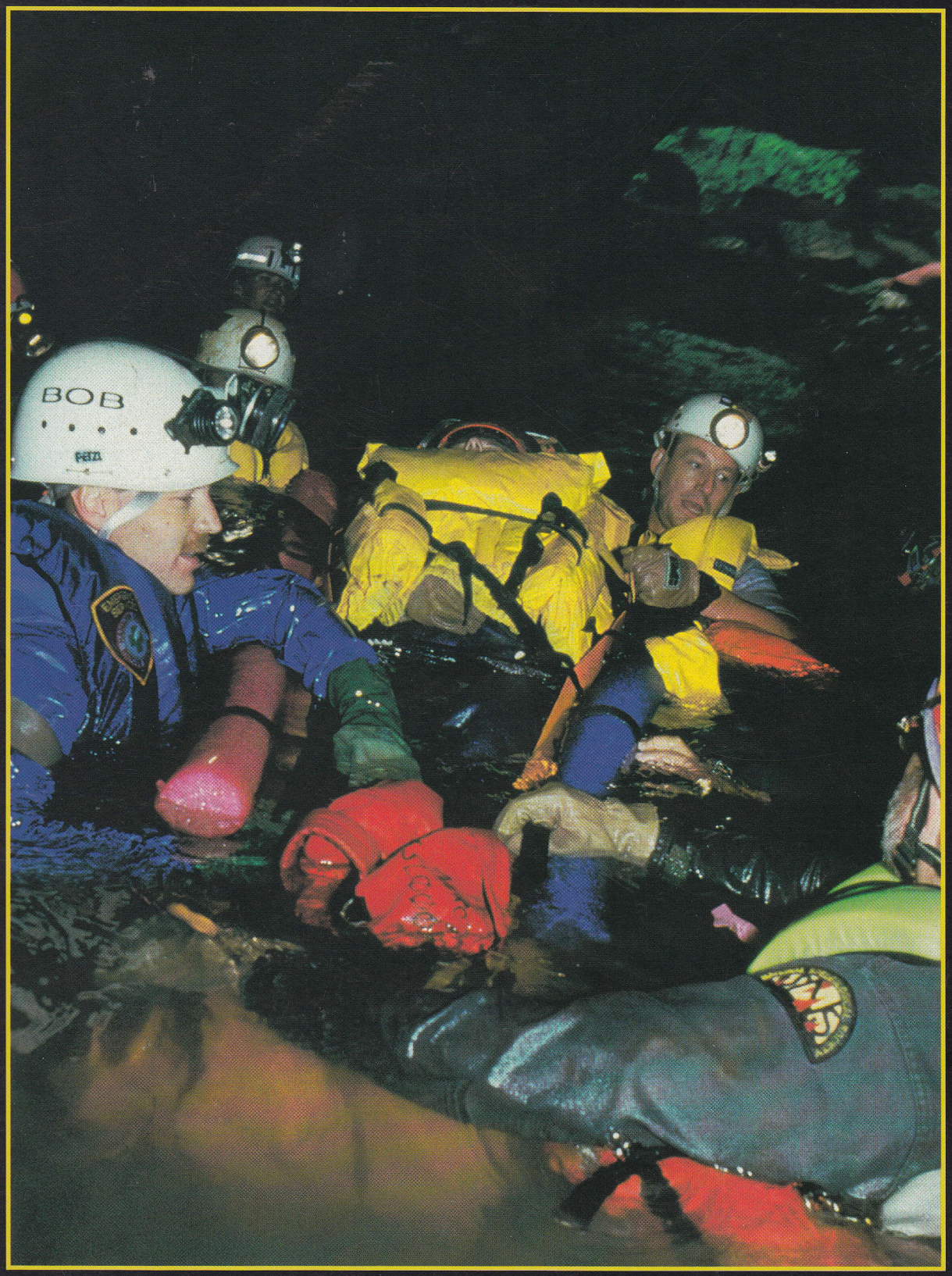
APRIL 2000, PART 2

NSS NEWS



American Caving Accidents 1996 – 1998

American Caving Accidents

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American Caving Accidents

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Features

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Front Cover
Moving a patient through flooded passage during an NCRC training exercise in Wet Cave, Tennessee. Photograph by Rick Walk. Copyright © 2000 Rick Walk.

Back Cover
Top: Steve Collins shelters injured caver Gerald Moni after his fall in McBrides Cave, Alabama. Photograph by Andy Zellner. Copyright © 2000 Andy Zellner.
Bottom: Lowering a patient during an NCRC training exercise in Cumberland Caverns, Tennessee. Photograph by Rick Walk. Copyright © 2000 Rick Walk.

Simple things that might save your life

Bill Putnam, Editor

In preparing this issue, several incidents in the reports have weighed heavily on my mind. In one case, this was made worse by the fact that I participated in the rescue of the injured caver and was present when she died, tragically and unexpectedly, just before reaching the surface. I want to use this space to talk about a few things that were involved in several serious incidents. I hope that this discussion will prompt you to consider your own caving habits and practices. We all need to think hard about the risks we take in caving and what we can do to reduce them.

The first thing I want to talk about is probably one of the most basic rules of vertical caving. Never, *ever*, hang a rope in a pit or down a drop without first tying a knot in the end. It is not unusual to wind up with a rope that doesn't reach bottom. As several incidents reported in this issue demonstrate, without a knot you can easily rappel right off the end of the rope and fall, suffering serious injury or death.

Many cavers tie a figure-8 loop in the end, providing a convenient loop to stand in and use during a changeover from rappel to climb if the rope comes up short. It's a habit every caver should cultivate. Oh sure – sometimes it's a short drop and you can look and see that the rope is on bottom. Do it anyway, so that it becomes a habit, and you won't forget to do it some day when you can't see and don't think to look.

Every caver has a responsibility to make sure this is done. Every caver must be responsible for understanding, inspecting and checking the rigging, and for pointing out or correcting dangerous conditions and situations. Caving is a team endeavor for most of us, and we have to look out for each other as well as for ourselves. In a dramatic and tragic example of the failure to remember this, Karen Prowett was killed at Stephens Gap Pit when these simple but critical issues were overlooked. Remember your responsibility and exercise it.

There are quite a few incidents in this issue involving falls due to out-of-control rappels. Such incidents are almost always avoidable. In addition to refraining from engaging in "speed rappels" and leaping around like television stunt men, there are several techniques that can make rappelling a lot safer while still allowing cavers to enjoy it.

It is apparent from these reports that many cavers do not thoroughly understand how their rappelling and climbing equipment works. Competent vertical cavers know how to control and tie off their rappel devices, and how to add and remove friction while on rappel. They know how to change over between rappel and ascent. They know how and when to use belays. They also know that experience is best obtained by starting with small drops and progressing to deeper ones.

Many cavers use a bottom belay for protection when rappelling. It is a simple technique, consisting of having a caver at the bottom of a drop holding the rope and ready to apply weight to the rope. The belayer should wrap the rope around his hips, holding the main line in one hand and the loose end in the other. The belayer then pulls down, or sits in the loop if necessary, to apply weight to the main line. The additional load will slow and usually stop the descent of a caver rappelling with almost any commonly used rappel device. The technique is most popular in regions where the pits tend to be somewhat roomy at the bottom and where rockfall is not severe.

The bottom belay is very useful in frequently visited caves, or well traveled and established routes in cave systems, where loose rock has been removed from the lip. It may be more risky and perhaps less useful in virgin caves or in alpine environments of shattered rock, where rockfall is a serious and constant threat or where narrow shafts leave no place for a belayer to hide.

It is true that there is some risk to the belayer, even under good conditions. The belay is most effective when the belayer is directly below the rappeller, requiring exposure to rockfall or impact by a falling caver. But the risk to the belayer can usually be mitigated. The belayer can often stand away from the rockfall zone or take shelter under an overhang. A sling and carabiner can be used if necessary to redirect the rope and allow belaying from a safer location. It is important to realize that in order for the belay to be fully effective, it must be applied quickly and correctly. You may only have a second to apply the belay and stop or slow a fall. It is wise to practice in a controlled environment before belaying in a cave.

Certainly there are circumstances in which the risk to the belayer is too great – for example in narrow pits with lots of loose rock, where the belayer cannot take shelter. In such cases a self-belay might be preferred. But the bottom belay is a good general tool that all cavers should know. Learn and understand the technique, and use it whenever circumstances permit. You never know when someone might need it.

Another technique popular with European cavers and used by some in the U.S. is to rappel with a self-belay, composed of a prusik or similar knot attached to the rope *below* the rappel device. The knot is fashioned out of a short sling attached to the caver's harness or leg loop and is held open by the rappeller's braking hand during descent. It must be short enough to grip the rope below the rappel device when released. Properly rigged, the knot is easily loosened after use.

Cavers experimented in the past with the Spelean Shunt and other self-belay techniques employing a prusik or ascender placed *above* the rappel device. These tend to jam and are often very difficult to release afterward. The European method works much better.

Some cavers think that belays are for beginners, and that anyone who needs one should not be doing a deep pit. This is a dangerous fallacy, because any caver can be hit by a falling rock and stunned or knocked out while on rappel. Some believe that is what happened to Alexia Hampton in Surprise Pit. Whatever the reason for her fall, the use of a bottom belay or self-belay might well have saved her life.

So take a few moments as you read these reports. Think about these things. Think about Karen and Alexia. Think about your fellow cavers and family. And be careful.

Overview of the 1996, 1997, and 1998 Reports

Following the example of previous issues of *American Caving Accidents*, the reports have been separated into two general categories: regular caving and cave diving, and then further classified by result or outcome and by causes and contributing factors. Once again, I have used the category "difficulty on rope," to encompass such problems as becoming stuck at the lip of a pit, clothing or hair caught in the rappel device, jammed rappel safety, or simply becoming unable to ascend or descend. My intent is to better describe these situations, which might otherwise be lumped under "stuck," "trapped/stranded," or perhaps "equipment problem."

In reporting the number of incidents versus NSS membership totals, only the serious incidents were used. The reader should also be aware that the members of the society make up only a portion of the population of active cavers. Further, not all incidents are reported to *ACA*. These numbers should not be considered reliable indicators of accident rates for caving, or used to draw conclusions about the relative degree of risk or danger involved in caving.

Incident Results

Fatalities

There was one fatal incident in 1996. A man rappelled into a flooded pit without climbing gear and either drowned or died of hypothermia when he was unable to escape the pool at the bottom.

In 1997 there were four fatal accidents reported. One involved a person who suffered a heart attack in Reeves Cave, Indiana. An inexperienced and possibly intoxicated caver was killed when he fell while climbing on rocks at the entrance of New River Cave, Virginia. One caver was killed when she rappelled off the end of a rope at Stephens Gap Pit, Alabama, and fell over 100 feet. A few months later, another caver was killed in Fern Cave, Alabama when she lost control of her rappel and fell about 50 feet in Surprise Pit.

There were four fatalities in 1998. Two involved heart attacks while caving. A hiker was killed by falling ice at Big Four Ice Caves, Washington. An inexperienced caver died after falling down a slope in the entrance of Spring Hill Saltpeter Cave, Tennessee. That incident has resulted in a lawsuit brought by the victim's family against the cave owners.

Injury and Aid

These incidents resulted in injury to one or more people, who then required help in order to exit the cave. While many of these involved rescue call-outs and outside assistance, some were resolved, without calling for rescue, by the caving parties themselves. The development of several small-party and self-rescue training courses is a welcome addition to cave rescue training available in the US. Active cavers should consider obtaining some level of cave rescue training, and should develop small group and self-rescue capabilities so that they can help their companions when necessary.

Aid, no injury

The majority of these incidents are rescues of individuals that cavers often refer to as "spelunkers." They are typically poorly equipped and inexperienced, and are often stranded when they break or lose their flashlights, run out of batteries, or get lost. A number of these incidents involved people stranded in pits without ascending gear after rappelling or descending hand-over-hand. Others involved cavers who did not know how to use their ascending equipment. Several incidents involved exhausted cavers stranded in a cave or on rope. Flooding and rockfall entrapments also accounted for several incidents.

Injury, no aid

These incidents resulted in injuries ranging from scrapes and bruises to sprained ankles and broken fingers. In each case, the victim was able to exit the cave with minimal assistance from members of the caving party.

No Consequence

Many of these incidents are of the "near miss" category. They are included so that the reader will be aware of the many things that can go wrong. Some of these offer good illustrations of effective self-rescue or small-group rescue.

Incident Types

Acetelyne Hazard or Explosion

There was one acetylene incident in 1996, resulting in a chemical burn. None were reported in 1997 or 1998.

Bad Air

One of the 1996 incidents and one 1998 incident involved bad air in caves. For a discussion of bad air in caves see Bill Mixon's article in this issue and Bill Elliott's article in the last issue of *ACA* (*NSS News*, December 1997 Part 2).

Caver Fall

Falls remain the leading cause of accident and injury. The reported causes and contributing factors include: climbing rock without a belay, using cable ladders without a belay, improper footwear (tennis shoes), inexperience, use of hand-held flashlights and lanterns, climbing or descending ropes hand-over-hand, rappelling off the end of the rope, and out-of-control rappels. Cheap helmets and elastic chinstraps continue to be a problem. Remember: your helmet makes a statement.

The hand-over-hand technique continues to claim its victims among the growing population of inexperienced and poorly equipped spelunkers. It also claimed one experienced caver in Goochland Cave, Kentucky in 1996 and another in McBrides Cave, Alabama, in 1997.

Several serious accidents occurred when cavers lost control on rappel or rappelled off the end of the rope and fell in pits. There were three incidents in 1996 in which cavers lost control on rappel and fell. One was caused by rockfall and another was caused by a high-speed "show off" rappel.

In 1997 two cavers rappelled off the ends of their ropes and fell. One caver was killed at Stephens Gap Pit, Alabama, and another was injured at Freeman's Pit, Indiana. Another caver was killed in Fern Cave, Alabama, when she lost control of her rappel. A 1998 incident resulted in serious injury for a novice rappeller at Moaning Cavern, California.

The use of a bottom belay or self-belay can stop or prevent an out-of-control rappel. Tying a knot in the end of the rappel rope is a standard safety procedure for cavers. Any rope rigged at a pit should have a knot in the end.

Drowning

The one fatality in 1996 was by drowning. It is thought that the victim lost consciousness due to hypothermia after being stranded in a flooded pit for some time.

In 1998 a caver drowned while crossing a river on the hike back from New River Cave, Virginia. Be sure to loosen or remove your packs and equipment before crossing deep water. You may need to dump them in a hurry.

Equipment Problem

This catch-all category includes rigging failures, slipping ascenders, light failure, rope failure, and misuse or lack of equipment. There were two incidents of harness failure and one rope failure.

Flooding

There were five 1996 incidents involving flooding. Two occurred in Fisher Ridge Cave, Kentucky when experienced cavers planning multi-day trips entered via a flood-prone crawl during questionable weather. They were prepared to camp for several days, however, so they were able to wait out the floods without difficulty.

There were two flooding incidents in 1997. Several cavers were trapped in Glow Worm Cave, Tennessee, when they entered via a low crawl in bad weather. Five cavers were trapped, including one caver who broke his leg, and three others injured during a flood in McBrides Cave, Alabama, when a group attempted a pull-down trip during bad weather.

There was a minor flooding incident in Bowden Cave, West Virginia, in 1998, in which cavers waited out a flood pulse before exiting.

The lesson taught by all these incidents is simple: pay attention to the weather conditions. Check the forecast for the caving area, and be alert for the possibility of flooding. If the cave is known to flood and you don't have a clear forecast, go somewhere else. It's just not worth the risk of entrapment, rescue, media attention, closed caves, injury, or death.

Hypothermia

Hypothermia is usually a secondary result in the reported incidents, occurring subsequent to cavers becoming injured, stranded, or trapped in a cave. In 1996, it is believed to have contributed to the drowning death of a man who rappelled into a flooded pit without ascending gear. There were several

Caving Accident and Incident Statistics 1986 – 1998

Result of Incident

Result Year:	86	87	88	89	90	91	92	93	94	95	96	97	98
Fatality	4	3	4	1	4	6	5	5	1	2	1	4	4
Injury and Aid	10	15	11	16	18	16	17	22	19	17	16	22	14
Aid, no injury	21	15	20	20	23	20	28	33	26	17	16	13	12
Injury, no aid	10	15	14	14	10	12	10	4	11	8	10	4	2
No consequence	19	16	12	21	9	12	16	3	20	12	11	4	8
Total	64	64	61	72	64	66	76	67	77	56	54	47	40
Incidents Involving Fatality, Injury, or	45	48	49	51	55	54	60	64	57	44	43	43	32

Incident Types

Type Year:	86	87	88	89	90	91	92	93	94	95	96	97	98
caver fall	25	14	20	19	22	22	22	19	20	15	21	27	15
trapped/stranded	-	-	-	-	-	-	-	1	13	18	18	13	9
rockfall	12	17	7	11	11	12	16	11	12	10	5	5	2
lost	8	5	3	9	4	3	4	5	12	7	4	5	3
equipment problem	14	17	20	20	23	21	20	11	11	4	4	2	1
difficulty on rope	-	-	-	-	-	-	-	-	11	4	6	5	1
other	3	4	8	6	8	4	5	4	6	6	3	2	3
hypothermia	1	2	0	5	0	2	4	0	3	6	6	2	2
exhaustion	0	1	1	3	0	2	4	2	4	1	4	1	1
flooding	1	3	3	4	2	2	1	3	1	4	5	2	1
bad air	3	2	1	1	1	2	1	1	2	2	1	0	1
acetylene	3	0	1	1	0	0	0	1	3	0	1	0	0
illness	0	0	2	3	2	1	0	3	3	0	1	1	8
stuck	3	1	0	1	1	3	5	5	2	1	2	0	1
drowning	1	2	0	2	2	2	2	0	0	0	1	0	0
Caving-related or Outside Incidents	-	-	-	-	-	2	1	0	2	0	1	1	5

Cave Diving

Result Year:	86	87	88	89	90	91	92	93	94	95	96	97	98
Fatality (one or more)	7	5	9	4	8	2	5	3	6	5	2	2	0
Aid, no injury	1	0	0	0	0	1	1	0	0	1	0	0	0
Injury, no aid	-	-	-	-	-	-	-	-	-	-	0	0	1
No consequence	1	2	1	1	0	5	1	0	1	0	0	0	0
Total Diving	9	7	10	5	8	8	7	3	7	6	2	2	1

incidents involving lost or stranded cavers in which some of those rescued required hospitalization and treatment for hypothermia. Remember: hypothermia can kill you all by itself, but it also impairs your brain, which makes it easier to make bigger mistakes.

Illness

There were ten incidents involving illness while caving. One 1996 incident required an unplanned bivouac in a cave. Heart attacks while caving accounted for one fatality in 1997 and two in 1998. There was one case of histoplasmosis and one possible rabies exposure, both in 1998.

Lost

Most of these incidents involved untrained and ill-equipped cavers with little experience. Many escalate to the "stranded" category when the batteries run out. Several of these incidents also involved hypothermia, with a few cases resulting in hospitalization.

Rockfall/Ice Fall

Rockfall remains a serious source of accidents and incidents, causing several injuries and rescues and four cases of entrapment. One of the entrapments was caused by a caver attempting to widen a passage to follow other cavers. Another involved digging for new cave, which was also a source of some near misses.

A fatal incident at Big Four Ice Caves, Washington, involved falling ice. Rockfall may have also been involved in the 1997 fatality in Fern Cave, Alabama, by causing an out-of-control rappel. Rockfall also accounts for several of the "near-miss" incidents.

Stuck

Despite popular perception, getting stuck is not much of a hazard in caving. There were, however, two rescue operations involving stuck cavers: one in Fault Cave, Colorado, in 1997 and a serious incident in 1998 at Keyhole Cave, New York, in which a major rescue was required to help a caver stuck in a crevice. There were also several incidents involving cavers who were temporarily stuck but managed to free themselves with some help from companions.

Trapped/Stranded

This category is used to describe incidents in which the caver or cavers are prevented from exiting the cave by rockfall, light failure, lack of equipment, equipment failure, or other causes. In many of the reported incidents, "spelunkers" became stranded due to inexperience, inadequate equipment and/or poor judgment.

Incidents in this issue include: entrapments by flooding, rockfall, and caver-induced passage collapse; falling down pits and sinkholes; key broken off in gate lock; a swimmer washed into a sea cave; and the old standby, rappelling into pits without ascending gear. One incident was fatal – the death by drowning or hypothermia of the man who rappelled into a flooded pit without ascending gear.

Exhaustion

There were four incidents in 1996 and one each in 1997 and 1998 in which cavers became too exhausted to exit and required assistance. Several of these incidents involved cavers who became exhausted while climbing, either on rope or on cable ladders. This type of incident is potentially fatal due to the rapid onset of "harness induced pathology."

A French study in 1984 and another in 1991 showed that an immobile caver hanging on rope can lose consciousness in a matter of minutes, with death occurring soon after. Competent vertical cavers should be able to perform a changeover to rappel and get off rope within a few minutes.

Difficulty on Rope or Ladder

There were six incidents in 1996, five in 1997, and one in 1998 in which cavers encountered serious difficulty on rappel or ascent. Most of these involved problems on ascent, and several involved the use of cable ladders on short drops.

Many of the cavers involved were inexperienced and did not know how to use their gear. Some were unable to deal with situations such as crossing the lip of a pit with weight on the rope from below, changing from rappel to ascent and vice versa, or climbing a cable ladder. It should go without saying that competent cavers master their systems and know how their equipment works. Practice makes perfect, as they say.

Climbing a cable ladder is not as easy as it sounds. Several incidents involved the use of a cable ladder without a belay. Two serious injuries resulted from this dangerous practice. Many U.S. cavers prefer to stick with SRT.

Other

This catch-all category includes: bumped heads with suspected neck injuries; an abrasion that developed a staphylococcus infection requiring hospitalization; a methamphetamine lab found in a cave; an in-cave bear encounter; a tree falling into a pit while cavers were on rope; and an animal trap encountered in a cave entrance.

