

American Caving Accidents

1980-81

Steve Knutson
Editor

INTRODUCTION

This issue of **American Caving Accidents** is appearing as an insert in the **NSS News** for the first time. This represents a compromise between the notion that it is best to publish for the whole Society and the financial limitations imposed by the current recession. Unfortunately we are forced to make the material fit a given space and must forego any "frivolities." In the future it is planned to do yearly issues as a **News** insert, making the information more timely. If the budget allows we should publish, in book form, 5 year compilations. These could contain various analyses and statistics.

The primary purpose of this publication is to allow cavers to educate themselves on the real hazards of caving through reading accounts of real accidents and incidents. Analyses are also offered but are not meant to be an absolute answer — sometimes they are just speculation based on what facts are known. In any case, use these analyses to make your own interpretation to become a safer caver. Usually the message an accident presents is clear. The difficulty, safety-wise, comes in one's own caving when one must see the potential hazard in a situation and avoid it **before** the accident occurs. Good luck, and remember that the individuals named in these reports are no better or worse than the rest of us — we all make mistakes, but accidents result from only a few of these mistakes.

The amount of information in these reports reflects the material sent to me. Please send, promptly, any clipping, report or article concerning an accident. Even a brief reference to an accident may give enough of a clue to allow me to successfully seek further info. Send to:

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Actually, I include, for their educational value a number of incidents. — accidents that didn't quite come off. Don't be afraid to report any interesting incidents.

Caver-manned rescue squads and the NCRC seem to be asserting themselves more and more but local rescue squads are still getting calls. Efforts should be made to educate these squads on cave rescue whenever possible. Education should also be aimed at the non-organized cavers — they are still getting into more than their share of trouble, with their dim flashlights and knotted ropes. Meanwhile, within the caver community the increased wetsuit caving seems to have increased flooding problems. Perhaps we need to pay more heed to potentially bad weather.

I can't say any more for lack of space but I need to thank all those who sent in material and wrote accident articles or reports. You make this publication possible. So I wish you good caving! And Hey! — **be careful in there.**

Steve Knutson

SAFETY AND THE NATIONAL SPELEOLOGICAL SOCIETY

The National Speleological Society is concerned with the safety of the sport of caving within its membership. On a society-wide basis we have the publication **American Caving Accidents**, the Safety and Techniques Committee and the National Cave Rescue Commission.

The Safety and Techniques Committee, whose present chairman is Allen Padgett, Rt. 3, Cleveland, GA 30528, is dedicated to the sharing of information and experience concerning safe caving methods. Its goal is accident prevention through involvement of responsible cavers throughout the society. The committee is open to anyone willing to help. Material is often published in the **NSS News**. At the annual national convention of the **NSS**, papers are presented on aspects of safety and techniques.

The National Cave Rescue Commission is governed by a board including a National Coordinator and several Regional Coordinators. The organization has garnered expertise in the various specialties of cave rescue. The NCRC can supply rescue teams and expertise as well as coordination via liaison with the United States

Air Force. For this purpose there is a toll-free call number, manned 24 hours a day: 800-850-3051. Be prepared to give your name, phone number, location, nature of the emergency, name and location of the cave, etc.

The NCRC also conducts cave rescue training seminars annually and solicits rescue oriented material for publication. Recently published is the NCRC Handbook of Cave Rescue. For information, write to NCRC % National Speleological Society, Cave Avenue, Huntsville, Alabama 35810.

The **NSS** also has local chapters called grottos which affect cave safety within their memberships by the common practice of holding sessions demonstrating proper safety and techniques. Obviously, a new caver joining a grotto benefits from his observation of safe techniques and practices on caving trips with established members. Also, some grottos have publications which occasionally carry articles with material pertinent to safety.

Chronological List of Accidents (A) and Incidents (I).

CAVE	STATE	TYPE	DATE
Previously unreported 1979			

Jam-up Cave	Missouri	A	Spring
New River Cave	Virginia	A	5-9
Whiting's Neck Cave	W. Virginia	I	11-17
Pig Hole Cave	Virginia	A	12-1

1980:

Fireside Well	Alabama	A	1-12
New River Cave	Virginia	A	1-18
Copeland Cave	Alabama	A	1-20
Not given	Alabama	I	?
Tongue River Cave	Wyoming	A	2-9
Sotano San Agustin	Oaxaca, Mexico	A*	2-16
Cave near Soddy-Daisy	Tennessee	A	3-8
Cave near Allentown	Pennsylvania	A	3-9
Carpenter's Pit	W. Virginia	A	3-9
Hoya de Guapas	Mexico	I	Spring
Vortex Springs	Florida	A	April
Tzitzicazapan	Puebla, Mexico	A	4-4
Tzitzicazapan	Puebla, Mexico	A	4-9
Sinnit Cave	W. Virginia	A	5-10
Church Cave	California	I	5-25
Reeves Cave	Indiana	A	Summer
Carlsbad Caverns	N. Mexico	A	7-18
Sinnit	W. Virginia	A	7-19
Fern Cave	Alabama	I	Summer
Fossil Mtn. Ice Cave	Wyoming	A	7-31
Armuchee Creek Spring	Georgia	A	8-1
Lost Creek Cave	Colorado	A	8-9
Sauta Cave	Alabama	A	8-12
Schofer Cave	Pennsylvania	A	8-15
Snail Shell Cave	Tennessee	A	9-8
Endless Caverns	Virginia	A	10-11
Carlsbad Caverns	N. Mexico	A	10-11
Kingston Saltpeter Cave	Georgia	A	11-8
Lost Cave	N. Mexico	A	11-23
Middle Cave	Indiana	A	Fall
Clarksville	New York	A	12-12
Three Caves	Alabama	A	12-13
Brinegar Cave	Indiana	A	12-22
Cat's Cave	California	A	12-29

1973

Waddel Cave Mississippi 3-24

1981

Pit near San Miguel	Oaxaca, Mexico	A	1-21
Roppel Cave	Kentucky	A	2-15
I-81 Cave	Virginia	A	3-8
Cedar Creek Cave	Tennessee	A	3-11
Lee Cave	Kentucky	A	3-14
Patton Cave	W. Virginia	I	3-16
El Retiro Pit	Guatemala	I	March
Buckner Cave	Indiana	A	Spring
Sullivan Cave	Indiana	A	Spring
Porter's Bluff Cave	Tennessee	I	4-4
Ebenezer Cave	Tennessee	A	4-11
Priest's Cabin Hollow Cave	Minnesota	A	4-12
Cool Springs Cave	Kentucky	A	4-13
Pulley Cave	Tennessee	I	4-19
Clover Hollow Cave	Virginia	I	4-25
Organ Cave	W. Virginia	A	5-2
Nutt Cave	W. Virginia	I	5-16
Devil's Eye Spring	Florida	A	5-23
Sinks of the Roundstone	Kentucky	A	6-6
Cathedral Springs Cave (Robin's Rift)	Virginia	A	6-14
Bigfoot Cave	California	I	7-5
Sloan's Valley Cave	Kentucky	A	7-11
Craddock Springs	Kentucky	I	July
Hell Hole Cave	W. Virginia	A	7-13
Sloan's Valley Cave	Kentucky	A	7-20
San Miguel Island Sea Cave	California	A	7-29
Fulford Cave	Colorado	A	8-22
McFall's Cave	New York	A	9-19
Grassy Cove Saltpeter Cave	Tennessee	A	9-19
Blowing Cave	Alabama	A	9-22
Bull Shoals Lake Cave	Arkansas	A	9-26
Ward-Gregory Cave	New York	I	9-26
Lost Indian Cave	Texas	A	9-27
Fisher Ridge System	Virginia	I	Fall
Lost World Caverns	W. Virginia	I	10-10
McFall's Cave	New York	A	10-10
Trapdoor Cave	Indiana	A	11-28
Clover Hollow Cave	Virginia	A	12-12
Knox County Sinkhole	Tennessee	A	12-21
Santa Fe Blowhole	New Mexico	A	12-28

1981 REPORTS

ACCIDENT: Missouri, Jam-up Cave

Spring, 1979

In the spring of 1979 there was an accident in Jam-up Cave on the Jack's Fork River in Missouri. The injured man was at the bottom of a 30 foot shaft. He was placed in a Stokes litter and a winch cable was attached. A rescuer was also attached to the cable to steady the litter on the way up:

A lift was attempted and had progressed about 12 to 15 feet when the rescuer with the litter signaled for a halt. The litter had become lodged in a crevice. It was freed and there followed a signal for the lift to continue. At this point the head end of the litter broke and the whole litter fell back down, barely missing two rescuers below. The rescuer on the cable was lowered to the bottom, where he rechecked the victim, maintaining an airway. It was then arranged to have enough men brought in to carry the victim out through an alternate passage.

REFERENCE: Don Haldimann *Personal Communication* January 20, 1981.

ANALYSIS: This appears to be the second example in recent years of the power of a winch proving too great for the litter or the hardware attaching it to the winch cable. The problem seems to be that when the litter hangs up on a ledge, or gets caught in a crevice, there is too much delay before the winch can be stopped. The power of the winch thus damages the hung-up litter or its attachment to the cable. The obvious recommendation, I guess, would be that, if a winch must be used, it not be more powerful than the strength of the litter or attachment hardware. It might also be possible, though, to improve signals to the point where there is no delay. At least in this case the victim survived. In the previous one he did not.

ACCIDENT: Virginia, New River Cave

May 19, 1979

At about 2 p.m. on Saturday, May 19, 1979, Scott M. Smith(20) and two companions were exploring in New River Cave in Giles County, Virginia. They were reportedly inexperienced and did not have proper equipment. At about 5 p.m. Smith fell 20 feet from a mudbank and landed on some rocks in a stream. He suffered a gash on his head, between the eyes, where a pointed piece of chert was imbedded. His companions went for help.

At 7 p.m. a Giles County Rescue Squad reached the victim. By that time, with soaked clothes, his body temperature had fallen quite low. The victim was placed in a litter and carried out by members of the VPI Cave Club with GCR members monitoring his condition. The route involved crawlways and both up- and down-climbs. At about 1 a.m. the victim was placed in an ambulance and rushed to Montgomery County Hospital. Surgery was required to remove the rock splinter.

REFERENCE: Edit. "New River Rescue, By the Media" *The Tech Troglodyte* Spring, 1979, p 16-18.

ANALYSIS: The hard mudbanks in caves can be quite steep and tall. Though one can kick small steps in them, for ascent or descent, they offer no purchase if one begins to slide or fall. They thus should be treated like any rock pitch - if a fall would likely result in serious injury, then the climb should be protected by a belay.

INCIDENT: West Virginia, Whiting's Neck Cave

November 17, 1979

On November 17, 1979, four cavers from the Baltimore Grotto, Richard Tretter, George Rickles, Mike Lurz, and Steve Jensen, in the company of four novices visited Whiting's Neck Cave, in the panhandle area of West Virginia. The cave is regarded as easy by cavers.

This group went in the back entrance and proceeded to the 45 foot drop where they rigged a handline, on the left, where the drop is not free. All went down except for Jensen and Rickles.

A that point a second group arrived. This included one "military-type" person who seemed knowledgeable about caving, a rockclimber, and 15 people in their late teens, 7 of whom were deaf. To confuse things further, a third group arrived.

The leader of the second group rigged the drop with goldline, right in the middle where it is 10 feet of free drop and 35 feet at an 80 degree angle. The use of the Bluewater handline of the first group was twice offered but refused. People of the second group started body rappelling down the drop.

The inexperience of the members of the second group was obvious so Jensen yelled down to Lurz to get Tretter, who had gone on ahead. In the next few minutes two girls had fallen, one 20 feet and the other 10 feet. Though both were unhurt they became briefly hysterical. Two others who had also gone down became stranded when they tried to ascend.

The first group decided things had gone far enough. The leader of the second group was instructed to leave the cave, and the situation was organized. Those below were gotten up, the two girls hauled up by brute force. Everyone exited the cave.

REFERENCE: Stephen Jensen *Personal Communication* January 23, 1981.

ANALYSIS: It appears that the "freedom" of the novice group and its leaders was violated. But certainly the novices, at least, did not know what they were getting into and possibly were saved from a serious injury. Such intervention can sometimes be done merely by suggestion, but direct action may often be the only way. I believe these Baltimore Grotto cavers lived up to their responsibilities.

ACCIDENT: Virginia, Pig Hole Cave

December 1, 1979

On Saturday, December 1, 1979, two students from VPI rappelled into the 120 foot entrance pit of Pig Hole Cave in Giles County, Virginia. They were equipped only with flashlights and had not brought ascending gear. They planned to exit through a drain pipe entrance at the back of the cave. The only flaw in this plan was that they did not know the route between the two entrances and had only two flashlights. Pushing on regardless, they explored their way as far as the Mud Bridge before one dropped his flashlight which rolled down into Hess' Hollow. With only one remaining flashlight and two spare batteries they realized the danger of continuing to explore their way along and returned to the entrance pit to await rescue.

That night a caver who had left his gloves in Pig Hole on an earlier trip returned to the area. He apparently heard the stranded cavers yelling and called the Sheriff. The Giles County Rescue Squad was called in and, from the description of the area, correctly presumed the site to be Pig Hole.

The stranded cavers were quickly ascertained to be uninjured and not hypothermic. The rope was not trusted by the rescue squad so they went to the back (drain pipe) entrance, reached the stranded cavers and led them out the same back way.

REFERENCE: Jim Haw "Pig Hole Cave Rescue" *The Tech Troglodyte* Winter, 1980 p 15.

ANALYSIS: Let's face it, when looking for adventure an inexperienced person can conceive of things which turn out to be quite unreasonable. How simple this situation would have been if only the group had had ascending gear or the knowledge of how to make some. As Haw points out, a really knowledgeable caver would have cut off the excess rope at the entrance pit and made himself a rig using, for example, helical knots, which work quite well even when the slings are the same diameter as the main line.

But, ascending gear or not, the trip was ill-conceived. Why not explore in from the back entrance first to be sure of the route? Why no extra lights? Yet another example of cavers outside the organized caving community equipping themselves in a way no organized caver would think proper.

ACCIDENT: Alabama, Fireside Well

January 12, 1980

On January 12, Lona Brown, Beth Maple, Dave Bradford, and Cindi Towle(23) went up to Fireside Well, a 117 foot pit across from Russel Cave in Alabama. At about 2 p.m. they rappelled in and then spent about 15 minutes on the bottom looking around. In exiting Lona Brown went up first followed by Cindi Towle. The rope, a PMI, was rigged from a tree down a steep slope to the breakover which was a rock with a vertical flat face two feet high. Below the breakover the drop was free.

Towle was climbing with two knots attached by slings to her feet and one Jumar attached to her seat harness. She reached this breakover, tucked her feet under her, stood up pushing the Jumar over and sat down, expecting to be supported by the Jumar. Unfortunately she was wearing oversize leather gloves and one of these had caught in the teeth of the Jumar and Towle went right over backwards. The Jumar then hit the top of the knots (ascender or "helical" knots) causing them to lose their grip and she fell free back down the drop. The knot slings were made of Tenstron and quickly melted through. In free-fall, Towle, amazingly enough, did not panic and reacted by trying to slow herself as you would a rappel, by moving the rope below her, around behind. This she did with her right hand. She feels that she also tried to grab the rope with her left hand, and when the hand resisted due to the glove being caught in the Jumar cam, she yanked it, with great force, out of the cam. The Jumar then caught the 7/16 inch PMI and she came to a very sudden stop, 20-30 feet from the floor.

Towle's injuries were light. She had a strained back and right arm and a pressure fracture of one lower vertebra. She was quite shaken. The sheath of the rope had parted where the Jumar caught and had been pulled down some 18 inches on the core. Towle transferred to rappel, freed the Jumar, and rappelled to the floor.

Another rope was rigged and after a couple of hours of regaining her nerve, Towle and the others exited the cave.

REFERENCES: 1) Jim Smith *Personal Communication* February, 1980.

2) Marion Smith *Personal Communication* December 29, 1980.

3) Cindi Coffroth (nee Towle) *Personal Communication* February 18, 1981.

4) Roger Ling "Jumars and Gloves - Unsafe at any Speed?" *S. Mississippi Grotto* Jan-Feb., 1980 p 11.

ANALYSIS: An accident like this is always a cue for some members of the caving community to condemn Jumars, gloves, knots Tenstron, pits and life in general. Certainly, one should always be careful not to let items of clothing, hair, etc., get caught in vertical gear. But there are "ifs" that are appropriate here which we should examine. If the ascending system had been all ascenders or knots which would not release when struck from above, as ascender knots do, then there would have been no accident. If the Jumar had been a knot, presumably, again, no incident would have occurred.

I don't feel that wearing gloves with Jumars is inappropriate. The fact that the glove initiated the accident is immaterial. Many things can cause an ascender to lose its grip. More pertinent is the point that any vertical system must be set up so that, if part of it fails, the caver is still safe. Towle's system was not so constructed.

Another point is the melting of the Tenstron slings. Polypropylene or polyethylene sling material is cheap but has a dangerously low melting point and should not be used in vertical gear.

In the final analysis, though, it is Towle's amazing presence of mind that prevented this from becoming a very serious accident.

ACCIDENT: Virginia, New River Cave

January 18, 1980

At about 7 p.m. on January 18, Lorrie Sherback (18), her husband and other companions entered New River Cave in Giles County, Virginia. They carried camping gear, intending to stay the night. The cave requires no vertical rigging and is popular with casual cavers. At about 8 p.m., about 2500 feet into the cave and just beyond the Blowhole, Sherback slipped at a climb and fell spread-legged onto a sharp rock. The fall was only a few feet but she had obviously suffered serious injury to the lower abdomen.

Her companions removed her wet clothing, put her in a down sleeping bag and

two went for help. At about 10 p.m. the Giles County Rescue Squad was called and they in turn contacted the VPI Grotto with whom they had worked well before. NCRC was called and they alerted the Blue Ridge, Holston Valley and Greenbrier Grottos.

At about 11 p.m. Pete Sauvigne and four GCR members pushed into the cave to administer initial first aid. The two members of the victim's party who had come out for help couldn't remember the way back. Some time was lost before the victim was located. A poncho was rigged to slow air movement past the blowhole and the victim was examined. The BP was 120/90 with a pulse of 120, weak but regular. There were some signs of hypothermia. "Considerable vaginal damage had occurred with a possibility of pelvic damage"(1). Reported evisceration proved to be a "prolapsed vulva"(1). Blood loss was due to a laceration, not internal injuries. An IV was administered, the wounded area sterilized and bandaged and the victim replaced in the sleeping bag along with chemical heat packs. As the heat took affect the rate of the IV was slowly increased. The patient became more aware and began to experience the pain of her injuries. She was placed in a Stokes litter lined with foam and evacuation began, about 1:45 a.m.

The route out in the meantime had been prepared by some 25 cavers and the evacuation went smoothly. At one section rescuers lay down, in column, passing the stretcher along above them. Several climbs and crawlways were negotiated. The initial crew of paramedics became cold and were replaced. At about 5 a.m. the victim reached the entrance, and by 5:15 a.m. had arrived at Montgomery County Hospital.

REFERENCES: 1) Anon. "Rescue Call of the Year - 1980" *First Aid Bulletin* October, 1980 p 6-9.

2) Jay Kennedy "VAR Region" *NSS News* June, 1980 p 136.

3) Pete Sauvigne "Accident Report" *Personal Communication* February, 1981.

ANALYSIS: Water in caves often carves beautiful abstract rock forms. It also creates some viciously sharp edges and points. When climbing above such things one must be very careful. In this case a fall of only a few feet produced serious injury. Even the use of a belay might not have prevented this accident.

The competence of both the Rescue Squad and the cavers in the local grottos is readily apparent in reports of this accident. The ability of these people to work together is certainly a plus for that area.

ACCIDENT: Alabama, Copeland Cave

January 20, 1980

At around 2 p.m. on Sunday, January 20, four cavers entered Copeland Cave in Blount County, Alabama. These were Dino Lee, Ricky Lee, Dale Elrod and James Clegg (all 16). They anchored a rope and descended the narrow 60 foot entrance shaft, apparently depending on the rope for support.

After exploring awhile they went to ascend this shaft, but found the rain-slickened, muddy walls made climbing nearly impossible. Friends knew where they had gone and their car was parked outside. They felt they would be found but were wet and cold and, obviously, the longer the wait the less fun it would be. Clegg, who had had a climbing course the previous summer put in a determined effort and made it out. At 7 p.m. he notified the Blount County Sheriff's Office and a rescue squad was dispatched. Using a block and tackle the three trapped cavers were hauled out. All were out by 9:30 p.m.

REFERENCES: 1) Harold Kennedy "Three Teenagers Rescued From Blount Cave After Companion Makes It Out" *Birmingham News* January 21, 1980 p 1.

2) AP "Trapped Teen-agers Lifted From Cavern" *Huntsville Times* January 21, 1980.

3) Anon. "Rescue" *The Huntsville Grotto News* 21:3 March, 1980 p 19.

ANALYSIS: It sounds like Clegg took an unnecessary risk in climbing the pitch to the surface but if the cavers were actually wet and cold, hypothermia could have become a real problem if their wait for rescue had become a long one. The owner of the property reportedly didn't know the cave existed. Possibly the climbing course Clegg had experienced gave him the ability to chimney the slick walls, with the aid of the rope when the others couldn't. In general this is just another example of cavers outside the organized community using primitive techniques.

