or not.

There is a <u>strong</u> need to curb this trend of violating our continuous-guideline rule. An excellent "solution" for many of the short gaps that exist in our cave systems in Florida is the "Gap & Snap" method. My first exposure to this procedure was several years ago while diving the Najaron Cenote cave system near Tulum in the Yucatan of Mexico. This beautiful system was initially, and continues to be, explored and surveyed by Jim Coke of Excursiones Dive Shop in Akumal.

In many gap locations, Jim permanently installed a bronze or brass clip with a piece of braided nylon guideline attached to the end of the "offshoot" guideline or at the nearest wrap of the main permanent guideline/gap location. To employ it, the cave diver simply detaches the clip from where it is "parked," stretches it out (a length which is already measured to exact distance of the gap), and clips it to the other line next to a permanent arrow marker that should be on the exit side of the attachment. It is fast and simple, and maintains the safe, continuous-guideline concept! This method would not slow down or become a hassle for the safe cave diver.

In the Devil's Eye Cave System in Gilchrist County, Florida (part of the Ginnie Springs resort property), a similar aspect exists at the "Hill 400" gap. At the end of the Hill 400 guideline at the gap location, a clip is attached and wrapped around the huge limestone projection. To deploy it, unwrap the guideline and clip to the main permanent guideline. Again, FAST and SIMPLE!

Who is responsible for this great idea? I confess I do not know but will assume that Jim Coke is. Perhaps someone can shed more light on this technique. As a proposal, I suggest that for gaps of 5' or less, this procedure become a standard. (For gaps of longer length it would be inappropriate because of too much dangling line, which would be a hazard for entanglements.) If we, as a safe cave-diving community, preach a rule, then it is best for <u>all</u> to practice what we preach.

"SCIENCE" VS. RECREATIONAL CAVE DIVING: THE REAL-ESTATE ISSUE
- by Milledge Murphey, Ph.D. (NSS #24433)

Having written and published two definitive papers defining the currently critical lack of available cave-diving sites, and having read with interest several letters and articles which have been stimulated by the previous two papers, I now want to pursue and define the issues further. Clarification is obviously needed as opinions seem so widely varied within the diving community that it is possible for misunderstanding(s) to have been developed.

<u>The "Science" Issue</u>. Some persons gain license to dive the many closed and often legendary dive sites under the guise of "science." Just what is science? First, scientific diving is conducted by divers under the strict auspices of verifiable scientists who typically (in diving) are members of national and international scientific bodies, are typically educated in a major scientific field (usually one of the "hard" sciences), and whose work (research) has been presented at meetings of such societies and in the professional journals of the professional scientific field in which the scientist is educated and has specialized.

Pseudo-science and pseudo-scientists exist, and in fact abound on the periphery of most scientific fields of endeavor, and it is most atypical when these peripheral individuals, who

are untrained in a scientific discipline, produce science. For example, most university faculty persons produce research results with the assistance of graduate students. The graduate students are learning to be scientists and the faculty persons are (in most instances) bona-fide scientists, thus the differentiation in roles. What does this discussion have to do with cave-diving site availability? Simply this: scientists can and do easily obtain access to most, if not all, sites for the purpose of legitimate science. In fact landowners usually want scientists to carefully study their properties for the purposes of increasing their knowledge of their holdings and often for commercial or conservation reasons.

Science then, is juxtaposed with development of properties for commercial purposes. Science may attempt to study methods for best use(s) of such natural wonders as cave-diving sites. Many times scientific-based recommendations are for conservation and protection of the crystal aquifer-window sites in keeping with long-term maintenance of pure water, natural beauty, delicately balanced ecosystems, sensitive animals and plants, or irreplaceable artifacts or other cave structures.

As an aside, anyone who has been cave diving in Florida for any length of time has witnessed the almost unbelievable changes made in the most popular caverns and caves by the continuing overuse and misuse of them. In the past a penetration of two or three thousand feet would reveal a relatively pristine subaquatic cave environment; however, today much longer penetrations yield views of misuse.

Numerous cave divers have written concerning this problem (a past article by Roger Werner comes to mind as I write this sentence). Thus the protective stance taken by many scientists is often in opposition to the developer or entrepreneur who, while wanting to maintain the site in reasonable condition, is primarily interested in realizing profit from the site regardless of mild, moderate, or even severe site damage which may be caused by overuse or a number of other causes including overdevelopment. What does this topic have to do with availability of dive sites? Simply this: uses of sites are usually determined by owners with some guidance from scientists or pseudo-scientists, either of which may be listened to, and the information, whether it be good or bad, used or not at the whim of the owner.

Who owns the springs and sinks in Florida? The people own some of them—which are administered by state or national agencies. Should we, the certified cave-diving people, have access to all of these state/federally owned sites since we do no damage to them? I think so.