Caving-related or Outside Incidents

There were seven reported caving-related incidents from 1996 through 1998. One involved individuals who descended a mine shaft with no ascending gear, another was a drowning which occurred on the hike back from a cave, and a third was an ATV accident en-route to a cave. Four involved bodies found in a cave or something described as a cave. These incidents are not included in the regular accident totals.

Cave Diving Incidents

There were two reported cave diving incidents for 1996. Both involved fatalities. The first occurred at Paradise Springs, Florida, and involved open-water divers who did not follow standard cave diving safety rules. One diver died when he silted out the water and did not have a guideline. The other involved an open water diver who was found dead in a sea cave. He was diving without a partner, and the circumstances of his death were unknown.

The two reported incidents for 1997 also involved fatalities. A fatality at Four Sharks Blue Hole in the Bahamas was attributed to nitrogen narcosis. The second incident involved a diver believed to have suffered an embolism or a heart attack while diving in Jackson Blue Spring, Florida. In 1998 there was only one reported incident – a case of decompression sickness ("the bends") during the Wakulla 2 expedition in Florida.

More on Bad Air in Caves

William Mixon

Bill Elliott's discussion of "bad air" in caves in the last issue of *American Caving Accidents* does not, I think, make very clear the distinction between too little oxygen (O_2) and too much carbon dioxide (CO_2). The confusion is natural as far as cave environments are concerned, because usually a percentage of CO_2 derives from the consumption of an equal percentage of O_2 during decomposition of material washed into the cave. For the same reason, the confusion is not particularly dangerous. However, those breathing artificial mixtures of gases, such as cave divers, need to know the difference, and there may be cases in nature, such as where volcanic gases are seeping into caves, where CO_2 appears without a matching O_2 deficit.

A considerable deficit of O_2, even down from the normal 21 percent of air to 10 percent, is not usually dangerous if the missing oxygen has been replaced by some harmless gas such as nitrogen or helium. What really matters is the actual density of O_2, called partial pressure in this context, which is a function of both percentage of O_2 and air pressure. At sea level, if the percentage of O_2 in the air is 21, then the partial pressure of O_2 is .21 atmospheres. At twelve thousand feet, because of the reduced air pressure, 21 percent O_2 gives a partial pressure of only about .13 atmospheres. That would also be the O_2 partial pressure at sea level if the percentage of O_2 were only 13.

So 13 percent O_2 at sea level has about the same effect as being at twelve thousand feet, assuming that the missing oxygen at sea level has not been replaced by something that is itself dangerous. Prolonged exposure would give an unacclimated individual some symptoms of mountain sickness, and his athletic ability would be somewhat impaired, but it would hardly be dangerous. Even Mt. Everest, at the top of which the partial pressure of oxygen is far below .10 atmospheres, has been climbed without supplemental oxygen. The article in *Underwater Speleology*, volume 22, number 1, that was cited in the last *American Caving Accidents* in connection with the analysis of Ian Rolland's cave diving accident contains a good discussion of hypoxia and a number of references.

On the other hand, a significant percentage of CO_2 will be dangerous, whether or not there is an accompanying deficit of oxygen. Too much CO_2 is dangerous because the partial pressure of CO_2 in your venous blood is about .07 atmospheres, which means it would be in equilibrium with air with seven percent CO_2 at sea level. At such a concentration, therefore, your body would not be able to get rid of CO_2 by outgassing it into the air in your lungs. Hence the problem with excess CO_2 depends on the difference between the concentration in the air and seven percent (with appropriate adjustments for higher elevations, where in fact a higher percentage of CO_2 could be tolerated because the partial pressure will be lower than the percentage in the air). This explains why a concentration of three percent CO_2 in air, a hundred times normal, is somewhat tolerable, whereas a further increase by a factor of only two, to six percent, results in an urgent problem. At three percent, you've lost less than half your ability to get rid of CO_2 generated in your body; at six percent you've lost roughly 85 percent of it.

A mixture such as 14 percent oxygen, seven percent carbon dioxide, and the rest nitrogen, such as might be found in a cave with very bad air, is dangerous because of the excess of CO_2, not the deficit of oxygen. A mixture of 90 percent oxygen and ten percent CO_2 would be deadly, whereas a mixture of 90 percent nitrogen and ten percent oxygen would not be. Of course, neither of the latter two mixtures is going to be encountered in a cave.

Near-normal oxygen concentration is used as an indicator of good air in industrial situations because solid-state oxygen sensors are available and because a deficit of oxygen implies that *something* is wrong with the air, and when safety is concerned, it doesn't matter much what. Where I used to work, the problem would have been SF6, not CO_2. I suspect that the threshold of 19.5 percent oxygen that Bill Elliott mentioned as the OSHA limit is mainly based on the expected precision of the oxygen meters.

Butane cigarette lighters or carbide lamp flames are often mentioned as indicators of bad air in caves. It is true that due to some combination of the deficit of oxygen and the excess of CO_2, their flames do burn in subtly different ways when the air is bad. But they will continue to burn in air that you can't breathe. A better indicator is a candle, which will not burn in significantly bad air. I think that is because the flame will not burn hotly enough to melt wax to feed the candle flame, which, although it can be started, will promptly go out. The melting point of candle wax is carefully calibrated to give the desired size of flame in normal air. Unfortunately, a candle will fail to burn in cave air in which you can still cave, with a lot of huffing and puffing, so it may be a bit too conservative, if safe, as a practical indicator. Most cavers have figured out that a candle is not very usable as a practical emergency source of light for moving through a cave, but they might still carry one as a good source of warmth, especially for an electric caver. Verifying a suspicion of bad air is another use for a candle.

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1. *William R. Elliott, "Bad Air in Caves,"* American Caving Accidents, NSS News *December 1997,Part 2*, *pp. 396-397, National Speleological Society.*
2. *Bill Stone, "Accident Analysis,"* Underwater Speleology*, v22n1, January/February 1995, pp. 15-25, NSS Cave Diving Section.*

Previously Unreported Incident

Dwight Livingston

1 April 1995
Emergency Cave, Maryland
trapped, inadequate clothing

Jess Kitting (24) and twelve Girl Scouts entered Emergency Cave, expecting to go caving. They descended the five drops (21, 55, 75, 53, 131, and 45 feet) and proceeded to the Lost Idiots Section, where the group encountered a group of Boy Scouts of about the same age and social standing. The Scouts had descended the pits using the corkscrew attachment to their Swiss army knives and were now stuck at the bottom. They erroneously believed that the can opener attachment could be used as an ascender to climb the pits. They were also concerned that Les Liechly, their leader, might have trouble using his Hand-Over-Hand system due to the need to raise his arms. Indeed, during practice he had a lot of difficulty trying to use the system, but they decided to take him on the trip anyway. Liechly had spent two days mostly sleeping in a car parked nearby. He had driven his Land Cruiser to the bottom of the fifth drop and tied his haul rope to it.

Kitting went to check Liechly's condition. He felt at that point that he should stay in the car. The Scouts, meanwhile, decided to split into teams of two and proceeded to the Secluded Section. When Kitting caught up later, she noticed the Scouts were having trouble keeping their lamps going. A short distance further she came upon what appeared to be a clump of fur and a homemade pipe bomb. Many Scouts showed signs of labored breathing, rapid heartbeat, and inadequate clothing. Suspecting bad air, Kitting lit a disposable lighter. The lighter burned normally, but Kitting thought that the air in the small passage was "definitely getting funky" and decided to exit the cave at once.

At the first climb, Kitting's pants jammed on duct tape. After twenty minutes of struggling out of her pants, she freed herself and fell, striking the wall several times along the way and losing her underwear following an impact close to her bottom. A slab of limestone 50 feet long and 20 feet wide and about six inches thick fell from the ceiling, pinning Kitting's underwear to the ground. Initial attempts by the Scouts to get Kitting on a stretcher and then a backboard were not successful. They tried to burn her T-shirt for warmth. A problem arose when it was discovered that Kitting had been carrying a semi-automatic pistol concealed in a shoulder holster, and was threatening to shoot the first Scout that touched her. There was a lot of discussion about letting her climb out on her own power.

Kitting decided to exit the lower entrance and left, crawling backwards. In the Very Confusing Section, Kitting encountered two cavers who had been sent to call for help in the 1992 issue of *American Caving Accidents* and had become lost. At the lower entrance she found the passage flooded. Outside, a sudden ray of sunshine had melted all the snow, and the water had backed up behind a snowmobile blocking the passage. Kitting tried to swim the pool, but a bag full of heavy, unnecessary gear she was carrying was not buoyant as expected. Fortunately, she found a surfboard floating among the dead SCUBA divers, and was able to exit. Meanwhile, the Scouts were attempting to light a 55-gallon gasoline lantern. This caused a "geyser like" explosion, opening another 35 by 40 foot sinkhole in the middle of Maryland State Route 31 in Carroll County.

1. *Dwight Livingston, Incident report,* Baltimore Grotto News*, February 1998, v29n11, p. 98.*
2. American Caving Accidents*,* NSS News *December 1997,Part 2, National Speleological Society.*

Comments: Many Girl Scouts reported inexperience and inadequate equipment. Kitting was fortunate to have found a surfboard, since these are not normally found in caves. Cavers should consider including one in their packs. Pants are generally a good idea, though some cavers refuse to wear them. Also, her underwear had an elastic waistband. Better caving underwear with an inelastic quick-release waistband would remain on. The quality of the underwear makes a statement about the value the wearer places on the contents.

NSS Membership and Number of Reported Incidents

Year	Members	Incidents
1986	6741	45
1987	7203	48
1988	7873	49
1989	8514	51
1990	9028	55
1991	9777	54
1992	10492	60
1993	11164	64
1994	11460	57
1995	11836	44
1996	11140	43
1997	11470	43
1998	11685	32

Only incidents resulting in aid, injury, or fatality are included. Membership figures include all classes of membership.

1996 Incidents

Date	Cave	Location	Result	Incident Type
Winter 1996	Ellisons Cave	Georgia	no consequence	rockfall, lost control of rappel
5 January	Log Cave	Alabama	no consequence	flooding, difficulty on rope
11 February	Weatherly Well	Tennessee	aid, no injury	entrapment by tight entrance
17 February	Langdons Cave	Indiana	injury and aid	caver fall, inadequate equipment
20 February	Fisher Ridge Cave	Kentucky	no consequence	flood entrapment
26 February	Flower Pot Cave	West Virginia	injury and aid	caver fall, descending hand-over-hand
February	Neversink Pit	Alabama	aid, no injury	difficulty on rope, stuck at lip on ascent
February	Thunder Canyon Cave	California	aid, no injury	stuck in crevice, exhaustion
17 March	Sycamore Cave	Alabama	injury and aid	caver fall, ascending hand-over-hand
21 March	Fault Cave	Colorado	aid, no injury	stuck
24 March	Buckners Cave	Indiana	aid, no injury	flood entrapment
7 April	Doghill/Donnehue Cave	Indiana	aid, no injury	stranded, exhaustion
7 April	unnamed pit	Guatemala	injury, no aid	caver fall
27 April	Buckners Cave	Indiana	injury and aid	caver fall, intoxication
11 May	Midnight Creek Cave	California	aid, no injury	caver fall, trapped under water
29 May	Great Cavern	Idaho	injury and aid	caver fall, inadequate equipment
May	Cave Mountain Cave	Arkansas	aid, no injury	lost, stranded, inadequate equipment
May	Samwell Cave	California	aid, no injury	stranded, descended pit hand-over-hand
1 June	Lick Creek Cave	Montana	aid, no injury	lost, stranded, inadequate equipment
2 June	Small Cave	Alabama	no consequence	difficulty on rope, equipment problem
15 June	Belle Cave	Arkansas	injury, no aid	rockfall
27 June	Bowden Cave	West Virginia	injury and aid	caver fall
29 June	Barrack-Zourie Cave	New York	no consequence	bad air
June	Bighorn Cave	Wyoming	aid, no injury	difficulty on rope, stranded, exhaustion
4 July	Laurel Caverns	Pennsylvania	injury and aid	struck head, suspected neck injury
6 July	Lechuguilla Cave	New Mexico	injury, no aid	caver fall, lost control on rappel
6 July	unnamed boulder cave	California	fatality	stranded, hypothermia, drowned
7 July	Lockridge Aqua Cave	Virginia	injury, no aid	caver fall
13 July	Goochland Cave	Kentucky	injury and aid	caver fall
14 July	Small Cave	Alabama	injury, no aid	acetylene hazard, chemical burn
25 July	Big Four Ice Caves	Washington	injury, no aid	ice fall
27 July	Lechuguilla Cave	New Mexico	aid, no injury	exhaustion, stranded in pit
July	Big Mouth Cave	Arkansas	injury and aid	caver fall, climbing hand-over-hand
3 August	McFails Cave	New York	no consequence	flood entrapment
17 August	Hero Bucket Horror Hole	Tennessee	injury, no aid	rockfall entrapment
23 August	Moores Bridge Cave	Tennessee	injury and aid	caver fall
28 August	Wind-Ice Cave	Wyoming	aid, no injury	stranded in pit, inadequate equipment
28 August	South Pittsburg Pit	Tennessee	injury, no aid	caver fall, lost control on rappel
14 September	Reeves Cave	Indiana	aid, no injury	lost, inadequate equipment
14 September	Trent Chasm	Alabama	no consequence	equipment problem
19 October	Cave Mountain Cave	Virginia	injury, no aid	abrasion resulted in staph infection
25 October	Laurel Caverns	Pennsylvania	injury and aid	struck head, suspected neck injury
26 October	Saltpeter (Pendleton) Cave	West Virginia	no consequence	rockfall entrapment
28 October	Hughes Cave	Alabama	injury and aid	caver fall, inadequate equipment
2 November	Pine Hill Cave	Kentucky	injury, no aid	caver fall
2 November	Waynes Cave	Indiana	aid, no injury	lost, stranded
9 November	Rogers Discovery Cave	Kentucky	injury and aid	caver fall, climbing without belay
17 November	Whitings Neck Cave	West Virginia	injury and aid	caver fall
29 November	Carpenter-Swago Cave	West Virginia	no consequence	difficulty on rope, equipment problem
30 November	Fisher Ridge Cave	Kentucky	no consequence	flood entrapment
14 December	Jewel Cave	South Dakota	aid, no injury	illness, forced bivouac in cave
23 December	Blowing Springs Cave	North Carolina	injury and aid	caver fall, climbing ladder w/o belay
28 December	Cave Without A Name	Texas	injury and aid	caver fall, stranded
unknown 1996	Susie Drop	Alabama	no consequence	difficulty on rope, equipment problem

1997 Incidents

Date	Cave	Location	Result	Incident Type
1 January	Grassy Cove Saltpeter Cave	Tennessee	injury and aid	caver fall, stranded in pit
18 January	Ogle Cave	New Mexico	aid, no injury	difficulty on rope, stranded
13 February	Sunny Jims Cave	California	aid, no injury	stranded, washed into sea cave
14 February	Cueva Cheve	Mexico	injury and aid	rockfall entrapment, caver fall
15 February	Pettijohns Cave	Georgia	injury and aid	caver fall
17 February	Secret Pit	Alabama	no consequence	rockfall
20 February	Battlefield Pit	Tennessee	injury and aid	caver fall, stranded in pit
22 February	Norman Cave	West Virginia	injury and aid	caver fall
2 March	Lava tube at Pisgah Crater	California	no consequence	illegal drug lab found in cave
8 March	New River Cave	Virginia	fatality	caver fall
9 March	Buckners Cave	Indiana	injury and aid	caver fall
31 March	Buckners Cave	Indiana	aid, no injury	lost, stranded, inadequate equipment
March	Ellisons Cave	Georgia	injury, no aid	caver fall, rope failure
25 April	Pinnacles Cave	Nevada	aid, no injury	stranded, exhaustion, difficulty on rope
2 May	Glow Worm Cave	Tennessee	aid, no injury	flood entrapment
5 May	Arnold Hollow Cave	Arkansas	aid, no injury	rockfall entrapment
14 May	Bull Cave	Tennessee	aid, no injury	stranded, inadequate equipment
31 May	McBrides Cave	Alabama	injury and aid	caver fall, flood entrapment
31 May	McClungs Cave	West Virginia	injury and aid	caver fall
31 May	Spring Valley Cave	Minnesota	injury, no aid	caver fall
May	Schmitt Farm Cave	Iowa	injury and aid	caver fall, inadequate equipment
May	unspecified cave	Kentucky	no consequence	difficulty on rope, equipment problem
Spring	unspecified Bath County cave	Virginia	injury and aid	caver fall
7 June	Big Bone Cave	Tennessee	injury and aid	caver fall
7 June	Lawrence Welk Cave	California	injury and aid	caver fall
4 July	Lilburn Cave	California	aid, no injury	difficulty on cable ladder
10 July	Wind-Ice Cave	Wyoming	injury and aid	caver fall
10 July	James Cave	Virginia	injury and aid	caver fall
12 July	Hellhole	West Virginia	injury and aid	caver fall
16 July	Laurel Caverns	Pennsylvania	injury and aid	struck head
19 July	Sotano de Tapacano	Mexico	injury, no aid	rockfall
July	Boulder Cave	Vermont	no consequence	rockfall
24 August	Garrison Cave #2	Missouri	aid, no injury	lost, stranded
30 August	Stephens Gap Pit	Alabama	fatality	caver fall, rappelled off end of rope
August	Anhumas Abismo	Brazil	injury and aid	caver fall, harness failure
Summer	Bowden Cave	West Virginia	aid, no injury	lost, inexperience
13 September	Sharps Cave	West Virginia	aid, no injury	lost, inexperience
26 October	J-4 Cave	Pennsylvania	injury and aid	caver fall
1 November	Fern Cave	Alabama	aid, no injury	difficulty on rope
1 November	Illinois Caverns	Illinois	injury and aid	caver fall
2 November	Fern Cave	Alabama	fatality	caver fall, lost control of rappell
22 November	Laurel Caverns	Pennsylvania	injury and aid	caver fall
22 November	Reeves Cave	Indiana	fatality	illness, heart attack in cave
14 December	unidentified sinkhole	Canada	injury and aid	caver fall
20 December	Morrells Cave	Tennessee	injury, no aid	caver fall
22 December	Crossroads Cave	Virginia	aid, no injury	lost, stranded, inadequate equipment
23 December	Freemans Pit	Indiana	injury and aid	caver fall, rappelled off end of rope

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or mail reports and information to:

American Caving Accidents
National Speleological Society
2813 Cave Avenue
Huntsville, Alabama 35810-4431

1998 Incidents

Date	Cave	Location	Result	Incident Type
15 January	Cueva de Horror	Mexico	no consequence	bad air
24 January	Saltpeter Cave	Kentucky	fatality	illness, heart attack in cave
31 January	Tom Pack Cave	Tennessee	injury and aid	caver fall
14 February	My Cave	West Virginia	injury and aid	caver fall
16 February	Small Wonder Cave	New York	no consequence	bear encountered in cave
28 February	Skagnasty Cave	Tennessee	aid, no injury	illness
14 March	Clarksville Cave	New York	injury and aid	rockfall
11 April	unnamed cave	Indiana	injury and aid	caver fall, inadequate equipment
25 April	Hanors Cave	New York	aid, no injury	stranded
26 April	Hidden River Cave	Kentucky	aid, no injury	illness, passed out in cave
3 May	Colisimo Cave	Pennsylvania	injury, no aid	possible rabies exposure
19 May	Morris Cave	Vermont	no consequence	entrapment
23 May	Cumberland Caverns	Tennessee	aid, no injury	illness
24 May	Cave Hill Cave	Illinois	aid, no injury	lost, stranded, inadequate equipment
24 May	Hughes Cave	Alabama	aid, no injury	lost
13 June	Bowden Cave	West Virginia	no consequence	flooding, brief entrapment
11 July	Bartons Cave	Pennsylvania	injury and aid	caver fall
18 July	Keyhole Cave	New York	injury and aid	stuck in crevice
18 July	Moaning Cavern	California	injury and aid	caver fall, lost control of rappel
23 July	Dislocation Cave	Alaska	injury and aid	caver fall
26 July	Blue Spring Cave	Tennessee	no consequence	caver fall, slipped at lip of pit
2 August	Big Four Ice Caves	Washington	fatality	ice fall
8 August	Surprise Cave	New York	no consequence	stranded, key broke off in lock
11 August	Coons Cave	Indiana	aid, no injury	stranded in pit, inadequate equipment
5 September	Sharps Cave	West Virginia	injury and aid	caver fall
3 October	Cassell Cave	West Virginia	aid, no injury	stranded, inadequate equipment
3 October	J-4 Cave	Pennsylvania	injury and aid	caver fall
12 October	Bowden Cave	West Virginia	aid, no injury	lost
13 October	Neversink	Alabama	no consequence	tree fell into pit while cavers on rope
13 October	unnamed sinkhole	Florida	aid, no injury	stranded, fell in sinkhole
24 October	Pinnacles Cave	Nevada	aid, no injury	stranded, difficulty on ladder
25 October	Whitings Neck Cave	West Virginia	injury and aid	caver fall
28 October	Spring Hill Saltpeter Cave	Tennessee	fatality	caver fall, inadequate equipment
30 October	J-4 Cave	Pennsylvania	injury and aid	caver fall
31 October	Pyeatts Cave	Arizona	aid, no injury	illness, exhaustion
October	Gabinarraca Cave	Costa Rica	injury, no aid	illness, histoplasmosis
5 November	3-D Maze Cave	Virginia	injury and aid	caver fall
21 November	Cumberland Caverns	Tennessee	fatality	illness, heart attack in cave
23 November	Torpedo Tube Cave	New York	no consequence	animal trap in cave entrance
28 December	Peppersauce Cave	Arizona	injury and aid	caver fall

Acknowledgments

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Cave Diving Accidents and Incidents

1996 Diving Incidents

Date	Cave	Location	Result	Incident Type
22 September	Paradise Springs	Florida	fatality	silted out, no guideline
30 December	unnamed sea cave near Santa Cruz	California	fatality	drowned, cause unknown

1997 Diving Incidents

Date	Cave	Location	Result	Incident Type
17 August	Four Sharks Cave	Bahamas	fatality	narcosis
27 December	Jackson Blue Spring	Florida	fatality	embolism or heart attack

1998 Diving Incidents

Date	Cave	Location	Result	Incident Type
12 December	Wakulla Springs	Florida	injury, no aid	decompression sickness

Caving-related or Outside Incidents

1996 Incidents

Date	Cave	Location	Result	Incident Type
29 December	unnamed mine shaft	New Jersey	aid, no injury	stranded, inadequate equipment

1997 Incidents

Date	Cave	Location	Result	Incident Type
3 November	unidentified cave	Indiana	no consequence	body found in cave

1998 Incidents

Date	Cave	Location	Result	Incident Type
27 June	Windy Mouth Cave	West Virginia	fatality	drowned while hiking back from cave
February	unspecified cave	Pennsylvania	no consequence	body found in cave
17 March	unspecified cave	Tennessee	no consequence	body found in cave
22 August	unspecified cave	Tennessee	injury and aid	Fell off ATV riding back from cave
13 October	unspecified cave	Vermont	no consequence	body found in cave

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1996 Accident and Incident Reports

Winter 1996
Ellisons Cave, Georgia
rockfall, lost control of rappel

Alan Barnette and three companions were descending the multi-drop route near Fantastic Pit. While rappelling the third drop, 270 feet, Barnette was struck on the back of the neck by a rock that became detached from the wall and fell. Stunned by the impact, he lost control of his rappel and fell the remaining 30 feet to the floor, landing on his large backpack.