The lesson here is that whatever technique you use, it should be practiced so that one knows his limitations. Then, changing conditions like the rain slickened walls could be taken into consideration and one would stand a better chance of success.

INCIDENT: Alabama, Cave unknown

1980?

This incident may not have occurred in 1980, but deserves notice. Only the essential details were given:

"At the top of the 80 foot fourth drop in a seven drop cave approximately half the stitching in the rappel harness ripped loose. Inspection revealed that the portion which failed was sewn with cotton thread." The rest was sewn with nylon thread and held.

REFERENCE: Tom Johnson and Bill Foote "Caving Harness Failure" *Cleave-O-Grotto News* November, 1980 p 68 (reprinted from Up Your Rope).

ANALYSIS: The harness was sewn by a shoemaker with the caver stressing and specifying nylon thread. However, when the spool of nylon ran out part way through the job, the shoemaker replaced it with one of cotton. Apparently he didn't understand that someone's life would depend on his work. If you have yours stitched, make sure the worker realizes this!

ACCIDENT: Wyoming, Tongue River Cave

February 9, 1980

Early in the day on February 9, Fred Lashley and several companions were exploring in Tongue River Cave near Sheridan, Wyoming. In the cave dry passages extend from the entrance for several hundred feet to an intersection with a stream passage. Just before this intersection are some climb-downs and the stream passage contains a waterfall. In this area Lashley fell 30 feet from a ledge, sustaining rib and leg injuries possibly including broken bones. He was rescued by agencies from Sheridan County, the evacuation requiring several hours.

REFERENCES: 1) Editorial "Tongue River Cave" *Aglarond* 9:6 March 15, 1980 p 2.

2) Editor *Sheridan Press* February 11, 1980.

ANALYSIS: Another example of climbing without a belay in an exposed place, but contributing factors could well have included hand-held and/or poor lights and a lack of slip-resistant soles on Lashley's foot gear.

DOUBLE ACCIDENT: Mexico, Oaxaca, Sotano de San Agustin February 16, 1980

Introduction:

In February of 1980 an expedition of very experienced cavers and speleologists led by Maicej Kyczynski arrived at the little village of San Agustin on the highlands around Huautla de Jimenez in the northern end of the state of Oaxaca in Mexico. Their objective was to attempt the connection between Sotano de San Agustin and two nearby deep caves, Sotano de Agua de Carrizo and La Grieta. An American expedition had attempted this the previous year and had no success, though the survey showed the three caves to be in very close proximity in one area. A connection would recover for San Agustin the title of deepest in the western hemisphere.

The Polish pushed into San Agustin and established a camp at the traditional site beyond the bottom of the Fishure, at about -536 m, called Camp II. From there the horizontal '68 Passage leads to the deeper parts of the cave. At its end is a 10 m up-climb, usually rigged with a rope for SRT ascent and rappel and then a long, complex drop, partly boulders, which dumps into a lake. Partway down is a side lead which was intensively explored by the previous American expedition since it leads toward the other two caves and the hoped-for connection.

The Poles, in doing a vertical cave such as this, were under a sizable handicap. The only rope available to them was of braided nylon of only 9 mm diameter — essentially a braided sheath without a core. Such a rope is not overly strong in new condition and is extremely susceptible to abrasion weakening. To get around this, the Poles used double rigging on all drops, with one rope for rappel and one for a safety shunt — if your main rope breaks you are saved by your sliding connection to the second rope. Furthermore, both ropes are tied off to a bolt or other anchor every 10 to 15 m down a drop. Using this cumbersome system, the Poles proceeded with their exploration.

The Accidents:

On Saturday, February 16, Jerzy Musiot and companions were moving along at the beginning of Kinepak Canyon in the area leading toward the site of the possible connection. Musiot was not belayed so when handholds failed, at about 9:30 a.m., he fell 8 m, suffering a broken leg. One companion went to Camp II for help while the rest of the party gave first aid and began to slowly move Musiot back toward camp.

When word reached Camp II cavers there gathered a first-aid kit, sleeping bag, stove and food and headed for the victim. At the end of the '68 Passage Jozef Cuber started his rappel, but to move as rapidly as possible in this emergency, he did not use the safety shunt. At about 3:30 p.m. his rappel rope broke and he fell about 20 m. Henryk Szezesny was below, heard rocks falling and dove for cover. He yelled "What happened?!", but got no answer. Returning to the drop he discovered the badly injured Cuber about 2 m below in a crevice formed by rock slabs and the wall.

Cuber was unconscious but after a few minutes he came to and asked for help. Szezesny removed Cuber's helmet, but didn't move him before heading down to get help from the five cavers aiding Musiot. There were now two injured cavers over 550 m below the surface.

Following a discussion, Marian Czepiel returned to Camp II to get a second set of emergency gear for Cuber, a sleeping bag, stove and food. Others went to Cuber to administer first aid. The victim was raised from the crevice and laid on a large, flat-surfaced rock. Cuber had no feeling in his legs but was in pain and requested pain killers. Being careful to move him as little as possible his cave suit was

removed and he was prepared for an extended stay. As a sleeping bag was slid around him some bleeding was noticed and this was thought to be from the anus, indicating internal injuries. One caver then stayed with Cuber while three others helped Musiot, with the injured leg, to Camp II. They arrived at 2 a.m. Sunday, over 16 hours after Musiot's accident. Meanwhile the remaining two cavers went to Camp II directly, rested, ate, and changed clothes. At 10 p.m. they headed for the surface to get help, arriving at 9 a.m. Sunday, the 17th. As soon as he heard the news, Kyczynski, the expedition leader, left the surface camp at San Agustin and went to Huautla to call for help. The situation was indeed serious — without extremely specialized assistance how would they get the injured cavers out?...and where in Mexico would they get such assistance?

Outside Help:

At 11:50 a.m. he got his first call through, to the Polish Consulate, requesting all possibilities for help be called. Kyczynski then reached Cruz Roja (Red Cross) de Naucalpan and asked for Lorenzo Garcia, the chief of CR Rescue. The Polish had spent time training him for this sort of thing prior to caving in Mexico. Garcia was out but called back later.

Alejandrina Casar was called by CR and went to the Polish Consulate to take charge of liaison. Fernando Casar at Cruz Roja began calling cavers for a rescue team. This eventually included a Doctor Mercado who was said to be capable of entering a cave. This group left Mexico City at 8 p.m. Sunday for Huautla carrying with them a winch the Polish had stored at Casar's house.

Henrique Hernandez, of the Sociedad de Exploraciones Geographical was called by CR for their rescue team. He had done some exploration in San Agustin in the '60's. Hernandez and two companions left independently for Huautla at about 5 p.m. Sunday.

Eleanor Ledesma Carron, the president of the Asociacion Mexicana de Espeleologia, became involved in the CR organizing effort and realized the San Agustin situation was beyond the CR capabilities. On her own she called Cuetzalan to obtain the services of the American cavers usually there. A runner was sent from the phone office in Cuetzalan to the cavers' house. The cavers were out but Vicente Silva, a Mexican caver renting the house next door got the message and went to where the Americans were. Bill Liebman went to town to call back for more information while a group of cavers just back from a grueling 20 hour push trip in Tzitzicazapan collected themselves. The return call revealed the dire seriousness of the situation — two men injured (one broken leg, one broken back) at over 550 meter's depth in San Agustin. Back at the house all available rope, hardware and medical supplies including a spine board were gathered and at 4 p.m. a crew of four Americans (Blake Harrison, Liebman, Steve Pitts and Doug Wilson) and seven Belgians (including Etienne Degrave, a medical doctor) left in Harrison's truck. Accompanying them in a second vehicle came Silva and Armando Amana.

At Zacapoaxtla, Silva called the Polish Embassy, CR and Eleanor Carron and relayed the info to Liebman in English. The Polish had arranged for helicopter transportation from Tehuacan, at the base of the mountains, to San Agustin, to occur at 7 a.m. Monday. Calls by Liebman to the U.S. resulted in a request to the Polish Embassy to request aid of the National Cave Rescue Association so that U.S. Air Force transport could be used if necessary. Meanwhile Amana took Degrave to the hospital to obtain medical supplies.

The Cuetzalan contingent left Zacapoaxtla to about 8 p.m. Sunday for Tehuacan and the chopper rendezvous. At 12:30 a.m. the truck blew a u-joint. This was fixed on the road by Harrison in 30 minutes and they arrived at Tehuacan at 1:30 a.m. on Monday. At the hospital they obtained medicines not available in Zacapoaxtla. Proceeding to the airport they met a group from Mexico City and learned that a DC-6 would arrive at 8 a.m. with more rescuers and the chopper at 9 a.m.

At San Agustin, when the calls for help went out, there were seven cavers available on the surface, five Poles and two Mexicans. Two entered the cave at 3 p.m. Sunday with medical supplies for Camp II. The others obtained medical supplies in Huautla and returned to San Agustin.

Deep in the cave Musiot had reached Camp II. After a 14 hour stay, mostly resting, he and his two companions left for the surface which they reached at 7 to 8 a.m. on Monday, February 18.

At 9 a.m. Monday, Casar's group arrived by vehicle at San Agustin, followed by Hernandez's group at 10 a.m. That same day Hernandez's two cavers went into the cave laying phone line, arriving at Camp II at 3 p.m. and coming back out on Tuesday.

Back at Tehuacan, on Monday morning the DC-6 arrived as scheduled with a load of cavers and Cruz Roja (CR) personnel. Lorenzo Garcia was the leader of this group and Bill Liebman was assigned to be the leader of the Cuetzalan contingent. Cruz Roja felt they could handle the situation but in light of the expertise and experience of the American/Belgian group, compromised and allowed them to participate. Lucky for Josef Cuber!

The chopper also arrived and at 10:30 a.m. a group of four rescuers was flown in, but Huautla was fogged in so they landed 30 km away, necessitating lugging the gear 20 minutes up a mountainside to the road. A truck was hired to cover the remaining distance. A second load arrived and both were trucked to Huautla, arriving at 5:30 p.m. The ferrying of rescuers continued.

Plans Are Made:

At 6:30 p.m. Liebman met with Kczynski, Lorenzo Garcia, Degrave and others to plan strategy. Musiot was already out. Cuber with a broken back and possible internal injuries was at the end of the '68 Passage, the horizontal trunk beyond Camp II. Between Camp II and the surface is some 550 meters of vertical rope work with little horizontal travel. This is a vertical caver's cave and this was only slowly dawning on CR. Already PMI rope had been left out of a chopper load in order to bring gas lanterns and other useless gear including a 400 m rope too large in diameter for Jumars. Also, it was obvious that CR was jealous of anyone usurping their duty of carrying out rescues in Mexico. They soon discovered the magnitude of what was before them. With little knowledge or experience in complex rope techniques, the CR people were prevented from taking a very active role in the in-cave part of the evacuation.

Three hours passed in discussion as groups were drawn up for rigging, stocking camps, moving gear, relief, etc. and contingency plans were made. Overcoming language barriers on teams proved to be impossible — there were four primary languages involved, English, French, Spanish and Polish with German as a secondary language. Two to four languages per group functioning in the proved to be the rule.

While the planning went on, phone line was being laid to the bottom of the last drop just short of Camp II, at -500 m.

The Rescue: Tuesday

At 1 a.m. Tuesday, a group of four including Degrave (a Doctor) entered with medical supplies and spineboard, reaching the victim at about 8 a.m. Degrave had been filled in on Cuber's status over the past 70 hours by Kczynski in German. The victim had lost a lot of blood in the first hour, had spinal injuries resulting in paralysis of his lower body and legs and had been unable to relieve his bladder. Degrave felt the signs pointed against internal injuries. He drained Cuber's bladder and administered a transfusion after which the blood pressure increased from 1 to 13 (on a scale where normal is 12 to 14) and the pulse rate went from 140 to 100. Also administered were Ringer's lactate, antibiotics and morphine.

At 8 a.m. another group of four entered carrying hardware and food. The pits above Camp II were changed from Polish to normal rigging from Camp I down to Camp II.

In the late morning Mike Boon and Alejandro Villagomez arrived and reported that some French cavers in Mexico City had not obtained an official request for their participation and would not be coming. They also reported that CR was discouraging others from coming saying there was plenty of manpower already.

At 1 p.m. a third group of four went in with food for the old Camp I and re-rigged the drops between Camp I (-260 meters) and the surface.

At 1:30 p.m. Degrave called and declared that Cuber would be ready to be moved in one to two hours.

At 2:30 p.m. two entered followed by a fourth group of four at 4 p.m. and Mike Boon.

Tuesday thus saw rescuers filtering down toward the victim, re-rigging drops and supplying Camps I and II as they went. Musiot left by chopper for the hospital. By late in the day there were 19 rescuers at Camp II or beyond, eight Poles, seven Belgian, two Mexicans, and two Americans.

Wednesday:

At about 1:30 a.m. Wednesday Cuber was placed in a stretcher and the evacuation began. At the first pitch (the end of the '68 Passage) the stretcher sagged and operations were suspended while a call went out for another stretcher. At 2 a.m. cavers entered the cave with another stretcher and food. Meanwhile, Liebman, at Camp II had provided the spine board in use and so proceeded to the victim and observed that he was improperly secured and rigged for hauling. These problems were corrected and at 6:30 a.m. transportation of the victim continued. He reached Camp II by 11 a.m. There were, at that point, 22 rescuers at Camp II, eight Poles, seven Belgians, four Mexican, two Americans and one Briton.

At Camp II there was a rest period and the victim was prepared for the transport ahead, up 500 meters of vertical pitches, several directly in waterfalls. Cuber was wrapped in plastic sheet secured with duct tape and a clyume was attached to provide comfort when he was alone during hauls up pits. Since he was paralyzed already, it meant he could be handled with less care but the intra-venous feeding had to be continued during transport and this added complications.

The new stretcher arrived at Camp II at 2:30 p.m. Wednesday but the spine board was working fine so the new one was not used. Ten minutes later a shift of 12 started Cuber up the seemingly unending pitches above. In this series there are two major pitches, a 60 m followed by a 90.

Thursday:

The 90 presented problems and was not negotiated until 3:30 a.m. Thursday. Several of the pitches above Camp II are very wet and must have required great determination on the part of the rescuers. We can presume that the counter-balance lifting method was sometimes used since this had worked well in the Harrison rescue in 1977, in which Liebman participated. Mechanical advantage systems were also used. A call went out for more plastic and tape for protecting Cuber from the water and at 5 a.m. Steve Pitts entered with supplies. Moving up through these wet pitches took time and the victim didn't reach Camp I until 5 p.m.

Thursday. The worst was over.

The planned system of teams, however, had broken down. Some cavers were near exhaustion and others had dropped out, necessitating rearranging of personnel. This resulted in groups without enough bilingual persons for proper communication. At Camp I the water-soaked clothes and sleeping bag containing the victim were changed.

Meanwhile, the major portion of the American Huautla expedition, led by Bill Stone, had heard in Mexico City that the rescue was still in progress and had proceeded with all speed arriving at San Agustin by 11 a.m. on Thursday. This group of fresh, expert manpower was comprised of Bill Stone, Jerry Atkinson, Doug Powell, Steve Zeman, Mark Minton, Dino Lowrey, Henry Schneider and Bob Jeffreys. They entered the cave at 1:45 p.m. to relieve the tired crews already at work. At 7 p.m. they all arrived at Camp I.

The tired rescuers were very happy to see the fresh manpower. Excess cavers were sent out with a few left to follow after the victim, carrying the trash at Camp I. At about 9 p.m. Cuber's evacuation resumed with Degrave still attending the victim.

Friday:

At 2 a.m. Friday a call was made for material to reinforce the stretcher. At 6 a.m., as they neared the Sala Grande (two pitches below the surface) a call was made for transport assistance and several members of the Socorro (Mexico) Alpine Rescue entered.

At 7:45 a.m. the victim reached the open air at the bottom of the pitch in the entrance dolina, where a winch had been set up. At around 9:45 a.m. Friday Cuber reached the surface and in another hour or so he was in a chopper, enroute to a hospital. Cuber's evacuation had taken nearly six days (138 hours).

At 7 p.m. the last of the rescuers were out and at 9:30 the Poles broke out special food and booze and a "successful rescue" party began. Saturday and Sunday was spent de-rigging and sorting gear.

REFERENCES: 1) Bill Liebman "Personal Notes and Interviews, 1980 San Agustin Rescue" *Personal Communication* February, 1980 31 pages.

2) Jill Dorman "Polish Rescue in San Agustin" *Speleoneers* August, 1980 p 59.

3) J.M. Boon "The Great San Agustin Rescue" *Stalactite Press* Edmonton, Alberta, Canada 1980 20 pages.

4) Bill Stone "La Nita Joined to San Agustin—World's Third Deepest" *NSS News* 40:9 September, 1980 p 201-208.

5) Mike Barret "Caver Climbed, Pulled to Save Injured Men" *St. Paul Dispatch* August 5, 1980.

6) Bill Liebman *Personal Communication* August 1981 9 pages.

ANALYSIS: If you believe that being paralyzed from the waist down but alive is better than dying, then Cuber was very lucky. If the experience and expertise of the Belgians and Americans had not been available I cannot see how his evacuation could have been accomplished.

The system of vertical caving, with weak, abrasion-susceptible rope used by the Poles was not the cause of this accident. Rather it was the failure to comply with the system by Cuber in his haste to reach Musiot. Still, a system like this has the odds against it. Apparently the Poles cannot utilize rope from this side of the Iron Curtain and so must make do with what they have. This is certainly a shame and may be the reason this Polish group has a reputation for getting into trouble.

During the evacuation the victim got cold, especially in the wet pitches, but suffered no hypothermia. The relative warmth of the cave certainly helped. He was delirious at times and on the last day ran a temperature of 102 degrees F, probably due to infection. The presence of Dr. Degrave was vital for Cuber, considering his injuries—he was within a few hours of death upon Degrave's arrival.

According to Liebman, the Belgians, Americans and the lone Briton operated smoothly in the evacuation, playing whatever role was necessary. This is certainly a product of a great difference in vertical caving experience.

The unselfish co-operation of these many cavers from several diverse nations is certainly remarkable. Forty-one cavers entered the cave, with about two-thirds working on the evacuation, the rest providing support in camps, monitoring phones, supplying camps and bringing in needed emergency supplies. According to the Belgians this was the deepest cave rescue ever. A monumental job well done.

ACCIDENT: Tennessee, Cave near Soddy-Daisy

March 8, 1980

On Saturday, March 8, two young people went to a cave in a high, steep embankment of earth and rock near Soddy-Daisy, Tennessee. Rebecca Conner (15) entered to explore. Some time after this the whole embankment collapsed. Her body was exhumed 18 hours later, on Sunday, by rescue workers.

REFERENCES: 1) UPI "Body of Spelunker, 15, Found" *Los Angeles Times* March 10, 1980 Pt. 1, p 8.

2) Anon. "Girl Crushed" *The Atlanta Constitution* March 10, 1980 p 2-A.

ANALYSIS: This cave appears to be of the type dug by youngsters in cut-banks. These are less stable than a bedrock cave, but there are areas in bedrock caves where similar instability is recognizable — ceilings of broken rock, rocks showing fresh fractures and entrance areas, where weathering and biological activity create

instability, to name a few.

ACCIDENT: Pennsylvania, Cave near Allentown

March 9, 1980

On Sunday, March 9, John Godshall (13), Michael Robinson (12), Thomas Raferty (13), and Brett Thomas (14) went exploring in a maze-like cave near Allentown, Pennsylvania. They were lightly dressed and carried only candles for light. After crawling around for awhile, observing, among other things, 'huge bats hanging from the ceiling...their eyes shining in the candlelight' Thomas tumbled into a small hole and dropped the candles. They realized they had not kept track of the way out and, in total darkness, were lost. Agitated, they yelled for help and crawled aimlessly about.

Hours passed, their hands and knees becoming raw from the crawling. Finally they saw light, went to it, but found it was only a shaft of sunlight coming through a small hole. The hole could not be widened and when the sun set they were in darkness again. They huddled together for warmth and to keep from falling through a big hole in the floor.

Meanwhile their absence was noted and the police were called in. Officers from the Allentown Police Dept. searched the cave and found the boys that night. They were in the cave for 18 hours.

REFERENCE: Michael Robinson "Boy, 12, Tells of 18 Hours of Terror—Lost in Black, Bat-infested Caves" *National Enquirer* 54:43 June 3, 1980

ANALYSIS: Youngsters will seek adventure and what could be more exciting than exploring a dark, mysterious cave with only candles. Impetuosity would lead them to use the candles if that is what fell to hand first. Can we reach cavers like this with safety education? Perhaps not but surely the offspring of NSS members wouldn't go caving like this.

ACCIDENT: West Virginia, Carpenter's Pit

March 9, 1980

At about midnight on Saturday, March 8, Don LaFace, Al Birchall, Henry Uhle, and Mike Gallagher entered Carpenter's Pit near Marlinton, West Virginia. They had driven to the cave in the afternoon and evening and rested several hours before entering. The entrance drop of 75 feet was rigged with a cable ladder.

At about 7 a.m. after a lengthy exploration, they returned to the entrance drop. Unfortunately they were quite cold and tired and only Gallagher was able to climb out. He proceeded to Marlinton to get help.

