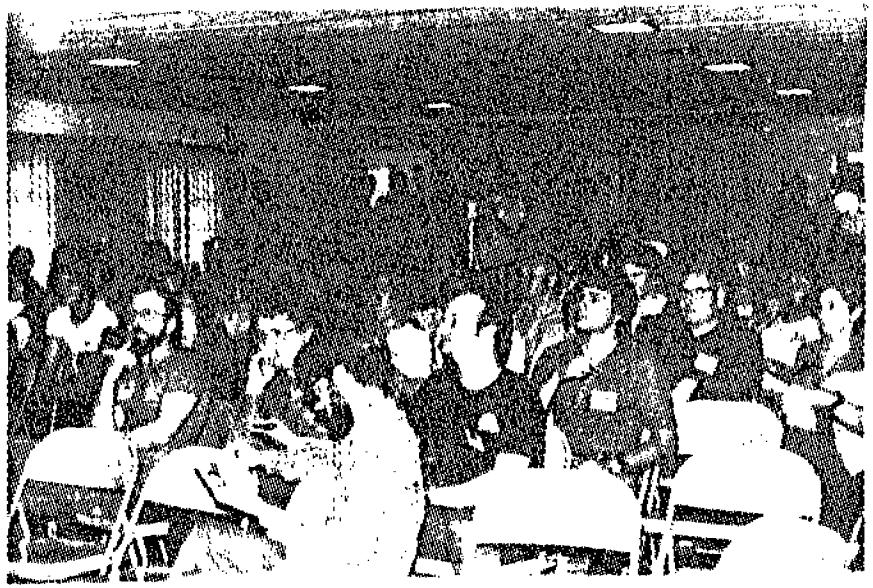


underwater speleology

OFFICIAL NEWSLETTER OF THE CAVE DIVING SECTION OF THE NATIONAL SPELEOLOGICAL SOCIETY vol 7, no 3

UNDERWATER SPELEOLOGY

Published Bi-monthly
Beginning in February
By
The Cave Diving Section of
The National Speleological Society

Membership in the NSS Cave Diving Section is open to any NSS member in good standing who is interested in cave diving and has paid the dues ($3.00 for 1980). Persons not wishing to join may subscribe for $5.00 per year. Checks should be made payable to "NSS Cave Diving Section" and sent to Stephen Maegerlein, P.O. Box 60, Williams, IN 47470.

Deadline is the second Friday of the preceeding month. Send articles and correspondence to the Editor, Gene Melton, P.O. Box 2353, Titusville, FL 32780.

Opinions expressed herein are not necessarily those of the NSS Cave Diving Section.

COVER

The Memorial Day Workshop was well attended. Peter Stace presented an outstanding slide show on cave diving in Australia. It was a pleasure having Peter and Barbra with us. Thanks to Peter and Barbra for sharing with us their country.

EDITORIAL

Support the "Cave Protection Act" by writing your state senator to support senate bill #s-910. For more information write: "Cave Protection Act", c/o Florida State Cave Club, U-Box 6885, Tallahassee FL 32313.

The workshop was a success. However, our endeavor does not go unnoticed when accidents happen. As note in the excerpt from PRESSURE. We must continue our efforts in the education and training of others.

CALENDAR

Oct 18-19	"Fall-out" Indian Springs, Tallahassee, Fla.
Nov 27-30	NSS Instructors Institute, Branford, Fla.
Dec 27-28	CDS Workshop, Branford, Fla.
Jul 12-16 1981	5th International Cave Diving Camp, Branford, Fla.
Jul 18-24 1981	8th International Congress of Speleology, Bowling Green, Ky.

105 divers at workshop

The largest group ever to participate in the cave diving workshop was here in Branford last weekend, as 105 divers gathered at the Branford Woman's Club May 24 and 25.

Mary Ellen Eckhoff, certified cave diving instructor from Live Oak, chaired the workshop.

Students received instruction and update on equipment, saw films on cave diving in the Bahamas and Austraila, heard new theories on Decompression Medicine, and explored a dry cave. Aspects of geology were examined by the cave divers and study was offered in reading of topo maps.