Barnette was stunned, but quickly recovered. He used a radio to let the others know what had happened. They re-rigged the rope in a better location and descended. After a brief conference, they decided to leave the cave.

Alabama Underground*, Jan/Feb/Mar 1996, v4n1, p. 2.*

Comments: Some of the impact was absorbed by the backpack, which may have served to cushion his landing. A prusik knot or similar device placed below the rappel rack can serve as a safety against this type of incident. The risk of rockfall is always present, and the first one to descend is at particular risk. The report also notes that the cavers forgot to tie a knot in the end of the rope before lowering it, so Barnette was proceeding cautiously. It might have been better to pull the rope back up and tie the knot first.

5 January
Log Cave, Alabama
flooding, difficulty on rope

David Drake and six other cavers entered Log Cave on a cold, wet Saturday morning on a trip sponsored by the Cullman Grotto. The entrance was taking in more water than usual due to several days of rainy weather. Crawling along the right side to stay out of the water, they followed the stream for 200 feet until it disappeared into a 30-foot pit. They rigged a rope and descended the pit, managing to avoid most of the water.

At the bottom, they followed the stream down a section of passage known as the Sewer. Drake noted the presence of logs and debris jammed into the ceiling above the stream, indicating that the passage sometimes floods completely. They spent some time touring the rooms and formation areas downstream.

When they returned to the pit, they were surprised to find that the water level had increased dramatically. They were concerned that the entrance passage above the waterfall might be flooded or that they would be unable to make the climb in the waterfall. Two of the cavers had never climbed a rope before. They considered returning to a dry room to wait for the water to subside.

After some reluctance, one caver got on rope and climbed through the icy water to the top and reported that the passage was not flooded. The remaining cavers then climbed out, though not without some difficulty. One caver had to be pulled over the lip. They exited to sunny skies without further incident.

3. *David Drake, "Waterlogged,"* Cullman Grotto Flowstone*, February 1996.*
4. *David Drake, Incident report, February 1996.*

Comments: Drake notes that they expected wet conditions, but got a bit more than they bargained for. Based on the weather forecast and his previous experience with the cave, he felt it was safe to enter. In an accompanying editorial, he writes that the general public sometimes unfairly criticizes caving as "crazy, stupid, and dangerous." He then notes that "maybe, just maybe, this time it was justified."

11 February
Weatherly Well, Tennessee
entrapment by tight entrance

James Lewis, Alan England (63) and Darrell Moore, all experienced cavers, accompanied Jerry Olson to a new cave Olson had located while ridgewalking. The entrance was a tight nine-inch wide slot leading in four feet and then dropping about seven feet to larger passage and another ten-foot drop. England was the only one who could fit through the slot, so he entered, using a rope as a handline. He noticed that the slot was quite tight, but had little trouble getting through. Using the same rope, he descended the second drop and found a small passage and additional drops requiring rope. Because he was alone, he decided not to go any further, and began his exit.

The ten-foot drop was easily climbed, but the entrance drop proved to be a problem. Despite all efforts and assistance from the cavers outside, he was unable to squeeze back up through the tight slot. Apparently, his relaxed posture and assistance from gravity had made entry much easier than the exit. After spending about 45 minutes trying to get through, England was tired and cold. The wet rock in the entrance had soaked his clothing, and the cold winter conditions were inducing hypothermia. After discussing their options, the cavers decide to call for assistance.

Lewis and Olson hiked back to Olson's house and called the East Tennessee Cave Rescue team. Rescuers reached the cave about two hours after the call. England had been resting, and had been given extra clothing and some warm food and drink to combat hypothermia. Using various rigging and hauling techniques, rescuers were able to free England after about an hour's work. He was able to walk back to the car without further assistance.

James Lewis, Victor Johnson, and Alan England, Incident report, undated.

Comments: England notes that he had a "gravity assist" getting in, and did not appreciate how difficult it could be to get back out. The tight slot hampered his ability to operate his ascenders, and made it difficult for anyone to help him. He was in the cave for five hours.

17 February
Langdons Cave, Indiana
caver fall, inadequate equipment

Paul Copple (37), Tony Ballard (32), and David Welch (30) entered Langdons Cave at about 2:00 a.m. Saturday morning to go caving. The men had been in the cave before, but had always stopped at the first pit. This time, Ballard wanted to descend the pit and go deeper into the cave. At about 3:15 a.m. he attempted to descend, but slipped and fell about 40 feet to the bottom, injuring his back. Copple attempted to descend to help him, but the small-diameter cord he was using broke and he fell into the pit, fracturing his ribs. Welch left the cave to call for help.

Personnel from the Department of Natural Resources and local fire and rescue teams responded, and were able to get the two men up the pit and out of the cave by 10:00 a.m. Saturday. Both men were hypothermic, and Ballard was in and out of consciousness. Ballard was flown by helicopter to the hospital, and Copple was transferred by ambulance.

1. *Christi Poole "2 men hurt, trapped by fall in cave,"* Louisville Courier-Journal*, 18 February 1996, p. B-3.*
2. *Bruce Bowman, Personal communications, undated.*

Comments: The men were not experienced cavers and were not using proper caving rope and equipment. It was reported that alcohol was a factor, and that the reason for the late night trip was that they had to sneak out to avoid spousal opposition. It was also reported that the rescuers were not trained in cave rescue, and cavers were not called in until late in the operation.

20 February
Fisher Ridge Cave, Kentucky
flood entrapment

Peter Quick, Brian Davis, Joe Meppelink, Eric Fehlauer, and Leigh Ann Vaughn of the Detroit Urban Grotto entered Fisher Ridge Cave on Saturday, February 17, on an exploration and survey expedition. The area to be surveyed was very remote from the entrance, so they carried supplies for a four-day underground camp. They planned to leave the cave on Tuesday, February 20.

The route to their camp passed through a crawl which sometimes fills with water after a rain, taking several days to drain. They found the passage open, and proceeded to their destination without incident. After establishing camp, they began their survey. Sometime later, they noticed that the flow volume of the water source near the camp had increased dramatically.

They realized that this indicated rain on the surface, and surmised that the low crawl would probably be flooded, preventing their exit. This turned out to be correct. They decided to move their camp forward to a dry area near the flooded crawl and wait for the water to drain. While waiting, they retrieved food and supplies from caches placed in the cave during earlier expeditions against the possibility of just such an occurrence. They settled in to wait for the water to subside, checking the level in the crawlway approximately every 12 hours.

When the cavers failed to return home by Wednesday, family members became concerned and contacted other cavers from the grotto. Steve Miller and Larry Bean, who were familiar with the cave, volunteered to drive from Michigan down to the cave and check on the overdue group. Local emergency services agencies were also alerted, as well as cave rescue teams in the region.

By the time Miller and Bean reached the flooded crawlway on Thursday afternoon, the water had begun to subside and they could hear Quick digging a trench to help drain the crawl. They made voice contact, and Quick realized that there was enough airspace to squeeze through. The cavers made their way through the crawl and exited the cave in good condition on Thursday evening, February 22, after six days underground.

1. *Cynthia Eagles, "Cavers trapped by water safely out,"* Louisville Courier-Journal*, 32 February 1996, p. A-1.*
2. *Mike Summers, Incident report, 23 February 1996.*

Comments: The report notes that the cavers knew from experience that the crawl was prone to flooding, but were unaware that rain was in the forecast for the weekend. It pays to know that sort of information.

They were prepared for a long stay and had extra supplies available, so the situation was not as difficult as it might have been. In such cases, it is sufficient to wait for the water to subside. This can be difficult to convey to the assembled media and non-caving emergency services personnel who are compelled by law and custom to respond. See the 30 November 1996 report for a familiar story.

26 February
Flower Pot Cave, West Virginia
caver fall, descending hand-over-hand

A group of eight people, equipped with bicycle lights, helmets, and a knotted rope obtained permission and entered Flower Pot Cave, descending the 38-foot entrance pit hand-over-hand. While attempting to climb out, Thomas Malloy (42) lost his grip and fell about 20 feet to the bottom, breaking several ribs. Local fire and rescue services were called, and Malloy was placed in a litter and hauled up the pit. He was transported to a local hospital for treatment.

1. *Joan Ashley,* Inter-Mountain News*, Elkins, West Virginia, Feb 26, 1996, p. 6.*
2. *George Dasher, "Rockin' Chair,"* West Virginia Caver, *June 1996, v14n3, p. 10.*
3. *National Cave Rescue Commission,* Muddy Litter Letter*, January-February 1996.*

Comments: Inexperience, inadequate equipment, and poor judgement. They did not have proper rappelling and climbing equipment. The hand-over-hand "technique" is a prescription for disaster. Malloy was lucky – a 20-foot fall can be fatal.

February
Neversink Pit, Alabama
difficulty on rope, stuck at lip

Three individuals rappelled into 160-foot-deep Neversink Pit. Two of them had never rappelled or climbed rope before. They attempted to climb out using prusik knots with all three climbers on rope at the same time. They became stranded when the first one up was unable to get over the lip due to the weight of his fellow climbers on rope below him.

The two below backed down and got off rope, but the stranded climber was still unable to get over the lip. They were saved when a local caver and cave rescue team member showed up to do the pit and found them hanging. He rigged an ascender above the lip and helped the stranded caver up. The others then climbed out under their own power.

Buddy Lane, Incident report, 2 March 1996.

Comments: A 160-foot pit is probably not the best place to try rappelling and prusiking for the first time. Many cavers carry an extra ascender to aid in crossing difficult lips. The lip at this pit is not difficult, and the incident was caused by inexperience and poor technique. Three people on-rope simultaneously is not a good idea.

February
Thunder Canyon Cave, California
stuck in crevice, exhaustion

Carl Diaz and eight other cavers from the San Diego and Southern California Grottos entered Thunder Canyon Cave in two groups. Diaz and five other cavers planned to make a through-trip from the upper entrance to the lower entrance, negotiating four drops (45 feet, 45 feet, 10 feet, and 20 feet) and a tight traverse to emerge at the lower entrance. The traverse is described as 15 feet long, with a "tapered bottomless floor," and very tight. Conditions in the cave were wet and cool, with waterfalls at the drops. The remaining three planned to tour the upper cave, examine the rigging points for the drops, and leave early through the middle entrance.

The larger group proceeded through the cave without incident, exiting after three hours of caving. Diaz volunteered to go back in through the middle entrance and retrieve the rope left at the second drop. When he arrived at the drop, he saw that the rigging had been changed, and concluded that the second group had continued on to the bottom and would leave via the lower entrance. He removed the rope and left the cave.

When he rejoined the group outside and discovered that the second group had not yet emerged, Diaz became concerned. He hiked down to the lower entrance, where he found that one of the three cavers had slid down into the crevice and become wedged mid-way through. The other two were unable to help him back up and through the tight spot. Diaz ran back to the first group and sent them down to assist. He then returned to the middle entrance, re-rigged the rope, and descended through the cave to the start of the traverse. By the time he arrived, the cavers had managed to use carabiners and other equipment to fashion a chockstone in the crack above the trapped caver. Webbing hung from the chockstone served as foot loops and allowed the caver to pull himself up and back out of the crack.

Diaz then escorted the now exhausted caver back through the cave, up three pits, and out the middle entrance. They exited about two and a half hours after the caver had become stuck.

Carl Diaz, "Rescue – Thunder Canyon," San Diego Grotto Newsletter*, March 1996.*

Comments: Diaz notes that the caver had not been to the cave before, weighed about 215 pounds, and admitted to being out of shape. He suggests being prepared for this type of incident with some 20-foot lengths of webbing or a handline, and perhaps some chocks or other removable climbing anchors. He also notes that it was probably not a good idea to de-rig the cave without knowing the plans and condition of the other group.

Cavers wedged in a crevice can quickly become hypothermic. There have been fatalities from such incidents. It can be very difficult to extract even a conscious caver from a tight crevice.

17 March
Sycamore Cave, Alabama
caver fall, ascending hand-over-hand

Eddie Taylor (22) and three companions entered Sycamore Cave around 3:00 p.m. on a Saturday afternoon. They used a knotted 150-foot rope to descend a 110-foot pit in the cave. When he tried to climb out, Taylor lost his grip and fell about 35 feet to the floor. He suffered bruises and a possible fractured pelvis.

Two of his companions left the cave and called for help at 7:30 p.m. Local rescue squads and a cave rescue team from nearby Huntsville responded. Taylor was placed in a litter, hauled up the pit, and carried out of the cave, reaching the surface at 3:15 a.m. He was taken to a hospital, where he was treated and released.

1. *Christopher Bell, "Injured caver rescued after eight-hour ordeal,"* Huntsville Times*, 18 March 1996, p. A-7.*
2. *Randall Blackwood, "Rescue 'R' Us,"* Huntsville Grotto News*, May 1996, v38n5, p. 9.*

Comments: The men did not have proper caving equipment, and were negotiating a deep pit hand-over-hand. Needless to say, this dangerous and unsafe method is not recommended. Still, there are several such incidents every year.

21 March
Fault Cave, Colorado
stuck

Randy Winans and companions were exploring Fault Cave near Denver when one caver became wedged head-down in a tight slot known as the Crack of Doom. His efforts to get out only made the entrapment worse. When they were unable to free him, his companions decided to call for help. Winans left the cave and used his cellular phone to call local caver Jim

Neely, requesting that Neely notify the Sheriff and round up some other cavers to come help.

Neely did as requested and arrived at the cave to find a full-scale rescue in progress. Cavers and local firefighters were already in the cave working to free the trapped caver. They removed some of his clothing, coated him with vaseline, and eventually managed to pull him from the crack. He was able to exit the cave and hike down the mountain without further assistance.

James Alan Neely, "Spelunker X Trapped in the Crack of Doom," Rocky Mountain Caving, *Winter 1996, v13n1, p. 7.*

Comments: The trapped caver was on his very first caving trip. It must have been quite memorable.

24 March
Buckners Cave, Indiana
flood entrapment

Two adults and five children had to be hauled out through the Bullseye Pit entrance when they became trapped after the crawlway inside the main entrance flooded. One of the children was about seven years old. No other information was available.

Jim Johnson, Incident report, undated.

7 April
Doghill-Donnahue Cave, Indiana
stranded, exhaustion

A caver became exhausted and stranded at the connection. Rescuers hauled him up the pit and assisted him in exiting the cave. No other information was available.

Jim Johnson, Incident report, undated.

7 April
unnamed pit in Guatemala
caver fall

Scott Sievertsen was in Guatemala with several other cavers on an expedition to find, explore, and survey new caves. In the second week of the expedition, the cavers decided to investigate a small pit near the campsite. After clearing loose rocks, Sievertsen rappelled the 40-foot entrance pit, clearing more loose rock during the descent.

At the bottom he found several leads to check. He stepped up onto a boulder to look into the largest side passage. As he leaned forward to look into the passage, the rock he was using for a handhold came loose. Sievertsen lost his balance and tumbled into the passage, along with the loose rock. He bounced off the walls and landed on the floor after falling eight to 12 feet. The "handhold" rock then struck him on the right arm and lower back. He felt pain in his arm and lower back. He was able to climb back up and exit the cave without assistance.

Upon returning to camp, he discovered that he had a serious laceration on his left shin, with some exposure of the bone. The nerves near the wound had apparently been damaged, and he felt no pain from the injury. It was cleaned, treated with antibiotics, and bandaged. He then made an eight-hour drive to the nearest medical facility, where the wound was sutured the next day.

1. *Rich Sundquist, "An MLG Trip to Guatemala ... or travels with Forrest,"* The Valley Caver, *Fall 1996, v35n3, p. 22.*
2. *Scott Sievertsen, Personal communication, 1 May 1998.*

Comments: Sievertsen notes that while he was already an accomplished caver at the time, he had limited experience exploring virgin cave. He feels that this was a significant factor in the accident. Loose rock and unreliable holds are much more common in unexplored caves than in caves which have seen some traffic. Sievertsen advises cavers to use extra caution when exploring virgin cave.

27 April
Buckners Cave, Indiana
caver fall, intoxication

An intoxicated individual fell in the cave and suffered a head injury. Rescuers were summoned, but arrived just as the injured party reached the entrance under his own power. No additional information was available.

Jim Johnson, Incident report, undated.

11 May
Midnight Creek Cave, California
caver fall, trapped under water

Richard Breisch, Collin O'Neill, Curt Wexel, and Renee Van Vreeswyk were part of a group of 11 visiting Midnight Creek Cave. The cave had been closed since 1994 by the government agency responsible for its management due to high levels of hydrogen sulfide in the water. The group was comprised of cavers and government safety experts, and the purpose of the trip was to test for the presence of dangerous gases or other conditions.

The party split into two groups, touring the cave without incident until they reached the upstream end and began their exit. Breisch was leading the trailing group, which included O'Neill, Wexel, and Van Vreeswyk, when he stepped on a slippery rock and fell down a three-foot diameter vertical chute in the stream. He landed in a standing position, but was wedged in the chute with his head below the water surface.

Breisch was not sure if he was at the bottom of the chute, and was afraid to move for fear of falling farther down. He also did not know how close the rest of the group was behind him and whether anyone had seen him fall. By bending forward he managed to create an air pocket which allowed him to breathe.

As he reached forward to see if he could chimney out of the water, Breisch felt someone land on top of him, forcing him down. O'Neill had seen the fall and reached in to help, but slipped and fell in himself. O'Neill called for help, and Van Vreeswyk was able to help him climb back out. Wexel then arrived, and the three were able to pull Breisch out of the chute as he pushed from below.

Once clear of the stream, Breisch found that he was unharmed. He had, however, lost his carbide lamp and prescription eyeglasses. He put on a wetsuit top that Wexel had in his pack, and they started out of the cave. The trip out took longer than normal because Breisch could not see well without his glasses, and was the only one in the group familiar with the cave.

1. *Richard Breisch, "Incident in Midnight Creek Cave,"* San Diego Grotto Newsletter*, June 1996.*
2. *Collin O'Neill, "Caving Accident Report,"* San Diego Grotto Newsletter*, June 1996.*

Comments: Breisch notes that the quick actions of his companions saved him from drowning. He felt that had he been alone he would not have been able to climb back out of the chute due to the heavy water volume. O'Neill notes that in his haste to help Breisch, he did not fully evaluate the danger of the chute and wound up becoming its second victim. O'Neill also observes that a spare pair of glasses would have been a good idea.

29 May
Great Cavern, Idaho
caver fall, inadequate equipment

An 18-year-old male was injured while attempting to rock-climb out of the vertical entrance of Great Cavern. The victim and his companions were attempting to gain entrance into the closed portion of nearby Crystal Ice Cave; a former commercial cave now closed and abandoned.

The victim was the first to rappel into the cave, and quickly realized that he was beyond his abilities. He attempted to climb the walls of the pit while his brother belayed him from above. The belay was not in line with the climber's route. He lost his grip on the rotten rock and swung across the pit, striking the far wall and breaking his ankle.

His two companions were unable to haul him up, so they called for help. The county search and rescue team responded, and hauled the injured climber out of the pit. His father arrived during the rescue, and took him to the hospital for treatment.

Scott Earl, Incident report, 1 October 1996.

Comments: The cave has been the scene of several other accidents, including one fatality. The boys believed that the pit led into Crystal Ice Cave.

May
Cave Mountain Cave, Arkansas
lost, stranded, inadequate equipment

Seven individuals from Clarksville entered Cave Mountain Cave at about 3:00 p.m. They were dressed in shorts and T-shirts and carried flashlights. They did not have helmets or other proper caving equipment. Four members of the group left the cave after about an hour. Two others exited shortly thereafter. The remaining individual was last seen entering a difficult and challenging section of the cave, which included some danger of falling.

After waiting for some time, the others re-entered the cave to search for the missing individual. They returned to the place where he had last been seen, but did not find him. After searching for some time, they left the cave and called for help shortly after 9:00 p.m.

Search teams entered the cave at 11:00 p.m. The initial search effort failed to locate the lost person. Search patterns were revised, and another sweep of the cave was made. At 2:50 a.m. searchers made voice contact with the lost person, but were unable to reach him until 3:45 a.m. He appeared to be suffering from hypothermia, and had difficulty speaking or moving. Rescuers warmed him and gave him some food, then helped him out of the cave, reaching the surface at 4:55 a.m. He was transported to a hospital for treatment of advanced hypothermia.