The State Police were called and, at about 9:30 a.m. they called the Marlinton Rescue Squad. Several rescue squad members and State troopers proceeded to the cave and hauled the stranded cavers out.

REFERENCES: 1) Editor "Cave Rescue" *Pocahontas Times* March 27, 1980 p.5.

2) Editor *Untitled The Windy City Spelunkers* 20:3 June, 1980 p.58.

ANALYSIS: Cable ladders look easy to climb but are quite the opposite. Your strongest muscles are in your legs and a well-conceived SRT vertical system (for climbing a rope) will require the legs and torso muscles and little else. A cable ladder requires arm strength and arms are easily fatigued when caving. The moral seems to be — go SRT.

INCIDENT: Mexico, Hoya de Guaguas

Spring, 1980

In the Spring of 1980 a group of cavers were doing the 700 plus foot entrance drop into Hoya de Guaguas. The rope in use was a 1200 foot PMI. Linda Varney, with some caving experience including several deep pits, prepared to descend. She was using a Bluewater rack with five bars, the top two grooved from use to a depth of 30½ of the original diameter. At the lip this caver expressed a nervousness about doing the drop and a fear of peer pressure if she failed to proceed — several of her friends had already descended.

She was about 200 feet down when those above and below heard the sound of the rope passing through the rack increase in pitch. A shout from above to "Slow down!" was answered by a shriek. The rappel was out of control. A caver below yelled to her to ram her brake bars up. Grasping the rope with her gloved braking hand, Varney was able to bring the rappel under control a short distance above the bottom. Following first aid to the burned and blistered braking hand the victim was able to ascend unassisted.

REFERENCES: 1) John Tinsley "Incident at Hoya de Guaguas" *SFBC Newsletter* 23:7 July, 1980 p.5-7.

2) Kathy Williams "1980 SFBC Christmas Trip to Golondrinas— Part 2" *SFBC Newsletter* 23:5 May, 1980 p.9-14.

ANALYSIS: Tinsley cites a number of factors as contributing to the incident. These include: 1) five versus six bars on the rack, 2) two bars quite worn, 3) the PMI new and still containing the manufacturer's lubricants, 4) lack of experience and, 5) previous instruction from macho cavers. I disagree with the first three. Five or six bars makes little difference—it is how closely they are jammed that controls friction. The wear likewise is not significant, for the same reason. PMI is not a

really fast rope and lubricants should have little effect. I believe Varney must have started off with the bars too far apart. One should always, if possible, get on the rope near the anchor and back toward the edge, putting one's weight on the set-up to test the friction, making adjustments before going over the breakover.

As to the 4th factor, Varney, with several deep pits done cannot be said to be inexperienced.

Varney obviously was yielding to peer pressure in doing the rappel when she didn't feel right about it. Her previous instruction and experience had apparently been obtained in a 'macho' atmosphere and thus she felt pressure to perform. I wonder if macho types realize the atmosphere they generate occasionally kills people?

Things might have gone differently if a) she were using a safety (ascender or knot, on the main line above her rappel device, attached to her seat harness) and b) she were not the last of her group of friends to descend. Those of lesser experience shouldn't go last or first.

ACCIDENT: Mexico, Puebla, Cueva de Tzitzicazapan

April 4, 1980

On Wednesday, April 2, a group of five cavers, Bob Benedict, Jeb Blakely, Jean Jancewitz, Bill Liebman and Rick Rigg, entered Tzitzicazapan, a cave adjacent to the town of Cuetzalan in the northeast corner of the state of Puebla in Mexico. They carried food and gear for a seven-day stay. With heavy duffel bags they made their way along the stream inlet passage leading from the entrance. After over a kilometer of this, occasionally quite narrow with a few swims and a couple of short waterfalls needing rope, they reached the 30 meter rappel into the main stream passage. Proceeding down this for some distance they turned left, climbing into a higher level passage which quickly led to the Big Room, a stadium-sized affair with a rolling, sandy floor where they established their camp.

The objective of this group was to push on down the main stream passage. A Belgian expedition had forced the previous terminus, a 300 m long boulder choke, and proceeded down virgin borehole through three more boulder chokes before turning back at the end of their allotted time.

At Cuetzalan rain is common, even in the dry season, and it occurred to these explorers that the boulder chokes, which had to be traversed through constricted ways at stream level, would be flood-prone and dangerous. In pre-trip discussions they decided that these chokes should be avoided between the hours of 5 and 10 p.m., assuming a two hour lag for the rain pulse to traverse the three km from the entrance to the first boulder choke, and observing that rains seemed to occur most commonly between 3 and 8 p.m. The first choke included a major tributary, thought to be the other main stream in the cave, giving the stream below a very large surface drainage area.

At 5 a.m. on Friday, April 4, they set out on a downstream push. In the first choke fishing line was paid out to mark most of the complicated route through the boulders. Of the group, only Liebman had been through this choke before and a lot of route-finding was necessary, the trip through taking five hours. Many arrows were smoked to help indicate the route. They pushed on, through the second choke before being turned back by a lack of rigging at a water chute.

At about 9:30 p.m. they began the traverse back through the first choke. Not far in Liebman and Rigg stopped to collect a biological specimen, the rest continuing. After a few minutes the two proceeded, stooping and crawling in the water through the boulders. Fifteen minutes later a small hole leads up into a room where one can stand. From there a chute leads down to the water and a four inch air space allows passage to a canal swim. Liebman went on down the chute but found no air space. He returned to the room and tried another chute and then another, with no luck. He rechecked the first and then returned to the room for a discussion with Rigg who had arrived. They decided the first was correct. Since the water had turned muddy they suspected a rise. At about this time they heard the others returning, yelling that the cave was flooding. Through a space between the boulders they could be seen and were directed to the low spot, now sumped, and all safely made it through. Packs were passed up and through the small hole leading back down-cave and the united group beat it back through the lower 15 m of boulder choke to open borehole. The stream had become a torrent.

The passage at that point was about 30 m wide and 10 m high, with a ledge offering refuge about four meters above the stream. The group assembled there and inventoried their supplies. Carbide was in short supply so they doused their lights and tried to sleep. The water level was marked and occasionally observed. Everyone was wet and cold and sleep was difficult. They huddled together in the dark.

About nine hours later the water crested, having risen 60 cm in a 10 meter-wide section. After 17 hours the stream was nearly back to normal and had cleared—they decided to leave. Three fearful hours later they had negotiated the choke, counting at least 13 places the route had been sealed off during the flood. After another hour they were back in camp, 38 hours after the trip had begun.

REFERENCE: Bill Liebman *Personal Communication* August, 1981 7 pages.

ANALYSIS: The flood hit during the predicted time span. The lack of heed given the prediction might have cost lives. It is one's right, however, to play the

percentages or not as one chooses. Liebman and Rigg waiting for the rest helped speed their passage through the difficult place and is certainly commendable.

ACCIDENT: Mexico, Puebla, Cueva de Tzitzicazapan

April 9, 1980

In early April a group of five cavers was camped in Tzitzicazapan, an extensive cave near Cuetzalan in northeast Puebla in Mexico. They had pushed the main stream passage after camping but had been trapped beyond boulder choke 1 by a flash flood. After the flood subsided they regained camp. In following days Bill Liebman, Jean Jancewitz and Bob Benedict mapped leads around the Big Room, while Rick Rigg and Jeb Blakely exited the cave since Blakely had to return to the States.

On Wednesday, April 9, the seventh day of the group's stay, camp was broken and they were ready to start for the surface when "The silence of the cave was broken by the sound of raging waters." There followed comments like "Did you hear something, too?" "Yeah, we did!", and "Oh, shit!"—the cave was flooding again.

They set up camp again and began to monitor the flow. The main stream rose 30 cm in a six meter wide passage, in a period of five hours. After 12 hours the waters had subsided and cleared up but flow was still above normal. The majority feeling was to go for it though it was pointed out that the entrance passage above the 30 m drop would be quite hazardous in high flow. They broke camp and headed out.

In the swims, waterfalls and narrow places, the high water proved negotiable but sapped their energy. Not far into the entrance series and still over a kilometer from the entrance, Benedict was swept off his holds in a short waterfall, falling about 1.5 meters, landing on his feet and ending up in a sitting position. His ankle was injured and would not accept weight. The large camp packs were stashed in a high place and tied down and they proceeded, carrying day packs and helping Benedict. They arrived at the entrance at 10 p.m. on Thursday, the 10th. At the hospital in Zacapaotla it was determined that the ankle was broken.

REFERENCE: Bill Liebman *Personal Communication* August, 1981 7 pages.

ANALYSIS: One can hardly fault the cavers for wanting to get out after two floods and a seven day stay. About the only thing one could say is that the weather records for Cuetzalan show that December, January and February are the heart of the dry season and the trip might have gone better if scheduled then.

ACCIDENT: Florida, Vortex Springs

April 12 or 13, 1980

On the weekend of April 12-13 Ronnie Tyner (24), John E. Swan (24), Merritt R. Steger (24), and Russell D. Hill (23), all from Texas, were among 50 divers from the Southwest who had come to explore the water-filled cave at Vortex Springs in Holmes County, Florida.

The four named above entered the cave as a group. At a 'stop' sign about 250 feet from the entrance they attached a 'thin, twine-like' line. The stop sign marks the farthest point divers are supposed to penetrate. The four continued, paying out the line behind them.

When the four failed to return, the Sheriff was notified and rescue divers were called in. The four were found about 100 feet beyond the stop sign, drowned. According to rescue diver Johnny Manuel, "They were in about as big a mess as I've ever seen. This thin line was all over them. I imagine they got all tangled up and one of them panicked and everybody got in trouble. They hadn't even tried to cut themselves out. Their knives were still sheathed on their legs."

REFERENCE: UPI "Underwater Caves Still Lure Divers, Despite Danger, Death in Black Holes" *Florence Times* (Alabama) April 15, 1980.

ANALYSIS: This multiple fatality brought the total fatalities in Vortex Springs to 24; nearby Morrison Spring in Walton County has claimed 28. These totals should remind us that cave diving is one of the most dangerous sports.

In this case the cause might be debated. Would getting tangled in line make four men simultaneously panic? I rather suspect they might have gone too far for their air supplies and the panic of running out of air caused them to get tangled in the line in their haste to leave. A loss of light might have had the same result with a line one could not simply grasp and pull one's self along to safety. Obviously one should be prepared both mentally (perhaps by practicing emergencies) and equipment-wise (perhaps by trying various articles in controlled situations to see how they perform in potential emergencies).

ACCIDENT: West Virginia, Sinnit Cave

May 10, 1980

On May 10 Randy and Gary Ferrell were caving in Sinnit Cave, Pendleton County, West Virginia. Traffic in the cave was described as moderate by others but there were several other groups in the cave at the time.

The two Ferrells had just come out of "Fisher's Tube" and were ascending to the Big Room. Gary Ferrell "lost his grip" and fell about 40 feet down slope, into and down the Fisher's Tube Shaft (the vertical drop overlooking the Fissure Passage),

down the scree funnel below it and into the portal of the Fissure.

The fall was heard by others in the Big Room, including Andy and Richard Huttner, Ron Kazen, Len Lewis and Scott Steinkolk. Examination of the victim showed a compound fracture and severe laceration of the left arm. The laceration was treated and a sling and chest support for the arm was rigged from nylon webbing. One group went for more help and another, with one person free climbing alongside the victim, belayed and lowered Ferrell down the Saltpeter Chute. Forty-five minutes of work got them down to the bridge where they were met by Robert Wingrove, a mine rescue expert. Once out of the cave, they were greeted by the local rescue squad who conducted the victim on to the hospital.

REFERENCES: 1) Andy Huttner "Another Trip" *D.C. Speleograph* June, 1980 p 14.

2) Ron Kazen "Rescue" *ibid.*

ANALYSIS: So many cavers free climb exposed pitches without protection that one has to think that a belay or handline would eliminate most accidents resulting from falls in exposed climbing. Why aren't more belays used? Possibly because it is not "the thing to do," possibly because in original exploration one is too turned on to take the time or has already run out of rope, or possibly because in well-traveled routes one knows that many others have previously passed successfully.

INCIDENT: California, Church Cave

May 25, 1980

On Memorial Day weekend the Mother Lode Grotto conducted a trip to Church Cave in Kings Canyon National Park in California. The group included Dave Cowan, Paul Greaves, Jack Espinal, Bob Pine and Eric Popoff. During their trip there occurred a series of earthquakes with an epicenter only 30 miles from the cave.

The first shock (6.0, Richter scale) occurred at 9:30 a.m. as they left the Boyden Cave parking lot to hike to the cave. At 9:50 there was another (Richter 5.7) as they hiked up the canyon. Shortly after that they entered the cave.

At 12:45 p.m. they were near the Torture Chamber. Espinal was down-climbing a wall, Greaves and Cowan were waiting to descend, Popoff was at the bottom of a 30 foot chimney while Pine was descending the tight chimney. At that point came another Richter 6.0 quake. The motion imparted to the walls nearly caused Espinal to be shaken from his hold. Pine, in the crevice, could feel the walls moving, giving him a massage. A few pebbles rattled down the chimney past him. A great, deep, disconcerting, humming "noise" occurred. When the shock died out, they collected themselves and decided to leave.

As they headed for the entrance there occurred a series of smaller after-shocks, each producing the deep humming noise which they found most unnerving. At 1:36 p.m. they were outside and another shock, of Richter 5.7 was felt.

REFERENCES: 1) Bob Ehr "Regions - Western" *NSS News* 38:10 October, 1980 p 235.

2) Bob Pine *Personal Communication* January 17, 1981.

ANALYSIS: Despite the major proportion of the quake, nothing really happened in the cave. There was no collapse nor apparent instability created. Of course, Church Cave is in a very massive marble deposit with relatively few structural features remaining (joints, open bedding planes) so the benevolence of a quake in this cave might be quite the opposite in another.

ACCIDENT: Indiana, Reeves Cave

Summer, 1980

Early in the summer two boys went exploring in Reeves Cave in Indiana. They became confused concerning the way out and eventually were overdue. The police were called and they called out local cavers to search the cave. The lost boys were found five minutes from the entrance.

REFERENCE: Kevin Komisarick "Reeves Cave Big Time Rescue" *The Bloomington Grotto Newsletter* 15:4 August 14, 1980 p 53.

ANALYSIS: One could probably make a successful wager that the boys were using flashlights and had no helmets. A recurring type of accident.

ACCIDENT: New Mexico, Carlsbad Caverns

July 18, 1980

On July 18 David Carson (19) and Jon Brock arrived at the Visitor Center at Carlsbad Caverns National Park in New Mexico. It was after closing time for cavern tours but the two proceeded along the tour trail nonetheless, down into the very scenic, spacious sinkhole entrance to the cave. The trail is chained off after hours, with a sign on the chain stating 'Do not go beyond Chain', but the barrier was apparently only psychological and the two had been drinking, so they stepped over and continued. Further along is a locked gate. Failing to get through this they left the trail and tried to bypass the gate on ledges at a higher level of the huge passage.

At about 9:45 p.m. Carson slipped from a guano-covered ledge, falling 40 feet onto a rubble pile. Fifteen minutes later Brock had found John McLaughlin, a Park

Technician. Further help was summoned and the victim, who appeared to have spinal injuries, was strapped to a back board, carried out of the cave and transported by ambulance to Guadalupe Medical Center in Carlsbad. It was determined that Carson had suffered a severed spine and was permanently paralyzed from the waist down.

REFERENCES: 1) Bobby Crisman, NPS *Personal Communication* June 10, 1981.

2) John Linahan, NPS *Report of Accident/Incident* July 24, 1980.

3) John McLaughlin, NPS *Case Incident Record* July 22, 1980.

ANALYSIS: It was reported that alcohol was on both men's breath and that they were equipped only with flashlights. The entry was illegal but even sober people are overcome at times with a desire for adventure and I feel this accident was almost predictable. The entrance passage is so big that it is only fenced and gated along the bottom. Given this situation it was seemingly certain that eventually a nut or a drunk would come along and try to climb around the fence. Indeed, the same thing happened again later in the year.

Organized cavers should not feel too self-righteous, however, since climbing in exposed places without a belay is a common practice. To be as safe as possible one should not climb unbelayed in a situation where a fall could have serious consequences.

ACCIDENT: West Virginia, Sinnit Cave

July 19, 1980

On Sunday July 19, Rick Sell (28) and Mark Watts (10) were caving in West Virginia. They had caved all day, doing Trout, New Trout, and Hamilton Caves and then headed for Sinnit Cave, the last for the day.

After visiting the waterfall and the Big Room they were heading out. It had been a long day and both were tired. They had just come down the chimney from the Big Room and passed the waterfall passage. At about 6 p.m. Sell was in the lead when he heard Watts say "Oh, no!" He turned in time to see Watts fall 10 to 12 feet to the bottom, striking the walls a couple of times.

Sell reached the victim "in seconds" and got him to sit down. He checked for broken bones and found none. Watts had abrasions on the back of his left shoulder, on his left arm and a bruise and abrasion on his upper left leg. He was somewhat shaken by the accident but after 15 minutes of reassuring talk he obviously felt better and they exited the cave without further incident.

REFERENCE: Rick Sell *NSS Accident Report* March, 1981

ANALYSIS: Sell names the pertinent factors. They were tired and actually physically over-extended. Sell, because of his experience led the way, but assumed too much for the less experienced Watts. Sell also points out that they could have been proceeding along lower down in the canyon.

In all, this is a common accident. One interesting point is that Watts' helmeted head struck the wall in the fall, but when he hit the bottom the helmet popped off. Helmets should have chin straps that don't allow the helmet to come off in a fall.

INCIDENT: Alabama, Fern Cave

Summer, 1980

In the summer of 1980 Roger Ling and Randall Blackwood were doing Surprise Pit in Fern Cave from the fourth rappel point, a 353 foot drop. Ling went down first, passing a knot about 100 feet above the bottom. Blackwood followed, with some foreboding since this was his first in-cave deep pit. Ling meanwhile had turned off his electric headlamp and was waiting at the bottom. About 150 feet down, the wall near the rappeller retreats and the drop becomes totally free fall. After passing that point, Blackwood quickly observed that his carbide lamp gave insufficient light to see a wall, even though it was producing a long flame. He looked up and down the rope — only darkness with a white rope leading into it. "Then I began spinning around the rope, then suddenly was upside down! I knew logically I couldn't be doing this, that my senses must be wrong. I quickly thought about the rack...no, I hadn't stopped in mid-rappel and (rope) was feeding slowly. I yelled at Roger and he switched on his lamp...I could see a wall...the vertigo left. My heart slackened its pace and I made a smooth, easy rappel."

REFERENCE: Randall Blackwood "A Trip to Remember" *Huntsville Grotto Newsletter* 21:10 October, 1980 p 81-83.

ANALYSIS: Vertigo is a very real condition and when it strikes it is very disabling. I know of one caver who suffers from it and cannot be suspended from a rope at any distance from the ground.

ACCIDENT: Wyoming, Fossil Mtn. Ice Cave

July 31, 1980

Saturday, July 31, Jeff Seneff (23) and Paul Jahner from Idaho Falls, Idaho, went exploring in Fossil Mtn. Ice Cave in Teton County, Wyoming. They descended the 1st drop of 20-25 feet, a steep slope of water ice, on a 1/2 inch polypropylene, laid rope, using the rope as a handline. This is the way the drop is usually done by visitors to the cave.

At the second drop, however, their lack of expertise showed. At this 45 foot,

partly free drop, there is a 9 mm nylon rope connecting two bolts to serve as an anchor point. To this they tied a 1/2 inch hemp rope using a granny knot. Seneff then descended, hand-over-hand. It is reported in a news article that Jahner also descended, but this was not verified by the rescuers. At any rate, when Seneff went to ascend, again hand-over-hand, he made it nearly to the top before tiring and losing his grip. He fell 40 feet, possibly landing on breakdown, suffering head injuries. Jahner exited successfully, went down the trail to the nearest ranch and called Driggs Hospital which in turn called the County Sheriff. Then he and a quickly arriving deputy went back to the cave and threw a sleeping bag down to Seneff.

To expedite the rescue the Sheriff used the Forest Service rescue call-up list, obtaining three climbing rangers from Grand Teton National Park and Chris Albers and Warren Anderson, cavers very familiar with the cave, from Wilson, Wyoming. These people drove to Teton Pass where they, with rescue gear, were ferried by helicopter to a spot near the cave.

At the accident scene, Albers and one ranger descended to the victim who was found to have only head lacerations and a sore leg. He had lost some blood, but had no back injuries. Despite the sleeping bag he was cold. After bandaging his head they put him in a climbing harness and put crampons on his boots. He was winched up the drop and 'walked' out of the cave. By that time it was late at night. Seneff was then helped down a 1500 foot scree slope to the trail where, as a passenger on a motorcycle, he rode out to the roadhead, a few miles away. At the road he was taken by Sheriff's car to the hospital in Driggs.

REFERENCES: 1) Warren Anderson *Personal Communication* Jan. 5, 1981.

2) Editor "Idaho Man Injured in Ice Caves" *Jackson Hole Guide* Thursday, August 7, 1980 p A16.

3) Editor "Idaho Man Rescued from Ice Caves" *Jackson Hole News* Wednesday, August 6, 1980.

