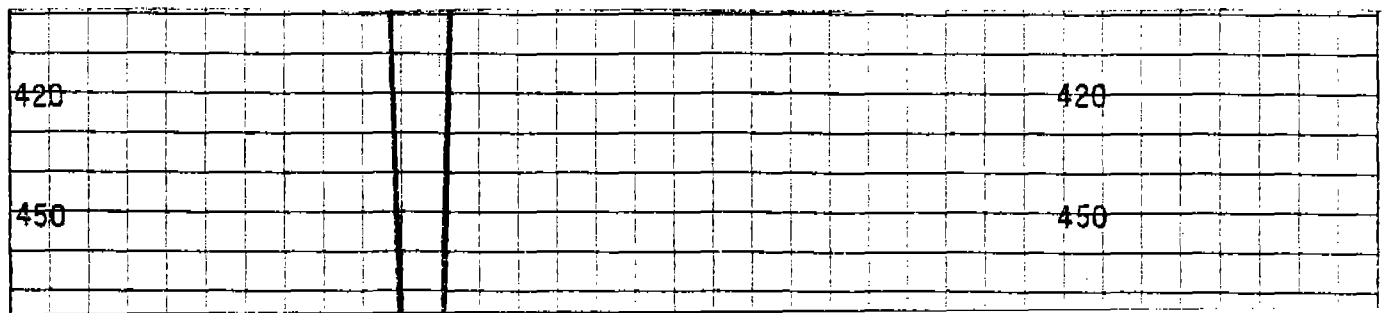




UNDERWATER SPELEOLOGY

OFFICIAL NEWSLETTER OF THE CAVE DIVING SECTION OF THE NATIONAL
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UNDERWATER SPELEOLOGY

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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 that is interested in cave diving and has paid the dues (\$3.00 for 1976). 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 Steve Magerlein, Rt. 14, Box 17, Bloomington, IN 47401.

Deadline is the second Friday of the preceeding month. Send articles and correspondence to the Editor, Sheck Exley, 1591 S. Lane Ave., Apt. 118C, Jacksonville, FL 32210.

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

CALENDAR

- July, 1977: Cave Diving Session and Annual Section Meeting at NSS Convention, Alpena, Michigan.
- Sept. 6-9, 1977: 3rd International Cave Diving Camp, Bristol, Great Britain. (This is just before the 7th International Speleological Congress - contact B.E.C. Travel Limited, 63 Dun Keld Road, Ecclesall, Sheffield, S11 9HN England.)
- 1979: 4th International Cave Diving Camp, Mexico. (Contact Eduardo Castro Ruiz, Cerro de Tezonco 117, Mexico, 21 D.F.)

FLORIDA CAVES TO CLOSE

The owners of Peacock Springs, the Cattle Breeder's Ass'n. of Lake City, Florida, has announced that the property is to be closed this fall. It will subsequently be sold as 20 one-acre lots priced at \$20,000 each with a 99-year lease on the rest of the tract.

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COVER

This month's strange-looking cover is inspired by the depth recorder chart of the *Reef Raider II* from a recent trip off of St. Augustine, Florida, in the Atlantic Ocean. See page 40.

COW SPRING TO CLOSE

The new owner of Cow Springs in Suwannee County, Florida, reknown as one of the more picturesque sinks in the area, has indicated to the editor that he will close the property by fall, 1977. Experienced cave divers may be permitted continued access through a system of signed waivers, however.

NACD SEMINAR CANCELLED

Due to circumstances beyond their control, NACD was forced to cancel this year's cave diving seminar for the first time in nine years. It seems that the host hotel, the Fairmont of Atlanta, tried to force upon them a \$5,000 guarantee at the last moment. With preregistrations 'way under what they normally are, the sponsors wisely decided it wasn't worth the gamble.

NEW MEMBERS - ADDRESS CHANGES

Kenneth E. Hillier, 7854 Old Kings Rd. S., Jacksonville, FL 32217

Mark Leonard, 1301 NE St., Richmond, IN 47374

Robert G. Ledbetter, 3802 Monte Vista Pl., Alexandria, VA 22309

Robert Goodman, 2214 Oxford Rd., Tallahassee, FL 32304

Rallin L. Peck, Box 9560 D-1, Ft. Gordon, GA 30905.