Private commercial developers own some, and most of these are available to us for a fee. In fact these sites are in some respects dependent on our use for their income (not all, or even most of this income, however, is dependent on cave-diver use of these sites). Thus some of the income generated by the commercialized sites is paid by cave divers. Damage in these sites is typically heavy and often the owners will remove material from the site to make it more "diveable." This is in contrast to the state-administered sites which are periodically closed to the public in order that the flora may regenerate.

Private, noncommercial ownership is another category. Herein are agency or church-camp sites, personal home sites, agricultural-use properties, etc. It is these sites that are subject to a variety of use formats. Can the scientists dive them? Usually, yes. Can certified cave divers dive them? Some can, most can't. Why? Usually, if any cave diving is allowed at all it is a "guide system" which allows the guides and their friends to dive. Some contend, as I did in the first two articles in the venue (and continue to do in this one), that we are training far more divers than we have freely open site space for. A visit to the Peacock area, Little River, and many other well-known (open and free) sites on any weekend will verify this. My contention is that we must obtain more of these sites and reverse the trend toward fewer sites. Is this a complaint? Certainly not; it is, however, an observation of fact.

The persons who are non-scientists and who have arranged by whatever means to dive in otherwise "closed" sites are viewed by some as persons who are helping all cave divers by arranging to be the only persons allowed to decide who dives at the site via a guide system or any other system. Personally, I believe that if we certify anyone as a cave diver then that person should also be included in the group who can dive at any site in question. Thus the certification card would be the ticket rather than any other "system" which may or may not be for the purpose of meeting the cave-diving needs of a self-serving few.

As an example of how it should be done I site the superior work of the Die Polder guides. Here, one may telephone one of the well-known and publicized guides, who, through a series of dives, will escort a trained and certified cave diver into this magnificent system. On the other hand, how many cave divers from the 50's and early 60's know of dozens of sites which are no longer accessible to certified cave divers in general? I submit, many.

What then should we do to acquire more access for cave divers. As I've stated before, I believe the NSS-CDS and the NACD should expend funds and energy toward this end by continuously emphasizing that full cave divers are safe and won't harm any site.

Is the limited, and in some cases, very limited, access to many sites suitable for most certified cave divers who can't dive them? Why not ask these "regular cave divers." Do they want to dive at more and different sites, or are they satisfied to return to the 10 to 15 sites which are available, and I might add, such sites are generally the most used cave-diving sites in the entire world? Personally, I can't fully understand their predicament, but I do understand that I rarely ever visit the few open and the several commercial sites on any weekend when the "regular cave divers" and instructors with students are at these sites in force. The expense and the crowds have caused me to save my diving at these sites for weekdays or in the off season.

Finally, the so-called elite cave divers themselves don't have the level of access that the genuine scientists have. They never have had such access and they probably never will. My summarizing comment is to present the access pyramid:

No. of Persons	*Category*	*Level of Access*
very few	*legitimate scientists and assistants*	*near total*
very few	*elite cave divers (guides & friends)*	*wide*
many	*certified cave divers (instructors & students)*	*little*

Does this diagram represent the facts? I believe that it does and therefore question our continued training of large numbers of cave divers when the finite number of available sites diminishes each year. As the few available sites become polluted, over used, and irreparably damaged, and as we train more cave divers, the situation will eventually become untenable and the activity will reach a near nonexistent state. Similarly, as the open-water diving population, trained variously (from deplorably to quite well), destroys coral reefs all over the world, they too may ultimately have no place to dive. It's certainly something to think about.

LETTERS TO THE EDITOR

June 10, 1989

Dear Editor,

Greetings from the frozen north. Actually, at the moment it is less than frozen, with temperatures in the high 80's and yours truly tooling around in shorts and CDS T-shirt. It's a two-beer (iced) evening and time to catch up on various correspondence.

The spring floods are abating, and it's time for some serious exploring. We've a few trips planned to the north end of Vancouver Island, and a new gypsum karst area in the Canadian Rockies ("The Blue Holes of Invermere...."). The latter place is downright scary, with deep blue vertical wells that descend to God know where. (Sheck.....Oh, Sheck.....!) Must wait for the water to clear before we shot-line dive these things. Ever try to find some North American cave divers who've dived gypsum caves, and get some advice on the vis and stability? Right!

In retrospect, Florida was a great time. Nice people, nice caves, and nice gear. Christ, did we spend money, and it didn't stop until Sawatzky and I scored 95's back here. The great quote of the trip was after we learned of your skin bends while diving with Zumrick. Sawatzky (also a diving-medicine MD) became very concerned that Al and I might be prone to bends, and didn't want our demise to cloud his reputation, so he padded the already conservative Canadian dive tables. Accordingly, Lamar was long out of the water before we eventually emerged. After two days of this, Lamar finally muttered, "Are you guys doing something down there that I should know about....?"