ANALYSIS: An exotic location, but the same old bit — a caver outside the caving community using the time-honored (in fiction), but useless vertical method of climbing a rope hand-over-hand. Considering the below freezing temperature of the cave the victim is lucky competent rescuers were so available.

ACCIDENT: Georgia, Armuchee Creek Cave

August 1, 1980

On Friday, August 1, Ron Langston (33) and companions were exploring, with scuba equipment, a submerged cave which is the headwaters of Armuchee Creek in Chatoga County, Georgia. To enter a tight place and explore beyond, Langston apparently took off his normal gear and pushed through with only a pony tank containing ten minutes air supply. He then continued "before his diving partners could attach a life-line to him" (2).

Langston did not return and finally his companions were forced to depart and notify the authorities. A Floyd County rescue unit reached the cave at 7:30 p.m. and divers took a look, but were forced to call in experienced cave divers from Atlanta to recover the body.

REFERENCES: 1) AP "Six Killed in Georgia Accidents" *The Atlanta Journal* August 3, 1980 p 16-D.

2) Anon. "Scuba Diver Drowns in Deep Spring Cave" Rome, Georgia newspaper, no date.

3) Larry Blair *Personal Communication* August 21, 1980.

ANALYSIS: The body was found wedged into a crack near the entrance. Larry Blair speculates Langston might have panicked with the loss of his air and tried to force himself through, thinking it was the entrance. The body was wedged so tightly it had to be pried free with a shovel.

Apparently the dangers of underwater cave exploration don't register on some people until their air runs out in a submerged cave. Why no safety line? Why no rigid time limit? Why alone? Langston was certified with the National Association of Underwater Instructors and with the YMCA. Yet he was just one of a long line of fatalities in underwater cave exploration, many of which seem to be due to spur-of-the-moment urges which violate one or more rules of good sense and safety. In other words, no natural set of circumstances kills them — rather they seem to create their own set of fatal circumstances. Why?

ACCIDENT: Colorado, Lost Creek Cave

August 9, 1980

On Saturday, August 9, Bruce Unger (30), Scott Trossen, Louise Hose, and Tom Strong hiked to a camping place near the lowermost cave of the Lost Creek System in the Lost Creek Scenic Area west of Denver, Colorado. The system is a series of talus caves in granitic rock through which Lost Creek flows. The lower cave was reputed to be not difficult yet a through trip had never been done and this was their goal. At this time of year they expected 10-15 cubic feet per second of flow and a water temperature in the 50's. Hypothermia should not be a problem as they intended to wear wetsuits, but the flow was recognized as sufficient to be a hazard. Unger was said to be experienced in caves with high water flow while the others were relatively inexperienced. All were experienced in wetsuit caving.

With camp established and lunch eaten they prepared to enter the cave. The plan was to go in the lower entrance, push upstream to the upper entrance, then map back. Trossen and Unger wore seat harnesses over their wetsuits while the other two carried theirs in their packs. They all used carbide lamps with a back-up electric lamp but only Hose and Unger had their electrics on their helmets. They all had waterproof flashlights and cyles. Two lengths of 5/16 inch Bluewater III and 50 feet of polypropylene were brought along. All were wearing lug-sole boots except Unger who had substituted cumbersome 'Shoe-pak' style, insulated, rubber boots since his wetsuit booties wouldn't fit inside his regular caving boots. The weather was good.

At 1:30 p.m. they entered the cave with Unger leading. The lead soon switched to Trossen. They were apparently in the water flow at least part of the time, moving as a team, helping each other. About 150 feet in they had to search for a route through boulders. At about this point Hose reports that Unger 'noted that his boots were slipping a lot' (5).

Hose led a traverse above the flow to a dry alcove. Unger then took the lead, re-entered the stream and continued to a plunge pool fed by a 30 degree chute. The water was rushing down a 2 foot wide slot, but above the water the passage belled out to a six foot width at head height. The chute was only 15 feet long but appeared to afford only friction for holds.

Unger proceeded up, straddling the water chute. The others waited in the pool, listening for any communication above the roar of the water. Near the top he yelled down that it was very slick and that one shouldn't stop until reaching the top. At the top was a room opening to the right with deep water feeding the chute. Unger made to move right, into the room. It was about 2 p.m.

At this point Unger either stepped into the pool or slipped off his holds into the water, feet first with legs extended. Either way he was immediately swept into the chute but became wedged near the top, his head and chest above water. He yelled for someone to come up and help. Hose went up and Unger yelled that his left foot was caught. The bulky boot was wedged tight. Hose was able to lift his right leg but that did not help. She called for the others. It was a desperate situation. Unger was holding himself above water against the heavy force of the flow but this could not last long.

Hose chimneyed above Unger as Trossen and Strong arrived. Unger, knowing his life was on the line, began to panic. Hose got into a position to hold Unger's head up but suddenly lost her holds and was swept down, catching on Trossen's and Strong's legs. Strong got her head out of the water and Trossen did the same for Unger. Unger had taken in some water and was choking a bit but was still able to talk. In panic he asked for someone to take his hand which was waving wildly underwater. Just then Trossen lost his grip and Unger's head went under — a moment later Unger's companions all lost their holds and were swept down the chute.

They landed in the pool in confusion. The carbide lamps were out and the only light was Hose's electric. Unger was underwater. Trossen re-ascended quickly and grabbed Unger's helmet to pull his head up — the helmet came off. Trossen lurched, lost his footing and again was swept down.

Hose and Trossen took off their cave packs and ropes and again hurried up to Unger. Trossen pulled up on Unger's cave pack. With a lurch the pack strap gave and both lost their holds, being delivered once again by the rushing water to the plunge pool below.

At that point Strong, who had stashed the gear, climbed the chute followed by Hose but neither could find Unger. A yell to Trossen sent him downstream looking for Unger who must have, miraculously, washed free. Strong and Hose descended and searched the pool. After a few minutes of frantic looking, they had found nothing. Hose re-ascended the chute yet again and, probing deeply underwater, located Unger who was further down into the crack. She communicated this to those below and Trossen climbed up, Hose moving upstream of Unger. Trossen got a grip, pulled, and slipped, catching himself partway down the chute. At this point they seemed to realize that they no longer had the strength to continue with what seemed futile anyway. Unger had been underwater for more than ten minutes. The words were spoken — "Unger is dead."

Sadly, and undoubtedly in mild shock, they gathered their gear and, at about 2:45 p.m., exited the cave.

Two weeks later (August 23), with water flow reduced 50 to 70% a body recovery team found it required the pull of a come-along attached to Unger's seat harness and anchored to an overhead, wedged boulder to free the body from the chute.

REFERENCES: 1) N. Pace "Report to the Coroner on the 1st Recovery Attempt" no date 3 pages.

2) T. Strong "Report to the Coroner - Fatality in Lost Creek Cave, August 9, 1980" August 22, 1980 5 pages.

3) L. Hose "Report to the Coroner - the Recovery Attempt I, August 10, 1980" no date 1 page.

4) L. Hose "The Recovery Attempt II, 23 August 1980" no date 2 pages.

5) L. Hose "Report to the Coroner - Fatality in Lost Creek Cave System, Park County, Colorado" August 22, 1980 5 pages.

6) L. Hose "Analysis of the Lost Creek Fatality" Unpublished report 1980.

7) S. Trossen, T. Strong and L. Hose "Lowermost Cave, Lost Creek System, Colorado" Report to ACA Fall, 1980.

8) Scott Trossen "Gone in Lost Creek" Unpublished report August 18, 1980.

9) Jay Arnold "Death in the Rockies" **NSS News** 40:9 September, 1980 p 209-215.

10) Norm Pace **Personal Communication** December 6, 1980.

11) Ben Galloway, M.D. "Autopsy - Donald Bruce Unger" August 24, 1980 4 pages.

ANALYSIS: (Knutson)

The coroner's report after autopsy concluded that "the cause of death is due to extensive head injuries and a fractured neck due to blunt trauma consistent with a fall" (11). There was no evidence of drowning yet this may not be conclusive due to advanced post-mortem decomposition. Both Unger's companions (7) and Jay Arnold (9) who interviewed by phone the doctors involved with the autopsy believe the death blow occurred when Hose washed over Unger the first time. Yet this cannot be. Park County Coroner Marty Flohrs gives the opinion that Unger could not have lived beyond the next movement of his head once the injuries were received (9) and the reports clearly show that Unger was both moving and talking for several minutes past that first blow, when Hose washed over him. The second time she did so he was underwater.

Under "Central Nervous System" the coroner found (11)

1) "a midline fracture extending into the right frontal bone."

2) "extensive fracturing of the base of the skull involving the sphenoid bone and the petrous portions of both temporal lobes."

3) "bilateral fractures of the frontal plates."

In other words there was extensive fracturing of the skull and some of this in areas covered by Unger's Ultimate helmet. I believe the evidence is strong that when Trossen, Hose and Strong washed down the chute the first time the force of the 10-15 CFS, which is extremely powerful, whipped Unger's head around and broke his neck. Then when the helmet came off shortly thereafter, the same powerful turbulence smashed Unger's head on the walls of the chute causing the rest of the skull fractures. How else could these fractures, "consistent with a fall" (11) be present when no fall occurred?

It seems that it is also possible that drowning was the cause of death via vaso-vagal reflex where cold water reaching the larynx causes a closing of the passage to the lungs resulting in abrupt heart stoppage. There would be no water in the lungs in this case. Still, this would have had to occur just before or in conjunction with the skull fracturing discussed above since there was a little hemorrhaging associated with that (11).

As to other factors I agree with the analysis of Unger's companions, given below, except that I would like to emphasize the danger of a flow of water such as they encountered. Heavy water flow caves are extremely dangerous. Even the strongest swimmer can be swept under a ledge or jammed into a crevice. Even a belay is of little use — once jammed somewhere by the force of the flow not even several people would be able to pull the victim out.

I don't wish to suggest that Unger's companions didn't do their all for him, but I can't resist, from the safety of hindsight, to suggest a possible course of action. This is purely conjective and may well have been impossible even had someone thought of it. Namely, take the rope available, tie it in a loop under Unger's armpits and anchor it above the chute, so that his head might be above water even when he tired. Then one might seek the proper equipment, come-along or whatever, to free him. Just a thought.

ANALYSIS: (Hose, Strong, and Trossen)

A disaster is always a potential when dealing with caves containing large amounts of rapidly moving water. Unger was the most experienced river caver of the party and we all had discussed the possible risks. Although none of us felt the quantity of water was too dangerous, delaying the trip two weeks would almost certainly have prevented the fatality. A slip into the lower water flow would probably have been a minor incident.

Unger was wearing bulky, hunter-style boots with soft rubber soles which he had earlier complained about being slippery. The climb was not difficult and the boots may have contributed to the initial slip. Also, Unger was straddling the chute. He effectively had only two points of contact with the walls, as no handholds were available. When his foot slipped he fell with a long limb (his leg) in line with the force of gravity and the force of the water. This must have greatly enhanced his chances of being trapped. When the others washed down the chute they had fallen with their limbs up high, preventing them from wedging.

The critical importance of an electric headlamp mounted on the helmet and turned on when traveling in water was emphasized in this accident. In an emergency situation, back-up light sources in a pack may be nearly useless. After the trio was washed down the chute, Hose's electric headlamp was the only functioning light in the cave.

While it probably made no difference, panic was a factor in our attempts to free Unger. Though physically able to do so when Hose reached him, Unger did not explain how he was trapped or how he could most effectively be helped. While the group always maintained control, Hose and Strong both felt that panic of varying degrees prevented clear thinking on their parts after Unger had gone under. Panic is a difficult emotion to suppress. Cavers can best learn to control it by mentally

preparing for such disasters, recognizing such incidents may happen to them, and trying to imagine responding in an appropriate manner.

ACCIDENT: Alabama, Sauta Cave

August 12, 1980

On August 12, Bill Varnadoe (57) led a surveyor employed by the U.S. Fish and Wildlife Service through Sauta Cave in Alabama. This was the first of three successive trips and its purpose was to acquaint the surveyor with the cave. On the two following trips they would accurately survey sufficient passage to establish the position of a surface land boundary in the cave.

Varnadoe with another caver had mapped the cave in 1956 but he had not been in it for six or seven years. Furthermore, they were using a type of miners electric lamp that was not especially bright. Consequently, in tracing the route of the proposed survey, the two reached the Mountain Room but there became disoriented. Choosing the wrong lead, they pushed along while it became increasingly narrow. At a place almost too tight to get through, Varnadoe realized he'd made a mistake but could see a landmark in a cross-passage beyond and decided to try to get through. Forcing himself through, Varnadoe cracked a rib. This did not hinder him so the trip continued, though they did lose their way a second time.

REFERENCE: Bill Varnadoe "Profitable Caving" *The Huntsville Grotto Newsletter* 21:11 November, 1980 p 91.

ANALYSIS: This is not much of an accident yet serves to illustrate a point. One can injure one's self merely by the exertion of one's own muscular strength. Weight lifters sometimes develop more muscle power than their own bones can handle.

ACCIDENT: Pennsylvania, Schofer Cave

August 15, 1980

At around 3:30 a.m. a group of seven Kutztown State College students, Greg Harris (20), Aaron Powell (20), Marvin Wiley (19), Jill Fortunato (18), Joan Howie (19), Pam Rhoades (19), and Doug Stanford (19), entered Schofer Cave in Greenwich Township about two miles northwest of Kutztown. They had come from a party celebrating the close of the summer school session.

Shortly after entering the cave their only flashlight failed. Two candles, their only other light source, didn't last long enough to get them out. They sat down to await rescue.

Fortunately, one student had declined to go into the cave. At about 6 a.m. this person began to worry and made a distress call on a CB radio. The State police at Hamburg got the message and called the Kutztown Fire Company. Police and fire personnel arrived on the scene at about 8:30 a.m. Two firemen crawled the 150 feet to the stranded cavers and by 9 a.m. had let them out.

REFERENCES: 1) Anon. "7 KSC Students Rescued" *Reading Eagle* August 15, 1980 p 1, 2.

2) Mike Dyas "Caves and Caving" *NSS News* 39:2 February, 1981 p 37.

ANALYSIS: It can be suspected that alcohol consumption played a role in this version of the repetitive scenario, 'the perils of flashlight caving'.

ACCIDENT: Tennessee, Snail Shell Cave

September 7, 1980

At about 4 p.m. on Sunday, September 7, six cavers entered Snail Shell Cave in Rutherford County, Tennessee. These were Ben Wynn (48) and five children from his neighborhood, Marty and LeRoy Judd (10 and 14) and Vickie, Donna and Connie Deary (7, 10 and 13). They had planned to exit at 6:30 p.m. On their way out, however, they inadvertently entered a passageway off the main route. While trying to back-track, their lights failed. They stopped and waited in the 65 degree cave.

When they did not appear at 6:30 as expected, an alarm was raised eventually yielding the Rutherford County Rescue Squad. They arrived at the cave at 9 p.m. and searched inside for some time without success. In fact, several rescuers became lost themselves.

At about 1:30 a.m. (Monday) one lost rescuer entered the same passage and encountered the lost cavers, somewhat cold and scared by this time. With light they were able to back-track to the correct route and proceeded out. Two other lost rescuers were found at 3 a.m. further into the cave.

REFERENCES: 1) Mark Paxton "Lost Groups Are Rescued From Cave" *Nashville Banner* September 8, 1980 p 1, 2.

2) Lisa Haman "Caving Over, She Says After Rescue" *Nashville Tennessean* September 9, 1980.

ANALYSIS: The cavers lights, which were probably flashlights, reportedly got wet and so ceased to function. A typical "non-organized" caver accident. The rescue was expedited by the fact that those outside knew what cave they were in and when to expect them out.

ACCIDENT: Virginia, Endless Caverns

October 11, 1980

On October 11, cavers were exploring in the non-commercial portion of Endless Caverns near New Market, Virginia. At 7:30 p.m., some 3/4 of a mile into the cave and 1/4 mile past the end of the commercial path, a caver took a 40 foot fall. A companion went for help. The New Market Rescue Squad was summoned and local cavers were alerted.

The New Market squad arrived first, at 8:30 p.m. but the companion of the injured caver wanted to wait for his own rescue people. At 10 p.m. he decided he could not wait longer and requested the New Market squad's help. Two members carrying first aid supplies were led to the victim. The route included places where one could not stand erect, a 30 foot, out-sloping, slick ledge above a 30 foot drop, and a 15 foot slippery climb up a wall into a narrow opening at the top.

The injured man had fallen down a 40 foot pit (8 feet by 4 feet) in a room 50 by 15 feet with a ceiling of from three to ten feet. Access to the bottom was best obtained by proceeding further into the cave, rappelling down a 60 degree bank and doubling back through a three foot wide passage to the bottom of the pit.

A "primary and secondary" look at the victim showed him to be conscious and responsive. He had multiple rib fractures, a possible fractured pelvis and numerous abrasions and contusions. There did not appear to be head or back injuries. Vital signs were stable. His chest was bound and the rib fractures stabilized. Blankets and heat packs were applied.

At 11:30 p.m. the first of the cavers arrived and began rigging the difficult places for transport. At 12:30 a.m. Dave Morrow, the on-site coordinator arrived and transportation of the victim commenced.

The victim was placed in a Reeves stretcher and the Reeves into a Stokes. This was lifted vertically out of the pit accompanied by a rescuer. At 12:45 the victim became nauseated — this was handled by turning the Stokes on its side. The nausea recurred several times. The victim remained stable although in severe pain. At 1 a.m. the victim was up the pit and two teams of six cavers each began the transport out. At the 30 foot ledge a tyrolean had been rigged and the Stokes was "trolleyed" across.

By 2 a.m. the victim was out of the cave and transported to an ambulance. Seventeen cavers operated in the cave with 13 outside. All were under the coordination of Dave Morrow, Dave Hubbard and Lee Noon. According to the New Market squad, "their expertise made a near impossible task look routine."

REFERENCE: Anna Lee Gardner "Caving With The New Market Rescue Squad" *First Aid Bulletin* December, 1980 p 10-11.

ANALYSIS: The rescue squad reporter was certainly impressed with the ability and energy of the cavers taking part in the rescue. There is too little information to assign a cause to the accident.

ACCIDENT: New Mexico, Carlsbad Caverns

October 11, 1980

On October 11 Scott Geml (18), Ron Doering and Terry Shaffer, all from Cannon Air Force Base, visited Carlsbad Caverns in New Mexico. At 3:30 p.m. Geml, who was driving, was stopped and cited by a park law enforcement officer for making an illegal pass. The three also received a 20 minute lecture and had several beers confiscated.

At about 4 p.m. the three reached the Visitor Center. It was after hours and no tours were being run. Undaunted they passed a chain barrier and several warning signs and followed the paved tour trail down into the gaping entrance to the cave. In the twilight zone they encountered a gate barring further progress.

Geml went over the rail and climbed out onto a ledge and along the sloping cave wall. At a point about 150 feet from the trail he reached an alcove about 65 feet above a lower switchback in the tour trail. Suddenly he fell, reportedly when a stalagmite handhold broke.

Doering and Shaffer ran up the trail to get help and encountered Darrell Bridwell, the officer who had cited Geml earlier. Bridwell radioed for further assistance while Doering ran back down and started to repeat Geml's folly. Bridwell called him back to the trail and sent him out of the cave. Unlocking the gate, Bridwell proceeded to where the fall occurred. He found Geml lying face-down by the trail, exhibiting no vital signs. Other park personnel arrived within seconds and verified that Geml was dead.

REFERENCE: Bobby Crisman, NPS *Personal Communication* June 10, 1981.

2) Darrell Bridwell, NPS *Report of Accident/Incident* CACA 80:38 October 11, 1980.

3) Darrell Bridwell, NPS *Case Incident Record, Case No. 80316* October 12, 1980.

ANALYSIS: Drinking probably contributed to this foolishness but it is also possible that since this was a purely "fun" outing that foolishness was a more probable frame of mind than if it were a serious caving trip. In any event, such exposed climbing should be belayed.

Since this is the second such accident this year for Carlsbad Caverns it might seem appropriate for the NPS to consider re-designing the access to the cave entrance. Considering the size of the entrance, this may not be possible. It is hope that no legal difficulties accrue since Carlsbad is an outstanding tour cave.

ACCIDENT: Georgia, Kingston Saltpeter Cave

November 8, 1980

On the night of November 7-8 two couples went to have a party in Kingston Saltpeter Cave near Cartersville, Bartow County, Georgia. One boy was 22, the other 16, and the girls were 16. They entered the cave at 1:00 a.m. on the 8th, set up a camp and lit a fire with wood and Durafume logs. They drank some beer, smoked some pot, and then went to sleep.

When they woke up they saw how bad the smoke was and realized they should get out. They were disoriented, however, and by mistake headed deeper into the cave. The 16 year-old boy was overcome by the fumes shortly after.

That same day, Joel Sneed, Jim Henry, Jay Henry and Larry Blair visited Kingston Saltpeter Cave on project work. They were aware that locals like to camp inside and that their campfires usually create a smoky atmosphere. On this day the smoke was particularly thick and acrid. Another group, a boy's club, arrived at that time so the cavers talked to them, advising their leaders to wait until the smoke cleared up.