1. *"Unprepared caver is rescued,"* Harrison Times*, 5 June 1996.*
2. Boston Mountain Underground*, Fall 1996, v8n3, p. 6, reprint of* Times *article.*

Comments: The missing caver had become lost, wandering the cave until his flashlight went out, leaving him stranded. He had no backup lights. He spent about ten hours sitting in the dark, cold and wet, wearing cotton shorts and a T-shirt, and became hypothermic. The report notes that the lost caver did several things wrong: he left the group, was improperly dressed for the conditions, and was without adequate sources of light. The entire group was ill equipped and unprepared for the cave. The report advises would-be cavers to join a grotto and get proper training and equipment.

May
Samwell Cave, California
stranded, inadequate equipment

Michael Richison (26) and Jeff Leeka (23) became stranded while exploring Samwell cave when they were unable to climb back up the ropes they had used to enter the cave. They were rescued by the Shasta County Mountain Rescue team, and were reported to be cold but otherwise unharmed.

Shasta Lake Bulletin*, 8 May 1998, p. 1.*

Comments: The men descended hand-over-hand, and could not climb back up the wet ropes. They did not have proper equipment for vertical caving.

1 June
Lick Creek Cave, Montana
lost, stranded, inadequate equipment

Jim Turton, Bob Furman, and Rodney Van Hoyt left Great Falls at about 2:30 p.m. to go caving, planning to return by 10:00 p.m. Instead, they spent 40 hours shivering in the dark after their lights went out, leaving them stranded. They feared that they would not get out alive. At some point, Van Hoyt suffered an epileptic seizure and nearly fell into a crevice.

Van Hoyt's wife became worried when he did not return by Sunday, and drove to the cave, where she found their

pickup truck but not the three men. She alerted authorities early Monday morning, and the mountain search and rescue team was dispatched to search the cave.

The three men were soon found, and were brought out of the cave about 8:20 a.m. Monday morning. Van Hoyt was treated for hypothermia. The others were uninjured.

"Great Falls men get lost in Lick Creek Cave," Bozeman Daily Chronicle, *7 June 1996, p. 5.*

Comments: Several factors including inadequate equipment, inexperience, and poor judgement contributed to this incident. Experienced cavers carry three sources of light per person. Each light should be good enough to permit a safe exit.

2 June
Small Cave, Alabama
difficulty on rope, equipment problem

Tom Moss was on rope climbing a 35-foot pit in Small Cave when the main buckle on his seat harness came undone, dropping him two to three inches before his leg loops caught the weight. He had neglected to properly fasten the buckle by feeding the webbing back through a second time. He knew the buckle was the double-pass kind, but was wearing the harness over a bulky wetsuit, and there was not enough webbing left for the second pass. Moss was able to swing over onto a ledge and fasten the buckle before continuing.

Tom Moss, Incident report, 6 November 1996.

Comments: Moss notes that he had recently ordered a larger seat harness especially for use with the wet suit, but that it had not come in yet. Harness buckles can easily come undone if not property secured. He was fortunate that the harness was the type with independent leg loops. With some designs, failure of the main buckle causes complete failure of the harness.

15 June
Belle Cave, Arkansas
rockfall

Rob Tayloe was leading a group of cavers on a tour trip when they came to a 30-foot climb-up about 1.5 miles into the cave. The first caver started up, and a second caver (female, age 22) followed before the first caver had reached the top. The others did not notice that the second climber had started before the climb was clear. The lead caver dislodged a rock, which fell and struck the second caver on the hand, causing injury to three fingers.

There were serious lacerations and some exposure of the bone. The cavers fashioned a makeshift bandage from some clothing and a piece of webbing. They made their way out of the cave, carrying the injured caver's pack, and drove to the nearest hospital. There, the wound was cleaned, sutured, and dressed.

Rob Tayloe, Incident report, 14 October 1996.

Comments: Tayloe observes that the accident could easily have been avoided by waiting until the climb was clear before following. He notes that, as the trip leader, he should have been paying more attention to this.

27 June
Bowden Cave, West Virginia
caver fall

An inexperienced caver fell while attempting a traverse. Cave rescue teams were summoned and the caver was carried from the cave. No other details were available.

Doug Moore, NCRC Eastern Region web site, undated.

29 June
Barrack-Zourie Cave, New York
bad air

Peter Haberland and six other cavers were working on a dig near the upstream North Sump in Barrack-Zourie Cave, using a "bucket brigade" technique to remove excavated material from the 90-foot long tubular crawlway. Digging went quickly at first, with full buckets being shoved out continuously. Whenever the digger at the head of the line became fatigued, they rotated the line. Soon, the time that anyone could dig became shorter and shorter and the diggers complained of lack of air.

When it was Haberland's turn, he noticed that his breathing quickly became very labored. Apparently, there was little exchange of air at the end of the tube, and their exertions were filling it with carbon dioxide. He tried to keep digging, but mild panic set in and he was forced to withdraw. Eventually, no one wanted to return to the dig face. They left, having made ten feet of progress for the day.

Northeast News, Northeastern Caver, *March 1997, p. 4.*

Comments: See Bill Mixon's article in this issue.

June
Bighorn Cave, Wyoming
difficulty on rope, stranded, exhaustion

Sam, Carl, Chris, Darren, and Eric entered Bighorn Cave by rappelling the 80-foot entrance pit. They spent eight or nine hours caving, then took turns climbing back up the entrance drop. Chris was the last to climb, and had difficulty as soon as he started. He was using a ropewalker system with Gibbs ascenders, and could not get the rope to feed through his system properly. He was out of practice with his climbing gear, and was using a lot of energy but making little progress.

The others had reached the top, where they found the weather cold, rainy, and windy. They put their equipment in the truck, and Sam stayed at the pit to coach Chris while Darren drove Carl and Eric back to camp. Darren was to return later to pick up Sam and Chris.

While the others were gone, Chris had reached the halfway point and become exhausted. He called up to Sam that he was finished, and could go no further. He also called up to report that his seat harness was coming undone. Sam advised him to

climb a little higher to a ledge where he could get his weight off the rope, fix his harness, and rest. At that point Sam regretted having let his climbing gear go back to camp. After several attempts, Chris was able to get onto the ledge.

When Darren returned, he and Sam decided that Chris was not going to make it out under his own power. They rigged a simple haul system and pulled him up the remaining 40 feet of the pit.

Sam Lair, "Climbing Incident at Bighorn Cave," Gem Caver, *Summer 1997, p. 4.*

Comments: Sam notes that Chris was an experienced caver and climber, but had not been caving for over ten years. He suggests that Chris should have done some practice climbs in a controlled environment to re-familiarize himself with his equipment and abilities. He also notes that it was a mistake to get separated from his own gear, which kept him from being able to go down and help Chris or rig a haul system.

It is probably not a good idea to let a person of unknown or lesser abilities climb last, or to leave the cave and go back to camp before everyone is safely out, especially if you are aware that someone is having difficulty. Caving is generally regarded as a team endeavor.

Chris was fortunate that there was a ledge he could reach to rest. Studies have shown that hanging immobile on rope in a climbing harness can quickly lead to loss of consciousness and possibly death. This condition is known as "harness hang syndrome" or "harness induced pathology." An exhausted or hypothermic climber is at serious risk. See the 1993 issue of *American Caving Accidents* for a discussion of this issue.

4 July
Laurel Caverns, Pennsylvania
struck head, suspected neck injury

Wendy (15) and Bonnie (15) were among 15 cavers exploring the undeveloped portion of Laurel Caverns on a church-sponsored youth group trip. They were accompanied by an adult advisor, Mike Carick, and by two Laurel Caverns employees, one of whom was Aaron Bird, an experienced caver. As they approached Petit Falls shortly before 1:00 p.m., Wendy stood up too quickly and struck her head on the ceiling, causing injury to her neck.

Bird sent the other employee and the rest of the group back to summon help. They met John Chenger, Laurel Caverns employee and experienced caver, and told him of the accident. Chenger went to the scene, where Bird and Carick had applied a SAM splint as a makeshift cervical collar to stabilize Wendy's neck. They had learned that Wendy had injured her neck in a skating accident some months earlier. Chenger was sent to get equipment and personnel to carry her out, while Bird and Carick waited with Wendy and treated her to prevent hypothermia.

Chenger left the cave, flagging a trail back to the accident site as he went. Once out, he gave instructions to summon paramedics and additional cavers, then enlisted the aid of a group of visiting boy scouts as well as members of Wendy's original group. Several scouts and youth group cavers were sent into the cave with a litter, initial response pack, and a cervical collar to be delivered to Bird at the accident site. Another group entered the cave to run field telephone line to the accident site. The equipment was delivered and telephone communications were soon established. Paramedics arrived and were sent to the accident site.

Meanwhile, another injury had occurred. While holding a light for rescuers working with Wendy, Bonnie slipped and fell off a rock, injuring her hip. After assessment, she decided she could walk out with assistance. She was accompanied out of the cave and taken to the visitor's center, where she was attended by paramedics.

Wendy was fitted with a cervical collar, placed in a litter, and carried from the cave, exiting at 3:44 p.m. She was transported by ambulance to a nearby hospital. Paramedics treating Bonnie decided to transfer her by helicopter to a hospital in Pittsburgh.

John Chenger, Incident report, NCRC Eastern Region web site, undated.

Comments: The accident site was about 10 to 15 minutes into the cave, not far from the tour trail. Several of the Laurel caverns employees were experienced cavers with NCRC cave rescue training. Rescue equipment, including the litter and cervical collar, is stored on-site for such incidents – a good idea for commercial cave operations. The use of untrained personnel in a cave rescue may incur a greater risk of additional injuries and complications.

6 July
Lechuguilla Cave, New Mexico
caver fall, lost control on rappel

Park employee Richard Houston (25) was adjusting a rope pad at the top of the 40-foot entrance drop when he lost control of his rappel device. He fell down the pit, sustaining bruises and abrasions from the walls, and fell past the normal spot for getting off rope and down an adjacent pit. The rope was tied off in the room above, which saved Houston from striking bottom by catching him in the dangling loop.

Harry Burgess, another park employee, was nearby and heard the fall and Houston's call for help. Houston was able to change over to ascent and climb up to the normal landing spot. His hands were blistered underneath his thick leather gloves. Burgess cleaned and dressed Houston's wounds, and Houston climbed out of the pit on his own. Burgess also exited, and Houston went to an emergency room for treatment.

Incident report, Carlsbad Caverns National Park, 6 July 1996.

Comments: The type of rappelling device used was not specified in the report, but it is important to securely tie off any rappelling device while working on rope pads or performing other activities on rope. The method varies with the device used. Do you know how to tie off your device of choice? Also, you should have an ascender attached to your harness that can be easily attached to the rope for backup. Houston was very lucky that the pit continued and the rope was tied off above.

6 July
unnamed boulder cave, California
fatality, stranded, inadequate equipment

Sam Meier (24) was rappelling near Hidden falls in Yosemite National Park when he descended 125 feet into a hole formed by boulders. The bottom of the hole was filled with deep water. Meier had no ascending equipment and was unable to climb back out. Officials believe that Meier succumbed to hypothermia and drowned.

"Accidents kill two, injure one," San Diego Union-Tribune*, 8 July 1996, p. A-3.*

Comments: It should be obvious that it is unwise to rappel into a pit without ascending equipment, but it happens all too often. As experienced cavers, we may feel certain that we would never do such a thing. But one can imagine a scenario in which a caver loses his pack down a hole or pit, and is left with no ascent gear and a pit to climb. A resourceful caver should be able to fashion a workable harness and/or a set of prusik knots from the tail end of his rope. It may not be a model of comfort and efficiency, but it may be good enough to get you out of a bad situation.

7 July
Lockridge Aqua Cave, Virginia
caver fall

Jess Wilson (34) was part of a group of four experienced cavers exploring Lockridge Aqua Cave on July 7. Entry into the cave involves negotiating a five-foot deep pool with about one foot of airspace. Most of the cave consists of large trunk passage, with occasional wading or swimming.

About 15 minutes into the cave, the obvious route went down under a pile of breakdown. Three members of the group followed that route as Jess Wilson climbed the breakdown to find an upper level passage. After about 100 feet, the upper passage ended at a pit that dropped about 17 feet down into the lower passage taken by the other cavers.

Wilson started to climb down. After he had descended five feet, the other cavers warned him that the pit was undercut, and suggested that he go back and take the easier way. Wilson insisted that he could see a route to the bottom. Before climbing down, he "tested" a potential foothold by kicking it. Satisfied that it would hold, he stepped down onto the thin ledge, which immediately broke, sending him to the bottom.

Wilson fell about 12 feet and landed upright on his right heel. His knee was locked, and could not flex to absorb some of the impact. As a result, he bit his tongue and chipped several teeth.

After resting, he found that he could walk with moderate pain. The group exited the cave in about 20 minutes. On the drive home, his foot became swollen and more painful. The following day he went to a hospital for X-rays and treatment. The exam found no broken bones, and he was sent home on crutches.

1. *Jess Wilson, Incident report, undated.*
2. *Jess Wilson, "Good Times, Bad Times,"* Commander Cody Chronicle, *Spring 1996, v16n2, p. 4.*

Comments: Wilson offers the following observations: "A foothold that looks like it should be 'tested' should probably be avoided. Jess was warned by his friends that the climb looked difficult from below. Such climbs should use a belay. The climb could be bypassed, and the safer option should be used when one exists. Jess was lucky to be able to self-rescue, because an immobilized patient would be difficult to move through the near-sump at the entrance."

13 July
Goochland Cave, Kentucky
caver fall, climbing without belay

David Bingham, Lee Trowbridge and four other cavers were making an entrance-to-entrance through-trip in Goochland Cave. They entered the cave at about 11:15 a.m., and were taking a little-known route to the Corn Hole Entrance. About four hours into the trip they came to a ten-foot climb-up, which was pre-rigged with a knotted rope for a handline. Four members of the party ascended hand-over-hand without incident. When Bingham made his ascent in the same fashion, he reached the top but lost his footing at the lip and fell. His body rotated during the fall so that he landed on his side, breaking his right femur near the hip.

Trowbridge helped Bingham move away from the drippy climb, and get settled on a bed of extra clothing and pads. They used a space blanket, hand warmer pouches, and extra clothing left by the other cavers to combat hypothermia and shock. Trowbridge then waited with Bingham while the others went for help. The authorities were alerted and cavers with rescue training were recruited from the nearby Karst-O-Rama convention. A full-scale rescue involving more than 100 people was mobilized. The first rescuers reached Bingham about four hours after his fall, and he was out of the cave about 19 hours after his accident.

1. *David Bingham, "Falling from Grace(land)," 6 August 1996.*
2. *Lee Trowbridge, Incident report, 13 March 2000.*
3. *Jeff Cody, "Karst-O-Rama '96,"* Mid-Hoosier Grotto Newsletter, *October 1996, v4n1, p. 5.*

Comments: The accident site was only about 800 feet from the entrance, but the tight passage and small pits hindered the rescue efforts. At one point Bingham had to be removed from the Sked litter to make it through a "torturous" crawl. Trowbridge suggests that the climb should have been belayed. Bingham agrees, and notes that he felt uncomfortable about making the climb hand-over-hand, but decided to do it because the others had made it up without difficulty. He writes, "Let me say this clearly and succinctly, a hand-over-hand climb without a safety is an accident waiting to happen." We agree.

14 July
Small Cave, Alabama
acetylene hazard, chemical burn

Bill Hanson, Tom Moss, and two companions were on their way out of Small Cave after a trip to the bottom of the

wet, multi-drop cave. Moss was dragging his pack behind him on a tether as they made their way along a stream passage. Moss picked up his pack and tossed it up onto a ledge five feet off the floor and started to climb up. Suddenly, he realized that he could smell acetylene, and that it was coming from his pack. He and Hanson immediately doused their carbide lamps to avoid igniting the gas.

Moss opened the pack and found that his carbide storage bottle had leaked, and that water had flooded it. Expanding gas had then ruptured the cap, allowing the carbide to spill out into the flooded interior of the pack. He placed the bottle inside a plastic bag, but could not seal it because the carbide was still actively releasing gas. They switched to electric lights and continued their exit.

Some time later, Moss became aware of pain at his right wrist under the cuff of his wetsuit. He discovered that some carbide had been trapped under the cuff when he had reached into the pack earlier. He rinsed the area off, and found that he had suffered a serious chemical burn. It was several weeks before the burn healed.

Tom Moss, Incident report, 6 November 1996.

Comments: Moss notes that he now uses a stronger Nalgene bottle for carbide storage.

25 July
Big Four Ice Caves, Washington
ice fall

Two boys, ages 10 and 12, were on a YMCA outing to Big Four Ice Caves when they were struck and injured by falling ice. One boy received a cut on one leg, and the other a scraped shoulder and leg. Both boys were able to walk out of the cave, and were met in the parking lot by emergency services personnel. They were taken to a local hospital where they were treated and released

1. Seattle Times*, 26 July 1996.*
2. *Mark Sherman, Incident report, 20 August 1996.*

Comments: It was also reported that the boys were throwing rocks at the ceiling just before the ice fell. Sherman observes that this was "not exactly a smart thing to be doing in an ice cave, especially after a week of temperatures in the high 80's and 90's."

27 July
Lechuguilla Cave, New Mexico
exhaustion, stranded in pit

At about 10:00 p.m. on Saturday evening Walter Feaster, leader of an expedition to Lechuguilla Cave, informed NPS personnel that a caver on the expedition was stranded and unable to climb out of the entrance pit. Felder Hogan had become exhausted and ill during the trip out of the cave and did not feel he could climb out on his own. Park personnel responded, reaching Hogan at about 11:30 p.m. He was shivering and severely nauseated.

When it was determined that Hogan would have to be hauled out, they sent for additional personnel and equipment. By 1:30 a.m. the team was assembled and a haul system was soon rigged at the pit. Hogan was on the surface by 3:30 a.m.

Incident report, Carlsbad Caverns National Park, 28 July 1996.

Comments: Lechuguilla is a very warm and strenuous cave. Hogan had eaten two sandwiches at about 2:00 p.m. and had some trail mix and beef jerky on the way out. Perhaps this was not enough for the long trip out. He also may not have taken in enough water. It is easy to become dehydrated in this cave, and there have been quite a few similar situations in which cavers have required assistance while exiting.

July
Big Mouth Cave, Arkansas
caver fall, climbing hand-over-hand

Three young men in their early 20's decided to enter the cave by tying a hemp rope around a tree and sliding down the 30-foot entrance pit. They were equipped with flashlights, and were not wearing helmets. Once on bottom they set out to explore, but were stopped by water in the passage.

Two of the men exited, climbing back up the rope hand-over-hand. The third man had some difficulty and made two unsuccessful attempts. On his third attempt he was almost at the top when he pinched one hand between the rope and the wall, lost his grip, and fell approximately 20 feet. He suffered fractures of his ankle and lower leg.

His companions summoned help, and local volunteer fire department and emergency medical services personnel responded. When authorities arrived at the scene, they decided to call in the county search and rescue team, which includes several cavers.

The victim was placed in a litter and hauled up the pit. Several fire and EMS people had descended the pit without climbing equipment and had to be hauled out as well. The victim was airlifted to a hospital for treatment.

1. *George Stowe-Rains, "Cave Rescue at Sulfur Springs,"* Boston Mountain Underground*, Winter 1996, v8n4, p.11.*
2. *Denver West, Interview by Bill Putnam, 14 March 2000.*
3. *George Stowe-Rains, Interview by Bill Putnam, 14 March 2000.*
4. *Richard Honebrink, Personal communication, 14 March 2000.*

Comments: The hand-over-hand "technique" claims another victim. There is a horizontal entrance about 200 feet via easy passage from the pit entrance where the victim fell, but no one involved was aware of this at the time. Stowe-Rains stresses the need for cavers and cave rescue teams to establish working relationships with fire departments and teach them about cave rescue techniques and resources.

3 August
McFails Cave, New York
flood entrapment

Bob Zimmerman led Richard Borowsky, Luis Esperanza, and Mony Esperanza on what was intended to be "a short

pleasure trip" in McFails Cave. Zimmerman was very familiar with the cave, having been in the cave more than two dozen times while involved in surveying it over the years.

The cavers entered the cave without incident, locking the gate behind them and placing the key on a ledge. They reached the bottom of Coeymans Dome at about 11:30 a.m. Leaving their vertical gear on a high ledge in the dome, they started off down stream. The water level in the stream was about three to four inches deep, which is typical for the cave.

After about five hours of caving, they started back towards the entrance at about 4:30 p.m., expecting to be out of the cave by 7:30. Zimmerman and Borowsky took a short break at the First Breakdown Room, about 3,500 feet from the entrance, while the two Esperanzas went ahead.

When they continued, Zimmerman and Borowsky were startled to find the water level in the stream rising rapidly. It became difficult to make progress against the flow, and they soon had to climb up and chimney above the stream to move forward. After about an hour, they caught up with the Esperanzas at a formation known as The Brain. Borowsky was unable to climb up out of the stream to the ledge above, and was helped by the others. They were still over 2,000 feet from the entrance. By this time the water level in the passage had risen about six feet.

They decided that they would have to wait for the water level to drop before continuing. At 7:30 p.m. they could see that the flood was beginning to recede. By 11:00 p.m. the level had dropped about two feet, and they were able to chimney above the stream and move toward the entrance. When they reached Coeymans Dome just before midnight, the waterfall there was raging. They decided it was still too wet to climb safely, and retreated to the Dreamland area where they could climb up above the stream and wait another hour or two.

By 1:40 a.m. the water level had dropped another three inches. All four cavers were cold and uncomfortable, and they were running out of carbide. They decided that it was time to go. The volume of the waterfall had decreased a bit, and they were able to climb up without too much difficulty. They were relieved to find that the flood had not washed away the key to the gate, locking them inside. The reached the surface at about 5:00 a.m.