Thomas Cook, NCRC National Diving Officer, Box 216, Mt. Sunapee, NH 03772

"DIVE LOG" BACK BY POPULAR DEMAND

Starting next issue this column will return with news of our members.
CDS NEWSLETTER, August 1976

REPORT ON 1976 CAVE DIVING SESSION: MORGANTOWN, WEST VIRGINIA
JUNE 29, 1976

The Cave Diving Session of the NSS Convention was held at the West Virginia University indoor pool at 2:00 PM Tuesday afternoon, June 29. Surprisingly, almost 300 persons were in attendance, and the Morgantown newspaper also covered the event.

The acting chairman, Sheck Exley, opened the Session with remarks regarding safety precautions taken during the Florida style of diving in clear, warm, completely submerged caves, as well as demonstrating the equipment used. Next, Tom Cook (acting vice chairman) spoke on the peculiar problems presented in diving through sumps to explore more "dry" cave, including his famous "cave pacs" (fiberglass protective transport cases for tanks and regulators - see vol. 2, no. 3 of *Underwater Speleology*, pp. 14,17-18). Both sets of equipment were set out on the pool deck for inspection by interested persons.

Jim Storey, past chairman of the Section, talked about some general problems encountered as well as what steps cavers should take to safely begin cave diving. Finally, Sheck closed with a presentation of Ned DeLoach's fabulous slides on Florida's Peacock Springs Cave System and invited everyone to hear Tom Cook's talk on "Cave Diving In The Northeast Region" Friday afternoon during the Safety and Techniques Session.

The subsequent practical session, closely supervised by Section members, involved running a controlled obstacle course under simulated cave conditions. This included general scuba practice as well as following a guideline through a plastic garbage can with the bottom cut out (making it necessary to remove tanks and push them ahead to continue). Jim Storey came up with the idea of using a fifty-foot roll of ten-foot-wide black polyethylene sheet to construct a mock cave conduit three feet high and four feet wide with the help of lane marking floats, lead weights, nylon string and lots of duct tape. This proved to be an excellent simulation and even added an extra dimension for the practicing diver - the cave walls pulsed as one moved through! A few hardy souls elected to free dive "Cook's Cave" (alias "Storey's Sump"), holding their breath, but we suspect this was only because they could escape through the flimsy "ceiling" or under the sides at any point...it's definitely *not* recommended for real cave sumps!

All in all the Session was quite a success, thanks in no small part to the preparations of Tom and the help of Jim and other Section members. A special word of thanks go to the WVU swimming coach, pool superintendant, NSS Convention staff and NSS members who supported us with their interested presence.

Plans have already started on the Cave Diving Session for next year's NSS Convention in Michigan. Doug Carter has located a spring nearby as well as a sump in Little Stream Cave, and of course Lake Superior is famous for its many excellent shipwrecks, which present conditions not unlike those we find in underwater caves... and let's not forget that this is the home state of one of our members, Terry "Flooded Mine" More! Anyone with any ideas please contact Tom Cook.

See y'all next year!

THE INFLATABLE DRY SUIT

(HOW TO CAVE DIVE WITHOUT GETTING WET)

by Terry More
NSS 15798

To be dry is to be warm and for the cave diver north of the Mason and Dixon Line or for my southern friends making dives with long exposures, the variable volume dry suit is not a luxury but a required piece of equipment. The dry suit makes diving in cold water at least bearable if not actually comfortable. With a dry suit longer bottom times are possible, air consumption is reduced and decompression is no longer a teeth-chattering experience. The dread of that inevitable trickle of cold water down the spine is history. And oh, how wonderful it is to fall into 38° F water without the fear of instant cardiac arrest.