At 10 a.m. Jay Henry and Blair headed for their project work in one area of the cave while Sneed and Joel Henry went to extinguish the fire if it was still burning. They headed for the area where most people camp. The smoke became thicker as they moved in this direction and soon they came upon abandoned items — two women's pocketbooks, two spread blankets and some 6-packs of beer. At this point the smoke was so thick that a Wheat lamp beam penetrated only six feet. Sneed's carbide lamp was of little use. It was apparent that someone was in the cave and possibly in trouble. A car was parked outside but had no note on it. They went on.

A short distance further into the cave they found the four young people equipped with flashlights which were barely working. One was lying unconscious on the floor with a girl kneeling over him and the other two were standing nearby, disoriented.

Henry and Sneed determined the best way out and began carrying the boy after checking for injuries. The boy's companions didn't offer to help and followed along as if stunned. When they got to a point where these companions could find their own way, they took off as if desperate to get out. Henry and Sneed yelled to the departing boy to tell Larry Blair to come and help and to bring a Coleman lantern. The boy did run into Blair but just said that the others needed the lantern, then headed out. Jay Henry went in with the lantern then had to come back to get Blair. The four of them carried the boy up the 200 foot steep incline to the cave entrance.

Blair took Henry's water bottle and went back to get the victims' possessions and put out the fire. Blair used a wet bandana over his face to go back in.

Outside, the unconscious boy came around enough to say a few words. The cavers stopped his companions from giving him water. The companions refused a doctor and had the cavers put the sick boy in the car and they left. The cavers were "totally spent" and experienced headaches for awhile afterward.

REFERENCE: Larry Blair *Personal Communication* February 8, 1981.

ANALYSIS: The rescuers may have been in danger. It is difficult to realize a truly dangerous oxygen or carbon dioxide level before one is overcome. Probably the acceptability, health-wise, for having a fire in a cave would depend on the ventilation of the particular cave. For the benefit of the ecology of the cave it would be best to keep all fires outside.

ACCIDENT: New Mexico, Lost Cave

November 23, 1980

On November 23, Butch Hendrix (37) and Charles Bruce visited Lost Cave in Eddy County, New Mexico, on a photo trip. They intended to share climbing gear. Hendrix had not rappelled before so the use of a carabiner-brake bar set-up was demonstrated by Bruce. Hendrix was obviously unsure and nervous about this unfamiliar technique. He had previously descended pits hand-over-hand and decided to use this more familiar method. He was told of it's dangers but insisted. It was also found that Bruce's chest harness would not fit Hendrix and that he would have to ascend with just foot-attached ascenders, apparently expecting to hold himself upright with hand and arm strength.

Bruce proceeded to rappel down the 30 foot entrance drop. Hendrix then grabbed the rope and started down, hand-over-hand. Part-way down he began to slip and then went down fast, with the rope sliding through his hands. He landed hard, but on his feet. His hands were badly burned and his back hurt. He chose to lie down. It was obvious that he couldn't ascend without a chest harness.

Bruce left Hendrix with water and warm clothing and exited the cave, proceeding to a caving friend's place to borrow a chest harness. The friend's harness was already loaned out so the two of them headed back to the cave, only a few minutes journey.

Using Bruce's seat harness as a chest harness, Hendrix made it out and was taken home. He was later hospitalized, presumably for the back injury and burned hands.

REFERENCE: Charles Bruce *Accident Report* March, 1981.

ANALYSIS: Bruce concludes that both were not using safe methods. He feels that he perhaps should have taken his rope and refused to enter. Such decisions are difficult and certainly will offend the person with the unsafe technique. Hendrix

was lucky he was with someone who knew proper techniques and had good equipment. The right thing to do, whenever faced with a situation requiring equipment you don't have, is to back off and get what is needed.

ACCIDENT: Indiana, Middle Cave

Fall, 1980

During the Fall of 1980 there was a Windy City Grotto trip to Middle Cave at Henderson Park, Washington County, Indiana. The trip included some 20 cavers. Bob Paterno and Joe Podge negotiated the tricky climb of the second waterfall to rig a cable ladder at the top and belay the others up. They felt the ladder was mainly to speed up the flow of people at this point and shorten the wait for turns in the cold water below. When two companions made it up they relieved Paterno and Podge who took a look at the rest of the cave. Everyone else made it up and continued exploring. A little later they began exiting and soon all but two had passed Paterno and Podge and been belayed down. They waited for the two for an hour, searched briefly, then proceeded, assuming correctly that the last two would come out on their own later.

After de-rigging, Paterno carefully started down, leaving his pack for Podge to toss down. "I eased myself into the alcove, found two good footholds, which turned out to be not so good, found one good handhold, and was searching for another. It was then, due to the slippery conditions or the holds breaking off (I'm not sure which) that my feet slipped out from under me..." (1). He grabbed unsuccessfully for a handhold, became inverted, and fell head first. The fall was 10 to 12 feet and the force was caught partly with at least one arm.

Podge descended to find Paterno lying with his face in the water. Pulling him upright, he shook him and yelled, asking if he were OK. Paterno came around quickly, checked himself and found that one wrist seemed to be broken. When Paterno no longer felt stunned they left the cave. The wrist was treated at a hospital.

REFERENCES: 1) Bob Paterno "Accident Report" *The Windy City Speleoneers* 20:6 December, 1980 p 108.

2) Mike Dyas "Caves and Caving" *NSS News* 39:2 February, 1981 p 37.

ANALYSIS: Paterno says he will insist on a belay on this climb in the future. "But if I came across a similar climb, with good handholds and footholds and so on, in a different cave, I would not hesitate to try and climb it without a belay. There has got to be a limit on how far you will go for safety." (1) I don't mean to pick on Paterno with this quote, since he represents many cavers with this sentiment. But is it really necessary to have this attitude? Certainly any caver will come to situations, especially in original exploration where he chooses to violate good safety rules to push on. But in a grotto trip like that described here I don't think deliberate danger is necessary. Let me explain with a situation like the one above.

A group reaches a vertical pitch and wants to go up. It looks climbable but tricky. Coming back down is always more difficult than climbing up so the best climber of the groups climbs, using a belay and pitons, chocks or bolts if the pitch is more than 15 to 20 feet. With an upper belay the rest ascend, and later are either belayed back down or a rappel is set up. For the last man to go down, either a bolt, piton, or chock is wasted or a natural anchor is found and a piece of sling is tied around it. A descending ring or chain repair link is attached to the anchor and the rope is doubled through it so that the rope can be pulled down. The last man then either rappels or receives a belay from below and climbs down. The rope is pulled down. If you are not clear about this process, check any good mountaineering manual.

ACCIDENT: New York, Clarksville [Ward-Gregory] Cave

December 12, 1980

After school on Friday, December 12, 1980 Ronald Ames (16) and Robert Tabor (19) rode the school bus to Clarksville. At a grocery store they purchased a 12-pack of beer, three packs of cigarettes, and a flashlight with standard batteries to go with the one they had brought with them. They were wearing shirts, jeans and sneakers plus coats, knit caps and gloves.

Proceeding down the road and into a wood they entered the Ward entrance to 3000 foot long Clarksville Cave at 2:45 p.m., leaving excess belongings in Mosquito Cave, a small cave in the same sinkhole. A note was left on a log under a rock giving the date, time of expected exit and name and address of someone to notify.

In the cave they brought only the two flashlights and one coat. After looking around the Big Room they headed south toward the Gregory section, crawled through the Ward-Gregory link, proceeded down into the Slickenside Block Room and into the Bathtub where they got wet to mid-thigh. Going along Cook Avenue they passed the rimstone dams finally stopping at Brindley's Sump. After a short break they started back.

Moving along Cook Avenue one flashlight was dropped. Proceeding then as quickly as possible, they made it through the Bathtub and to the Slickenside Block Room before the remaining flashlight failed when the batteries went dead.

They were wet from the thighs down in a 50 degree cave and realized that they needed to get out if they could. With Tabor leading they searched the walls, looking for the passage out. This endeavor took them up a slope into the Pixie Passages.

The sound of dripping water led them on into the Lost Rock Hammer (Root) Room. There they stopped and assessed the situation. They had left the note at the entrance and also had told some of their classmates of the proposed exploration and felt they had hope of early rescue. They decided to wait, periodically searching for the way out to keep warm.

Outside the note was found but only at 5 p.m., before the expected exit time, so no alarm was taken. After that it snowed and the note was covered, not to be found again until after the rescue. Fifteen to twenty cavers visited the cave that afternoon but the stranded cavers were not encountered.

On Saturday morning Ames was missed by his guardian, Doug Warner. Warner called around, finally calling the Albany police requesting them to check the streets. Shortly after that Warner heard that the boys might be at Clarksville Cave, so he notified the Albany County Sheriff.

Deputies went to the Wards entrance and yelled in, obviously not knowing how extensive the cave is. There was no response and no footprints in the snow so they concluded the boys were not in the cave.

In the cave, Ames and Tabor huddled together under the single coat, squeezing water out of mud to alleviate thirst. They had no food. They amused themselves and established that they were not going blind by throwing rocks against the wall and watching for the sparks. Time dragged on.

By Tuesday of the following week it had become obvious to Karen Boggs, a counselor at the High School, that Tabor was missing. She contacted Warner and expressed the opinion that the boys had not simply taken off on some trip and were in fact stranded in the cave. On Wednesday, December 17 she talked with Nick Viscio, another teacher at the High School, who was an avid caver. Viscio said he could get cavers for a search right away; Warner gave his OK and the calls went out.

Cavers called were told to meet at the Clarksville Super Mart at 5 p.m. With Bill Stevener (NECRO) coordinating, cavers on hand were: Tammy Hauser, Ron Sloan, Sue Field Sloan, Chuck Porter, Randy Draper, Al Hicks, Richard Schaefer, Joe Flores, and Pete Teresco. Also available were Bob Mayo and John Middlebrook, emergency medical techs with the State Office of Parks and Recreation. Two unsuccessful calls had gone out to National Cave Rescue Commission regional coordinator Warren Hall.

At 5:30 p.m. the first team entered the cave to search from the Gregory Entrance to Brindley's Sump. They exited 30 minutes later with no evidence that the boys had been in that part of the cave.

A second team entered at 6:15 p.m. to check all side passages from the Ward Entrance to Brindley's Sump. At 6:40 a third team went in the Ward Entrance heading upstream to check the Lake Room. They exited at 8:20 with no evidence of the exploration of the lost boys.

At 9:00 p.m. a Team Two member exited the cave to report that the victims had been found alive. One had a sprained ankle and both were somewhat hypothermated with numb hands and feet. Their first comment was "Is Christmas over?"

Warner was notified, an ambulance was called and an evacuation team entered the cave at 9:25 p.m. By 9:45 the boys were in the ambulance, on the way to a hospital. They had been in the cave 5 1/4 days.

REFERENCES: 1) Douglas Hauser "Rescue at Clarksville" *NSS News* 39:3 March, 1981 p 65-66. Also in the *Northeastern Caver* 12:1 Winter, 1981.

2) Anon. "2 Youths Lost Since Friday Are Found" *Schenectady Gazette* Thursday, December 18, 1980 p 39.

3) Anon. "How the caves were thwarted" *The Northeastern Caver* 12:1 Winter, 1981 p 11-12. Also in the *Spotlight* December 25, 1980.

4) Bill Stevener "Clarksville Cave Search and Rescue" *The Northeastern Caver* 12:1 Winter, 1981 p 15-19.

ANALYSIS: Unfortunately for these boys, they had a reputation for taking off on trips (spelled 'running away') so their rescue was greatly delayed. Otherwise this is just another repetitious chapter in the annals of flashlight caving.

ACCIDENT: Alabama, Three Caves

December 13, 1980

On Saturday, December 13, cavers were exploring at Three Caves near Fagan Spring Road near Huntsville, Alabama. At about 2:30 p.m., Robert Meijer suffered a fall while rappelling. He was taken to Fox Army Hospital and was reported to be in stable condition.

REFERENCE: Anon. "Fall While Rappelling Leaves Soldier Stable" *The Huntsville Times* December 14, 1980.

ANALYSIS: Too little information.

ACCIDENT: Indiana, Brinegar Cave

December 22, 1980

On Monday, December 22, brothers John (23) and David (19) Moring from Cincinnati, Ohio, went exploring in Brinegar Cave near Bloomington, Indiana. The elder brother had not been caving before, but the younger had gotten experience

while an explorer scout. At around noon they left their station wagon at the end of Eller Road on the edge of Blenz's property (NSS Cave Files). They had two helmets, a carbide lamp, an electric headlamp, an electric hand lantern and some rope, but took only the carbide lamp, one helmet, and the rope into the cave. When their light failed sometime later they became stranded.

The cavers were expected home on Monday evening and their parents apparently called the police and eventually, on Wednesday, a Cincinnati caver, Tom Gracini was called for help. He called Blenz's place where cavers usually register before caving and relayed the info on the cavers and their equipment. Pat Ennis was there and called Don Paquette. Others were put on standby while Paquette checked the car. At about 5:30 p.m. he broke into the car and came to realize the lost cavers had only one light with them. He returned to Blenz's and put a search in progress.

At 7 p.m. other cavers arrived and checked the entrances to Wayne's, Shaft, Grotto and Coons Caves. At 7:45 Paquette called Tom Rea in Indianapolis to put the Central Indiana Grotto on standby.

At around 9 p.m. the search party returned having found nothing. Other cavers who had logged in at Blenz's on trips that week were called without results.

At 10 p.m. several cavers checked Buckners. Lee Noon was called and a warm gas body warming system was put on standby to be flown in if needed. Hypothermia was a concern. Travel time for the system would be two hours.

At 1 a.m. Thursday, the Indianapolis stand-by group was called in. Three cavers headed for Brinegar's at 2 a.m. with a more thorough search planned when more manpower arrived. The lost cavers were found in the entrance stream passage in the pits just after the crevice. They were in good shape so their rescuers recharged their lamp and they were escorted out arriving at Blenz's at 3:15 a.m.

REFERENCES: 1) Barbara Mogenstern "Two Brothers Lost in Cave Found Safe After Two Day Search" *Cincinnati Post* December 26, 1980.

2) Dick Blenz *Personal Communication* June 1, 1981.

3) Don Paquette "...And to All, A Good Night!" *BIG Newsletter* 16:2 p 20-21.

ANALYSIS: Brinegar is not a cold cave so hypothermia was not a problem. Also, there was water in the cave which the lost cavers apparently made use of.

The main theme here is the recurring one of non-organized cavers going caving ill-prepared. If they had left a note giving their objective on their car it would have made their rescue much simpler.

ACCIDENT: California, Cat's Cave

December 29, 1980

On Monday afternoon December 29, seven kids were playing at the base of a cliff adjacent to the Quail Hollow Road near Ben Lomand, Santa Cruz County, California. About 200 feet up the near-vertical sandstone cliff and about five feet from the top is Cat's Cave, a rock shelter about three feet in depth. There had been little rainfall in preceding weeks but fog swept the ridgeline above in the mornings and the ground was damp. The cliff and cave were a site for fossil collection.

At 4 p.m., two of the youths, Shawn Carlson (14) and Steve McGovern (12) climbed up to Cat's Cave and began using a claw hammer to batter their names into the sandstone overhead. At about 4:15 there was a rumble as the "front upper portion of the cave slid off" (2). Carlson was buried completely and McGovern up to his shoulders.

The youngsters below were alerted by McGovern's cries. Three climbed up to assist McGovern and two ran down to get help from a nearby house. A call went to the Ben Lomand Fire Department and a rescue squad was at the site in ten minutes. After five minutes of hand removal of debris both victims had been freed. McGovern was uninjured. Carlson, who had been under two feet of debris for 15 minutes had no pulse and was not breathing. He was placed in a Stokes litter, lifted over the cliff top, carried to an ambulance, and transported to Community Hospital in Santa Cruz. Carlson was declared dead on arrival.

REFERENCES: 1) F.P. McPherson, Jr. *Santa Cruz Sentinel* Wednesday, December 30, 1980 p 2 Thursday, December 31, 1980 p 12.

2) W. Drager Jr. *Personal Communication* (Fireman at the Scene) Undated.

3) John Alan Clardy *NSS Accident Report* December 29, 1980 4 pages.

ANALYSIS: The dampness combined with unstable conditions created by fossil collection possibly contributed to the collapse but the foolish activity of pounding on the ceiling of a cave is what cost Carlson his life. This is only a shelter cave but the entrance area of any cave should be judged potentially unstable due to weathering and biological activity. Furthermore, unstable ceilings exist in some parts of many caves — treat such areas with great respect.

1981 REPORTS

Incident: Mississippi, Waddell Cave

March 24, 1973

At about noon on March 24, 1973, Archie Middleton and Steven Carey entered Waddell Cave in Smith County, Mississippi to carry out biological studies. The cave is basically a single stream inlet passage which ends in a sump after 600 feet. One hundred feet from the entrance is a very low crawlway followed by a breakdown room, another tight crawl and the rest of the cave.

Carey and Middleton proceeded to the end of the cave and carried out their studies. This done, they started for the entrance and noticed the stream was rising. They rushed to the first crawl and got through. They were then relieved — if the outer crawl was flooded they could hopefully wait out the flood on the breakdown. They pushed on and found the outer crawl still open. Outside it was raining heavily. **Reference:** Steven Carey "Near Entrapment in Waddell Cave" **MUD** February, 1982 p 17.

Analysis: Carey wrote to point out the dangers of this particular cave in bad weather. One should heed the weather in any potential stream cave exploration.

Accident: Mexico, Oaxaca, Un-named pit near Huautla January, 21, 1981

In January of 1981 a group of cavers including Dan Dible, Jim Smith, Chris Kerr, Jill Dorman, Mike Sanders and Marion Smith from the United States were investigating caves near Huautla de Jimenez in the northern end of the state of Oaxaca in Mexico. On Wednesday, January 21, several of the cavers went hiking in search of new pits, taking along a 200 foot PMI rope bought in 1979. Taking the road toward La Providencia for awhile, they soon struck off on a trail. After doing a 160 foot pit they moved on. The afternoon had become enshrouded in fog and at this point the wind was blowing. A thrown rock at a second pit indicated a depth of some 50 feet. After the vegetation was cleared, the PMI was rigged to a boulder about 15 feet from the edge.

At around 5 p.m. Danny Dible (25) got on rappel and started down, dislodging a large (10-20 pounds) rock as he passed the lip. He continued, but after he had rappelled 20 feet or so, those on the surface saw the rope suddenly become slack — it had broken at a spot damaged by the falling rock. Fortunately the rope had been rigged with excess on the surface. It was quickly re-rigged and Chris Kerr rappelled in. Dible, meanwhile, was moaning and calling for help. Kerr immediately sent his vertical gear up and, using it, Marion Smith descended.

Dible had fallen free for at least 30 feet and landed on a rubble slope down which he tumbled for a short ways. He was obviously injured and bleeding but still conscious, though confused as to what had happened. Kerr examined him for injuries and observed a possibly broken left wrist, a damaged right knee, possible broken ribs, possible back injuries, injured left elbow, a cut lip and abrasions on the forehead.

A space blanket was made into a crude tent over the victim and two carbide lamps were placed under it for warmth. Dible still complained of feeling cold so obviously shock had set in. The situation was communicated to those on the surface and Mike Sanders went back to the house for the truck. Thirty minutes later Kerr left to get a doctor. This left Smith with Dible amidst the stinking, bloated sheep and goat carcasses in the pit.

At 8:20 p.m. Kerr returned and lowered additional items — stove, food, drink, carbide, first-aid kit, sweater, parka, etc. The extra clothes were put on Dible and he was given a pain pill.

A hour and a half later the truck arrived with Sanders and Jim Smith. Smith descended bringing a Kelty pack frame, webbing and a large first-aid kit. He examined Dible and requested two 3 1/2 foot splints which were shortly sent down. The right leg was splinted, Dible's chest harness was put on and he was attached to the rope by his seat and chest harnesses (the seat harness was already on). Kerr and Smith changed places and a second rope was rigged through a pulley fastened to ropes stretched over the pit. Then Dible was hauled up with Kerr climbing the first rope, guiding him. It was near midnight.

Dible was then carried about 1/4 mile along the slippery, muddy trail, through the cold, foggy night to the waiting truck. The seven mile transport to Huautla was taken slowly to ease the bumps with Dible on a foam pad, under a sleeping bag. No doctor was available in Huautla so, after a nights layover, Dible was taken to the hospital in Tehuacan. He was treated for a broken finger and a strained back and knee.

References: 1) Marion Smith **Personal Communication** August 17, 1981.

2) Peter Sprouse **Personal Communication** June, 1981.

3) Bill Stone **Personal Communication** July, 1981.

4) Jim Smith **Personal Communication** December, 1981.

5) Chris Kerr **Personal Communication** December 22, 1981.

6) Dan Dible **Personal Communication** December, 1981.

7) Chris Kerr "A Day In Mexico" **Speleotype** 14:2,3, October, 1981 pp 3-8.

Analysis: As Dible passed over the lip on his descent he obviously kicked loose some dirt and small rocks. A 10-20 pound rock also fell but may not have been noticed by Dible. About 20 feet below, the rope passed over a second lip. Kerr theorizes that "Because he held the rope behind him and may have been standing or kneeling above the entrance lip when the rock fell, it is likely that the rope was severely damaged....at the lower (second) lip, the damaged place would have been 'hidden' below the....lower lip."