Environmental concerns played a large role in the two-day program, and special emphasis was placed on the impact of phosphate mining on diving in North Florida.

Two cave divers from Australia, Peter and Barbara Stace, were on the workshop agenda with a film of their cave diving adventures at home.

The Cave Diving Section, headed by India Young of Macon, frequent Branford visitor, is an affiliate of the National Speleological Society.

The majority of participants in this weekend's workshop were novices in cave diving.

Worthy of special notice is the second edition of "Basic Cave Diving--a blueprint for survival," an illustrated paperback book by Sheck Exley, published by the National Speleological Society. Proceeds of sale beyond costs are donated to the Cave Diving Section of the society.

Exley of Jacksonville will be remembered as a frequent diving visitor who has engineered a number of rescue/recovery operations in spring caves of this area. His experiences as diver, instructor, and emergency expert are reflected in the pages of the practical book.

The publication is available locally at the Steamboat Restaurant, or by mail at NSS-CDS, 10259 Crystal Springs Rod., Jacksonville, Fl. 3221.

It has been the conditioned habit of cave diving visitors to leave the springs and rivers of our area in better shape than they found them. We are grateful for commerce and educational opportunities they bring, as well as their love for Branford's natural beauty.

FLORIDA DIVING DEATHS

The Morbidity and Mortality Weekly Reports for February 15, 1980 states that there were 34 underwater diving deaths in Florida during 1978. This was up 31% over the 26 reported during 1977. The diagram shows that except for the last four years, fresh water deaths have exceeded salt water deaths, although one tends to think of Florida as a salt water resort area. As is shown, cave diving is a large contributer to fatality statistics, although these figures lessened in recent years. There is an average of 10 cave-diving deaths per year among non-resident divers as compared to 6 among Floridian divers. The recent decline in cave-diving deaths may be due to a statewide publicity campaign concerning the dangers of cave diving. Warning signs at high-risk sites and the fencing off of the most dangerous caves has apparently had an impact.

The vast majority of deaths are due to inexperience and/or carelessness, although occasionally environmental factors or equipment failure are to blame. Only 6% were job-related. (Margaret F. Werts)

Reprinted from the June, 1980 issue of PRESSURE, Newsletter of the Undersea Medical Society, Inc.

SUMP DIVING.....Thomas Cook

Sump diving has been called "dirty cave diving" or mudding. Often sumps are reached only by dragging diving equipment over rocks,through mud and hoisting them up and down drops. If your equipment is still functioning when you reach the terminal siphon* to be entered, you usually then face a narrow, easily silted underwater passage with little current and limited visability. Sump diving is a bit different from cave or spring diving.

Sumps are located inside caves, usually in the nastiest and farthest section of the cave. One of the first problems encountered in sump diving is transporting the needed equipment through the cave and have it arrive at the dive site in some semblance of functioning order. Over the years the Inward Bound Cave Diving Group has tried several methods of reaching this goal. The best method to date involves the use of fiberglas cylinders in which the SCUBA tanks are housed. The wet suits ,if not worn, and or dry suits, which are never worn in a cave, are carried in a back pack. The other diving equipment, mask lights,ect are packed in a fiberglas sledge or other fiberglas container. The instructions for the construction of the SCUBA tank pac can be found in Underwater Speleology,Vol 2,#3,June 1975.

The tank is enclosed in a case called the tank pac, this can be worn by a porter, dragged or hoisted over any obstacle. It may also be worn by the diver during the dive. The pac protects the first stage and valve from damage. Two of these pacs can be hooked together to form a set of doubles. Since there are drain holes a slots for regulator hoses in the pacs water and mud can enter the pac and foul the valve, so a rubber band made out of an inner tube is placed over the valve. The tank pac can take a great deal of manhandling through difficult places without damage to the tank inside. The equipment pac that is used is called a sledge. It is made of fiberglas and is a rectangle in shape. It has a top of heavy pack cloth that is closed by nylon laces. It can be worn like a pack or dragged or hauled by the hauling strap.