I am completely sold on the dry suit and hopefully, I can be of some assistance to those readers who are contemplating making the switch. I will limit the following discussion to only those dry suits with which I am personally familiar: the Unisuit, the Imperial Bubble Suit and the O'Neill Supersuit. All are one piece suits made of 1/4 inch closed-cell neoprene rubber with watertight seals at the face and wrists (as is the case with the Unisuit) or sealing cuffs at the wrists, ankles and neck (Supersuit and Bubble Suit). For a side by side comparison of dry suits currently on the market see *Skin Diver*.¹

My experience with the Unisuit is very limited. I have not used the Unisuit on a cave dive nor do I know anyone who has. European cave divers, however, have made some rather spectacular cave dives using this suit, so apparently it can be used successfully.² Open water divers almost universally praise the Unisuit and for sheer warmth it is unsurpassed. It is also, however, more bulky than other dry suits and thus makes long swims fatiguing. In addition, the price is considerably higher than most of its competitors.

I personally own the Imperial Bubble Suit. I chose the Bubble Suit because it is the brand available in my area and not because it offered any special advantages over another make. The O'Neill Supersuit is comparable design-wise to the Bubble Suit. However, the workmanship and materials of the Supersuit seem to be of higher quality, as is the price.

I have used the Bubble Suit in water as cold as 34° F and as deep as 200 feet. By itself, a dry suit does not offer much more thermal protection than a conventional wet suit and normally in water colder than 60° F I wear wool long underwear and a 1/4 inch shorty neoprene vest in addition to the suit, gloves and wetsuit boots. With this additional protection a dive to 150 feet in 38° F water with a bottom time of 40 minutes plus decompression is easily tolerated. At 46° F and 150 feet, bottom times of 50 minutes are quite comfortable and in water warmer than 50° F, cold is not really a problem. As is the case with a wet suit, the neoprene is compressed with depth and thus its insulating properties are reduced. On shallow dives or at decompression in cold water, where suit compression is not a problem, much longer exposures are possible. The hands and feet still get cold but the body stays warm and comfortable. The Bubble Suit is very comfortable to wear, it is less restricting than a wet suit and just as easy to swim, once its idiosyncracies are mastered. Also, because it is a variable-volume suit it can be used for buoyancy control. When used in combination with a buoyancy compensator the cave diver has a completely redundant buoyancy system. In addition, when swimming large volume

tanks at depth, by balancing the buoyancy between the B/C and the suit, the diver can maintain a better center of balance, thus making swimming easier and safer.

A dry suit fits differently than a wet suit. Body fit should be somewhat loose to allow the wearing of thermal underwear, etc. If diving in extremely cold water, the diver might even consider wearing a cheap wet suit under it. However, fit should not be so sloppy that it allows for exaggerated air shifts. The wrist and ankle cuffs must fit tightly to insure a good seal. Attached boots are available and make for a drier suit but for cave diving, where a lot of walking is involved, wet suit boots are probably the wiser choice. Wool socks worn under wet suit boots provide adequate protection against having cold feet. In addition, socks also absorb excess water, preventing it from sloshing around in the boot every time a step is taken. Also, Unisuit gloves are much warmer than regular wet suit mitts and at about the same cost. Because of the high neck, an attached hood is unnecessary, a regular wet suit hood works fine. Knee pads are also a valuable investment.

Inflatable dry suits require air to be introduced into the suit, either orally or by a low pressure inflator hose connected to the regulator. The small amount of air needed (about .2 cubic foot at ambient pressure³) provides both insulation and prevents suit squeeze. This cushion of air can, however, cause trim problems. In a head down configuration air rushes to the feet; when a head up position is taken the air bunches up around the neck and shoulders. It takes several dives to get used to the suit's buoyancy characteristics and it is advisable to make a few open water dives before attempting a cave dive with a dry suit. An automatic inflator is a good addition to any dry suit. It keeps the regulator in the mouth where it belongs, saves time and only requires one hand to operate. I have also found it easier when both the suit and the B/C are used for buoyancy, to completely deflate the suit before leaving the bottom and only use the B/C to make the ascent to the surface. This seems to cut down on the confusion of having to manipulate two separate hoses. One hand is thus free to hold the reel and light while the other hand is used to regulate buoyancy during the ascent.