1. *Bob Zimmerman, "Flood in McFails,"* The Northeastern Caver, *September 1996, p. 77.*
2. *Richard Borowsky, "It Never Floods in Summer,"* Met Caver, *September 1996, p. 48.*

Comments: Zimmerman notes that he had never known the cave to flood, except during spring rains. A severe storm cell had passed over the cave at about 5:00 p.m., dumping several inches of rain in a very short time. The soil may have been saturated by heavier than normal rainfall in the preceding weeks.

The cavers used plastic bags as hats and shirts to preserve body heat and combat hypothermia. Their decision to wait out the flood pulse was in part motivated by the fact that there have been previous fatalities in the cave which involved climbing in a waterfall.

17 August
Hero Bucket Horror Hole, Tennessee
rockfall entrapment

Mike Rogers, Jack Thomison, Gerald Moni, Mike Ficco, Dave Doolin, and Alan Cressler returned to Hero Bucket Horror Hole to push a lead in the new cave that they had opened by digging the previous day. Thomison and Rogers started into the new passage after removing some more of the debris. Thomison squeezed through a crawl to enter the new section and was waiting for Rogers to follow.

Rogers started in with his feet first. When he was just about through, the slab he was crawling under peeled off the wall and crashed to the floor. Rogers' head and shoulders were still in the crawl and the falling block squeezed him into the floor and propelled him out. The block had knocked him out of the way and just barely missed pinning him to the floor.

Everyone was stunned by the close call and the fact that Rogers and Thomison were now trapped by the large block. Moni left to get more tools and was able to borrow a large sledgehammer from a friend who lived nearby. Meanwhile the others were working with rock hammers both outside and inside to break up the slab that was blocking the way. Finally, after four hours of continuous work, Ficco was able to finish breaking up the slab to allow Rogers and Thomison to escape.

Jack Thomison, Incident report, undated .

Comments: Diggers must always be alert for signs of instability. Collapse is an inherent risk in digging projects. Use caution in virgin passage, and look for loose or suspect rock.

23 August
Moores Bridge Cave, Tennessee
caver fall

Two experienced vertical cavers were exiting Moores Bridge Cave following a biological inventory trip. This involved climbing a 20-foot rope pitch followed by 50 feet of chimneying and climbing up a steep, narrow slot. While getting off rope at the top of the 20-foot drop, the second caver slipped and fell back down the pit. He suffered facial and skull fractures and a broken wrist.

His partner heard the fall and heard him moaning. Realizing what had happened, he quickly went outside to call for help. Rescuers soon arrived, and the partner assisted medical technicians in reaching the fallen caver. At first, the caver was conscious and his condition seemed good, but it declined as the rescue operation proceeded.

An additional cave rescue team was called in about two hours after the accident, and the caver was eventually hauled up the pit and out of the cave, exiting about five hours after his fall. He was transported by helicopter to a nearby hospital, where he was listed in critical condition. He later recovered.

1. *Jack Thomison, "Cave Accident/Rescue," TAG-Net #842, 27 August 1996.*
2. *Danny Britton, "Anderson Co. Rescue," TAG-Net #845, 30 August 1996.*

Comments: Don't remove your safety ascender from the rope until you are out of danger of falling. Perhaps the entire slot should have been rigged so that the cavers could have remained on rope until completely out.

Britton notes that the cave is close to the road, close to town, close to cave rescue resources, and not very difficult. The victim was only 100 feet from the entrance. Still, the rescue took five hours to accomplish and a caver nearly died. As noted in other incidents described here, rescue call-outs and operations are very time consuming, and even an apparently simple rescue can take many hours. Britton also suggests that it is foolish to take chances based on the belief that rescue is nearby.

It was also reported that the initial response agencies were not trained in cave rescue and were not fully aware of nearby specialized cave rescue teams. It is the responsibility of such teams to work with the local emergency response agencies, establish good relationships, and make their capabilities known. Legal responsibility and duty rests with these authorities, and cavers have to communicate and work with them regularly if they expect to be called.

28 August
Wind-Ice Cave, Wyoming
stranded in pit, inadequate equipment

A group of three rock climbers attempted to make a pull-down through-trip. They became stranded when they could not find the way through after pulling down their rope. They were reported overdue the next day. Rescuers quickly located them and helped them exit the cave.

John Gookin, Incident report, 28 August 1996.

Comments: This was the second of two nearly identical incidents at the cave in August. In the first incident, the cavers were able to get out on their own by free-climbing all the drops except the last one, which they ascended by climbing an accessory cord they had left rigged. It's a good idea to be sure someone knows the way through before committing to a pull-down. At least someone knew where the cavers were.

28 August
South Pittsburg Pit, Tennessee
caver fall, lost control on rappel

Karen Carr, Raleigh Marlin, Ray Nelson, and Dave Keever (39) were visiting South Pittsburg Pit, a 160-foot open-air shaft. Keever, who was the last to descend, rigged in using only the top four bars of his six-bar rappel rack, and attempted to do a "speed rappel." He intended to drop rapidly into the pit and jam the bars together as he approached the bottom, producing an effect similar to a bungee jump. He had been practicing the maneuver for nearly a year, and intended to impress the others.

Keever started his descent and quickly gained speed, but when he attempted to slow himself by jamming the bars together, he was unable to regain control. He crashed into the floor of the pit two or three seconds later at a high rate of speed, knocking the lights off of his helmet and scattering batteries around the area. He was stunned by the impact, but did not lose consciousness.

The others rushed to Keever's aid and checked him for injuries. They helped him get off rope and collect his gear. He found that he was able to stand and walk, but felt pain in his lower back, and was unable to bend at the waist. After some discussion, he decided that he would be able to climb out on his own. He climbed slowly, with Marlin climbing alongside on another rope. Keever was able to walk down to his truck, and Carr drove him home. He put his gear away and cleaned up, then went to the hospital. X-ray and CAT scans revealed a compression fracture of the L1 vertebrae, with two separated fragments and debris close to the spinal cord. He was fitted with a full body brace and kept in the hospital for five days. He wore the brace for four months.

David Keever, Incident report, 24 July 1998.

Comments: Keever gets right to the point in his own analysis: "Stupid, stupid, stupid! That urge to 'showboat' nearly killed me. I placed others at risk – inexcusable! Reckless, irresponsible, I've got a long list of adjectives that describe my actions that day, and none of 'em are favorable. Why go any faster than needed for a smooth descent?"

At the risk of overstating the point, speed kills. Even if you don't lose control and crash, fast rappels and sudden stops are hard on the rope, the equipment, and the caver. All three will eventually be damaged. It may look cool on TV, but it is not the way to cave. Also, using only four bars on a six-bar rack is a dangerous and unsafe practice. As Keever learned, most cavers find that four bars do not provide enough control for safe descent. If one bar gets knocked loose going over the lip, as has been known to happen, the remaining three may not be enough to stop a fall. Use five or six bars and spread them as needed for a smooth descent.

14 September
Reeves Cave, Indiana
lost, inadequate equipment

Michael Lorance and three other experienced cavers arrived at Reeves Cave at about 8:00 a.m. on a Sunday morning. They were surprised to see another vehicle already at the parking area. The entered the four-mile long cave system planning a fun day of exploration.

As they approached the Chandelier Room, they heard voices calling for help. Arriving in the room, they found two young men eagerly awaiting their arrival. They appeared to be in good condition, though Lorance noticed that one was barefoot. They had entered the cave on Saturday afternoon and had subsequently become lost. When they were unable to find the way out, they returned to the high room out of the water and sat down to wait.

Lorance and companions provided the young men with food, water, dry clothing, and heat pads. When they were ready to go, they escorted the men out of the cave. Lorance noticed that the two were looking pretty tired and frazzled until they saw they entrance light, at which point "it was as if they had been shot out of a cannon." They reached the surface around 11:00 a.m. As the group enjoyed the warm sunshine,

Dick Blentz arrived and told the two men to call home right away.

Michael Lorance, "Reeves Cave Trip/Rescue," Mid Hoosier Grotto Newsletter, *October 1996, v4n1, p. 4.*

Comments: Lorance notes that the two had at least the good sense to let someone know where they were going.

14 September
Trent Chasm, Alabama
equipment problem

Paul Deaver and three other cavers were preparing to descend the 209-foot pit in Trent Chasm when Deaver accidentally dropped his pack down the pit. His climbing gear was in the pack, along with a camera, a can of Beanie-weenies, a water bottle, a lighter, and two carbide lamp bottoms. The impact made an impressive noise.

Deaver rappelled the pit and located the pack. The camera, lighter, can of food, and two lamp bottoms were all crushed. Nevertheless, he deemed the climbing gear safe to use. He climbed out of the pit without further incident

Huntsville Grotto Newsletter, Oct./Nov. 1996, v38n10, p. 9.

Comments: How many cavers would be comfortable using that climbing gear?

19 October
Cave Mountain Cave, West Virginia
abrasion resulting in staph infection

Carl Moore was exploring Cave Mountain Cave with a group from the Fall VAR convention. While squeezing through a tight spot, he tore the right arm of his coveralls and suffered a small scratch on his elbow. He had forgotten to pack his elbow pads and his first aid kit. He continued the trip, leaving the cave several hours later, and did nothing to clean or dress the wound.

The abrasion to his elbow never healed, and in December infection caused a 105-degree fever and severe swelling. He sought treatment at a hospital, where the infection did not respond to antibiotics. His condition worsened, and osteomyelitis (infection of the membrane surrounding bone) was suspected.

After a long series of treatments, tests, and bone scans, he underwent surgery in March. A large abscess and surrounding necrotic material was removed. The abscess was caused by a staphylococcus infection. Following the surgery, Moore recovered.

Carl Moore, Incident report, 10 April 1997.

Comments: Moore writes: "My arm recovered, but I lost four months of caving, expended much of my sick leave, and experienced four months of pain because I neglected one of the most basic of caving safety precautions – bring a first aid kit and use it when necessary."

25 October
Laurel Caverns, Pennsylvania
struck head, suspected neck injury

A group of about 70 middle school students from Pittsburgh was on a guided trip through the undeveloped section of the cave when a 13-year old girl struck her head and was injured. She was wearing a helmet, but the force of the blow was severe enough that the guide decided that medical assistance was warranted.

Part of the group was sent out to summon help. Local emergency services agencies were called, as well as cavers from local grottos. Rescuers immobilized the girl's head and spine and placed her in a litter. She was then carried out of the cave and transported by ambulance to a local hospital.

Doug Moore, Incident report, NCRC Eastern Region web site, 29 October 1996.

Comments: Very similar to the July 4 incident. Moore notes that this rescue took five hours to accomplish. It is important to remember that even simple cave rescues often take hours to mobilize and execute.

26 October
Saltpeter (Pendleton) Cave, West Virginia
rockfall entrapment

George Dasher and Ed Saugstad were surveying in a large room accessed by a steep crawlway up through the floor. As Dasher moved back to read the compass, the floor collapsed into the crawl. A three-foot long by two-foot wide by 18-inch thick block had fallen into the opening, preventing their exit. The block was too big and too well seated to move. Their companions were unable to help them from below. After some maneuvering, the trapped cavers were able to move enough rocks to create a new opening that bypassed the block. They were only trapped for about 15 minutes.

George Dasher, "WVACS Activities," The West Virginia Caver, *December 1996, v14m6, p. 22.*

Comments: Dasher notes that they failed to notice the obvious unstable rock hanging over the crawlway. He was tired and was concentrating on the survey. Fortunately, he and Saugstad are both experienced diggers, and were able to open up another exit.

28 October
Hughes Cave, Alabama
caver fall, inadequate equipment

Jerry Meeks (18) and three companions entered the cave carrying one lantern and a flashlight. About 300 feet into the cave, Meeks handed the lantern to one of the others and tried to cross a ledge. He lost his balance and fell about 30 feet suffering a cracked sternum, two broken ankles, and a compressed lumbar vertebra. His companions went for help, and a 60-person rescue effort was mobilized. Meeks was strapped to a backboard, placed in a litter, and carried from

the cave. He was taken to a hospital and was reported to be in fair condition the next day.

1. *"Man rescued after fall in cave,"* Huntsville Times*, 29 October1996, p. B-4.*
2. *Wes Coleman, "The Hughes Cave Incident,"* Huntsville Grotto Newsletter*, December 1996, v38n11, p. 5.*

Comments: No helmets, no headlamps, no belay, no common sense.

2 November
Pine Hill Cave, Kentucky
caver fall

Jean Trowbridge, her husband Lee, their daughter Kirsten, and Tom Karaus were leading a caving trip for 12 college students from Florida. Jean Trowbridge led the students in through the horizontal entrance while Lee, Kirsten, and Tom rigged and rappelled the Skylight Dome entrance.

The two groups met at a junction, where Kirsten Trowbridge announced that she was not feeling well and wanted to go out. Lee accompanied her out of the cave via the horizontal entrance and drove her back to their camp.

The others continued their trip, having no difficulties until they reached a deep pool. While traversing along the wall to avoid the pool, Lisa Liebold (20) took a long step, missed the foothold, and sprained her ankle. The group had a first aid kit, and an ace bandage was applied to Liebold's ankle. She was able to walk with some help. Jean Trowbridge and one of the students started out of the cave with Liebold while Karaus took over as leader and continued the trip with the other students.

Lee Trowbridge returned to the cave and entered via the Skylight Dome rappel, expecting to meet the others at the bottom. After waiting several hours he decided to climb out. As he reached the top, Karaus and the students arrived at the bottom. Karaus was not able to communicate the details of the accident to Trowbridge, but did establish that he would not be climbing and that it was OK to de-rig the pit. Trowbridge removed the rope and returned to the vehicles.

Liebold and her companions made slow progress through the cave, taking frequent rest breaks. They exited and arrived at the vehicles shortly after Lee Trowbridge and about 15 minutes before Karaus and the rest of the group. Liebold's ankle recovered in about four weeks.

Jean Trowbridge, Incident report, 8 February 1997.

Comments: Trowbridge notes that she has been through the cave many times and usually winds up swimming across the pool. She notes that the cavers were already soaked from climbing waterfalls, but that beginners often expend a lot of effort trying to keep out of the water. This sometimes exposes them to unnecessary dangers. Trowbridge also expressed concern that Lee wound up doing the pit solo.

2 November
Waynes Cave, Indiana
lost, stranded

Four cavers became exhausted and lost after ten hours underground. The trip leader and two others made it out of the cave and called for help. Rescuers located the missing four, provided them with food and water, and led them out of the cave.

Jim Johnson, Incident report, undated.

9 November
Rogers Discovery Cave, Kentucky
caver fall, climbing without belay

Shelly Wolf, Pat Marcee (19), Chris Gilbert, and three other cavers entered the cave on Saturday morning, descending a 30-foot handline slope at the entrance, a 15-foot drop, a 20-foot climb, and a 75-foot pit. After exploring at the bottom of the drop, the group started out.

While ascending the 75-foot pit, Wolf noticed a hole in the wall about 30 feet off the floor. She pointed out the lead to Marcee, who decided to climb up and check it out. Wolf also tried to swing over to the lead.

About 17 feet off the floor, Marcee lost his grip and fell, breaking his left leg below the knee. The other members of the group were around a corner and did not see the accident. Wolf called down to the others, who came to Marcee's aid.

Wolf climbed the pit and retrieved a sleeping bag, an inflatable pad, water, an emergency blanket, and other supplies to help keep the injured caver warm. The cavers placed Marcee on the pad and wrapped him in the blanket and sleeping bag. Gilbert left the cave to call for help.

Rescuers responded, and Marcee was carried out of the cave and taken to a hospital after a 12-hour ordeal.

1. *Shelly Wolf, Incident report, 28 December 1996.*
2. *Christopher Gilbert, Personal communication, 30 May 1998.*

Comments: Gilbert notes that Marcee was an experienced caver and climber who should have known better than to attempt the climb without a belay. He had safety equipment available, but chose not to use it.

17 November
Whitings Neck Cave, West Virginia
caver fall

A woman fell in a cave in the Whitings Neck area early on Sunday morning. The woman was about 250 feet from the entrance when she slipped on muddy ground and fell about 40 feet. Her one caving companion went for help. Firefighters had to crawl through tight passages to reach her, and they had to use ropes and a body harness to bring her to the surface. She was taken to a hospital, and it was reported that her injuries were determined to consist of minor abrasions on the legs.

George Dasher, "Rockin' Chair," The West Virginia Caver*, v15n1, p. 10.*

29 November
Carpenter-Swago Cave, West Virginia
difficulty on rope, equipment problem

John Chenger, Garret, and Tammy arrived at the parking area to this once-popular but now-closed vertical cave, having received permission from the owner. They were surprised to see another vehicle present. When they arrived at the cave entrance they encountered three men, Jim (the leader), Will, and Sam, who were preparing to rig the 145-foot shaft. The men claimed to be NSS members from Maryland, and gave a vague story about having received permission from a man they ran into in the woods while visiting another nearby cave. John and his companions gave them the benefit of the doubt and accepted the story. Jim claimed to have been to the cave several times before, which struck Chenger as odd because the cave had been closed for several years.

The two groups rigged separate ropes, and Chenger did not pay much attention to the Maryland group except to observe that Jim was using a sewn harness made of cotton webbing while his companions tied Swiss seats with webbing. Chenger and companions then watched as the Maryland group used a thin polypropylene line to lower several packs, propane lanterns, and some kind of military surplus cylinder into the pit before descending.

Once the first group was clear, Chenger rigged in to his own 300-foot rope and descended. The pit is broken into three parts, an initial 80-foot drop, a 15-foot waterfall drop, and a final 50-foot drop to the bottom level and the main trunk passage. Chenger found the Maryland group had gone down the 15-foot drop, and could hear them discussing something below. He called to Garrett and Tammy to come down, which they did.

When Chenger attempted to descend the 15-foot drop, he was surprised to find his rope loaded from below. The Maryland group was apparently using it to descend the final 50-foot drop. It turned out that their 200-foot rope did not reach, so they helped themselves to Chenger's rope. When the rope was clear, Chenger rappelled the 15-footer to find Sam instructing Will in rappelling technique. Jim had already gone down the last drop.

Tammy and Garret had seen enough by this time, and elected to climb back to the surface to prepare for the likely rescue. Chenger followed Sam and Will down the 50-foot drop to talk to Jim. He too had seen enough, and wanted to leave and take his 300-foot rope with him. He offered to re-rig the Maryland group's unused 150-foot rope in the last drop, so that he would not have to wait while they climbed.

Sam and Will announced that if Chenger was leaving, they wanted to leave too. Jim disagreed, and an argument ensued. Chenger had had enough, and announced that he was going up and would drop down another rope for the three. When he reached the top of the 50-foot pit, however, it was clear that the other Maryland rope would not reach. Before he could retrieve the 150-foot rope to rig the drop, the others started climbing out on Chenger's rope. He was forced to wait for them.

Will and Sam both had trouble getting over the lip and required help from Chenger. All three Maryland cavers were using makeshift climbing systems, and were clearly inexperienced in vertical caving technique. Sam climbed the wet 15-foot drop with help from Chenger, who then followed. While Will and Jim climbed the wet drop, Sam and Chenger started up the final 80-foot climb on separate ropes. Part way up, Chenger adjusted Sam's climbing rig, adding another foot loop and making it much easier for Sam to climb. In the process, he dropped a glove, and rappelled back down to retrieve it while Sam continued his ascent.

As Sam neared the top, he discovered that his seat harness was coming apart. He called up to Tammy and Garret, who rigged a belay line and prepared to drop it down to Sam. Unfortunately, Sam did not know how to tie any knots, so Garret quickly tied a figure-8 loop sized to fit over Sam's shoulders and under his arms.

Chenger climbed up and checked the harness, finding that the knot on the Swiss seat was OK, but that the harness was very loosely tied and was sagging down around Sam's thighs whenever he stood up. By this time, Will and Jim had arrived at the bottom of the 80-foot drop and were attempting to get on rope under two climbers. Chenger yelled at them to leave the ropes alone and wait until they were clear.

Sam was hypothermic and beginning to panic, so Chenger called up and asked Tammy and Garret to get their cable ladder and rig it into the pit. They did so, and Sam climbed the ladder on belay and made it out of the pit. Chenger then climbed out followed by Will and Jim.

Sam appeared to realize how close he had come to serious injury. Will also listened carefully as Chenger and the others explained proper safety procedures and made suggestions for improvement. Jim, however, was unfazed, and commented only that it was an easy drop and he didn't know what Sam's problem was.

John Chenger, "Close Cave Catastrophe, West Virginia," West Virginia Caver*, April 1997, v15n2, p. 4.*

Comments: The Maryland cavers did not have permission and were trespassing. They were inadequately equipped and unprepared for the cave. They were fortunate that Chenger and his friends were there to help them. We have included this lengthy account as an illustration of how inexperienced cavers can get into serious trouble without realizing it or appreciating the danger. There are no substitutes for good judgement, proper training, and experience.

30 November
Fisher Ridge Cave, Kentucky
flood entrapment

Brian Davis and five other cavers planned to spend the Thanksgiving holiday weekend surveying from a base camp in Fisher Ridge Cave. Three cavers entered at noon on Thursday. Davis and two other cavers entered at noon on Friday. They entered by the same entrance and route used nine months earlier on the February 20 trip. They were not concerned

about flooding, because the low crawlway which had sumped in February had since been enlarged and modified to make flooding less likely.

Upon reaching the base camp site, Davis noticed that the water level in the spring near the camp was high. By 3:00 a.m. Saturday, its volume had increased dramatically. After some sleep, both groups decided to abandon their survey plans and leave the cave.

When they reached the low crawl, the cavers found that it had once again flooded. They spent three hours digging a trench to help drain the sump. After waiting another three hours, they could not see any improvement. They spent three more hours enlarging the trench to promote drainage, then settled down to wait.