Take care. Will send you an article or two once we get rolling this summer.

Best regards,

John Pollack (NSS #8495), South Slocan, British Columbia, Canada

May 23, 1989

Dear Editor,

Just returned from a diving expedition to Akumal-Tulum with Steve Gerrard and six others. Steve asked me to let you know my thoughts re the trip.

First the diving. World Class in caves that had all the formations of Carlsbad and fresh/saltwater layers to play in. Mike Madden calls them toy caves and, compared to the Florida caves, they are less challenging. But such [illegible], such fun. Hikes through the jungle, ten-foot giant strides and then...a world that Disney would marvel at.

The support system down there is great. Good diving accommodations and all the air needed to dive dive dive. On most days we dove two sets of dives. The Cedom Dive Center people made this possible by filling our tanks at night so we could get off to an early start the next day.

Great Diving. Great Fun. If you have not been there a real treat awaits you. Good diving to you.

Peter Schulz, Oakland Park, Florida

May 21, 1989

Dear Editor:

I recently returned from a group cave-diving trip to the Akumal, Mexico area. The trip was organized and led by Steve Gerrard.

We stayed in a delightful condo near Akumal owned by Bruce Schadow of Minneapolis, MN. Tanks, air, and guidance were professionally and personably provided by Mike Madden, Joanie Patrick, and the staff of the Aventuras Akumal dive shop.

Well organized and well led, super folks (wet AND dry), plush accommodations, and cave diving with an extraordinarily high WOW factor add up to memories to last a lifetime.

My thanks to all involved.

David Lund, Minneapolis, Minnesota

Dear Editor,

In October 1987, I received my NSS-CDS Basic Cave certification at Ginnie Springs. I went through the course with my dual-manifold aluminum 80's rig. Because the dives were based on the 1/3 Air Rule using a single tank, I was required to make each dive on the 1/6 rule, as were the other students who were using dual-tank rigs. The main reason behind this was that you were less likely to exceed the 500'-penetration training limit with a single tank, using the 1/3 Rule.

As was discussed during the recent NSS-CDS Spring Workshop in Branford, there is a big effort right now on the part of the NSS-CDS and NACD to convince the state- and county-run parks to adopt a policy which prohibits Basic Cave Divers from diving the springs and cave systems in these parks with dual-tank rigs. Only single-tank diving will allowed.

Unfortunately, the deaths of some Basic Cave Divers in Orange Grove Sink and Emerald Sink in 1988, and Basic Cave Divers observed staging and scootering in some of the more popular cave systems, are no doubt what has given birth to this policy.

Many Basic Cave Divers, like myself, will be affected by it, and will most likely move their cave-diving activities to the uncontrolled locations, until these divers become full cave divers, if this is their desire.

It is my intention to become Full Cave certified. But while I am still Basic Cave certified, I do not feel that I should be prevented from cave diving in the parks unless I use a single-tank rig. If the Basic Cave Diver observes the limitations of the training given, why penalize that diver for using dual-tank rigs?

Because of the single-tank policy, I believe we are going to observe more Basic Cave Divers use staging and scootering techniques to cave dive. This may open up a whole new hornets' nest of problems. How will the parks enforce that?

I consider myself a somewhat competent cave diver who abides by the limits of my Basic Cave training and the Rules of Accident Analysis on most of my cave dives.

I love diving caves and I want to become the best cave diver that I can make of myself. But don't tell me I can't cave dive legally with a dual-tank rig! My techniques and stability are much better with doubles than with a single tank, and I do love having that extra air, if I need it. Do I put my two sets of dual-tank rigs in the back of my closet and buy some single tanks with Y-valves? No way!

I want to make it clear that these are my own personal opinions and not any attempts to buck the system, so to speak. I just wanted my opinions to be heard.

Sincerely,

Frank Lavallee (NSS #27829), Brandon, Florida

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AIR POCKETS MAY BE UNSAFE

New information has come to light concerning the possible cause of the deaths of two open-water divers at Vortex Spring March 19, 1989, reported in the March/April issue of UWS (16:2).

According to Capt. John Zumrick, M.D., a U.S. Navy diving-medicine authority and NSS-CDS cave-diving instructor, evacuated cylinders were provided by the Navy Experimental Diving Unit and gas samples were taken from some of the air pockets in the spring. Analysis revealed an extremely low oxygen content in at least one of the pockets, and also a fair amount of toxic hydrocarbons (methane, etc.). Dr. Zumrick said he thought it possible that the divers could have surfaced in one of the air pockets, removed their regulators from their mouths, breathed the bad air and quickly lost consciousness. This hypothesis would readily account for the fact that the divers had such large amounts of air remaining in their tanks (2500psig and 1800psig). The reasons for the poor quality of the air in the pockets are not known, although analyses of spring-water samples have frequently yielded extremely low oxygen contents, which would promote rapid absorption of oxygen from the exhaust air. The Moral of this article seems to be: Don't take any chances with the exhaust air in rock pockets on ceilings or in abandoned decompression troughs that you may happen upon.