The number of porters needed to service one diver depends on the cave configuration. If its mostly walking passage or easy crawl ways, not over a mile long then three porters will usually suffice for one diver. If difficult terrain or long distances are to be encountered, then two additional porters are needed to swap off tank handling jobs and relieve the other porters as needed. Usually such cannon fodder can be found in local caving grottos. Those keen bright eyed novices who are chomping at the bit to go caving and are willing to do anything to get in on a cave trip, even to drag a SCUBA tank through a 1100 ft crawl way with bearly enough height to keep their chins out of the mud.

* The term terminal siphon is used as this is what the cave feature is labled on a cave map. If a diver pushes the siphon and comes up in a air passage, then it becomes a sump.

In some cases such as Single-X cave in New York, the cave passage was so difficult that three different shifts of porters were used to support one sump diver. The second crew took the equipment up the hill to the cave entrance, the first team then took the equipment into the cave and left it at the sump. Three hours later the second team and the diver went into the cave to dive the sump.Six hours after the divers went in the cave the third crew went in to bring the gear out. This all took about sixteen hours.

When designing such a trip it is usually best to leave the timing and make up of the porter crews to the caver in charge as he will usually have more knowledge of the cave and the abilities of his people than you do.

Before a cave diver takes on a sump he or she should sit down with some of the local cavers who are familiar with the area and the cave and discuss it. By viewing a map of the cave and questioning the cavers one can get a pretty good idea as to what to expect in caving and diving. It is also a very good idea to make a recon trip through the cave to get a first hand look at the sump. Many times the cavers in the area are well versed in the local geology and can pretty much tell you what you can expect in and out of the water. They usually do not notice things like flow rates or the amount of silt in the water. It does seem that many cavers harbor one fanatical thought, that just beyound the sump lies a huge trunk passage that will make all the other caves in the area look like cracks in a sidewalk. If for some unforgivable reason you don't find it, they,the cavers, are convinced that you did not go far enough and then make plans to mount another diving expedition.

The structural make up of the sump will determine the type of equipment and techniques to be used. For this reason it is advisable for the diver to make a recon trip to the sump before the actual dive. Cavers perception of dive conditions and suitable staging areas is somewhat strange at times. Because I did not make a recon trip I have had to suit up in some weird places such as hanging on a cable ladder in a shaft twenty feet above the sump and on my back in a passage with a vertical relief of 24 inches.

A point to keep in mind is, is the sump a resurgence, a insurgence or stagnate? If it is a insurgence then plans would call for keeping as many of the porters out of the stream passage as possible and establishing a staging area (suit up area) where alot of movement won't silt up the water. A resurgence is not a problem, some resurgences with little flow may be trenched thereby increasing the flow, and maybe doing away with your dive. Moving a few rocks sometimes makes quite a difference between silt hanging in the water and it clearing up quickly. A stagnate sump is a problem if it can not be trenched as silt will hang in the passage the entire dive, also this kind of sump tends to have deep accumulations of fine billowy silt the kind that is very easy to stir up and takes a long time to settle out. An insurging sump means that silt will preceed your dive but your exit visibility will be better. In a resurging sump your entrance dive will have good visibility,but you may have poorer visibility on the exit run. Of course factors such as current, passage structure and your speed will determin your visibility conditions. It is not uncommon to exit under zero visibility conditions, silt techniques are fine if you have room to use them. Good cave diving technique is still the best anwser to combating the problem of silt,but there are other factors to take into consideration when faced with diving a constricted sump.

If the sump has tight sides or the vertical distance is a yard or less, then you may not need flippers or a B.C. as you may be doing the dive on your hands and knees. In many cases if you are diving a narrow sump you will stir up the silt and exit with zero visibility a lot of time there is no other way.

If you plan to dive a sump and have not expe ienced silt in cave diving it would be in your favor to practice diving in silt out conditions in a lake, under ledges to get the feel of it. In such conditions it is wise for the diver to be slightly positive and work the ceiling in and out and keep the line up against the ceiling. By not wearing flippers or cut off flippers and pulling oneself along the ceiling the tendency to stir up silt is minimized. Staying on the ceiling is also comforting while exiting through a silt out, at least you know where one wall is as you follow the line out. Of course if you harpen upon a large sump then you would outfit yourself with full sump diving gear.