After a meal and some sleep, they returned to the crawl to check the water. This time they found a six-inch airspace above the water. Two cavers started through to see whether the way was clear. They found that the entire crawl was flooded for 400 to 500 feet, with air space ranging from six to 18 inches. The two cavers made it through, exiting at dawn on Monday. The others waited for the water to drop further, then followed. All the cavers were out by early afternoon.

Brian Davis, Incident report, 14 December 1996.

Comments: They were trapped for about 48 hours. This was the second flood entrapment at this cave in 1996. The local forecast before the trip was for scattered showers. Davis notes that the cavers were confident that their modifications to the crawlway would prevent a repeat of the February 20 entrapment. This confidence proved to be unfounded. At least this time there was no callout and rescue response.

14 December
Jewel Cave, South Dakota
illness, forced bivouac in cave

Keen Butterworth, Marc Ohms, Stan Allison, and Mike Wiles were on a trip in Jewel Cave when Butterworth began to feel ill. He felt he could continue, so the group proceeded. When they reached their destination, however, Butterworth became very ill and began to suffer vomiting and diarrhea.

The group started out of the cave – a six-hour trip for a healthy caver, involving five miles of passage. Butterworth moved slowly, and became dehydrated when he was unable to take water or food. About halfway out, the group reached Cloud Nine – a room where rescue supplies were stored. Butterworth rested while the others heated a package of soup. He was able to keep the soup down, and began to feel better.

They continued for another hour until they reached the site of another rescue cache. Butterworth was unable to travel, and they decided to let him spend the night there to rest. Allison stayed with Butterworth, while Ohms and Wiles headed out, planning to return with help and supplies if the others did not follow by 9:00 a.m.

Butterworth awoke the following morning feeling much better, and was able to hold down some food and water. He and Allison started out, and exited at 8:00 a.m.

Marc Ohms, Incident report, 30 January 1997.

Comments: Ohms observes that Butterworth should have spoken up sooner when he realized he was becoming too ill to continue. He admits, however, that this can be difficult to do, especially when the potential for a big breakthrough is very high, as it was on this trip. He also suggests that the others might have paid more attention to Butterworth when he first mentioned not feeling well, so that they could have encouraged him to start out sooner. Ohms also notes that the pre-placed rescue packs helped prevent a more serious situation.

23 December
Blowing Springs Cave, North Carolina
caver fall, climbing ladder without belay

Gary Lynn Adams (35), Jason McElreath, Travis Dockins, and Lee Kisselburg entered Blowing Springs Cave armed with hammers, chisels, and a home-made rope ladder. McElreath and Kisselburg had been to the cave before, and had been stopped by a 48-foot pit about 700 feet into the cave. They could hear the sound of water below, and wanted to reach the waterfall and search for fossils.

They entered the cave at about noon on Monday, and Adams soon discovered that the cave was a tight fit for his five-foot nine-inch, 220-pound frame. By 12:30, he had decided caving "wasn't my thing." He wanted to reach the waterfall and collect fossils, however, so he pushed and squeezed and shoved himself through the tight passages. At times, his companions pushed and pulled on his arms and legs to get him through the tightest spots. Dockins soon decided that he'd had enough, and left the cave. The others persevered, and reached the top of the 48-foot pit around 2:30 p.m.

Kisselburg expressed concern, and suggested that they should not descend. Adams was determined to see the waterfall, and volunteered to go first. They rigged McElreath's homemade rope ladder, and Adams climbed down. They did not have a belay rope. Adams writes that the descent "took every ounce of strength I had." On bottom, he tried to squeeze into a six-foot wide, one-foot high crawl to follow the sound of the water, but did not fit. He began working with a hammer and chisel to enlarge the opening, while McElreath descended. He was also unable to fit through the opening. Kisselburg called down that he was getting cold, and the two decided it was time to leave.

McElreath climbed first, and had some difficulty. About ten feet below the top, he stopped climbing and announced that he did not think he could make it. He rested against a ledge for a few minutes, then made it to the top. Adams then started up, "confident I could make it because I worked out regularly." About six feet below the top, he ran out of strength and could not pull himself up the remaining rungs. When he could no longer hold on, he fell to the bottom, glancing off the wall on the way down.

When he regained consciousness, he found himself lying on the floor of the pit. He could move his arms and legs, but felt pain in his back and legs. He was afraid to try to get up. His companions heard him moaning, and called down that they would go for help. Both men exited the cave, leaving Adams alone.

Adams' companions went to the nearby Nantahala Outdoor Center to call for help. John Neach, an experienced caver, promptly went to the cave and was the first to reach Adams. Neach also requested that the Chattanooga-Hamilton County cave rescue team be called. Cave rescue teams from Chattanooga, Tennessee, Walker County, Georgia, and Knoxville, Tennessee, were called by the local authorities, who also called in local cavers to assist. Neach and a paramedic reached Adams several hours after the fall, and stayed with him for nearly 15 hours during the rescue operation.

Rescuers reached Adams about 2:30 a.m. on Tuesday morning. He was placed in a Sked litter and hauled up the pit. The combination of Adams' size and the tight passages made it extremely difficult to move him through the cave. Rescuers were forced to spend hours working to enlarge the passage enough for him to fit through, moving thousands of pounds of rock and making extensive modifications to the cave passage. Adams was brought to the surface at about 5:00 p.m. on Tuesday, and was transported to a hospital. He was found to have only bruised ribs and abrasions, but was kept overnight for observation.

1. *Gary Lynn Adams, "A Plunge Into Darkness,"* Guideposts*, May 1997, p. 21.*
2. *Anonymous, "Rescue in Blowing Springs Cave," South Carolina Interstate Grotto* Tunnel Vision*, 20 March 1997, v8n2, p. 16, reprinted from the Flittermouse Grotto* Der Fledermaus*.*
3. *"Hamilton unit helps rescue man from cave,"* Chattanooga Times*, 26 December 1996, p. C1.*
4. *"Man trapped in cave is grateful to survive,"* Knoxville News-Sentinel*, 26 December 1996, p. A5.*

Comments: Inadequate equipment, inexperience, poor judgement, massive rescue, trashed cave. The men had no real experience or training in safe caving, and did not know that ladder climbs should always be belayed. Building your own rope ladders for caving is also questionable. Experienced cavers routinely use single rope technique for this pit. It is also not a good idea to leave an injured person alone.

The rescue took 18 hours. Adams spent 26 hours in the cave after his fall. Over 150 rescue workers were involved in the operation. The Associated Press wire service report closed with a quote from Adams: "Caves are for bats, and they should be kept that way."

28 December
Cave Without A Name, Texas
caver fall, stranded, inadequate equipment

In his account of the incident, George Veni writes: "Cave Without A Name is a fine, small show cave located about 40 kilometers northwest of San Antonio, Texas. It consists of a large, well-decorated passage that extends about 200 meters to a stream, where the tour trail ends.

"About 2:00 a.m. on 28 December 1996, five young men from San Antonio broke through the gate and entered the cave. They had been on a tour some time previously, and had heard of a decorated upper-level passage located off-trail down the stream. They used tour lights to light their way to the water, then waded about 150 meters downstream. The water reaches chest-depth, and airspace gets as low as 30 centimeters. Amazingly, they found the sometimes-hard-to-find hand line that leads six meters up a slippery climb to the upper passage, then began their ascent up a tricky and slippery seven-meter free-climb into the decorated area.

"Somewhere near that point, their lights ran out of fuel, and on trying to exit the passage, one of the team, Shane Andrew Malone, fell and hurt his ankle. Reports conflict on whether the ankle was broken or sprained. Two of his companions, Joe Green and Brett Wilson, managed to get out of the cave safely, while two others, John Edward Soto II and Eric Virgil, stayed with him. The Kendall County Sheriff's Department and Boerne Volunteer Fire Department responded. During the past year, the BVFD was the site of a National Cave Rescue Commission cave rescue training course.

"Rescuers entered the cave at 8:40 a.m. and Malone, Soto, and Virgil were out within about an hour. All three were treated for hypothermia. No damage was done to the cave, and the gate will be repaired courtesy of a metal working shop in San Antonio. All five people were arrested and charged with criminal trespass.

"The accident analysis was well-summarized by BVFD Assistant Fire Chief Mike Fincke: 'They went down there with just cigarette lighters and a whole load of stupidity.' They were reduced to trying to find their way out of the cave using the illuminated dial on Virgil's watch."

1. *George Veni, "Rescue of Buffoons at Cave Without A Name,"* The Maverick Bull*, February 1997.*
2. *Anonymous, "Cave adventure goes awry,"* Hill Country Recorder*, 1 January 1997, p. 1.*

Comments: Cigarette lighters as caving lights? Veni's report is aptly titled.

unknown 1996
Susie Drop, Alabama
difficulty on rope

Carl Craig rigged in to descend Susie Drop, a 98-foot pit, by first placing his quick-attach safety ascender on rope, then rigging his rappel rack below it. He left the safety ascender on the rope as he squeezed through the tight slot at the top of the pit. As he lowered himself in, his rack caught on a projection of rock, popping the fourth bar off rope and spreading the remaining bars. He began to fall, but was saved by the ascender attached to his harness.

Huntsville Grotto Newsletter, v38n10, p. 3.

Comments: A nice example of the importance of the quick-attach safety ascender. Craig notes that he does not remove it from the rope until he is hanging free and ready to rappel. Many experienced vertical cavers recommend wearing your full climbing system while rappelling, so that the safety ascender is readily available and you are ready to do a changeover if any problem develops during descent.

1997 Accident and Incident Reports

1 January
Grassy Cove Saltpeter Cave, Tennessee
caver fall, stranded in pit

Nathan Payne (16) and three teenaged companions were exploring the cave when Payne slipped and fell about six feet in a pit known as Hell Hole Number 2. He injured his wrist in the fall, and was unable to climb back out of the hole. His companions went for help, and local rescue squad members were notified shortly before 3:00 p.m. It took about an hour for rescuers to reach Payne. Once they hauled him out of the pit, he was able to walk out with some assistance.

Mike Moser, "Boy, 16, rescued from inside cave," Chattanooga Times*, 3 January 1997.*

Comments: The newspaper article noted that this was the second rescue at the cave in two months. No information was available on the other incident.

18 January
Ogle Cave, New Mexico
difficulty on rope, stranded

Melynne Conway, Gary Mahan, Meliene Davis, and Bill Sawyer visited Ogle Cave accompanied by park employees Jason Richards and Paul Mauermann. Richards was first to make the 180-foot descent of the entrance pit, followed by Mahan. Conway was the third person down, and took about 30 minutes on the rappel. The typical time for this descent is about five minutes, and Richards became concerned. He also heard Conway comment that she hoped she would be able to climb out. As a result, he decided to shorten the tour to allow more time to exit.

When the group was ready to climb the pit, Richards sent Mauermann up first, followed by Mahan. Conway climbed about 80 feet in 30 minutes. She then climbed another 20 feet before becoming exhausted. After a 15-minute break, she still felt unable to continue. Richards called up to the top and instructed Mauermann to radio for help. Richards was concerned about harness compression, and urged Conway to move around and try to keep climbing. She managed to ascend another 16 feet before help arrived.

Park personnel Lance Mattson, Harry Burgess, Dale Pate, and David Hall arrived at the top, along with caver Joel Williams. They rigged a second rope, and Mattson rappelled down to Conway and changed her over from ascent to rappel. Richards belayed Conway as she rappelled back down to a ledge. Richards secured Conway to the ledge and climbed out to help with the hauling. Conway was then hauled up the pit, reaching the surface at about 9:30 p.m.

Incident report, Carlsbad Caverns National Park, 18 January 1997.

Comments: It's always helpful to have a second rope available, but it is better not to need one. Cavers should know how to change over and descend, and should use that option before becoming totally exhausted. Cavers waiting at the bottom should know how to climb up and help a stranded caver get back down. The maneuver is called a pick-off, and requires practice, but it can save lives. Exhausted cavers hanging on rope are at serious risk.

Every vertical caver should know how to do these things. You don't always have time to send out for or rig another rope. The NCRC training courses provide a good place to learn. The cavers had assured the park personnel that they were prepared for the 180-foot pit. Where cavers are unknown, asking for evidence (such as past experience) of such assertions may be worthwhile.

13 February
Sunny Jims Cave, California
stranded, washed into sea cave

Matt Tickner (25) was rescued by a lifeguard after being trapped in Sunny Jims Cave. He had apparently been washed into the cave after jumping from a 90-foot promontory known as Deadmans. Authorities began searching the area after receiving a 911 call at 11:30 p.m. from a man claiming that his brother had jumped from the cliff.

Lifeguards searching the area below the cliff heard Tickner's yells from inside the cave. Lifeguard Wayne Auer was able to swim into the cave and help Tickner up to a landing at the base of a stairway leading to a shell shop on the road above. Auer later reported that it appeared that Tickner had been drinking, and did not want to risk swimming back out. Tickner then waited there while Auer swam back out to contact the shop owner about opening the stairway door. When Auer returned to the cave equipped with a rope and rescue buoy, Ticker agreed to swim out under tow. Auer towed him out of the cave and helped him up the trail to the road. Tickner was fully clothed, and denied jumping from the cliff. He refused medical treatment.

Terry Rodgers, "Lifeguard rescues man trapped in sea cave after 90-foot plunge," San Diego Union-Tribune*, 14 February 1997, p. B-3.*

Comments: There was a similar incident on 8 January 1995 involving a surfer washed into this cave. See *American Caving Accidents*, December 1997, p. 423.

14 February
Cueva Cheve, Oaxaca, Mexico
rockfall entrapment, caver fall

Carl Bern (23) and Steve Wells (24) were making their way back to the entrance following a trip in the upper portion of Cueva Cheve. They were about 20 minutes from the entrance, moving through large passage with some breakdown when they came to a ledge along one wall. Bern walked across and climbed down from the far end. When Wells followed, part of the ledge broke loose from the wall, sending both Wells and a four-foot diameter by two-foot thick slab down

on top of Bern. The slab landed on Bern's left leg, pinning him to the floor. Wells landed nearby and injured his ankle.

Fortunately, Bern's leg was sheltered by a crack in the floor and was not crushed by the slab, which was estimated to weigh about 700 pounds. Some of the weight of the slab was on Bern's leg and foot, restricting his circulation below the knee. Though injured himself, Wells came to Bern's aid and the two used some webbing and carabiners to rig a 2:1 haul in an attempt to move the slab. When this failed, Wells left to get help.

Wells hobbled and crawled out of the cave, taking about 30 to 40 minutes to reach the entrance. Other members of the expedition were in camp just outside, and responded immediately, taking vehicle jacks, hammers, and other equipment. Matt Oliphant and Page Ashwell were the first to reach Bern, about an hour after the accident. They were able to use the 2:1 haul to shift the rock and stabilize it, which also restored Bern's circulation below the knee.

When the others arrived with additional equipment, they rigged another haul system to further stabilize the slab. The decided not to try to lift or pull if off for fear of crushing Bern's leg. Instead, the used hammers to break off the part of the slab that was still pinning Bern's foot. Once that projection was removed, Bern was able to slide his leg out from under the rock. Bern had no broken bones and was able to leave the cave under his own power.

Several days later, Wells and Bern made a two-hour drive to the nearest doctor. There was no X-ray machine available, and Wells was diagnosed with a sprained ankle. Bern had two half-dollar sized patches of necrotic tissue on his calf from compression by the rock. Both men rejoined the expedition and continued caving. When Wells returned home several weeks later, he was still experiencing pain in his ankle. He had it examined, and the X-ray showed that he had fractured one of the bones in his ankle. He later had surgery to pin and repair the ankle.

1. Steve Wells, Interview by Bill Putnam, 15 March 2000.
2. Carl Bern, Personal communication, 16 March 2000.

Comments: Sometimes there is just no way to spot loose rock or other dangers in the cave. It is one of the inherent risks of caving. The men had been dealing with loose rock throughout the trip, and were alert to the danger. Bern was lucky that his leg was not crushed. He noted that he was also fortunate to have a group of experienced cavers camped right at the entrance. He wrote: "If the response time had been any longer the stone tourniquet might have claimed my leg." Note the use of vehicle jacks as improvised rescue tools.

15 February
Pettijohns Cave, Georgia
caver fall, descending hand-over-hand

At about 6:30 p.m. Bradley Hood (20) was using a knotted rope to descend a 20-foot drop into the Volcano Room. He lost his grip on the muddy rope and fell about 15 feet, landing on a rock and injuring his lower back. He was in a lot of pain and felt that he could not get out on his own, so his companions left the cave and called 911 for help.

Cave rescue teams responded, and a 70-person rescue operation ensued. Hood was packaged in a litter and carried out of the cave, reaching the surface at 7:26 a.m. He was transported to a nearby hospital where he was found to have cracked several vertebrae. He was placed in a back brace and released the next day.

Allen Padgett, Incident report, 17 February 1997.

Comments: This is yet another hand-over-hand casualty. Hood was carrying a flashlight and was not wearing a helmet. Pettijohns Cave is located in a state wildlife management area and is visited by more than 10,000 people each year. Most of its visitors are as poorly equipped and prepared as this young man. Surprisingly, this was the first major rescue in the cave in almost eight years.

17 February
Secret Pit, Alabama
rockfall

Victor Bradford and David Drake were spending the day bouncing pits in the Paint Rock Valley and decided to do Secret Pit, a 144-foot open-air drop. They rigged to some nearby trees and Drake descended. While he was waiting for Bradford to rappel, a small rock fell and hit the floor near the rope. Bradford reached the bottom and Drake prepared to climb out. When Bradford spotted a register, he insisted they both sign it. Drake walked over to do so. Suddenly, a "volleyball-sized" rock fell from above, landing near the rope with a loud impact. The men were startled but not injured, and both climbed out without further incident.

David Drake, "Secret Pit," Cullman Grotto Flowstone*, March 1997, v4n3, p. 3.*

Comments: Drake notes: "Had Vic not seen the register and insisted we sign it, one of us, probably me, would have been on rope at the time of the rockfall. Apparently we had disturbed its resting place near the top of the pit on our rappel, and it took a few minutes for it to release from the viscous grip of its muddy bed." It's always good practice to check the lip and clear loose or suspicious rocks, and to avoid standing in the rockfall zone at the bottom of pits. A rock that size falling that distance could kill even a helmeted caver.

20 February
Battlefield Pit, Tennessee
caver fall, stranded in pit

Two men who claimed to be searching for a lost dog in a national park on Lookout Mountain discovered a 40-foot deep pit. One of the men climbed down into the pit holding a small flashlight. He lost his footing and fell in, sustaining facial and scalp injuries as well as other abrasions during the fall. He tried to climb out, but became stranded in a crack partway up.

His companion gathered some vines and attempted to lower them to the man, hoping he could use them to climb out. Eventually, the second man decided to call for help. Park rangers responded and called in the cave rescue team. The

man was fitted with a harness, lowered to the bottom, and then hauled out of the pit. He was taken to a hospital for treatment.

Buddy Lane, Incident report, 20 February 1997.

Comments: Both men were intoxicated. Authorities suspected that they were engaged in the illegal collection of artifacts. Digging tools, a metal detector, and other items of evidence were found hidden nearby.

22 February
Norman Cave, West Virginia
caver fall

John Dale entered Norman Cave with a group of Boy Scouts and grotto members at about noon. They planned to spend the day exploring and camp in the cave that night. After dropping their equipment off at the campsite, they spent several hours touring the cave. About halfway back to the campsite, Dale lost his footing, stumbled, and fell off a ledge, injuring his left foot.

After a brief discussion, Dale and his companions decided that he could make it out with some assistance. It took about three hours for him to reach the entrance. He was driven to a hospital, where X-rays determined that he had not broken any bones but had damaged the ligaments in his foot. He was fitted with a cast, which he was to wear for six weeks.

John Dale, "My first overnight spelunking adventure," Tri-State Grotto Dead Dog Dispatch*, March 1997, v12n3, p. 46.*

2 March
Pisgah Crater lava tube C-10, California
illegal drug lab found in cave

A group of cavers from the Desert Dog Troglodyte Grotto were visiting the cave when they noticed a strong chemical smell. The found chemicals and other paraphernalia apparently stored in a high passage. They reported the situation to the county sheriff's office, which dispatched investigators from the Narcotics Division. Investigators summoned the cave rescue team to assist.

The investigators determined that the equipment was an illegal drug lab, which had been broken down for storage. The site was photographed and the materials were removed from the cave. The strong chemical smell persisted for some time, and local cavers were warned of the presence of potentially hazardous materials.

Bryan Lavender, Incident report, 4 March 1997.

Comments: As visitors to out-of-the-way places, cavers should be alert to signs of criminal activities. Defenders or booby-traps may be present.

8 March
New River Cave, Virginia
fatality, caver fall

A group of five individuals arrived at the cave late in the afternoon, equipped only with a few hand-held flashlights. Several in the group began exploring rooms just inside the entrance. While climbing on rocks outside the cave entrance, a 30-year-old man slipped and fell. He suffered severe injuries, and died within minutes. Some of the group left to summon help. His companions carried the body down to the road where they met area rescue squad personnel. Investigators reported alcohol use by the victim and companions. They did not have permission to be on the property, which was posted.

Tim Kilby, "Caving fatality," Cavers Digest #5433*, 1 April 1997.*

Comments: The group did not have helmets or other safety equipment. They had no knowledge of safe caving practices.

9 March
Buckners Cave, Indiana
caver fall

A caver fell in a crevice and broke her tailbone. Rescuers assisted her to the Bullseye Pit entrance and hauled her out. No other information was available.

Jim Johnson, Incident report, undated.

31 March
Buckners Cave, Indiana
lost, stranded, inadequate equipment

A young man and his sister were exploring the cave and got lost. When their light went out they became stranded. Rescuers found them near the T-Rooms and led them out of the cave. No other information was available.

Jim Johnson, Incident report, undated.