The rope was examined and the core and 2/3 of the sheath were found to be cleanly cut — the other third was slightly frayed. Dible claims to have rappelled slowly. It must be that the damaged place was unobvious but it is also likely that Dible was not intensely thinking of possible rope damage. The combination of the

these two circumstances led to his rappelling onto the damage, the rope breaking and his fall. The message to receive here is that in any situation of possible rope damage, one must be **extremely** careful and feel and look for damage on every foot of rope as one descends. Better still, pull the rope up and check it if you suspect damage.

In the aftermath there were several fortunate circumstances that should be mentioned.

- 1) There was enough excess rope to get someone to the victim right away.
- 2) A space blanket was available right away.
- 3) First-aid supplies and expertise were available.
- 4) Rescue knowledge and manpower were at hand.

Accident: Kentucky, Roppel Cave February 15, 1981

On Saturday afternoon February 15, four cavers, Dave Black, Bru Randall, Cady Soukup and Roberta Swicegood, got ready to enter Roppel Cave near Mammoth Cave National Park in Kentucky. The latter three had arrived early that morning and slept until 3 p.m. They originally intended to do some surveying in the north end of the cave but had decided to make it a combination photo/survey trip when they added Black to their party at the field house. All four were experienced cavers but only Soukup had been in the cave before. They were to follow good verbal directions.

They entered the cave, rappelled down the entrance and Coalition Chasm drops and split up when Black stopped to take a photo of Randall on the rope. A wrong turn later by the two that went on allowed the other two to pass them, unknowingly. They eventually got together in the Black River Canyon and continued toward their objective. They proceeded through the Brucker Connection and began to traverse

the P-Survey Stream Canyon. Because of the photography and route-finding a normal 4-5 hour trip had stretched to 11 hours.

The P-Survey Passage is "a deep, narrow, stream canyon with wide upper level ledges." It is necessary to cross at times to follow the best ledges. At about 3:30 a.m., Swicegood, while leading, came to where the ledge on one wall narrowed. Seeing muddy boot prints on a 4 inch thick chert ledge she stepped across. The ledge disintegrated and Swicegood fell 8 feet into the stream, striking a breakdown block in the streambed.

The victim was able to rise immediately but could not grip with her left hand and felt "considerable pain." The arm was examined by Randall and Soukup who decided it was fractured just above the wrist. Swicegood was given aspirin and the arm was tightly wrapped with a bandana. The victim experienced a brief spell of faintness and the group started out.

Things went easily at first. The pressure of the swelling arm against the bandana served to immobilize it. An elbow pad on the injured arm allowed it to be used on holds. At Arlie Way they stopped at a cached first-aid kit and gave the victim Empirin and put a make-shift splint on the arm. With the pain lessened they proceeded into the difficult traverse of the S-Survey. The very tight canyons were negotiated with little difficulty to S-64. At that point one would usually "traverse along the passage about halfway up the wall, to a point where a straddle with a left-hand hold is required to get into position to climb into a window at the top of the passage." A fixed rope hangs from the window so they tied the victim to the end of the rope and set up a belay in the window. Swicegood then climbed directly up, using tension from the belay as a substitute from left-hand holds. Just below the window Soukup straddled the passage to provide an essential leg foothold.

The rest of the S-Survey was uneventful. At the drops the splint had become too tight and was removed, the bandana being snugly retied. Then Swicegood ascended, her Gibbs rig being put on and taken off the rope by the others. They exited the cave at about 1:30 p.m. (Sunday) — the trip out had taken about 10 hours.

The injury was diagnosed at a hospital as a compression fracture of the ulna two inches above the wrist.

References: 1) Bru Randall, Cady Soukup, Roberta Swicegood **Accident Report** D.C. Grotto of the N.S.S. February 15, 1981 3 pages.

2) Roberta Swicegood "Fall in Roppel" **D.C. Speleograph** 37:3 March, 1981 p 10-13.

Analysis: The previously used chert ledge broke in an ordinary usage situation and most cavers would have done exactly what Swicegood did — use the ledge for a foothold without checking it. Indeed, to get things like surveying done in large caves, one must move expeditiously along to the job site or there will be little time for work and one cannot pause to check every hold. Still, let us remember that holds can be checked for soundness — by kicking, pounding, pulling or stomping — and one should not be caught unawares by a collapsing hold.

The group had been in the cave 11 hours and it was 3:30 a.m. but they reported feeling fresh and stated that fatigue was not a factor.

The use of the bandana in immediately wrapping the break allowed the subsequent swelling to immobilize it. Despite the trip out of the cave the fracture was in place and required no reduction before a cast was applied. A physician

pointed out that it is vital to check circulation in the fingers at regular intervals if this technique is used.

Swicegood commented on the attitude of the group aiding her, stating that their calm, cheerful and positive attitude was a great psychological help. This should be emphasized — the power of suggestion is extremely strong. Anyone aiding an accident victim should always and without exception make positive references to and about the victim, and the chances for survival, if this is at issue. Also, one should always consider the victim to be in shock or capable of going into shock momentarily for obscure reasons. Thus if the victim can proceed, as in this case, protect the victim from falls as much as possible, either by belaying or by placing someone below on short climbs to break their fall, should the victim unexpectedly collapse. Shock can make a wimp out of anyone.

Swicegood was using a chest-pulley equipped Gibbs rope-walker setup which allowed her to ascend with no inefficiency caused by the broken arm. The ascenders had to be put on the rope and taken off by someone else, however.

As with most groups after experiencing an accident, this one decided they should have had more first-aid equipment. They propose that "groups should carry a few more items, including pain medication, and anti-diarrhetic, an Ace bandage, and a triangular bandage," in addition to the tape, gauze antiseptic, etc., one normally carries.

The treatment of the injury was greatly aided by the complete first-aid kit stashed in the cave.

Swicegood also reported the expected symptom of shock, an increased susceptibility to cold. The danger of hypothermia is increased when an accident occurs.

All-in-all, this group executed a perfect self-rescue. Rescue groups would have less work to do if more caving parties were ready to rescue themselves.

Accident: Virginia, I-81 Cave **March 8, 1981**

On March 7 or 8 a rescue was carried out by the Smyth County Rescue Squad in I-81 Cave, Smyth County, Virginia.

Reference: Greg Kramer "Trip Reports" *Bat Times* 1:1 Spring, 1981 p 10.

Analysis: Too little information.

Accident: Kentucky, Lee Cave **March 14, 1981**

Shortly after noon on Saturday, March 14, John Dickerson, Mike Mergans, Scooter Hildebolt and John Barnes entered Lee Cave in Kentucky. They were all experienced cavers, wearing wetsuits, and had 115 feet of rope, vertical and surveying gear, and a first-aid kit.

Chimneying down the entrance drop, they proceeded through a short crawl into a room where they rigged their rope on a 90 foot pit. Descending, they attempted to enter an obvious lead about 10 feet above the floor.

Dickerson climbed up and perched in the slot-like lead. Then Mergans threw the others' packs up. One of these was caught by Dickerson's little finger which bent back with a "snap." Dickerson, a First-aid Instructor, decided the finger was probably broken and that he should go to a hospital for treatment. He down-climbed, put on his vertical rig and ascended the rope. The rest followed with the gear. They were out 1 1/2 hours after the accident. The finger was x-rayed at Fort Knox and found to indeed be broken.

Reference: John Barnes "A Freak Accident" *The Kentucky Caver* 15:2 March, 1980 p 13.

Analysis: Another self-rescue made simple by the close proximity of the accident site to the entrance. The accident itself could happen to anyone, but it had an effect on Barnes who was moved to state: "I feel that every caver should seriously consider getting first-aid training, and should carry at least a small first-aid kit while caving. Caving has its dangers. But if we are prepared, and are careful, we can continue to enjoy this great hobby to its fullest."

Incident: West Virginia, Patton Cave **March 16, 1981**

On March 16 Marshall Homes, Jimmy Lynn and George Dasher (27) were surveying in Patton Cave in West Virginia. They surveyed the Backdoor Entrance pit and then headed toward the Football Field. Just west of the Helter Skelter Room they spent some time mapping leads below the breakdown which Homes had already scouted. On the third lead Dasher was in front doing lead chain and keeping book. At a junction Homes couldn't remember which direction was best so Dasher chimneyed up to look over a breakdown block. He was trying to keep a clean book and so tried to climb using his hands as little as possible. He was about 10 feet above the floor and moving one foot when the other foothold broke. Since his hands were not in use, Dasher fell to the floor, landing on a muddy spot, the only place not covered by jagged breakdown. Dasher had the wind knocked out of him but was otherwise unharmed.

Reference: George Dasher "Incident in Patton Cave" *The Carabiner Wrap Up* 7:6 August, 1981.

Analysis: The desire to keep a clean book shouldn't compromise safety. It turned out that it was possible to proceed under the rock.

Incident: Guatemala, El Retiro Pit **March, 1981**

In March of 1981 three cavers, John Burkig, Steve Knutson and Todd Rasmussen were scouting for caves on the 10-11,000 foot high Cuilco Plateau in Guatemala. On the day in question Burkig remained in camp while the other two hiked several miles across the plateau in search of the elusive cave. Finding a pit, a rope was rigged and, stepping through a small tangle of brush at the lip, both descended the 40 foot drop. A sloping passage led to another pit and a second rope was rigged. This second pit proved to be about 80 feet but offered no continuation. At the entrance pit, Rasmussen began to ascend when suddenly burning branches began falling! Speeding his ascent through smoke he arrived at the top to find the brush around the pit in flames — indeed the only part not on fire was the root of a tree over which the rope passed at the breakover. By the time Knutson ascended, the fire had been extinguished.

Reference: Steve Knutson *Personal Communication* July, 1982.

Analysis: The fire had been ignited by the cavers' carbide lamps but this had been so subtle — it apparently only smoldered at first — that they did not notice it. If the rope had burned through they might never have been found. Take heed.

Accident: Indiana, Buckner Cave **Spring, 1981**

In Spring, 1981 two cavers entered Buckner Cave near Bloomington, Indiana. They proceeded past the Volcano Room but upon reaching the end of the passage they became disoriented and so sat down to await rescue. Authorities were eventually notified. Cavers were called in (Monroe Speleunking Club), soon located the lost cavers and brought them out.

Reference: Kevin Komisarck "Pulling Off the Big Rescues in Indiana" *BIG Newsletter* 16:3 p 36.

Analysis: This year seemed to experience a rash of lost cavers. Deficient light sources possibly contributed to this occurrence.

Accident: Indiana, Sullivan Cave **Spring, 1981**

In the spring of 1981 a group of six cavers went exploring in Sullivan Cave, Indiana. Their objective was the Spiral Room. They encountered high water conditions but proceeded anyway, thru up to chest-deep water. At the Backbreak one caver became too cold to continue. It was decided that she should be evacuated. Dick Blenz and emergency agencies were called and a stretcher and sleeping bag were carried in to the victim, who had been wrapped in a space blanket. She was talked into walking out which took 15 minutes.

Reference: Kevin Komisarck "Pulling off the Big Rescues in Indiana" *BIG Newsletter* 16:3 p 36-37.

Analysis: This incident may seem silly, but a hypothermia victim can actually die while moving. After the body temperature falls to a critical point, further movement will result in depletion of the last vital reserves of energy and death follows. Obviously this was not a problem here, but should be kept in mind.

Incident: Tennessee, Porter's Bluff Cave **April 4, 1981**

At about 1 p.m. on Saturday, April 4, Dan McDowell, Tim McDowell and Ricky Cole entered Porter's Bluff Cave in Clarksville, Tennessee. The large entrance of the cave leads to a water crawl about 40 feet long and 3 feet high, walking passage for 100 feet, then another 40-50 feet of crawl before yielding to 1500 feet of walking passage. In this distance the cave stream has about 15 feet of drop, mostly in small rapids and waterfalls in a 200 foot section before the crawls leading out.

On the 4th the weather forecast gave a 70 percent chance for light to moderate showers. Beyond the 1500 foot walking section was 20 feet of crawl and more walking. Dan McDowell went to check it out. Three hundred fifty to four hundred feet further he came to a 12 foot waterfall, of perhaps 25-30 gallons/minute. He turned back and five minutes later was with his companions. Almost at once a new sound could be heard — like a train going over the cave. They were wondering if it could be the waterfall when suddenly the pool of water they were standing beside developed a noticeable current!

The group, as one, headed for the entrance. Before they had gone 500 feet, previously still water portions were running with a current. They began to run where the passage allowed. At the stream descent before the entrance crawls it was all white water.

Just before the crawls Dan McDowell told the other two to wait while he checked

to see if the crawls were still passable. He had been making mental notes of high places to retreat to, just in case. Everything was OK and in a few minutes they had made it out, with 15 inches of air space in the last crawl section. The water continued to rise as they exited the cave. Outside it was not raining. They had been in the cave less than two hours.

Reference: Dan McDowell "Run, Its Flooding — Porter's Bluff Report" **The Michiana Caver** 8:7 July, 1981 p 85-87.

Analysis: While the group was inside there had been a half-hour rain but it had not been overly heavy. The very rapid rise is speculated by McDowell to be due to a storm sewer entering the cave system upstream.

Accident: Tennessee, Ebenezer Cave April 11, 1981

At about 4 p.m. on Saturday, April 11, John McReynolds (16), Ron Funnell (19) and Greg Rogers (15) entered Ebenezer Cave in West Knox County near Knoxville, Tennessee. Only McReynolds had any caving experience, having previously been in this cave. They had only two flashlights between them and no helmets or lug-sole boots. The cave is well-known locally and closed to caving.

After 30 minutes of exploration the group was heading out and arrived at a 40 foot pit about 200 feet south west of the cave entrance. This pit necessitates an exposed traverse with only a few holds, wet and muddy. They had done the traverse on the way in. As McReynolds attempted to crawl across with a flashlight in his hand, he slipped and fell, striking two ledges before landing in waist-deep water.

The noise of the fall and the screams of Rogers and Funnell brought the quick assistance of another group, six cavers, who were exploring nearby on the stream level. While John Walker, of this group, pulled the victim out of the water, Rollin Hotchkiss went for help.

Outside, Hotchkiss called the 911 emergency number. The operator alerted the fire department which alerted the Knoxville Volunteer Rescue Squad. The KVRs called a caver squad member, Tricia Fink and she and Gary Daugherty responded directly to the scene. Arriving at 6:30 p.m. Fink observed a lack of cave-trained personnel and had the E. Tennessee Grotto called for additional personnel. These arrived at 8 p.m.

The two cavers stranded on the far side of the pit were allowed to crawl across while safetied by a locking "biner" to a fixed line.

Meanwhile an EMT, Rick Crux, descended to the victim and aided him while a hauling system was set up. With Crux and Daugherty attached to the litter, it was hauled up, reaching the top of the pit at 9 p.m. McReynolds was out of the cave by 9:21 p.m.

The injuries were diagnosed as a subdural hematoma, abrasions and contusions. The victim was in intensive care for six days but fully recovered.

References: 1) Tricia Fink **NSS Accident Report** no date 5 pages.

2) Stan Dehozier "Teen-ager Falls, Injured While Inside Knox Cave" **The Knoxville News-Sentinel** Sunday, April 12, 1981.

3) Editor "Trey McReynolds in Serious Condition Following Weekend Fall in Cave" **Ibid.** Monday, April 13, 1981.

4) Editor "Injured Cave Explorer Taken From Critical Care Unit" **Ibid.** Sunday, April 19, 1981 p AA-4.

Analysis: The group was under-experienced and under-equipped for what they were doing. Even teen-agers can learn proper belaying techniques — any exposed, tricky climb or traverse should be belayed. Even a crude belay might have saved this situation.

Accident: Minnesota, Priest's Cabin Hollow April 12 1981

On Sunday, April 12, a group of eight cavers visited Priest's Cabin Hollow, a cave adjacent to Horn Lake in Winona County, Minnesota. This is a maze cave in the top part of a 250 foot high bluff overlooking the lake.

After driving to within 150 feet of the entrance. They got out their caving gear and, at a little after 11 a.m., they entered the cave. Two of the party looked for survey stations, to continue their survey, while the others explored the small maze.

"At about 11:30 Paul Scobie (34) was crawling rapidly through a small belly crawl about 30 feet long when he began to experience chest pains." A rest did not relieve the pains so he crawled back to a room where the surveyors were. This room opens to the surface and was well-lit by daylight. Scobie reported that he didn't feel well and lay down. His chest pains got steadily worse, however, and in another 15-30 minutes he was unable to move without increasing the pain. Still, he was "conscious, calm and rational." A couple of blankets were fetched from a vehicle and some time was spent looking for poles with which to make a stretcher, none were to be found so they laid out the blankets next to Scobie, moved him onto them and rolled up the edges for hand-holds. With three people on each side they alternately carried or dragged the victim back to the entrance. There were tight places and the flexible blanket stretcher proved most effective. They reached the vehicles about 12:30 p.m.

One vehicle was sent to the nearest phone to call for an ambulance while the

other followed slowly, transporting Scobie. They reached a main road and the ambulance arrived shortly after. Scobie reached a hospital shortly before 2 p.m. As suspected, he had suffered a heart attack and was hospitalized for three weeks. After several months of physical therapy he had resumed normal activities including caving.

References: 1) Calvin Alexander "Rescue at Priest's Cabin Hollow" **Minnesota Speleology Monthly** 13:5 May, 1981 p 46-49. (Also in **Spelean Spotlight** 10:6 June, 1981 p 9-12.)

2) Paul Scobie "Observations from the Victim" **Ibid.** 13:5 May, 1981 p 49.

3) Calvin Alexander "Priest's Cabin Hollow" **Ibid.** July, 1981 p 71-73.

4) Calvin Alexander **Personal Communication** May 7 and August 11, 1981.

Analysis: Scobie had done no caving for several months but reportedly led an "active life" and was in "reasonably good shape." Yet a 30 foot belly crawl caused a heart attack. It is obviously advisable to perform regular exercise that stresses and conditions the cardio-vascular system to a similar extent as the activities you occasionally take part in.

Scobie gives the usual symptoms for future reference:

"Pain may be most prominent, usually in the center of the chest behind the breast bone, frequently accompanied by nausea, sweating, and numbness radiating to the arms, neck or jaw. The degree of pain may vary considerably, from mild 'indigestion' to unbearable intensity. If pain does not abate in two minutes, suspect a heart attack." It is typical that the victim will deny the possibility of a heart attack.

Accident: Kentucky, Cool Spring Cave April 13, 1981

On Sunday April 12, 1981, a group of high school students supervised by adults were in Cool Spring Cave, Trigg County, Kentucky taking part in the caving portion of an outdoor awareness program. The students had had a "short course" on cave safety and the adults had "more than average caving experience."

The group proceeded from the entrance about 100 yards along a large stream passage to one of the larger rooms in the cave. At 12:15 a.m. one boy (age 14) was climbing on a slick mudbank, lost his balance and fell over backwards, landing on his back. He complained of severe back pains and so was not moved.

At 12:40 a.m. the program director and the Trigg County Rescue Squad were notified. Program and Rescue Squad personnel carried out a quick evacuation. Examination of the victim at Trigg County Hospital showed only muscle strain.

Reference: John Mylroie "Accident Report" **Unpublished Report** April 14, 1981.

Analysis: As Mylroie points out, a mis-step can occur even in easy caves. He also observes that the County Rescue Squad, untrained in caving, required the cavers present to carry out the evacuation. It might also be mentioned that mis-steps are less likely to occur at noon than at midnight.

Incident: Tennessee, Pulley Cave April 19, 1981

On Sunday April 19 1981 John Hofelt, David Parr and Joe Douglas entered Pulley Cave in Davidson County, Tennessee, on a survey trip. The day dawned cloudy and they had thought about going to a different cave but the sun briefly came out and strengthened their resolve.

Entering the cave through the "Corkscrew" entrance descent, they proceeded into the lower stream passage and headed up the main canyon passage, some 20 feet high and three feet wide, to where it branches. The right branch carried the main stream and heads for a swallow located nearby. They began surveying the left-hand branch. A little rain had begun falling as they entered and as they started surveying, rumblings were heard from the right branch. The noises continued as they set five stations. Suddenly Parr yelled "Get out of here, Quick!" and everyone broke and ran. Parr headed up the passage to where he knew it connected to the upper level — the other two beat it down stream and immediately were in knee-deep water as sticks and debris raced past. Fear of loss of light and tripping in the debris raced through their minds. In a few minutes they were out the entrance, now a waterfall.

Reference: John Hofelt "A Quick Lesson in the Hydrology of the Pulley Cave Area" **Speleoneers** April, 1981 p 13-15.

Analysis: The thunderstorm dumped almost an inch of rain in five minutes and 1.7 inches over a 15 minute period. Cavers should pay attention to weather forecasts, which are readily available. In thunderstorm conditions one should certainly think twice about visiting stream passages.

Incident: Virginia, Clover Hollow Cave April 25, 1981

On April 25 there was a caving trip to Clover Hollow Cave in Virginia as part of the spring Virginia Region meeting. A number of the cavers had little vertical experience and inadequate vertical gear. The exit from the cave, up a series of drops, is slowed by the necessity to pass vertical gear up and down drops. To speed

things up Roberta Swicegood left her vertical gear with the main party and free-climbed up several drops toward the entrance.