Equipment for sump diving is a little specialized. Helmets are usually worn, with low visibility it is easy to hit ones head on various unseen objects. They are also handy in underwater mapping. Most underwater helmets have lights on them. A plan for making a inexpensive underwater helmet can be found in the El Cheapo Book Of Home Brewed Cave Diving Equipment,(now who in the world would ever lay a title like that on a book).

Speaking of lights in sump diving super duper 100,000cp nova beamers are not needed. A small compact 30-50,000cp light is enough. The lower the light power the less light that will be reflected by the silt. It should be noted that in cedar water or water with high mineral content, as found in the Greenville Marble caves of New Your, the tungsten sealed beams that are used for most lights will be absorbed by the colored water so that even the most bright light will appear as only a dull red glow. For this type of water quartz lights are needed. The large battery cases that are hung from the belt are discouraged. Not only are they to large and fragile to haul through a cave but they get in the way at close quarters in a constricted sump. The golden rule of sump diving equipment is have nothing hanging from you that could get caught or stir up silt. A self contained light is much better. Always remember when packing a dive light to be carried into a cave to disconnect the battery. Carry at least three lights plus a couple of chemical light sticks. I have found it helpful to place a bright light or strobe at the entrance of the sump so in limited visibility you can see home. It is a comfort at times in a particularly difficult dive.

Reels can be a problem at times. I find that a heavy reel made of fiberglas or metal tend to withstand the rigors of transportation better then the plexiglas kind. The Forrest reel which is non jamming is plexiglas but is very rugged. In sump diving a 1/8 in line is used with limited visibility it is difficult to see the line so you must be able to feel it with mitts on and a 1/16 line is difficult to feel. Also the thinner line tends to get cut through quicker then the heave line. Braided line is perfered to a sheaf line as it is tougher. Usually lines are not tied off to projections, projections tend to be sharp and the act of tying a line off might create unneeded silt. Jump lines are almost never used as sumps tend to be single passages.

The trouble with using a 1/8 inch line is that it takes a larger reel to hold as much as a reel with 1/16 inch line. So you either have to have a larger reel or use less line which means you have to shorten your dive or take a couple of reels. Most of the time only one reel is needed. If you are using two reels and must tie one off on to the other then tie a small strobe onto the tie off also,this is of help on the way out in low visibility conditions.

Your wet suit should have elbow and knee pads, an 1/8 inch thick. A pocket for a flashlight on the thigh is also a good idea. Everything should be stuck in your suit some place; nothing should be hanging from you. A good idea I got from Rick Rigg is to make a sump diving vest. He used a war surplus 40mm gernade ammo vest. I made mine out of heavy nylon cloth and put in two big pockets and elastic straps to hold various items. The vest can be worn over or under the horsecollar BC,but we are tending towards back inflators or BC vests. So the sump vest is worn under the straps of a back mounted BC and under the BC vests. On some of the BC vests there is room enough to add pockets and straps and such. Remember try to stay streamlined.

If the cave is not cold, then you may not want to wear your wetsuit in the cave while going to the sump. If you have to travle through alot of water or are in a northern or western cave then you may want to wear your wetsuit bottoms and boots and carry your top. If your from Fla. then everything will be cold to you.I strongly advise everyone not to wear a dry suit in a cave, if you must wear one on the dive then carry it in a pack and put it on in the staging area. Remember wet suits are made to swim in and not walk in.

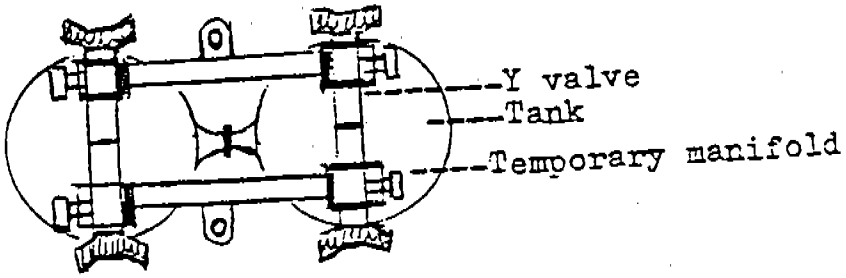
Guages should be all together in a protective case, they can easily be scratched into unreadability after only a few encounters with some hungery rocks. I've had them catch on projections and one was ripped off my arm. By placing them all on a guage carrier they can be easily shifted from one place to another as the situation dictates. My own guages are in a neoprean forarm band which is strapped to my arm with velcro, it also carries my little knife. All guages should have as big a face as possible uncluttered with needless signs,colors or other cute but usless things and have a glow in the dark background.