Maintenance is really no greater than with a wet suit. The zipper should be lubricated with silicone every few dives and make sure the zipper teeth are aligned and not full of sand before closing. I have also found that Weldwood contact cement works better than regular wet suit glue for making repairs.

Normally the corrugated inflator hose is attached to the suit slightly to the left of the center of the chest. When I ordered my suit from Imperial I had the inflator hose moved to the right shoulder. With this arrangement the hose does not interfere with the chest or shoulder straps. In addition, it separates the suit and B/C hoses, thus making identification and use easier. It also places the hose higher on the suit and deflation is more rapid. I also replaced the 7 inch corrugated hose, which comes with the suit, with an 18 inch B/C hose.⁴ Another modification was the substitution of a Scubapro extra long low pressure hose, for the standard automatic inflator hose.⁵ The extra 5.5 inches this hose provides plus the extra length of the longer corrugated B/C hose makes the inflator much easier to operate.

Dry suits also have their disadvantages. Probably the biggest drawback is the expense. They are expensive, retail prices range from around \$300 to up-

wards of \$600. A dry suit is also somewhat more difficult to put on and most require the help of a buddy to zip up. Many divers complain that the neck is restricting, especially when in a heads up position, and the air bunches up around the neck and shoulders. Dry suits also require more weight than a wet suit. I need 14 additional pounds to be neutral at 10 feet with double 72's. I personally do not like to wear a weight belt so I have mounted a 16 pound lead weight between my tanks. Out of the water a dry suit is hot and heat prostration can be a problem, so do not attempt any long hikes on hot humid days.⁶ Conversely, on cold days they provide excellent exposure protection during the pre- and post-dive periods.

There is another problem requiring serious consideration which I almost hate to even mention. Believe me though, it is a problem which, when encountered, will truly make you wonder if all those gruesome stories you have read about the bends are really true or if they are just the figment of a vivid imagination. The problem is, what do you do when your bladder is about to burst, your eyeballs are beginning to float and you still have 40 minutes of decompression to complete?

Cave divers, generally, I have found are a rather crude bunch and not at all mindful of temporarily converting a cold wet suit to a naturally heated hot water system. However, the thought of turning a dry suit into a wet suit is another situation altogether. My only advice is, plan ahead, suffer in silence or.....

Whoops, I have got to go, I think I just heard the washing machine shut off.

Footnotes

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2. "Longest Cave Dives," *Underwater Speleology*, vol 1, no. 5 (fall, 1974), p. 28.
3. *U.S. Navy Diving Manual*, vol. 1, "Air Diving," Sept. 1973, chapter 5, p. 13.
4. Berry Distributors, 6059 W. Addison St., Chicago, IL 60634, Seatec B/C hose, Catalog no. HA400, price \$3.99.
5. Scubapro Extra Long Low Pressure Hose, Catalog no. 562-40.
6. Exley, Sheck, "Summer Trip Report," *Underwater Speleology*, vol. 2, no. 5 (Fall, 1975), p. 38.

Additional Reading

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2. McKenney, Jack, "The O'Neill Supersuit," *Skin Diver Magazine*, vol. 23, no. 8 (August, 1974), pp. 30-31, 36.
3. *The NOAA Diving Manual*, "Sec. 4.8.4. Variable-Volume Dry Suit," pp. 4-25 to 4-26.

RED SNAPPER SINK

by Sheck Exley
NSS 13146

Unlike the sink- and spring-pocked west coast of Florida,¹ the ocean bottom off the northeastern coast of that state is a flat, rather featureless sand-covered plain that slopes gently out to the edge of the continental shelf many miles from shore. The water is too cool for the fabulous coral reefs of waters farther south. As a result, the fish congregate around any shelter-providing feature no matter how insignificant - usually a three-foot-high ledge or broken-up shipwreck.

In 1962, the skipper of a St. Augustine commercial snapper boat was idly chugging along an 85-foot-deep section of this sandy plain, carefully watching his electronic depth sounder for the short jag that identifies one of those small ledges. Leaning back in his chair with his feet propped up on the counter, a cigar dangling out of one side of his mouth and an open beer can in one hand, he probably bore a close resemblance to Robert Shaw as Quint, the hardened sea captain in the film *Jaws*. Suddenly the line on the depth sounder jagged...and jagged...and JAGGED...right on out of sight!