SAFETY FIRST - by H.V. Grey (NSS #23062)

It is easy to become complacent, to become lulled into a false sense of security, thinking that because we are trained in cave diving and are following the basic rules of Accident Analysis, we are therefore categorically immune to the fatal consequences of minor problems which have the potential to upgrade into full-scale emergencies. This can lead us to relax our vigilance and make serious errors in judgment even early in the planning stages of a dive.

Each of us has his own unique personal diving limitations. What might be perfectly acceptable dive parameters for a fully trained, highly experienced cave diver could well be nothing short of suicidal for the neophyte. What might be a perfectly acceptable penetration goal for a strong swimmer who regularly runs marathons, could be disastrous for an overweight diver with poor aerobic fitness. Even anxiety about going into a cave for the first time because of its reputation or a description of the conditions to be found within, can put one diver at a serious mental disadvantage over another. A few of these limitations are completely objective, for example, level of certification, currency of hydros, VIP's, etc. But most of them are subjective, and not necessarily easy to quantify or dichotomize. It is therefore up to each one of us to take full personal responsibility for establishing and adhering to our own personal diving limitations.

The following is a list of suggested questions to ask yourself before each and every dive. (You will want to add other specific questions as your personal situation dictates.) The underwater cave explorer is as completely dependent upon his self-contained life-support apparatus as an astronaut is. And a cave dive is no less serious a matter in terms of its potential consequences (that is, your death) than a space flight. Unless you can answer each question on this checklist with a resounding YES, don't give yourself the green "All Systems are Go." Correct the problem—tape those fins, fix that leak, tumble those tanks, get that good night's sleep, tone down the dive plan, or whatever it is that is required—and <u>then</u>, and only then, make the dive. Remember:

When one of us "buys" it, we all pay.

1. Am I well rested, well nourished, and free from alcohol, drugs, medications, and emotional worries that might impair my performance?
2. Is all of my equipment in proper working order (current hydros, VIP's, overhauls and maintenance, batteries fresh or charged, tanks properly filled, O-rings sound, everything visually inspected and tested, etc.) so that I can have the highest <u>probability</u> of being able to rely on it in an emergency?
3. Is the planned dive well within my personal training, experience, equipment, physical, and mental limitations? Consider:
   a. Line arrangements (integrity, placement, multiple T's or jumps, etc.)
   b. Air planning (taking into account any greater-than-normal hazards such as siphons, silt, restrictions, use of scooters, etc., which would require additional margins of safety more conservative than the bare <u>minimum</u> of 1/3's)
   c. Depth (vs. the intended gas mixture, vs. the complexity of the cave, decompression requirements, oxygen availability, my experience at that depth, my physical condition, etc.)
   d. Duration of lights (primary light[s] carried on my person to exceed the planned <u>or potential</u> [due to time-delaying problems] duration of the dive) and adequate back-ups
   e. Training Limitations (within Cavern or Basic Cave, or Sump or DPV training and experience, etc.)
   f. Silt, Restrictions, Flow, Visibility, Temperature, or other adverse environmental conditions
   g. Anticipated Task-Loading (am I planning in advance to try to do too many things at once or take on too many adverse conditions?)
4. Is the planned dive well within the personal training, experience, equipment, physical, and mental limitations of my buddies, and am I in no way encouraging them to exceed their limitations or instruct them in cave-diving in lieu of their taking a proper comprehensive course under a trained and impartial instructor?
5. Have I practiced all my emergency skills with my buddies recently so that my reflexes—and theirs—will be in good working order?
6. Am I fully committed to the idea of **<u>safety first</u>**, and turning the dive (even at the surface or) at any point before air turnaround if mental, physical, equipment, or environmental conditions deteriorate below acceptable minimums?
7. Can I honestly say that I have used the **<u>best possible judgment</u>** in making this a safe dive?

[POST SCRIPT: I circulated an early draft of this article several months ago amongst our board members and safety and recovery coordinators. Mark Leonard had one of the most profound and searching responses. He asked me if I thought it would really do any good, if it would really make any difference. He said that he honestly believed that each one of the four Full-Cave- or Basic-Cave-certified divers who had recently died while cave diving (i.e., Bill McFaden, Roberta Swicegood, Debi Eaves, and Bill Cronin) would have conscientiously gone through my list of questions and, without hesitation, would have firmly and sincerely answered Yes to every single one of them. I'm afraid he may very well be right. However, I think Dustin Clesi is also right: ". . . if only one untrained, improperly equipped diver heeds the warning that they portend . . . it will have all been worthwhile."]

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