March
Ellisons Cave, Georgia
caver fall, rope failure

Paul Bowen and several cavers from a local grotto visited Ellisons cave and descended the 125-foot Warm Up Pit. While his companions were climbing back up, Bowen explored the area at the bottom and found a rope hanging down in an alcove. He decided to climb up and see where it went. He rigged on with his climbing gear and began the ascent. When he was about 25 feet up, the rope broke and he fell to the floor. He received cuts and bruises, but no serious injuries. He was able to exit the cave under his own power.

1. *Keith Sutphin, "Dangerous ropes in Ellisons," TAG-Net #1032, 20 March 1997.*
2. *Allen Padgett, "Ellisons Rope Incident," TAG-Net #1039, 27 March 1997.*

Comments: The rope was rigged from an 80-foot drop into the Warm Up Pit from a passage leading to a seldom-used entrance. It had been abandoned nine years earlier, and had been hanging in a waterfall ever since. Bowen knew nothing about the rope or its history.

Padgett observes: "The first lesson learned here is do not assume any fixed line you find in a cave is in any way safe. Research before you climb. The second lesson is do not

assume that it is obvious that no one would climb a line abandoned such as this. If you place a rope it becomes your duty to remove it."

If you have to ascend a doubtful rope, you should consider testing it by having two or three cavers hang on the bottom. If the rope or anchor falls, falling debris could be hazardous but it is probably less so than a falling caver. Bowen was lucky not to be seriously injured or killed.

25 April
Pinnacles Cave, Nevada
difficulty on rope, inexperience

Doug Billings and three other experienced cavers led novice cavers Jim Crouch and Rick Temple on a grotto trip to Pinnacles cave. The trip was to provide an introduction to vertical caving for Crouch and Temple. They rigged two ropes in the entrance pit and descended without incident.

The group set off to explore the cave, rigging an etrier at a short climbdown and two more etriers at a second 15-foot climbdown. This second drop was tight, and Crouch, who was rather large, had some trouble. They rigged a short rope so he could rappel. Halfway down, he became wedged in a squeeze while on rappel. He was stuck for about 20 minutes while the others worked to free him. Crouch decided to wait at the top.

The others continued their exploration until they ran out of time and had to start out. There was a brief problem when the two ropes in the entrance pit became tangled while Malini Killian was climbing. She was able to pass the tangle without too much trouble. Crouch started his climb while Billings and Temple waited at the bottom. He had trouble with the ascent from the very start. He could not get his system to operate correctly, and soon became exhausted. He was already tired from his earlier experience in the slot. When the second rope was free, Temple rigged on and began climbing. He soon passed Crouch and exited the pit.

Billings then got on the second rope and climbed up beside Crouch to help. He tried unsuccessfully to pull Crouch over onto a nearby ledge. Finally, he decided they were going to have to haul Crouch up. Billings got off rope on the ledge and the cavers above pulled up his rope. They used pulleys to rig a haul system and dropped the rope back down to Crouch, who attached it to his harness. With assistance from the cavers above, Crouch was able to continue climbing and exit the pit. The rope was then dropped back down to Billings, who climbed out.

Doug Billings, "Pinnacles Trip," The Troglodytes Tribune*, Quarter Four 1997, v2n3, p. 6.*

Comments: Crouch had practiced with his system, a modified Frog rig, at Billings' house before the trip but was not yet skilled in its use. He was also a large person, and had difficulty staying upright while on rope. Billings notes that the system was not very efficient, and that Crouch was already tired from the earlier difficulty in the slot. The cavers showed good initiative and rescued their friend from a difficult situation. Still, it is wise to be certain that you are capable with your chosen system before venturing into a pit.

2 May
Glow Worm Cave, Tennessee
flood entrapment

Don Hunter, Seamus Decker, Kim Grossman, Micah Callough, and Suzanne Debois arrived at Glow Worm Cave on a Friday afternoon, planning a short survey trip for the evening. Bill Walter, the owner of the cave and an experienced caver himself, expressed concern about the crawlway given the forecast for evening thunderstorms. Hunter did not think that a short duration rainfall - even from a thunderstorm - would be a problem. They entered at about 5:30 p.m. through a low crawlway which had been known to sump on occasion.

After traversing about 150 feet of low, downward sloping belly-crawl, the group emerged into larger passage and began surveying. About 30 minutes into the survey, they noticed that the water flow was increasing. They dropped everything and ran to the entrance crawl, where they found the passage already sumped. Outside, it had begun to rain heavily. The rain continued for several hours. The trapped cavers retreated to a dry room and prepared to wait out the flood. They spent the night huddled together for warmth.

Walter was concerned about the rain, but had confidence in the cavers and their judgement, and did not check on them that evening. At 6:00 a.m. the next morning, he received a call from Jeff Dilcher, who had arrived too late on Friday for the trip and was planning to survey with the group on Saturday. Dilcher was concerned, and reported that the group had not come out during the night.

Walter met Dilcher at the cave, where they found the entrance to the 150-foot crawl sumped. They noticed a high water mark about one foot above the current level, and decided to monitor the rate of drop at hourly intervals. They considered alerting cave rescue units, but decided that there was nothing to be gained at that point, since they could only wait for the water to recede. Walter felt that there had not been enough rainfall to cause major flooding in the cave, and that only the entrance crawl was flooded. They decided to see about getting a pump to drain the crawl, and to keep checking the water level.

Walter and Dilcher spent the next few hours trying to find a way to pump out the crawl, but had no luck. The water was too far into the cave to place a pump without creating problems from the engine exhaust. At 12:30 p.m. they returned to the cave to check the water and found about eight inches of air space above the pool. Walter noticed air flowing into the cave, and felt that the crawl must be open. He and Dilcher went back to their vehicle to get wetsuits, planning to enter and search for the missing cavers. When they returned to the entrance, they found the others emerging unharmed. They were all out by 1:00 p.m. The cavers were trapped for 19 hours.

1. *Don Hunter, "CACA Update: Trapped in Campaign,"* The Southport Digs*, May 1997, v3n6, p. 6.*
2. *Bill Walter, "Trapped in Campaign (The Landowner's Perspective),"* The Southport Digs*, June 1997, v3n8, p. 23.*

Comments: Hunter freely admits that the group should not have entered, given the forecast and the obvious risk of flooding.

5 May
Arnold Hollow Cave, Arkansas
rockfall entrapment

At about 9:00 a.m., four people entered Arnold Hollow Cave to push a small lead about 400 yards back in the cave, hoping to gain entrance to a formation room believed to exist beyond. Three women, Dell Lancaster (36), Diane Lancaster (40), and Phyllis Nelson (64) accompanied the cave's owner, John Nelson (40) on the trip.

When they arrived at the tight spot the three women went through. John Nelson, described as a "rather robust fellow," decided to enlarge the crawl to allow himself easier access and to make it easier for everyone on the way out. While digging chert and hammering on some loose slabs of breakdown, he caused a collapse that blocked the passage and left the three women trapped inside. Nelson tried for about an hour to remove the blockage, then left the cave to get help.

Local rescue and emergency services units responded, and cavers were called in to assist. Rescuers examined the passage and the collapse area, and decided that it would be too dangerous to dig or move anything without shoring and cribbing. They were able to pass food, clothing, and a small stove to the women, who were calmly waiting in the larger room beyond the collapse.

Personnel from a nearby silica mine offered to help, and assisted cavers in cutting timbers and shoring up the passage. Once that was complete, rocks were moved and chiseled to re-open the passage. By 8:30 p.m. the entrance to the room was open and the women exited the cave in good spirits.

Ed Corfey, Incident report, 17 May 1997.

Comments: Corfey writes, "The best lesson that can be learned from this is that passage alteration should never be done with people deeper in the cave. Entrapment is not to be taken lightly. Rescue can be delayed and/or take hours or even days. In this instance the collapse could have fallen on the women causing serious injury. Being able to dig out a small hole to pass blankets, food, water, and a heater helped prevent hypothermia."

14 May
Bull Cave, Tennessee
stranded, inadequate equipment

Four college students in their twenties entered the cave at about 2:30 p.m. intending to descend the first two drops of 40 feet and 169 feet. They were not experienced cavers, and did not have proper climbing systems and safety equipment.

All four descended the first pit, and two of the students rappelled halfway down the 169-foot pit, stopping at a ledge when they ran out of rope. They became stranded on the ledge when they were unable to figure out how to use the Jumars and other equipment they had available. It had been raining earlier in the week, and the cave was very wet, with quite a bit of spray on the ledge.

The two unfortunates yelled up to their companions above and told them to go for help. One of them was able to climb hand-over-hand up the 40-foot pit and exit the cave. He went to the nearest house and called for help. Park rangers responded, and called in a cave rescue team from Knoxville to assist.

Rescuers entered the cave shortly after 7:00 p.m. and rigged both drops with haul systems. Two of the students were in fair condition and were assisted from the cave and treated for hypothermia. The third had become severely hypothermic while stranded on the ledge, and had to be placed in a litter and carried out. He was transported to a hospital and treated for hypothermia. The students were out of the cave by 9:45 p.m.

David Brace, "Bull Cave Rescue," TAG-Net #1089, 17 May 1997.

Comments: Brace reports that the men were fined the maximum amount of $50 each for entering the cave without a permit. Bull Cave is located in a national park, and is the deepest cave in Tennessee at 741 feet.

31 May
McBrides Cave, Alabama
caver fall, flood entrapment

Gerald Moni (52), Nancy Aulenbach (25), Forrest Platt (22), Andy Zellner, Alan Cressler, Andy Porter, Steve Collins, Gary Chambers, Brent Aulenbach, Shane Snyder, and Doug Strait left the SERA Cave Carnival planning a "short but sporting" pull-down trip in McBrides Cave. The cave has an upper entrance and a lower spring entrance, connected by 6,000 feet of stream passage broken up by eight wet pits ranging from 20 to 90 feet deep. It is a popular wetsuit vertical cave, and is sometimes done in high water conditions to make it easier to travel through some of the crawling sections.

It was raining as they left the campground, and had been raining steadily for several days. The area forecast was for continued rain and thunderstorms through the weekend. They were confident that the cave would be passable, however, and were encouraged when the rain abated somewhat as they arrived at the cave.

They parked near the spring entrance, obtained permission from the landowner, and hiked to the upper entrance, 450 feet above the valley floor. The cave was taking a sizeable stream, which disappeared into the boulders near the entrance. The group entered the cave at about noon, climbing down a chimney and then making two dry rappels of 23 and 34 feet before encountering high water at the bottom of the second drop. The water complicated the descent of the next pit, a 25-foot drop. Several in the group remarked on the high water level, noting that the third pit was normally dry. The cavers pulled down the ropes and continued into the cave.

The water was higher than anyone remembered from previous trips. Nevertheless, they moved through the cave without incident until they reached a climbdown near the top of the 90-foot pit. The climbdown is about eight feet, with a

plunge pool at the bottom. In 1992 a caver fell off this climb and struck a hidden ledge in the pool, breaking her foot and requiring rescue. Despite this, Cressler jumped down the climb and into the pool, and encouraged Platt to do the same, telling her where to jump to avoid hitting the submerged ledge that had resulted in the earlier incident. Platt jumped and hit the ledge, breaking her tibia just above the ankle.

They discussed retreating to a dry area and waiting while some of the party could exit the cave and re-rig the upper pits for her to climb out, but Platt decided that she would rather keep moving and go out the lower entrance, which would probably get her out sooner.

The group rigged the nearby 90-foot pit, and everyone descended. The water was very strong, pounding the cavers as they rappelled. Platt had some trouble on the descent, but Chambers was able to belay from below and pull her to one side of the waterfall. Brent Aulenbach's headlamp was knocked down into his face, resulting in a cut on his nose. Strait went last, after rigging the rope for pulldown. He received a minor injury to his ankle during the descent.

Alternately carrying and assisting Platt, the group continued down the next two pits. They came to a belly crawl leading to the seventh drop – a 25-foot pit broken by a large ledge nine feet down. The crawl is about 50 feet long, and in the cave's flooded state had only a few inches of airspace above the strong current. The rig point is in the stream crawl right at the lip, and it can be difficult to descend even in low water.

Porter scouted the passage, and reported that the rig point was under water and that there were about two inches of airspace in the one-foot high, eight-foot wide passage at the edge of the pit. The cavers decided that they would have to descend by gripping the rope with their hands and sliding down to the ledge, where they would then be out of the water and able to rig in and rappel the remaining 16 feet to the bottom.

Several of the cavers made it through the crawl and down the pit, including Platt. All had difficulty avoiding being washed over the drop. Gerald Moni attempted to descend as the others had. As he slid over the lip, however, he lost his grip on the rope and fell to the ledge, nine feet below, breaking his left femur. He cried out for help, and was heard by the cavers waiting below. The time was 3:20 p.m.

Chambers climbed back up the 16-foot drop and found Moni lying on the ledge. He called down to the others, told them what had happened, and told them to go for help. Their second rope was still somewhere above, so Cressler cut a section off of the excess rope hanging down. Accompanied by Porter and Platt, he started for the next pit.

At that point, Steve Collins started down the nine-foot drop. Chambers guided him down, and helped Collins avoid landing on Moni. Several more cavers descended the nine-foot drop, guided by Collins and Chambers. Nancy Aulenbach broke a finger when her hand became pinched between the rope and the rock as she went over the lip. The last two cavers, Snyder and Zellner, did not come through.

The waterfall was arching out into the pit, leaving Moni out of the flow. He did not want to be moved, and felt he could wait where he was until help could be brought in. Collins and Chambers stayed on the ledge with Moni, while the others descended the remaining 16 feet to the floor and started out.

By this time, Nancy Aulenbach was hypothermic and could not stop shivering. She was wearing polypro and a cave suit rather than a full wetsuit. The water appeared to be rising, and they could not afford to be trapped in the cave. Strait led the cavers toward the lower entrance.

They went through about 200 feet of low passage with about five inches of airspace and arrived at the last pit. All of the water funneled down a three-foot diameter hole and fell 25 feet to a deep pool. They descended the pit and made their way through 2,500 feet of stream passage, including several sections of low-airspace, to arrive at the spring entrance.

About one and a half hours passed after Moni's fall before Zellner and Snyder were able to descend the nine-foot drop and rejoin their companions. By this time, the low-airspace passage leading from the bottom of the pit had sumped. Moni, Chambers, Collins, Zellner, and Snyder were flooded in, and spent the next 12 hours waiting and trying to keep warm. Moni remained on the ledge, while the others waited in a sandy room at the bottom of the 16-foot drop. Collins spent much of the time with Moni, travelling up and down the 16-foot drop to keep warm and check on the water.

Cressler, Porter, and Platt had exited the cave at about 4:30 p.m. and had gone to the cave owner's house to call for rescue. Cressler and Porter then set up a stream gauge to monitor the water level at the lower entrance. The water continued to rise. Strait and the Aulenbachs made it out of the cave at about 5:45 p.m. Platt and Nancy Aulenbach later went to an emergency room for treatment, then returned to wait for the others to come out.

Rescuers began to arrive at about 6:30 p.m. The water level reached a peak at about 7:00 p.m., and then slowly began to recede. Rescuers attempted to enter both entrances. At the upper entrance, they were stopped by a siphon at the third drop. A team entered the lower entrance and was able to make its way to the bottom of the last pit, bypassing two sumps and navigating several very-low-airspace sections while working against the strong current.

The waterfall at the last pit presented a problem, which was solved by pulling the rope to one side. Two cavers were then able to climb up into the dry room at the top of the pit. Pushing upstream, they were stopped by the siphon just below the room where the trapped party was waiting. They retreated to the dry room at the top of the last pit, notified the rescuers outside, and waited for the water level to drop. They used a small stove to heat tea and soup as they waited and watched their stream gauge.

Over the next four hours, during which time the stream level and weather conditions were closely monitored, the water level slowly dropped. By 5:30 a.m. the water level had dropped several inches – enough that rescuers were finally able to get through to the trapped cavers.

Snyder, Zellner, Collins, and Chambers were cold but unharmed. All were suffering from hypothermia, with Zellner in the worst condition. He and Snyder were also wearing cave suits and polypro rather than wetsuits. They were given food and hot drinks, and were able to make their way out of the cave without further assistance.

Moni was lowered from the ledge to the room below, then placed in a Sked litter. He was in pain, but was reasonably warm in his full wetsuit and nylon coveralls. Rescuers floated him through the 200-foot long low-airspace passage to the room at the top of the last pit. He was lowered down the drop into the waiting hands of rescuers below.

A makeshift warming tent had been set up below, and Moni rested there and was examined by medical personnel. He was in very good shape considering his injury and the long stay in cold wet conditions, and was ready to get out of the cave. Teams of cavers moved him quickly through the passage, and he was out of the cave by 1:45 p.m. He was taken by helicopter to a hospital for treatment. He made a full recovery.

1. *Associated Press, "Spelunkers survive horror 500 feet down,"* The Birmingham News*, 2 June 1997, p. 4B.*
2. *Steve Collins, "SERA '97 – McBrides Cave & Rescue,"* Speleonews*, Summer 1997, v16n3, p. 4.*
3. *Alan Cressler, "McBrides Cave," TAG-Net #1104, 3 June 1997.*
4. *Gary Chambers, "McBrides Trip Report," TAG-Net #1104, 3 June 1997.*

Comments: The ground was saturated from the earlier rains before the cavers arrived. Light rain continued after their entry, and heavy rain fell in the late afternoon. The area forecast indicated one to two inches of rain that afternoon. On saturated ground, that was enough to cause a serious flood in the cave. The evening forecast predicted heavy rain through the night.

Fortunately, the predicted evening thunderstorms moved by to the north, and the rain abated during the rescue. There was serious concern that rescuers might become flooded in along with the trapped cavers. Had the rain fallen as predicted, the cave would likely have remained flooded through the next day, and the outcome might have been very different. Several of the trapped cavers were severely hypothermic by the time rescuers reached them.

Members of the party later stated that they had not given enough consideration to the weather conditions, and that they should not have entered the cave that day. They were expecting a fast trip in "sporting" conditions, and were not prepared for a long stay underground. Some were inadequately clothed for the conditions, wearing only polypro and nylon cave suits. Those who had on full wetsuits fared much better. Jumping into the pool was unwise, given its history.

Cave trips can take on a momentum of their own. "Pull-down" trips are especially committing. Cavers sometimes need to stop, think, and discuss hazards and options before making irrevocable decisions.

31 May
McClungs Cave, West Virginia
caver fall

Eric Hadden (11) and 25 other boy scouts entered McClungs Cave with four adult scout leaders. Some of the scouts had been caving before, but others were on their first caving trip. The leaders did not have much caving experience. The scouts had helmets, but were carrying hand-held flashlights. After about five hours of caving, the group was headed out and moving through the Entrance Canyon. They were about 25 or 30 minutes from the entrance when Hadden lost his footing and fell about 15 feet down the canyon.

The group leaders notified authorities, and a rescue effort including many local cavers was mobilized. Hadden was placed in a litter and carried through the canyon and out of the cave, exiting just after midnight. An ambulance was waiting to take him to a hospital for treatment. Hadden spent the night in the hospital and was released the next morning. He had no broken bones, but was heavily bruised on one side from waist to ankle.

1. *George Dasher, "WVACS Activities,"* The West Virginia Caver*, August 1997, v15n4, p. 13.*
2. *Al Stubbe and Dave Socky, "McClungs Cave Rescue,"* The Carbide Dump*, June 1997, v32n6, p. 28.*

Comments: The various reports point out several issues. In the opinion of the cavers who know the cave, it is not suitable for first-time cavers. There were too many scouts and not enough adults. There were no experienced cavers with the group. They were not properly equipped for the cave.

Traversing a cave often requires both hands, and this canyon is reported to be slippery and exposed. Hand-held flashlights are not suitable for primary caving lights – helmet-mounted lights leave the hands free for caving. Finally, the five-hour trip was probably too long and strenuous for the group. Hadden was reportedly having difficulty before the fall, and may have been exhausted.

31 May
Spring Valley Cave, Minnesota
caver fall

Jay Kennedy was working on a solo aid climb on a wall in the Colossal Room while three companions worked on a dig downstream. He was about ten feet above his last anchor when one of his aid pitons pulled out of its crack. Kennedy fell about 20 feet, and his self-belay, a three-wrap prusik, slid about 12 inches before catching the fall. Kennedy sustained bruises and abrasions on his arms and right leg, but no serious injury. His wetsuit provided some padding and protection, softening the blow to his right tibia and possibly preventing a fracture.

Kennedy checked himself for injury, and finding none, climbed back up to his anchor and retrieved his slings. He then descended from the wall, packed his gear, and left the cave without further incident.

Jay Kennedy, Incident report, 4 June 1997.

Comments: Kennedy notes that he is a caver of 20 years experience, and sometimes caves solo under controlled circumstances. In this case, the other cavers were not far away if assistance was needed, and he felt comfortable climbing alone with a self-belay. After the fall, he decided to return to the cave at a later date with a belayer and a drill to climb using traditional bolting technique.

May
Schmitt Farm Cave, Iowa
caver fall, inadequate equipment

Three youths decided to descend the 60-foot entrance pit and explore the cave at the bottom. Two of the youths lowered the third down on a rope. When they attempted to pull him back up, the rope broke. The young man fell about 15 feet to the ground and broke both his wrists. The county search and rescue team was called to rescue the stranded youth.

Marc Ohms, Incident report, 29 May 1997.

Comments: The youths were not using proper caving equipment and techniques. It was reported that the Iowa Grotto had done several mock rescue exercises with the county search and rescue team. The time and training paid off.

May
unspecified cave, Kentucky
difficulty on rope, equipment problem

James Johnson was on rope climbing a pit in a multi-drop cave in Kentucky when one of the foot loops on his Frog climbing system snagged just below the lip. As he turned and reached down to free the loop, he heard a "click" and looked down at his Croll chest ascender to find that it had disconnected from the rope. He immediately clipped in to the anchor rigging with his two cow's tails, and was then able to free the jammed loop by removing his foot ascender from the rope and turning around.

James K. Johnson, "Petzl Croll," Cavers Digest #5451, 6 June 1997.