Chemical light sticks are always handy to have around. I have made a fiberglas case that holds three of them. At the end of a stick is a hole, by putting a large rubber band through the hole the stick can be attached to important reference points with a post hitch. Over the years these lights have had their light output increased. One must remember though that there is no way to tell how good the light stick is until you use it, so carry more then one.

Talking about light visibility and so forth the brighter you are underwater the more visible you will be to your diving partners. For example bright paint or strips on your flipper will enable the person behind you to keep track of your flippers and not get his mask kicked off. A gaudy coloron your tank will also help others keep track of you.

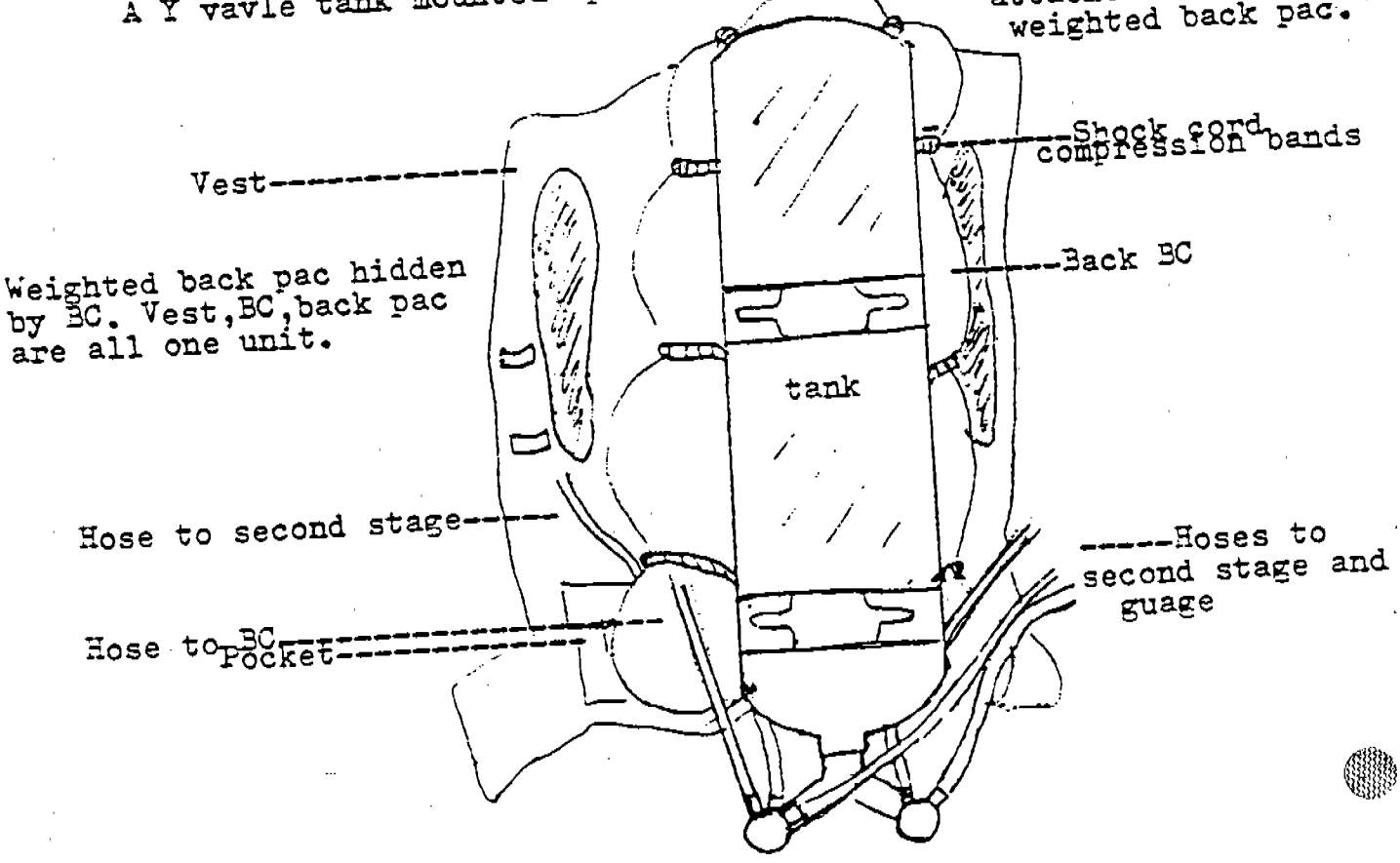
A new feature that has come out on the market is the Y valve. This valve lets you attach two independent first stages to a single tank. If one regulator freeflows you turn it off on the valve and switch over to the other regulator.This is a great safety step forward for single tank diving.To be able to turn the valves off by yourself you have to wear your tank upside down, that is valve side down. Play with the placement of the tank in your backpack until you can easily turn the valves off. Wearing the tank upside down,considered in some circles of heavy water divers and mud pushers as the only way to wear a tank, will mean that you will have to use longer hoses for your BC and second stages if you are not already using the four and five foot regulator