At the 70 foot entrance drop she met a group of 13 cavers using that pit for vertical practice. There was no experienced caver with this group. As she watched, each person rappelled down secured by a top belay. One woman started down using a tied seat harness of one inch tubular webbing and a rack. "About seven feet down she suddenly slipped, slammed sideways against the face and was held by the top belay. She tried to right herself and again slipped and fell against the face." This continued, the woman rappelling sideways down the drop. The seat sling had been tied wrong, allowing the rack to slip around, almost to the small of her back. It took 2 1/2 hours to get the two groups up the drop.

The 13 member group had learned caving from a book — they had no experienced caver in their area.

Reference: Roberta Swicegood **Personal Communication** June 4, 1981.

Analysis: The group had been forced to learn caving from a book since there was no experienced caver known to them. The situation was perhaps not good but one learns by experience. At least they had the very good sense to use the upper belay while practicing. The only solution to this is for the NSS to seek a higher profile, making itself more accessible to interested cavers.

Accident: West Virginia, Organ Cave

May 2, 1981

At about 11:30 a.m. on May 2, Roberta Swicegood, Paul Stevens, and Mike Dyas entered the Lipps Entrance to the Organ Cave System in West Virginia. Their objective was the mapping of leads in the lower Jones Canyon area. After proceeding 1 1/2 hours they were in a trunk passage floored with heavy breakdown approaching the first waterfall. Dyas was in front beginning the last breakdown obstacle. He started a "minor climb across a V-shaped notch in the breakdown, bracing with hands on boulders to either side." With no warning, a quarter-ton rock to his left slid several feet, pinning Dyas by his left calf.

After a brief struggle Dyas got free and sat down to recover from shock while the others examined the leg. Damage appeared to be limited to severe bruising and probable muscle/tendon strains.

Aspirin was administered and the group headed back for the Lipps Entrance. The distance was 2500 feet, consisting of breakdown trunk, slippery streamway and simple crawling and stooping through the Lipps Maze. Dyas proceeded slowly with minimal assistance, pausing twice to soak the leg in cool water. They exited the cave 2 hours after the accident. Examination at a hospital verified the lack of a fracture.

Reference: Mike Dyas "Accident in Organ" **D.C. Speleograph** 37:6 June, 1981.

Analysis: It is reported that there was no visual indication of instability in the well-traveled passage. A true accident.

Incident: West Virginia, Nutt Cave

May 16, 1978

On May 16, Bill Fields (48) led a party of five on a photo/pleasure trip in Nutt Cave, West Virginia. They entered the cave at about 10 a.m. and proceeded to the first room, taking photographs as they went. There they stopped for lunch. A short time later they continued into the cave, taking photos and checking side leads. At the first drop a rope was rigged, presumably for a handline, and all went down.

At this point Fields started down a small hole on the right. Right away he became faint and fell to his right. He had to be pulled back out. He was perspiring heavily, had a "beet-red" face and was experiencing blurred vision. He was very weak and unable to stand unsupported. He rested for 15-20 minutes and began to feel better.

Fields insisted on continuing so they proceeded down the drop to the stream where they did more photography. Fields made it out without further incident. On Monday extensive testing indicated a possible slight heart attack and very high blood pressure.

Reference: Bill Fields "Near-Disaster in Nutt Cave, West Virginia" **D.C. Speleograph** 37:7 July, 1981 p 10.

Analysis: Fields obviously had a suffered a physiological malfunction and should not have been allowed to continue. Victims are not the best judge of what should be done.

High Blood pressure is a treatable condition and one should have checkups at some regular interval to detect its onset.

Accident: Florida, Devil's Eye Spring

May 23, 1981

It is reported that, at 11 a.m. on Saturday May 23, a rescue attempt was made on a diver in trouble in Devil's Eye Spring in Spring County, Florida. It is not known if the victim survived.

Reference: Scott Vanghel **Personal Communication** June, 1981.

Analysis: Too little information.

Accident: Kentucky, Sinks of the Roundstone

June 6, 1981

On June 6, Jack Hissong (41) led a group of 8 Boy Scouts and Scout Leaders from Troop 44 in Mack, Ohio, on a trip into the cave at the Sinks of the Roundstone in Rockcastle County, Kentucky. The scouts included R. Morris (38), E. Zimmerman (48), R. Fine (17), T. Morris (13), D. KoCata (12), G. Marsh (12), N. Long (12) and D. Moore (12).

The scout group had essentially no experience in caving, but received slide show instruction, demonstration and suggestion of equipment needed, followed by an equipment check three days before the trip.

The weather forecast immediately before the trip indicated a 40 percent chance of light thundershowers with clearing by evening. Hissong had been in the Sinks of the Roundstone before during rain and observed no great changes (only three inches) in water levels. Nevertheless he checked three points on the surface stream inlets and these appeared normal.

At 10 a.m. Saturday the party of nine entered the Railroad Tunnel entrance. All had "three light sources, hard hats, food, small packs, etc." For the first 4 hours everything went smoothly — there was no evidence of excess or increasing water flow. The group experienced the various aspects of caving and had a good time. Most of the food was eaten at a lunch break.

At the four hour mark they were leaving the northern portion and rejoined the main passage where it is a simple walk to the main entrance. Sometimes this is dry but even if wet, it is easy to wade across. This time, however, they encountered a four foot deep, swiftly flowing stream with floating organic debris. Obviously there was very heavy runoff occurring outside.

Hissong waded in and decided the flow to be too great for all the rest. They decided to backtrack and leave the way they had come in — the Railroad Tunnel entrance.

Increased water flow made the going slow and at the Funnel, the slippery mud slopes made getting across very difficult. Possible by-passes were checked but found to be sumped. Short ropes and slings were combined into a handline and everyone made it across, each waiting his turn while the water rose around his feet.

They moved on to a point overlooking the large Junction Room which by then was impassable — "a raging violence of currents, waterfalls, and maelstroms created by cross-currents pouring in from the fully-sumped north wall passages. It was obvious they were stopped. Still, Hissong tried to make a solo exit to get help but twice was nearly killed when he was swept under and held by the current. Both times he fought his way to the surface and finally got out of the flow on a ledge some 140 feet from where the others were. At this point he decided to give up the exit attempt until he 100 percent certain of making it. The others retreated to a high, dry place and set about combating the inevitable hypothermia. This they did best by making a body-pile thus conserving body heat. The excess food was pooled and rationed. If someone became too cold, he would be sent to exercise in a crawlway. There was communication between Hissong and the group by lights and shouting.

Hissong decided that, once the water fell to a safe level, he would exit, get auto inner tubes and return to float everyone through the deep parts. A few hours later he communicated this to the others and set out. He exited quickly and drove toward a service station, encountering portions of the road flooded with 2 1/2 feet of water. The truck stalled repeatedly and he was forced to backtrack. Finally he gave up and at a mine he was able to get a truck inner tube. After calling the State Police, he returned to the cave and carried out the ferrying operation. All were out by 7:30 a.m. on Sunday, 21 1/2 hours after entering.

References: 1) Jack Hissong **NSS Accident Report** June 17, 1981 11 pages.

2) John Erard "Suspenseful Spelunking Ends Safely" **The Cincinnati Enquirer** Tuesday June 9, 1981 p C-2.

Analysis: The group had probably given proper consideration to the weather. The storm was unusual, dumping 3.6 inches in a two hour period. One has to question the wisdom of Hissong's attempt to exit while the flood was in full rage. If you have a safe refuge, wait it out.

Accident: Virginia, Cathedral Spring Cave [Robins Rift]

June 14, 1981

At about 5 p.m. on Saturday, June 13, a caver work crew completed the excavation of the Robins Rift, breaking through into the Cathedral Springs Cave System in Bath County, Virginia. Timbers had been used to hold loose material during the work but a permanent culvert was to replace the timber shoring.

On Sunday an attempt was made to put the culvert in place but it proved to be too unwieldy. After the attempt the workers formed two survey teams and entered the cave. One of these comprised of Bob Carts (22), Ed Ricketts (over 40), Mike Artz (21) and Dick Sanford (over 40) went in Sunday afternoon, after the other crew had exited. After about 2 1/2 hours they completed their objective and headed out. At Robins Rift, Carts proceeded through the squeeze but immediately after that a collapse occurred moving one wall toward the other, compressing the squeeze by six inches. A loose rock filled most of the remaining space, the constriction then

being about the size of a human head. The VAR rescue network was notified while those on the scene worked to enlarge the opening and stabilize the collapse. Within a half hour such progress was made that one of the trapped cavers was able to get out. Space blankets and food were passed in. Two rescuers arrived at 5:45. By 7 p.m. all were out, more rescuers arriving shortly after.

References: 1) Editor (Ed Ricketts communication) "An 'Almost' Rescue at Robins Rift" *D.C. Speleograph* 37:7 July, 1981 p 32.

2) Bob Carls *Personal Communication* December, 1981.

Analysis: The entrance had collapsed several years earlier shortly after being dug open. None of the rocks supporting a huge boulder overhanging the entrance moved. It is reported that if this had fallen, it would have likely trapped the cavers for several days.

Incident: California, Bigfoot Cave

July 5, 1981

On Sunday July 5, Mark Fritzsche (24), Steve Knutson, and Lynn Clarke visited Fleetwood Dome in Bigfoot Cave, Siskiyou County, California. Fritzsche climbed a wall fissure for 45 feet to inspect the top of the dome, but upon downclimbing he slid off a friction slab and fell about 20 feet to a scree slope. He landed on his feet, tucked and rolled out, suffering a bruised elbow and hip. The party exited the cave without assistance.

Reference Mark Fritzsche *Personal Communication* August, 1982.

Analysis: If one wishes to be safe, one must use protection and a belay for such climbs. In a cave like this one (37 degrees) it is doubly foolish to risk a serious injury. Fritzsche narrowly missed hitting sharp boulders which could have caused severe injury. Fritzsche felt that "his climbing instincts and mental awareness were hampered by a bad cold." I should mention that, even though I was there, I do not exert absolute control over others.

Accident: Kentucky, Sloan's Valley Cave

July 11, 1981

On July 11, at about 10 a.m., Dave Carr (20), Jeff Hill and Phil Oldiges entered the Scowling Tom Entrance to Sloan's Valley Cave in Pulaski County, Kentucky. They intended to pursue two leads at the Suicide Room, so named because of unstable breakdown, which required a 12 foot climb to reach. Each had about six years of experience and were very familiar with the cave.

By noon they were nearing their objective having come through passages more than half of which were crawls or tight canyon. At a very steep breakdown slope Carr went up first. At 12:15 p.m., partway up, he felt a boulder come loose but was able to hold it while he moved one foot out from under it and called for his companions to get out of the way. They did and the boulder was released, crashing to the bottom. In releasing the rock, however, Carr's left arm was pulled far behind his back and became dislocated. He was in extreme pain and unable to move the arm at all. When the others reached him he made sure they knew what to do if he went into shock.

Hill and Oldiges quickly fashioned a sling to immobilize Carr's bad arm and then assessed the situation. Carr would have a lot of trouble from the pain just walking and their route in had taken two hours through a lot of crawls and tight places. It would obviously be better to try to get out the pits of Screaming Willy's Entrance since it was closer. They went for it.

At a 50 foot long, very tight canyon it was nearly impossible for Carr, with his injury, to squeeze through. At last he made it. Further along, a climb-up also proved to be a major difficulty. At crawls he had to proceed on his side only, any other way being too painful. A little after 6 p.m. they reached the base of the three connected pits of the 59 foot drop of Screaming Willy's Entrance. Since they had not entered this way the pits were not rigged but they are occasionally free-climbed. Oldiges had done this before so he headed out for help. Carr was by then in extreme pain and in danger of going into shock.

At the fieldhouse there were no other cavers so Oldiges grabbed his rope and rigged it at the entrance pit series. He then rappelled down and he and Hill tied Carr to it. Oldiges and Hill ascended the third drop and the two of them hauled Carr up. They were unable to repeat this at the second drop so Oldiges went for reinforcements. A nearby resident was obtained and, at about 7 a.m., the three of them were able to pull Carr up the two remaining drops to the surface. A Pulaski County Rescue unit, which had been called, took Carr to a hospital and he received treatment at about 10 p.m.

References: 1) Phil Oldiges "Why It's Called the Suicide Room" *The Cave Cricket Gazette* 6:6 p 63-64.

2) Dave Carr *Accident Report* Unpublished September 11, 1981 5 pages.

Analysis: This is another good example of a caver self-rescue carried out with rational deliberation.

Carr feels the two major decisions — to head for Screaming Willy's and to haul him out without waiting for the rescue squad — were the right ones. The other entrances were further away and reaching them presented many difficulties. Not waiting for the rescue squad was a bit chancy but an injured man in extreme pain is

certainly incentive to go ahead. A good pain killer can make it easier to wait.

Incident: Kentucky, Craddock Springs

July, 1981

After attending the cave diving session at the International Congress, Bob Nadich and Scott Morris, experienced cave divers, headed for Craddock Springs to push a lead they had discovered previously. The lead, however, appeared to have closed, due to the shifting of breakdown.

While setting a line, a slab of breakdown fell on Morris' legs, pinning him. Nadich, above, observed a continuous stream of bubbles coming up in one place and assumed something was wrong. Descending, he aided Morris in shifting the rock. The whole incident took only a few minutes and there were no injuries.

Reference: Scott Morris "Fear and Loathing in Swine Springs" *Clevo-O-Grotto News* October, 1981.

Analysis: Cave divers conducting a self rescue in an incident that could have been serious if the victim had been alone. Organized cave divers seem to have a very good safety record. The numerous fatalities seem to come from scuba divers who enter caves, not from divers who have trained for cave diving specifically.

Accident: West Virginia, Hell Hole Cave

July 12, 1981

At about 7:30 p.m. on Sunday, July 12, Phil Lederer (23), Dick Baker (24) and Tom Starken (23) entered Hell Hole Cave in Pendleton County, West Virginia.

All three went down the first drop and secured a rope to a rock to do the remaining 45 foot drop to the bottom. Starken descended and Lederer went next. As he started his rappel the rock anchoring the rope came loose. Baker made a grab but couldn't hold it, receiving a laceration on one hand. Lederer "plummeted off the wall of the cavern and slammed into the ground." His face had received a blow resulting in a laceration and a black eye — otherwise he was unharmed.

A party of six was following them down and one of these went out for help. Local cavers, the North Fork Rescue Squad and State Police from Franklin responded and soon began a rescue operation. A harness was rigged to a rope and all the cavers were hauled up. Lederer was transported for further treatment after examination by rescue medical personnel.

Reference: Anon. "Spelunker Survives 5-Story Fall In Hell Hole Cavern In Pendleton County" *The Inter-Mountain News* (Elkins, W. VA) 74:240 July 13, 1981.

Analysis: Breakdown is not a good rope anchor unless it is obviously bombproof — securely wedged in a fissure or extremely heavy and not on a slope. Even an apparently stable rock can go if force is applied in just the right direction.

Accident: Kentucky, Sloan's Valley Cave

July 21, 1981

Shortly after midnight on Monday, July 20, Tony Hughes (17), Tom Hughes and Rob Rieman entered Sloan's Valley Cave in Pulaski County, Kentucky. They were experienced cavers and Tony Hughes had been in this cave "a half dozen times previously."

Tony Hughes guided the group down the "southern extension" when they came to a drop blocking the way. A fixed rope there proved to be muddy. At about 3 a.m. Tony Hughes slid down the rope to a ledge just below the top but realized in the process that it was too muddy to allow him to ascend.

Hughes told the others to retrace their route to the surface and he would meet them, following a different route. They departed but Tony Hughes soon found his alternate route flooded from heavy spring rains. He eventually returned to the rope and struggled to the top. He had lost his field map of the cave, however and soon found himself lost.

Meanwhile his companions twice returned to the rope drop looking for him, then called the Pulaski County Rescue Squad. By 10 a.m. the PCRS had sent 8 men into the cave. At about noon a "mud-covered, bedraggled" Hughes emerged from the cave, having missed the rescuers who came out sometime later.

Reference: Robert Kidd, Jr. "Safe Spelunker" *The Commonwealth-Journal* (Somerset, KY) Tuesday July 21, 1981 p 1,12.

Analysis: The cavers were reportedly using flashlights as a main source. It is easier to get disoriented the less light one has. Obviously they would have been better off if Tony Hughes had checked his alternate route before sending the others out — if possible, keep a party together.

Accident: California, San Miguel Island Sea Cave

July 30, 1981

On Thursday, July 30, Mark Kellum (18) was scuba diving with his father near San Miguel Island off the coast of California near Santa Barbara. After entering an underwater cave "his equipment apparently snagged on a ledge." When he failed to appear, other divers took fresh tanks of oxygen and conducted a search. This was

hindered by murky water and by the time Kellum was found it was too late.

Reference: UPI "Scuba Diver Drowns, Trapped in Cave" **The Sacramento Union** August 1, 1981 p C11.

Analysis: Scuba divers who enter underwater caves on the spur-of-the-moment are not likely to be adequately prepared. Cave diving can be relatively safe if one has proper training, preparation, equipment and technique.

Accident: Colorado, Fulford Cave

August 22, 1981

At about 8:30 a.m. on Saturday, August 22, a church group including 19 youngsters (ages 3-17) and 5 adults entered Fulford Cave in Eagle County, Colorado. Their light sources were flashlights and, while most of them had hardhats, most of these did not have chinstraps. Foot gear consisted mainly of tennis shoes.

The leader, Kab Benefield (30), tried to keep ahead of the group to check out potential hazards along the route. When things slowed up some of the youngsters took off on their own to some extent. At some point Benefield checked a hole or pit and instructed everyone to stay away from it. Dominique Wasslein (16), a French citizen, either did not hear or understand this, and went to the drop. At about 10:30 a.m., "while leaning out over it," Wasslein slipped and fell about 25 feet, losing his hard hat and landing in a streambed in an area covered with breadown.

Benefield returned, spied the victim and tried to climb down to give aid. He fell also, landing on his back suffering rib injuries and a cut hand.

Meanwhile, Clarence Williams, Gene Dover, and Anthony Garcia entered the cave, soon meeting youngsters who related that there had been an accident. They soon reached the victims, Benefield sitting in the water holding the unconscious Wasslein. A doctor who happened to be in the cave arrived and examined the victims, advising them to get Wasslein out as soon as possible.

After some discussion, Dover went to the entrance to cut tree limbs for making a stretcher while the others escorted the women and children out, instructing them to call the Eagle County Sheriff. The stretcher was completed using a pair of coveralls and tubing from a truck. Six cavers then started moving Wasslein to the entrance. Benefield followed under his own power. Over halfway out they met four cavers coming in who donated some jackets and vests and helped in the transport. At the entrance drop they met the Sheriff's rescue group. Since the basket litter had not arrived, the victim was put in a seat harness and pulled up the drop. He was transported the remaining distance to a waiting vehicle by the rescue group.

Wasslein had suffered severe lacerations to the head, forehead and chin, a skull fracture and various strains and bruises.

Reference: Clarence Williams "Rescue in Fulford" **Caving in the Rockies** 23:9 p 13-14.

Analysis: The cave is muddy and slick and offers hazardous conditions, such as the pit. The cavers had slick-soled footwear (mainly tennis shoes) and were novices. This coupled with the lack of control of the group was inviting disaster.

The lack of a chinstrap makes a hard hat almost useless in a fall.

Accident: New York, McFail's Cave

September 19, 1981

At about 11:30 a.m. on Saturday, September 19 two groups entered McFail's Cave in Schoharie County, New York. A seven person group from Rensselaer Polytechnic Institute went in the Hall's Hole Entrance, rigging the drop with a cable ladder and facility for self-belay. A second group of six from Ithaca, New York, used the Ack's Shack Entrance for entry but planned to exit Hall's Hole and had received permission from the RPI group to use their cable ladder rig. In case RPI left ahead of them, they rigged Hall's Hole with a Goldline rope. All were wearing wetsuits.

After some exploration the Ithaca group split up and three left early, via Hall's Hole using the cable ladder with self-belay.

Later, the two groups met as they reached Coeyman's Dome for the 70 foot climb to exit Hall's Hole. Ithaca moved into the Dome first and their leader, Bill Donaldson, made ready to climb. He had a Gibbs SRT rig but chose to climb the cable ladder instead. He had done several 40-50 foot ladder climbs before but not wearing a wetsuit. His carbide was burning low so he used his helmet-mounted electric headlamp. A non-spring-loaded Gibbs was attached to the RPI Bluewater III for a self-belay. No water was falling in the rigging area.

Donaldson proceeded up but found himself to tire quickly — it had been a hard trip, crawling and stoop walking with heavy photographic gear, and the wetsuit was binding his movements. He had to rest often and at 60 feet he went to rest for about the 5th time. At each rest stop he had put his full weight on the Gibbs safety. At 60 feet he was at chest level with a ledge. When his weight came on the Gibbs, the sling broke and Donaldson fell.

As he fell he grabbed at the ladder and safety line and must have broken his fall somewhat that way; he landed on both feet and fell back into a sitting position. He got up saying that he was fine but was made to sit again by his companions while they checked for injuries. All they could find were two very small scratches on his

right wrist.

The RPI group arrived. After a brief discussion it was decided to haul Donaldson out rather than allow him to climb. Eric Smith proceeded out and to the parking lot to enlist the help of the other three Ithaca cavers. Meanwhile three RPI cavers went up and set up a hauling system. The Bluewater III safety line was fixed to a bolt at the top, then down to a pulley attached to Donaldson's harness, up through another pulley at the top and on to the group doing the hoisting. Several Gibbs ascenders served as safeties in front of the haulers. Donaldson's pulley was duplicated with a carabiner and he was safetied to a standing line with a Gibbs ascender. The hoist was completed quickly with no problems. The remaining cavers followed using SRT and all were out by around 3 a.m.