"My gawd..." The cigar fell to the cabin deck as the captain gaped at his instrument, and beer sloshed out of the can as his feet came off the counter. Within the next few hours the skipper and his crew caught an incredible 6000 lbs. of snapper from the "bottomless" hole in the bottom of the sea. But, as luck would have it, a storm suddenly came up and drove him away from the hole before he could get an accurate "fix" on its location. Returning to shore, one can imagine the disbelieving stares and guffaws that greeted the fisherman's tale.

However, it's hard to argue with a boat load of fish, so the search was on to rediscover the "bottomless hole." Finally, in 1968 another, loran-equipped snapper boat rediscovered the hole and got a position. If the hole, now called Red Snapper Sink, had been a wrecked galleon loaded with Spanish gold, that position could not have been a more closely-guarded secret. In the next two years an estimated 168,000 lbs.² of snapper were removed from the sink by the close-knit group of fishermen.

In 1970 one of the fishermen returned with several skeptical USGS geologists who sounded the hole and collected water and sediment from the 465-foot level.³ The account in the *Jacksonville Journal* mentioned that the scientists moved over just a few feet from this point and were unable to hit anything with an electronic sounder with a 600-foot range! During this time Bob Hill, a diver from Melbourne, Florida, descended to a water depth of 315 feet, reporting a steep slope from 88 feet to 150 feet, then a precipitous drop to the bottom, broken only by a few narrow ledges.⁴

Within a very short time, most of Florida's cave divers had heard of Red Snapper Sink and were trying to make arrangements to "check it out." Irwin Strickland, a long-time cave diver no longer active, made a dive to 300 feet and reported an undercutting wall typical of Florida's inland sinkholes but

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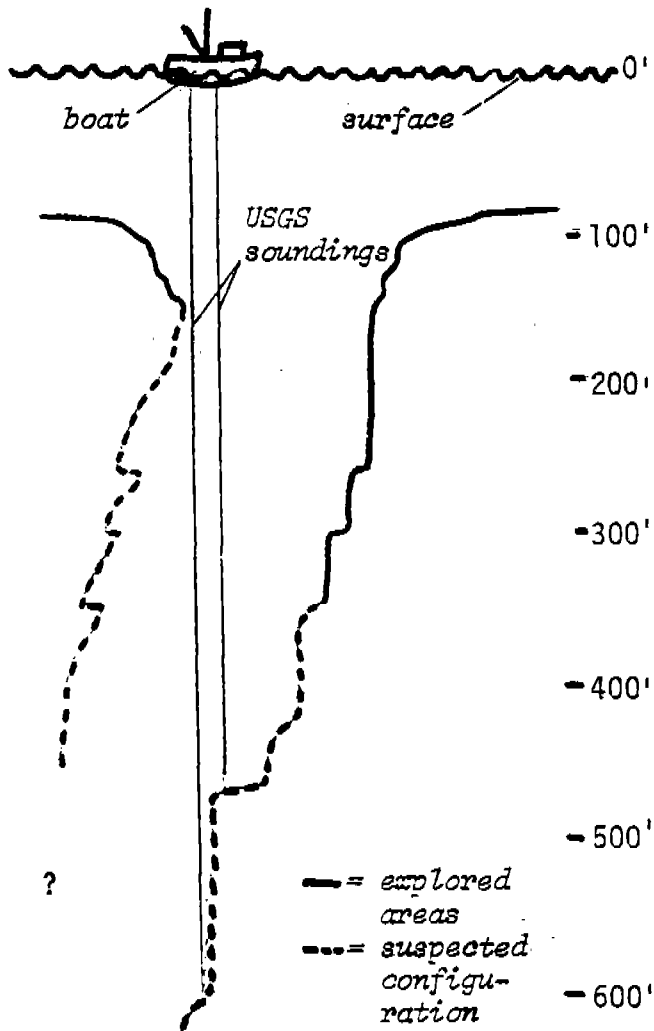


fig.- PROFILE OF RED SNAPPER SINK

all of our charter money back. This was too good an opportunity to pass up, so bright and early that morning Ed Hall, Ed Kalakauskis and new Section member Ken Hillier and I loaded onto Vic's boat and headed out of the mouth of the St. John's River on the long 3-4 hour trip to the sink. Upon arriving in the area, Vic set the *Reef Raider II* on a slow spiralling course to search for the sink.