Uses of the Y valve tank



Two Y valve tanks hooked together with two temporary manifolds

A Y vavle tank mounted upside down on a back mounted BC with attached vest and weighted back pac.



hoses that are standard in cave diving. Wearing the tank upside down also gives you about another two more feet for the buddy hose. In a constricted sump it is usual for only one person it fit in a passage at a time. If you have to furnish air to someone they will not be able to swim out of the cave next to you but must be behind you. For that reason make sure your hoses are long enough and your flippers are marked in bright colors.

One of the problems,from a safety stand point, is that it is very difficult to talk, bribe or otherwise coerce enough cavers to carry equipment for a three or two man dive team.In a sump dive two divers is adequate but one is usually the reality. If the sump is large then both divers will go in. If the sump is thought to be particulary arduous then only one diver will make the dive. The second diver will act as the safety diver.At a prearranged time if the sump diver is not out the safety diver goes in after him. If the sump diver gets in trouble he waits for the safety diver to to assist him. If you expect difficulties in the sump discuss them with your safety diver and determine what you two are going to do when and if certain situations arise. In one sump the safety diver was to pull me out by my feet if I did not come out on time. The safety diver came in gave a tug signal on my foot and pulled me out of the sump by my feet.It's easy to get stuck when you can't see where you are going.

Conditions may dictate that there will be only one diver in the party, such as a mass desertion of porters when they see your diving equipment in the car. In this case the diver should recon the sump before the dive and decide what he will need and develop a dive plan. During the dive the solo diver should abort the dive at the first sign of equipment failure, dangerous environmental conditions or just a bad feeling about the dive. A solo dive is timed at the staging area and after a rearranged time and the solo diver does not return a caver is sent out to contact the area NCRC cave rescue coordinator.

If you are on a timed dive and just by the luck of the gods you do find the mythological trunk passage of cavers dreams, don't go running down miles of virgin passage. Take some bearings check your watch and go as far as you can,but leave yourself adequate time to return to the staging area on time. Don't forget to make a sketch of the new area and put in some bearings.

There is a method of sump diving called"worming". This technique consists of crawling on ones stomach through a narrow sump. Underwater earth moving is usually required. In this type of operation the diver does not expect to see anything. The diver has to be careful not to stir up so much mud that his second stages will clog, this has happened to me in a waterfall sump in Vermont. When one is going to worm, all loose equipment is taken off or fastened down. Flippers and a BC are not used,and the weight belt is sealed closed. Nothing is left projecting that could hang a diver up. This type of sump can be entered head or feet first. If a diver goes in head first and gets in trouble the back up diver goes in and pulls the "wormer" out after a set time has passed. Most of the time "worming" is done by entering the sump feet first. Movement is accomplished by slithering backwards. You cannot imagine how much information

your feet can tell you. If a wormer gets stuck in this position it is much easier for the back up diver to communicate with him and also pull him out. If a wormer gets into difficulty in this position he can usually get free as his arms are free. Worming should not be done solo, this is a two person operation. This type of sump diving(?) is not recommended for those who don't like tight places or those who like to see where they are going.