Reference: Bob Addis "McFail's Accident" **The Northeastern Caver** 12:4 Fall, 1981 p 108-10.

Analysis: It is reported that the 1/4 inch Goldline was an 18 inch loop, about 1 1/2 years old, used once before, in "good" shape. The break appeared almost as a cut.

It is speculated that the sling, under tension rubbed against the ledge and was at least partially cut — perhaps as Donaldson slipped from the ladder as he went to make a rest stop. In any case 1/4 inch rope is a bit thin for a serious belay and ladder climbs should always be belayed. It requires more personal equipment but I believe one is safer using SRT versus cable ladder. Certainly ladders require more arm strength and stamina.

The non-spring-loaded Gibbs is a poor choice for a shunt safety. There is no guarantee that it will catch if you fall.

Accident: Tennessee, Grassy Cove Saltpeter Cave

September 19, 1981

On September 19, 1981, a group of 8 cavers from the Nashville Grotto was on a clean-up trip to Grassy Cove Saltpeter Cave in Cumberland County, Tennessee. After the clean-up they did some exploring. Jean Smyre was climbing when a handhold broke. The fall resulted in a broken arm. The Cumberland County Rescue Squad carried out the evacuation.

Reference: Editor "September 19" **Speleoneers** December, 1981 p 71.

Analysis: Too little information — when free climbing keep three points of support and, when circumstances dictate, use a belay.

Accident: Alabama, Blowing Cave

September 22, 1981

At about 4 p.m. on Tuesday, September 22, James McClain, James Edwards, and Larry Jenkins (all 16-18) entered Blowing Cave, north of Scottsboro in Jackson County, Alabama. While exploring they may have become confused as to direction but in any case eventually experienced failure of all their light sources but one, a kerosene lantern. They decided to sit and wait for help.

When they failed to return, those who knew of their objective called the police. The Scottsboro Rescue Squad arrived at the cave and attempted to search for the lost cavers, paying out string to find their way. They were unsuccessful and eventually contacted the Madison County Rescue Squad for assistance. Members, including cavers who knew the cave well, were activated and arrived at the scene at about 4:30 a.m. They began a search and soon found the lost cavers just beyond the 'Wild Cat Rock Pile.' They were escorted out.

Reference: Don Francis "Cave Rescue" **The Huntsville Grotto Newsletter** 22:10 October, 1981 p 81.

Analysis: The group did the right thing in waiting for rescue. Scottsboro, inexperienced in cave searches, should have called for help sooner. Another example of non-organized cavers having insufficient light sources.

Accident: Arkansas, Bull Shoals Lake Cave

September 26, 1981

On the evening of Saturday, September 26, a man went scuba diving in Bull Shoals Lake in Arkansas. This diver had NAUI certification and 8 years experience. Still, the objective of the dive seems a bit unusual. The diver intended to take the end of a fishing line into an underwater cave, leaving it baited with several 5 pound catfish in hopes of catching a 70 pounder that was suppose to inhabit the cave. He was seen to swim into the cave but did not reappear.

Sometime later authorities were notified and a search/rescue effort was begun, coordinated by William Burns from Missouri. A U/W recovery team from Kansas City, MO proceeded to the accident scene late Sunday evening. Meanwhile Tom Cook was called and he put an NCRC diving team on alert but the alert was rescinded when it was learned that it was a body recovery.

Burns arrived on the scene first and dove the cave, finding the fish line and bait. Pushing further, he came to where the passage height lowered to only 16-20 inches, about 70 feet into the cave. There was no sign of the missing diver but the water was very silty, with visibility in the range of "0-5 inches." Moreover, there were obstacles which kept snagging his safety line and hoses.

The KC team arrived and entered in pairs, but found no sign of the lost diver.

Throughout the search there was a problem with the low visibility and unseen obstacles. One diver pushed past the place where Burns had stopped and pulled himself up over a tight lip to where the low passage continued. Suddenly a large rock fell from the ceiling striking the diver in the face, causing him to retreat.

No body was found.

Reference: Tom Cook **NCRC Cave Diving Accident Report** January 29, 1981 2 pages.

Analysis: Tom Cook — "It is very apparent that the missing diver was not using proper cave diving equipment — no reel, only one light. The cave is a very dangerous one, visibility is always very poor and there are numerous obstacles....In this case a fish line would not be adequate as a safety line; indeed, a fish line should never be used as a safety line."

Cook and Burns conjecture that the diver planted his bait and in so doing stirred up the silt, then let go of the fish line losing his way. Still, the body was not found — Burns thinks it might be in deep water outside the entrance to the cave.

In accentuating the bad practices of the lost diver, it should be pointed out that he was working in a hazardous, low-visibility situation, alone.

Incident: New York, Ward-Gregory Cave

September 26, 1981

At 3:30 p.m. on Saturday, September 26, 1981, four juvenile cavers, Thomas Fargossa, Greg Plunkett, Jim Hennessey and Steve Sgalson entered Ward-Gregory Cave in Clarksville, New York. They carried "2 cell flashlight, candles, matches and drinking water." They did the main area of the cave and headed out. Fargossa and Plunkett noticed another passage and decided to continue exploring — the other two left. After awhile the two in the cave became confused and for hours "wandered in and out of different passages."

Hennessey eventually contacted Fargossa's parents who in turn called the State Police and Albany County Sheriff. At 10:15 Ron Sloan of the Northeastern Cave Rescue Network was alerted and at 10:35 got the go-ahead for a search and rescue at the cave. Equipment and four rescuers reached the cave 15 minutes later. As they prepared to enter, the lost cavers exited.

Reference: Richard Schaefer **Unpublished Report** Undated.

Analysis: Another small episode in the annals of flashlight cavers.

Accident: Texas, Lost Indian Cave

September 17, 1981

On Sunday, September 17, Steve Eddy (19) and companions were exploring in Lost Indian Cave in far northwest San Antonio. According to rescuers Eddy was "climbing out of the cave when he lost his grip on a muddy rope, then lost his footing and plunged (50 feet) back into the cave." He was evacuated three hours later by Emergency Medical Service technicians. He apparently had no serious injuries.

Reference: Anon. "Teen Spelunker Rescued from Lost Indian Cave" **The San Antonio Light** Monday, September 28, 1981.

Analysis: The authorities have tried to seal this cave but apparently it is dug open again by locals. This is the "third evacuation in recent years." Another example of spelunkers using techniques no 'organized' caver would use.

Incident: Kentucky, Fisher Ridge System

Fall, 1981

In the Fall of 1981 a group of three cavers were beginning a trip into the Fisher Ridge System near Mammoth Cave, Kentucky. At a 50 foot drop there is a permanently rigged rope — one rappels in and utilizes "a series of tricky climbs" to exit. The rope is 100 feet long and the lower portion is used for a second drop, somewhat offset, rigged to a boulder. Thus the rope for the first drop is secured at top and bottom.

As Keith Ortiz prepared to descend it was noticed that the rope was especially taut. It was decided that it was probably snagged on the boulder at the bottom and would easily come free when the weight of a climber was on it. Ortiz rappelled, but 15 feet down observed that the rope was snagged on a projection 20 feet above the floor. Continuing the rappel would not allow him to reach the snag which was to one side. Without ascending gear he could not go up, nor did he want to wait for someone to climb around — the Swiss seat he was using would surely stop the circulation in his legs.

By undoing the Swiss seat Ortiz was able to climb to a nearby 'window', a safe perch from which to wait for the rope to be freed. One of his companions insisted the climb down from the 'window' had been done. Using the Swiss seat as a handline Ortiz downclimbed the 35 feet to the floor.

Reference: Keith Ortiz "Close Call in Kentucky" **Spelean Spotlight** January, 1982 p 4.

Analysis: As Ortiz observes, "every trip involving ropework should have along at least one set of climbing gear....Certainly any number of situations can be imagined where a rappel may need to be aborted."

It is definitely easier to climb up than to downclimb but if it takes "half an hour" to climb down then it must take something similar to climb up — why not always take vertical gear and prussik? A "half an hour" of "tricky climbs" done free sounds like an accident waiting to happen.

Incident: West Virginia, Lost World Caverns

October 10, 1981

On Saturday, October 10, a family group of four including a four month old baby, was trapped in Lost World Caverns in Lewisburg, West Virginia, when the electric light system failed. A circuit breaker failed but light was not restarted for 45 minutes until another visitor reported it. The group suffered "cold feet and fear."

Reference: Anon. "Cave Family Lightless" **Sunday Gazette-Mail** (Charleston, W. VA) October 11, 1981 p 7A.

Analysis: They certainly got their money's worth — a real wilderness experience.

Accident: New York, McFall's Cave

October 10, 1981

Shortly after 2 p.m. on Saturday, October 10, four cavers, Norm Berg, Dan Kowalski, Ken Nichols and Tom Oakes arrived at McFall's Cave in New York. As with all trips into McFall's, this one was pre-arranged but the leadership had changed with Nichols assuming control as they prepared to enter the cave. Nichols had good rock climbing, caving and wetsuit experience. Kowalski and Berg were vertical cavers with some wetsuit experience, but Oakes had only practiced vertical work in trees just prior to the trip and had no wetsuit experience. Berg had a proper light set-up, with carbide main source and helmet-mounted electric back-up. Nichols had only a carbide (with flashlight back-up) while Kowalski and Oakes had carbides with flashlights taped to their helmets.

In the parking lot it was arranged with a Canadian group for them to replace rigging after completing their scheduled, shorter trip.

Both Ack's Shack and Hall's Hole were rigged with 11 mm kernmantle rope. The latter entrance rigging was complex — the main line was anchored to the gate and clove-hitched to a 'biner' at the regular bolt anchor. This was changed by the Canadians so that the rope merely passed through the bolt 'biner'. Below the bolt a knot was tied and a 'biner' linked this with a rope also anchored to the cave gate.

By 2:30 p.m. they had all descended Coeyman's Dome (Hall's Hole). Leaving their vertical gear, they proceeded downstream in the main passage. After reaching the Terminal Siphon they went to the SE Sump and started up the NW Passage. About 200 feet up this Kowalski and Oakes began to feel tired so the group turned back.

At Coeyman's Passage, Berg and Kowalski decided to take a half-hour round trip up the main passage while Nichols and Oakes started out.

Nichols went up the waterfall, resting briefly only twice. Oakes came next. His carbide was out, the taped flashlight was carried in a pocket before it fell out and was lost, partway up. He did not wear his gloves. Fifteen feet up his hands became numb and stopped functioning. He shouted to Nichols that he couldn't make it. Nichols told him to go back down but the reply was that he (Oakes) couldn't. The situation was serious.

Nichols tried unsuccessfully to hoist Oakes a bit so he could untie the main line to lower it. He then realized he could use the second rope (fixed to the main line below the bolt) to lower Oakes. He untied this at the gate, wrapped it once around the bar, cut the main rope knot at the gate and lowered Oakes.

Oakes had meanwhile fallen silent. Within a minute or two after being lowered, Berg and Kowalski arrived to find Oakes shivering violently, teeth chattering. He was disoriented and panicked. It was 9:45 p.m. Communicating with Nichols they learned what had happened. Nichols told them to wait, he would go for help. He lowered his spare carbide lamp, food and extra carbide, then departed.

Berg and Kowalski got Oakes out of the spray. After quickly recharging their lamps and grabbing a bite of gorp, they moved 50 feet on down to a dry cubbyhole. Sitting Oakes on a coil of rope, they took off his harness and wetsuit top and pulled down the Farmer John top. A dry wool sweater was put on the victim and the wetsuit replaced over it. They then huddled together with five carbide lamps as close as possible, eating and drinking and moving only occasionally to stretch their legs.

By 10:20 p.m. Nichols had gotten to a phone and put the Northeastern Cave Rescue Network in action. At 10:30 he returned to the cave and told the three waiting that help would arrive in a couple of hours.

At 11:40 six Canadian cavers arrived, the first of many responding to the callout. Three of these suited up and after midnight, when Bob Addis (chairman of the McFall's Cave Committee) arrived, it was agreed that cable ladders should be rigged and that Tom Miller would descend with an upper belay.

Between 1 and 1:30 a.m. the waterfall was rigged and Miller descended. By 2:00 a.m. the victim and his two companions were out. A checkup at a local hospital showed them all to be OK.

Reference: Bob Addis "Rescue at McFall's" **The Northeast Caver** 8:1 Winter, 1981 p 4-9.

Analysis: McFail's is a controlled-access cave, under the control of the National Speleological Society. Whatever policies were in force to allow access to the cave must take the major share of the responsibility for this near-fatality. No one inexperienced in vertical or wetsuit caving should be allowed in a cave where both are required. Moving in a wetsuit takes more stamina than caving without one and vertical work becomes easier the more it is practiced.

The leader of the group must also share responsibility but in this case the leadership changed hands shortly before the trip and Nichols was forced into the job by default. Even so, he did extremely well and probably saved Oakes' life by getting him lowered from the falls as quickly as he did. Note that the altering of the rigging by the Canadians and the possession of a knife by Nichols were two circumstances that allowed Oakes to be lowered.

The group was poorly equipped for the trip. When a cold (40-45 degree) waterfall is to be climbed it is essential to have a helmet-mounted (not taped) electric light. This allows a margin of safety when one experiences vertical equipment hang-ups. Oakes had waterproof gloves but chose not to wear them, allowing his hands to become numb. It is presumed that lack of faith in, or complexity of his vertical system was cause for that decision. One must develop a rig for cold caves that can be operated with gloves on. Actually, waterproof gloves without wool liners probably wouldn't have kept Oakes' hands warm for the whole ascent but they would have helped.

The moral of such a situation as occurred is that one must always beware of taking an inexperienced person on a difficult trip. They may be enthusiastic and insist on going but remember this: the novice has no real idea of what he is getting into. He will expend more energy than an experienced person doing the same things and have less muscular stamina than a person who has practiced that particular activity before. Thus, when push comes to shove and one must gut it out on stamina and willpower alone, the novice will generally be the first to die, as Oakes nearly did here.

Accident: Indiana, Trap Door Cave

November 28, 1981

On Thanksgiving weekend, 1981, 16 adults were on a caving outing in the Garrison Chapel Valley area near Bloomington, Monroe County, Indiana. Ten had previous caving experience and four were Michigan Interlakes Grotto members.

On Saturday the group entered Trap Door Cave and spent two hours in thorough exploration. In exiting, two members had cleared the entrance and Glenn Anders was "almost to the stand-up offset pit." Suddenly the wall of the stream gully at the entrance collapsed. Anders was met by three large rocks (1-400 pounds), one impacting his left shoulder and the others pinning his hardhat. In the encounter, Anders had drawn his legs up. In this position he had difficulty breathing and Don Maxwell, the next behind, helped him extend his legs.

A fourth year medical student was at the entrance in a party about to enter when the collapse occurred. He entered, loosened Anders chinstrap and examined him for injuries, finding only a "depressed area of his shoulder." The collapse area seemed to have stabilized so the victim was "talked" on out the entrance. Others had gone to Blenz's house for additional help. The thirteen cavers behind Anders had retreated out of the entrance crawl to an upper level room where they marshalled their extra food and lights in case their stay proved long.

Anders was taken to a hospital where examination produced no real injuries. Meanwhile additional help arrived, set up a block and tackle, and removed the smaller of the three rocks. The others were pronounced stable so the trapped cavers exited.

Reference: Glenn Anders "Trapped in Trap Door Cave" *Spelean Spotlight* January, 1982 p 5-6.

Analysis: As Anders observed, it was a good lesson to all to carry extra food and light on all caving trips, even ones that look easy and straight-forward. He also makes the point that novices in a party should be well-briefed on initiating a rescue. In this case the two non-trapped cavers were novices and had to be told by the trapped Anders how to seek help.

Accident: Virginia, Clover Hollow Cave

December 12, 1981

At about 9 a.m. on Saturday December 12, four VPI Grotto cavers entered Clover Hollow Cave in Giles County, Virginia. After doing 65 foot and 17 foot drops, they approached a 12 foot downclimb in a chimney. A cable ladder is permanently rigged here to allow passage in case of storm water flow.

Two cavers descended without using the ladder. At 9:45 a.m. Lee Little started down using the ladder without a belay. On a sloping ledge near the top one hand became stuck under a rung. He pulled his hand free but its release pitched him over backwards. He fell 10 feet landing on cobbles, curled up on his side.

He was examined immediately with the only apparent injury being "a bad bruise between his right hip and rib cage, near the kidney." He was in "significant" pain and had difficulty lifting his right leg. The climb up the ladder was made only with pain and difficulty so an evacuation was decided on. One caver left the cave and at

10:30 a.m. called the grotto rescue number requesting 12 cavers and a litter.

By 12:30 the cavers and litter had arrived and the evacuation had begun. Pulleys were set up for the haul up the 17 and 65 foot drops. A short crawl was encountered halfway out that would not allow passage of the loaded Stokes litter. Little crawled through while the Stokes was passed through a high, narrow slot above. The victim cleared the entrance by 3 p.m. At a hospital he was found to have suffered only a severe bruise.

Reference: Pete Sauvigne *Accident Report — Clover Hollow Cave Giles Co., VA* Unpublished Undated.

Analysis: Sauvigne points out that the lack of a belay was the same for the free climbers as for Little on the cable ladder. This does not excuse the situation, however. In ladder climbing as in freeclimbing one should always have three points of support. Thus a hand should not be moved until the other hand has a secure hold.

To go on a bit further, it seems to me to be OK to free climb without a belay if one has some control over a potential fall. That is, if, when I fall, I can control my body such that I will land on my feet and then can tuck and roll, I can handle a fall of some distance without injury. If on the other hand a fall will pitch me on my back or make me land in an uncontrolled fashion, I will ask for a belay. Ladder climbing is usually of the latter category and, I believe, should always be belayed. Circumstances dictate procedures.

Accident: Tennessee, Knox County Sinkhole

December 21, 1981

On December 21, Jeff Hogue (34) of Linton, Tennessee, approached a friend to borrow his truck to drive to a town in North Carolina about 120 miles away. When the truck refused to start, Hogue announced in frustration that he would walk. The weather was cold, with freezing rain.

About a mile from his friend's house, while walking through wooded country he lost his footing and slid and fell into a sheer-walled 18 foot deep sinkhole in the earth.

Hogue tried to dig holds and climb out but the walls were soft mud and wouldn't support him. As the snow melted he had water but he could not trap any, due to evaporation, and he was soon without any. He tried making a ladder from his long underwear and sticks but again the earth would not support his efforts. Time passed.

At night it became very cold and he would shiver uncontrollably. Yet in the daytime it was quite warm. After a few days he began to hallucinate. Finally he was sure he would die — he was exhausted, dehydrated and hypothermized. Suddenly he heard voices. Then a face appeared at the top of the hole. He had been found by teenagers out squirrel hunting. He had been in the hole for 8 days.

References: 1) Editor "Eight Days — Hiker Trapped Without Water in a Dungeon of Deadly Mud and Rock" *Globe* 29:4 January 26, 1982.

2) Editor "Hiker Relives His Terrifying Eight-day Ordeal Trapped Down 20 Foot Sinkhole" *Star* January 26, 1982.

3) AP "Trapped Man Drank From Mud in Sinkhole" *Atlanta Constitution* Thursday, December 31, 1981 p 2-A.

Analysis: The victim had lost 25 pounds and had his body temperature fall to 85 degrees — dangerously low. He was hospitalized for hypothermia, trench foot and dehydration. Enough said.

Accident: New Mexico, Santa Fe Blowhole

December 28, 1981

While hiking in the Caja del Rio area of the Santa Fe National Forest, Howard Stark (30) of Santa Fe met two amateur archeologists, Bob Adams and Learoughn Caldwell. These two convinced Stark that a trip to a deep volcanic vent near Santa Fe would be worthwhile, since it was rumored that skeletons and artifacts had been found there.

On Monday, December 28, the three made a trip to the 'Blowhole', as it became known in subsequent news articles. At about 4:30 p.m., after flipping coins to decide who would descend, Stark "lowered himself" on a rope. At the bottom he found only that he had not the strength to ascend the 150 feet to the surface.

Caldwell stayed at the hole while Adams went to the car and called for help on his CB radio. After 45 minutes the call was picked up by a carload of skiers. These people had a snowplow operator call the Sheriff and then fearing the call was not believed, contacted the police in person. The skiers and Sheriff's deputies headed to the scene using radio station KSNM's tower for a rendezvous. This involved Jim McNally, a KSNM engineer, who offered the use of a 600 foot rope and harness used for tower climbing. This was used to pull Stark to the surface, at about 7:45 p.m., unharmed.

References: 1) Gayle Swart *Personal Communication* March 29, 1982.

2) Editor "Non-Caver Gets Stuck" *SW Caver* Jan-Feb., 1982.

3) Howard Houghton "Santa Fe Man Rescued From Deep Hole" *Albuquerque Journal* December 29, 1981.

4) Roger Navanjo *Offense/Incident Report — Santa Fe City Police* December 28, 1981.

Analysis: Cavers operating without the benefit of the highly-evolved vertical techniques of the organized caving community.