Finding a 125-foot-diameter hole in the bottom of the Atlantic some 30 miles from land is no easy feat even with the most sophisticated navigational equipment, so I was shocked when, within 15 minutes of beginning our search, Ed Hall's deep, booming voice suddenly interrupted our conversation with "I believe that's it!" Instantly our eyes were riveted on the depth chart. There is a strange thrill that one experiences when that monotonously flat line abruptly dips down out of sight. People instantly run to the sides of the boat and stare downward, trying to pierce the deep, clear blue water with their eyes to see what lies below.

Vic set the anchor in the hole itself, then the four of us splashed into the water fully outfitted for cave diving - double tanks, lights, reel and all. I had vaguely expected a sort of marine Zuber Sink - dark, featureless walls in a murky green haze, with horizontal visibility 20 to 40 feet. I

of course on a much larger magnitude.⁵ Another group from Daytona Beach managed to find the sink and spent an exhilarating afternoon spearing the large, unafraid fish that congregate there.⁶

Perhaps as a result of the spearfishing episode, but probably the result of their naturally clannish, secretive attitude, the word among the snapper boats was quickly out: no trips for skindivers. In 1974 a group left Jacksonville, complete with TV crew and newspaper coverage, only to return seasick and without finding anything. Last winter a very reluctant snapper boat consented to take yours truly out on a similar all-day "ride" ("Sorry we couldn't find it, fellers, but thanks a lot for the money") that must have looked everywhere except in the right place.

Finally, on July 24th we finally hit paydirt. The *Reef Raider II*, captained by champion spearfisherman Vic Lloyd, had located the sink, obtained a "fix" on the location with his sophisticated LORAN, and promised to put us on the sink or give us

was amazed at what we actually found as we pulled our way down that swaying anchor line... clear blue water with visibility in excess of 80 feet down to a thermocline at 60 feet, then cooler, 72° F water with 60 foot visibs the rest of the way down. Everywhere I looked were large schools of big, curious fish - jack, spadefish, grouper, snapper, barracuda. Apparently the spearfishing episode had not yet had any impact on the demeanor of the fish. Around the lip of the sink were hundreds of large sea shells of various descriptions. Apparently some of these had washed out of the sediment, for Charlotte Lloyd, the skipper's wife and a reknowned skindiver in her own right, indicated to us after the dive how some of them were starting to show signs of permineralization.

The closest thing I can relate to in describing the actual sensations of diving into the hole is a Caribbean wall dive, only Red Snapper Sink, being a totally enclosed wall, is better. True, the walls of the sink did not sport the plush gorgonians and black coral of the warmer waters, but they did have a scenery all their own. My quartz light (55 W) revealed splashes of vivid reds, oranges and yellows from the encrustations at all depths. Our use of a guideline and reel proved to be quite unnecessary since there was more than enough natural light to keep track of each other during the dive. I suspect that on this day a deep submersible would have been able to see daylight coming down from the 500-foot-level!