Recently a new technique for entering swift insurgences was successfully executed,(the technique that is, and not the divers who thought it up. It is based on our white water recovery tecnique. A nylon rope 3/8 inch or better is fed into the insurgence . The divers wear a Willans seat harness and a connecting chest harness. Two jumars are used to fasten the diver to the rope. One jumar is connected to the seat harness by a piece of webbing about a foot long. The other jumar is attached to the chest harness by a shorter piece of webbing, and has a piece of webbing running down the leg and tied to a foot. The jumars control the rate of decent and enable the diver to clime back up the rope on ascent. The jumar on the seat harness is a safety, the jumar on the chest harness and attached to the foot is used for ascending.

Going into a insurgance divers get knocked around but on the exit run you usually have better control. Wear a helmet. I would not recommend this to anybody who is not completly at home with this equipment and has not practiced this technique to near perfection in swift water before attempting it in a cave. Also remember to tie a large knot at the end of the rope you put in the water you don't want to come off the end of it.

If after you have read this gibberish of a demented sump diver and you still lean towards self-destruction then seek out other sump divers and ask to participate in one of their dives. If no sump divers are around your neck of the woods, contact the NSS Cave Diving Section or the nearest NSS Grotto and see what they have to offer you. If you go to a grotto meeting look for two or three cavers who are over in a corner apart from the rest of the group. These people should be whispering, drawing on the floor looking a cave maps,ect. These are the real cavers and they are the people to talk to.

Remember common sense is the base line for all planning. Make a recon of the sump prior to diving it and work out a dive plan based on this information ahead of time. Don't forget to check the weather. Don't be afraid to call off a dive any time. I have done this many times when things were not right, of course there was a great gnashing of teeth and aborted attempts on my person by anguished cavers, but all in all,cavers are as demented as sump divers so we all get on pretty well.

Sump diving is not always fun, many times it is alot of work, hard work The tecnical, logistical and environmental problems are many. These things are what makes sump diving interesting. Plus I guess we all share a bit of that illogical dream "Just on the other side is a huge trunk passage, I know it's there"* Well for what ever reason you decide to pursue the dark art of sump diving I hope the past rantings of a gnarled old sump diver who has silt on the brain has been of some help and may the great Hodag have pity on you.

* A direct Quote from a troglodyte engineer.

REQUEST FOR NOMINATIONS OF CDS OFFICERS

The Executive Committee, acting as the Nominations Committee, has nominated the following slate of officers for 1981. The Executive Committee hereby requests Section members to submit additional nominations which they feel would be appropriate. Members are urged to check with their nominee prior to submitting his or her name. Nominations should be submitted to the Section Secretary by November 24, 1980 so that ballots can be prepared and distributed by November 27. The results of the election will be announced at the Section meeting on December 27.

Chairman:	Dennis Williams
Vice-Chairman:	Karen Wark
Secretary:	Mary Ellen Eckhoff
Treasurer:	Steve Maegerlein
Newsletter Editor:	Gene Melton
	John Zumrick

William K. Fehring
Section Secretary
3508 Hollow Oak Place
Brandon, FL 33511

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TIME TO RENEW?

Some readers started receiving Underwater Speleology in the midst of a volume. You can determine when to renew your dues or subscription by examining the top of the address label on this issue. If the top line of the label reads 7-3, then volume 7, issue 3 is your last issue. Send your dues ($3.00) or subscription ($5.00) to Stephen Maegerlein, Treasurer. Remember, you must be a current NSS member in order to be a member of the NSS Cave Diving Section.

Some of you will find an "*" after the volume-issue number on the address label. That means the Cave Diving Section will represent you at the 1981 NSS Congress of Grottos. Write to Bill Fehring, Secretary, if you want to change your status.