Our dive, which was on the east (seaward) wall of the sink, mirrored the findings by Bob Hill : a series of ledges during our descent brought us closer to the center of the hole. This suggests that the 465-foot mechanical sounding reported landed on a similar but unseen ledge far below, while the deeper (600-foot-plus) shot missed the ledge and plummeted down into even deeper water (see profile on page 41). Further, the fact that we failed to observe the opposite wall at any point during our dive (since we descended at least 40 feet away from the west wall we could have spotted the east wall if it had come as close as 100 feet from the opposite side) lends credence to Irwin Stickland's report and suspicions by Dr. Warren Leve of the USGS ⁷ of an overhanging wall on the opposite side. One of the more interesting aspects of this is that, if the depth of the hole directly below the eastern lip exceeds 736 feet, then Red Snapper would supplant Fantastic Pit in Ellison's Cave, Georgia, as the deepest vertical cave pit in the U.S. ⁸

The only other known feature even remotely similar to Red Snapper Sink in the area is Crescent Beach Spring, a submarine spring due east of the sink and some 3 miles offshore. A photograph of the large "slick" over the 135-foot-deep spring is shown on p. 10 of *Springs of Florida*.⁹ This slick, stories of Spanish pirates replenishing their supplies of drinking water there, and some very crude outflow velocity measurements, led Dr. H.K. Brooks of the University of Florida to estimate the outflow at the awesome figure of 1500 cfs, larger than any other Florida spring.¹⁰ However, since that time more accurate measurements by Dr. Brooks have revised the figure considerably downward to 40 cfs¹¹ and ascribed the 70-foot-diameter slick to the violent mixing of fresh and salt water. This mixing keeps sediment suspended in the water at all times and makes visibility very poor at all depths. The water emerges from an unpenetrable collapse at the bottom which may have been caused by depth charges detonated during World War II in ef-

forts to destroy the "enemy submarine" causing the slick to appear.¹²

This spring caused the USGS to wonder if Red Snapper were a similar submarine vent. But no evidence of fresh water was found at any depth sampled. However, their expedition did report unusually large amounts of oxygen in the water below 400 feet. This fact, along with our failure to find any additional thermoclines or visibility changes during our dive, suggests that there may be a flow of sea water *into* the sink.

We plan to dive under the overhanging wall (assuming it exists) on a future trip and attempt to lower a sounding line from that point to the bottom to try to obtain a more accurate figure for the total depth of the sink. However, without a major technological breakthrough, there is little chance that humans will be able to examine the bottom of Red Snapper Sink without a deep submersible. Perhaps someday the use of a special submarine similar to the Cousteau "diving saucer" will enable us to discover and explore a huge insurging conduit hundreds of feet beneath this mysterious gaping hole in the bottom of the sea.

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12. Brooks, H.K.- "Geology of Florida," lecture at 3rd Annual NACD Seminar on Cave Diving, High Springs, Florida, May 30, 1970.

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FLORIDA PIT SURVEY

The editor is now compiling a list of the deepest "free-hanging" vertical drops in Florida caves. Thus far the list, to be published in a future issue of *Underwater Speleology*, contains 18 verified pits in excess of 100 feet (not including unchecked sites like Red Snapper).

AMERICAN CAVE DIVING DIRECTORY

by Eduardo Castro Ruiz
Vicechairman, International Cave Diving Commission

During the discussions at the Assembly of the 2nd International Conference of Cave Diving and Rescue Work (Barcelona, 1975), I was appointed to be the Vicechairman of the Commission for Cave Diving during the period 1976-77.

Now, I am compiling the *American Cave Diving Directory* and general information guide of our members in all parts of America and Australia. Below please find a questionnaire covering information for the cave diving directory and for general information. Please fill them out and mail to: Eduardo Castro Ruiz, Cerro de Tezonco 117, Mexico, 21 D.F.

Thank you in advance for your kind attention.

NAME _____ NATIONALITY _____

ADDRESS _____ ZIP _____

COUNTRY _____

SPECIALTY IN CAVE DIVING (MARK WITH "X"):

EXPLORATION _____ RESCUE WORK _____
TRAINING _____
TOPOGRAPHY _____
FILMING AND PHOTOGRAPHY _____
SCIENTIFIC APPLICATION _____ IF YES, WHAT KIND _____

OTHERS _____

GROUP OR SOCIETY YOU ARE AFFILIATED _____

YEARS OF EXPERIENCE IN CAVE DIVING _____

ANY INTERNATIONAL EXPERIENCE (CIRCLE) YES NO

IF YES, WHAT KIND _____

COUNTRY OF EXPERIENCE _____

SIGNATURE _____