Comments: This incident is worth reporting because it illustrates the need for redundancy in your climbing system. When the Croll became unclipped, Johnson was still secured by the tether from his seat harness to the foot ascender, but quickly used his cow's tails for backup. Cavers should always have a cow's tail and/or third ascender for use in such situations, as well as for negotiating lips, rebelays, and knots on rope. Ascenders can and do disconnect themselves from the rope. Slings and buckles sometimes fail. Design your system to protect against these problems.

Spring 1997
unspecified Bath County cave, Virginia
caver fall

Cheryl Valone, a first-time caver, fell while traversing a ledge about 20 feet above the floor, injuring her lower leg. Cheryl was caving with an experienced group and had proper safety equipment. Her companions sent for help, and local rescue squads responded. She was carried out of the cave several hours after her fall. No other details were available.

Ollie McKagen, Cavers Digest #5464, 25 July 1997.

7 June
Big Bone Cave, Tennessee
caver fall

Larry Matthews was leading a group of friends on an easy trip in Big Bone Cave. Several of the cavers were on their first "wild" caving trip, and Matthews had selected the cave for its large easy passage and interesting history. They had entered at about 12:30 p.m. and were approaching the Muster Ground at about 2:30 p.m. when Ann Caste lost her footing at an 18-inch step in the passage floor and fell, breaking her ankle.

Two of the others helped her up, but she was unable to walk, even with their support. Matthews decided to go for help. Accompanied by one of the other cavers, he exited the cave, hiked up the mountain to his vehicle, and drove to the park headquarters, where he reported the accident. Park officials called the Sheriff to dispatch the county rescue squad.

Matthews returned to the cave, where he met the park ranger as well as members of the rescue squad and sheriff's department. The rescuers were not equipped for caving, but did have emergency medical equipment. Matthews and the park ranger led them into the cave and to the accident site. There, they splinted Caste's ankle and began moving her out of the cave.

They did not have a litter, and wound up fashioning a substitute using a blanket. That worked for a while, and when it began to come apart they retrieved a backboard left at the entrance and used it for the rest of the evacuation. Caste was out of the cave about four hours after her fall, and was carried up the hill to an ambulance. She was transported to a hospital where she had surgery the next day to repair her ankle, which had been broken in three places.

1. *Larry Matthews, "Big Bone Cave," TAG-Net #1109, 8 June 1997.*
2. *Virginia Burgess, "Big Bone Cave Accident Report," Spencer Mountain Grotto* Mud & Rope*, June 1997, v2n6, p. 3.*

Comments: Matthews notes that the rescue squad worked very hard and did a good job, but were hampered by the fact that they lacked most of the standard equipment for cave rescue. Once again, it is apparent that cavers and cave rescuers must work with local rescue squads to increase their awareness of cave rescue techniques and resources. Also, when reporting an accident cavers should tell the authorities about cave rescue teams that may be available in the area and explain the need for the special equipment and training that those teams can bring to the effort. Know how to contact cave rescue teams in your area, and be ready to help local officials reach them.

7 June
Lawrence Welk Cave, California
caver fall

San Diego Grotto members including John and Cassiopeia Barlow were leading a group of Boy Scouts (ages 10 to 15) on an introductory caving trip. A woman named Brenda, who was the mother of one of the scouts, took a ten-foot fall,

twisting her ankle and landing on her back. One of the scouts was able to slow her fall enough to prevent serious injury, but she felt pain in her hip and ankle. When she tried to climb back up to the entrance, she began showing signs of shock. The cavers sent one of the scouts to retrieve a pack of rescue equipment they had left at the entrance, and used slings to help the woman up the climb and out of the cave.

Cassiopeia Barlow, "Lawrence Welk: A Scout Adventure," San Diego Grotto News, *July 1997, v3n10.*

Comments: The cavers were wise to have rescue and first aid equipment available. It would have saved some time if they'd carried it with them instead of leaving it outside. Shock is a serious concern in any caving accident, and must be recognized and treated quickly.

4 July
Lilburn Cave, California
difficulty on cable ladder

Roger Mortimer, Merrilee Profitt, and Glenn Butcher entered Lilburn Cave in King's Canyon National Park as part of the ongoing Cave Research Foundation project there. Just inside the entrance is a 40-foot pit, which was rigged with a cable ladder and belay line. Butcher had some trouble descending the ladder. After a short trip checking phone lines, the group headed out. They stopped for water and a snack before beginning the ladder climb. Once again, Butcher had difficulty with the ladder, climbing only five feet on his first attempt and three feet on the second try. He did not want to rest on the belay line.

The group considered making the three-hour traverse to the second entrance, but decided against it due to the distance and the presence of several exposed areas along the route. The decided to send for help from cavers staying at the cabin nearby. Five cavers returned and quickly rigged a haul system and a separate belay from above. Butcher was hauled up the first part of the pit, where the ladder hung free, and was able to climb the last part where it lay against the rock.

Roger Mortimer, Incident report, 19 August 1998.

Comments: Mortimer attributes the incident to inexperience and poor conditioning. Butcher was on his second caving trip, and had very limited experience with cable ladders. Mortimer notes that the group always uses a belay at the ladder for both ascent and descent, a wise practice.

10 July
Wind-Ice Cave, Wyoming
caver fall

Cindy Budge, John Davidson, Warren Anderson, Ian Gersten, Keith Benefiel, and several others entered the upper Ice Cave entrance of the cave on a training trip for members of the Teton County Search and Rescue Team. They planned to descend six drops in the Ice Cave section and exit via the lower Wind Cave entrance. The Wind Cave entrance is connected to the Ice Cave section at the bottom of the sixth drop by a small pit which they planned to ascend using a cable ladder and belay line rigged in advance.

The trip went as planned until they reached a junction near the bottom of the cave. At that point the group split up, with Budge, Davidson and Anderson taking a shorter route down the sixth drop, a 25-foot pit, while Gersten and Benefiel chose a longer alternate route involving a ten-foot chimney.

The 25-foot drop was not rigged. Anderson, an experienced caver and one of the original explorers of the cave, was familiar with it and decided to climb down and retrieve the belay rope from the nearby cable ladder climb. He climbed down the drop and up the cable ladder without belay, removed the rope from the ladder climb, then climbed back down the ladder and up the 25-foot pit. He then rigged the 25-foot drop for the others to rappel.

Meanwhile, the group taking the longer bypass route came to the ten-foot chimney climb. Gersten lost his footing in the chimney and fell, bruising his back and breaking a finger. After a short break the group continued down the passage, arriving at the bottom of the 25-foot pit and the ladder climb.

Budge and Davidson had rappelled the drop and were waiting for Anderson to de-rig the rope and climb down. Anderson had instructed them not to climb the cable ladder until he could reestablish the belay line. Despite this, Budge climbed the ladder without belay. As she reached the top, she slipped, lost her grip on the ladder, and fell the entire 20-foot length of the climb. Budge fell sideways, striking Benefiel, who had just turned the corner and walked into the area, unaware of the climber above. He was knocked to the ground by the impact. Davidson saw her slip, lunged across the room in an attempt to break her fall, and was also knocked down by the impact. Budge ultimately landed on a breakdown pile.

Budge broke three ribs, punctured and collapsed one lung, and sustained various bruises and abrasions in the fall. Benefiel was stunned by the impact and suffered a knee injury. Davidson suffered no serious injury.

Moments after the fall, the remainder of the team, including an EMT, arrived at the scene. After assessing everyone's condition and treating the obvious injuries, they determined that Budge and Benefiel could walk out with assistance. Budge was able to climb back up the ladder, this time on belay, and exit the cave with some assistance. Benefiel was able to exit under his own power.

Once out of the cave, Budge felt better and was able to hike back down to the team base camp. After reaching the camp, her condition began to deteriorate. She had difficulty breathing and felt pain in her chest. The team called in a helicopter to take her to the hospital. The following day doctors used a chest tube to reinflate her collapsed lung. Gersten traveled by horse from the camp to the trailhead and was then driven to the hospital for treatment of his injuries.

1. *Mark Hoffman, "County rescuers rescue one of their own team,"* Jackson Hole News*, 16 July 1997.*
2. *Thomas Dewell, "Search and Rescue members injured during cave training,"* Jackson Hole Guide*, 16 July 1997.*
3. *Keith Benefiel, Incident report, 28 April 1998.*

Comments: Benefiel notes that all the team members had been instructed in class not to climb cable ladders without a

belay. He speculates that Budge may have overlooked the rule after seeing Anderson, a very experienced caver who was not a rescue team member, "scamper up and down" the climbs. This serves as yet another reminder that it is not safe to climb a cable ladder without a belay.

Communication was also a factor, in that a caver walked into a fall zone just in time to be hit. Team members need to keep track of who is doing what on a drop, and when the fall zone is clear for entry.

10 July
James Cave, Virginia
caver fall

A group of boy scouts was inside the cave near the entrance when one of the adult leaders fell about 15 or 20 feet. The group sent for help, and the county rescue squad responded. The man was able to exit with assistance. No other information was available.

Ollie McKagen, Cavers Digest #5464, 25 July 1997.

12 July
Hellhole, West Virginia
caver fall

Ed Devine, Gordon Brace, Lewis Carrol, and Bob Anderson entered Hellhole at about 10:00 a.m. on Saturday to explore and survey a lead discovered during an earlier trip. They rappelled the 150-foot entrance pit and proceeded into the newly discovered section of the cave, where they descended another 100-foot pit. After some digging, they broke through into large passage with many new leads. They had spent about 11 hours surveying in the new area when Anderson slipped while climbing up a boulder and fell about three or four feet. When he landed, he suffered severe fractures of his lower leg.

The cavers attempted to stabilize Anderson's leg with a makeshift splint, but the damage was too great, and they could not make it secure enough for him to try to move through the cave without causing more internal damage. Devine and Brace gave their extra clothing and supplies to Anderson and Carrol and started out to get help. They were several hours travel from the entrance.

Carrol and Anderson tried to keep warm as they waited. About 12 hours after the fall, the first rescuers reached the accident site. A wire mesh splint was applied to stabilize Anderson's lower leg and foot. The rescuers pointed out that the passage would be difficult to move a litter through, and that Anderson would get out a lot faster if he could travel with assistance rather than being carried. Anderson felt he could do that, and was ready to go.

For the next several hours, Anderson crawled, hobbled, and squeezed through the passages with help from rescuers as needed. He rested often, and his medical condition was carefully monitored. The two pits were rigged with haul systems, and fellow cavers quickly pulled him up. He reached the surface at about 10:45 p.m. on Sunday night and was taken by ambulance to a nearby hospital.

1. *Bob Anderson, "The Hellhole Rescue,"* The West Virginia Caver*, October 1997, v15n5, p. 13.*
2. *Steve Mosberg, "Rescue in Hellhole," Parkersburg Area Grotto* Subterranean Flyer*, 21 July 1997, v14n5, p. 9.*
3. *Doug Moore, Incident report, NCRC Eastern Region web site, 14 July 1997.*

Comments: There is little doubt that a full carry-out rescue would have taken much longer. The accident site was over a mile from the entrance. Several sections of passage were modified and enlarged to make it easier to get through. Anderson underwent multiple operations to repair his damaged leg. Once again, a short fall resulted in severe injury and a 24-hour ordeal.

16 July
Laurel Caverns, Pennsylvania
bumped head, plus other incidents

A young boy named Matt, approximately 11 years old, was on a commercially guided trip into the undeveloped section of Laurel Caverns when he struck his head, causing minor neck injuries. He was wearing a helmet provided by Laurel Caverns. The employees leading the trip decided that he needed to be carried out, and sent word out for a litter and assistance. About 20 fire and rescue personnel and 30 cave rescue volunteers responded. The accident site was at the very back of the cave, and the evacuation took about 3.5 hours.

Doug Moore, Incident report, NCRC Eastern Region web site, 17 July 1997.

Comments: This was reportedly the third incident of the day at the cave. Earlier, a visitor had suffered a broken ankle and was able to walk out with assistance. In another incident, a caver fell and suffered minor injuries. All three incidents involved different groups touring the cave.

19 July
Sotano de Tapanco, Mexico
rockfall

John and Suzy Pint took a group of cavers including several novices to the cave for a beginning vertical trip. The entrance is a hole about three feet by six feet, which opens into a long fissure. A second, smaller hole nearby offers a view of the upper part of the 50-foot pit.

The cavers descended the pit without incident and explored the area at the bottom, finding a second pit that was choked with rocks. They also noticed a one-inch diameter tree root which reached from the surface all the way to the bottom of the pit. One member of the group tugged on the root, announcing that it almost looked strong enough to climb on.

About an hour later, one of the novice cavers was on rope, making her first ascent of a pit while John Pint watched through the skylight above. The climber was about 30 feet off the floor when a two-foot long, eighteen-inch wide, six-inch thick block broke loose from the wall about three feet above her. The climber was able to fend off the rock with her hands, and it fell toward the three cavers below. Fortunately, they had

moved away from the rockfall zone to look at some formations.

The climber received scraped knuckles on both hands and bruises on her legs, but was otherwise unharmed. The rock landed on and damaged the excess rope lying on the floor of the pit.

John Pint, Incident report, 8 August 1997.

Comments: Pint observes that it had not previously occurred to him that roots can grow behind huge chunks of rock in a very solid, stable looking pit and create a life-threatening hazard. He was not sure whether disturbing the long root might have loosened the rock, but suggests that such things be left alone.

The three cavers on bottom had been standing right where the rock fell until moments before the incident. It is risky to stand in the rockfall zone of a pit at any time, and is especially dangerous while someone is on rope. Make it a habit to quickly get clear of that area and stay out of it whenever possible. Rockfall is one of the leading causes of accidents and injury in caving.

July
Boulder Cave, Vermont
rockfall

Kevin O'Classen, Steve Hazelton, Jay Conlin, and Jay's nephew Patrick had bottomed Boulder Cave and were on their way out. Conlin climbed up the chute leading to the entrance, followed by O'Classen who was watching to make sure Conlin fit through the squeeze. When he saw Conlin safely out, O'Classen turned and started back down the chute.

Suddenly, the large rock he had been standing on for several minutes broke loose from the wall, taking several others with it. O'Classen fell about six feet to a shelf of rock, and was struck by some of the other rocks during the fall. He landed on top of the largest rocks, which he estimated at 250-300 pounds. He was not seriously injured.

Everyone climbed out, taking care to avoid the loose rock in the center of the chute. A few smaller rocks and some gravel fell as O'Classen made his exit.

1. *Kevin O'Classen, "Boulder Cave Trip Report,"* Vermont Cavers Association Newsletter*, December 1997, v6n6.*
2. *Chuck Porter, "Northeast News,"* Northeastern Caver*, March 1998, p. 4.*

Comments: O'Classen observes that it is fortunate that no one was underneath him and that the collapse did not occur when Conlin crossed the rock and he was standing below.

24 August
Garrison Cave #2, Missouri
lost, stranded

Jon Beard, Rick Miller, and Victor Foster were surveying an upstream lead in the cave while three other cavers surveyed in another area. Miller decided to leave early, and started out solo. When the rest of the group finished surveying and exited the cave, they were surprised to find Miller's vehicle still present.

Part of the group returned to the cave and searched in vain, covering the entire "old cave" section. The decided to call in more cavers from their grotto to help with the search. The second search group repeated the search of the "old cave" section and then moved into the "new cave," where they soon found Miller about 500 feet down the passage. He had become lost on the way out, and had been waiting for seven hours.

Jon Beard, "Trip Reports," Kansas Kaver*, December 1997, v14n5, p. 5.*

30 August
Stephens Gap Pit, Alabama
fatality, caver fall, rappelled off end of rope

Karen Prowett (46), Ricky Rawlins, Terri Rawlins, James Englett, Ann Englett, Jeff Hearne, and Bonnie Teasley arrived at the parking area for the cave at about 12:15 p.m. They planned to spend the afternoon rappelling and climbing in the 143-foot open-air pit entrance. All were experienced cavers, with the exception of Ann Englett, who was just there to watch. Most, including Prowett, had done the pit before.

They hiked to the cave where Englett and Ricky Rawlins began rigging several ropes. A 200-foot rope was rigged on the waterfall side of the pit for rappelling. A 77-foot rope was rigged alongside as a "safety rope," with about 35-40 feet of its length hanging in the pit. The cavers did not tie a knot in the bottom of the short rope. A 245-foot rope was rigged on the opposite side of the pit to be used for ascent. After rigging the ropes, the cavers tried to adjust the long ropes so that they had no excess rope on bottom.

Englett was the first to descend on the 200-foot rope. When he reached the bottom, he noted that the 245-foot rope was short, and called up to Rawlins to lengthen it. While they were making the adjustment, Prowett went to the rappel rope and began to rig for descent. The others were not watching as she rigged, and no one noticed that she had rigged her rappel rack onto the 77-foot "safety rope" rather than the 200-foot rappel line.

At about 1:15 p.m., Prowett backed over the lip on rappel, pausing to call "Rock!" as several small stones were dislodged, then began to descend rapidly. When she reached the end of the short rope there was no knot to stop her from going off the end of the rope, and she fell about 100 feet to the bottom of the pit. Englett saw her fall, and rushed over to her. Hearne, who was trained as a paramedic, quickly climbed down to the pit bottom via a side entrance. He could not detect a pulse. Prowett was killed by the impact.

Hearne remained at the bottom while Rawlins went for help. Emergency personnel responded, and Prowett was carried out through the lower entrance of the cave.

Terri Rawlins, Incident report, 10 September 1997.

Comments: It is imperative that any rope rigged in a pit or down a drop first have a knot or loop tied in the end to prevent this from happening. The short rope was intended for use as a "safety rope" for the cavers to clip onto while rigging for

rappel. Instead, it was improperly rigged and created a dangerous situation, with tragic results.

Prowett made a mistake in rigging to the wrong rope. She did not notice the light weight of the short rope, and may not have paid enough attention during the rigging to be aware that one rope did not reach bottom. She did not look down to check the condition of the rope below her before going over the lip. But these things would have amounted to only a minor inconvenience if there had been a knot in the end of that rope.

It is every caver's responsibility to inspect and understand the rigging, and to point out and correct dangerous situations. This accident was entirely avoidable and should not have happened.

August
Anhumas Abismo, Brazil
caver fall, harness failure

Bill Rennaker and two cave-diver companions traveled from Miami to Sao Paulo, Brazil, where they met up with Brazilian cavers and traveled to Anhumas Abismo, where they planned to explore a deep underwater pit. The cave entrance is a 276-foot pit, with about 70 feet of slope above a 200-foot free drop to a deep pool and submerged passage below. The Brazilian cavers had explored the cave earlier, reaching a depth of about 200 feet below the water surface, where they reported that the tunnel dropped down a deep pit. Rennaker and companions were equipped with special tanks and gas mixtures, and planned to dive as deep as 400 feet to explore the pit.

Rennaker had never rappelled before, but his hosts assured him that it was simple. They provided him with a harness and rappelling equipment, and described their use. The harness was described as "rated at 165 pounds, " which gave the 200-pound Rennaker pause, but his hosts assured him that they had used it with divers larger than him. He watched carefully as one of the Brazilians descended. Rennaker then rigged in and backed over the edge. As he leaned back, he felt himself drop several inches as his full weight came onto the rope and harness. He was startled, but then continued his rappel. He was then surprised by "the over-weighted climbing harness failing completely and suddenly giving way."

Rennaker found himself falling down the 200-foot drop. He was wearing leather gloves, grabbed the rope as tightly as he could, but the rope burned through the gloves and cut into his hands. He fell the full length of the drop and crashed feet-first into the pool at the bottom, sending up a huge geyser of water. After several seconds, Rennaker surfaced, and began swimming toward a ledge at the side of the pool.

Rennaker had suffered deep abrasions to both hands as he tried to grip the rope and slow his fall, but had no other injuries. His companions wanted to exit, but Rennaker vetoed the idea. His hands were hurting, but the 56-degree water muted the pain, and he did not want to try to go back up the rope yet. He decided to go ahead with the planned dive. They decided that he would signal the others and turn back if his hands bothered him too much.

The men donned their equipment and followed the dive line to a depth of 200 feet, where they tied on a new line and proceeded. They were disappointed when the passage ended at a depth of 260 feet.

After decompression, the men emerged from the water and geared up for the climb up the rope. Rennaker's hands were useless by that point, so he was hauled up. His hands were permanently scarred.

Tom Morrisey, "A Pre-dive Dive," Scuba Times*, March/April 1998, p. 52.*

Comments: It is not clear just how the harness failed or what was meant by "rated at 165 pounds," but it should be obvious that the men did not have the proper equipment and training for a 200-foot pit. Rennaker was quoted as saying, "I've learned my lesson. I wouldn't cave-dive without training and I now know better than to rappel without training. I'll get the right equipment and learn to use it the right way."

Diving with reduced manual dexterity is very hazardous. People who have been injured often display poor judgement and their condition may deteriorate suddenly. If this had occurred during the deep dive, Rennaker (and perhaps one or more of his companions) could have died. If someone is injured, aborting the trip should be the default decision.

Summer 1997
Bowden Cave, West Virginia
lost

Cave rescuers were called when a group was reported overdue in the cave. They were found in the first room, about 100 feet from the entrance, where they had been unable to find the passage out. No other information was available.

Doug Moore, NCRC Eastern Region web site, undated.

13 September
Sharps Cave, West Virginia
lost

Marshall Holmes and several other cavers entered Sharps Cave and immediately encountered a poorly-equipped group exiting the cave. One person in the group had a helmet and Wheat Lamp, and the others had a few flashlights and no helmets. They also carried a short length of two-inch manila rope. Some of their lights had died, and they were having difficulty with a climb just inside the entrance. Holmes gave them some help, and spoke with them about caving safety and proper equipment. The party left the cave, and Holmes' group continued their trip.

Some time later, Holmes and companions were resting in Halloween Hall when they heard voices approaching. The group from the entrance had apparently gone to a nearby store, bought fresh batteries, and ventured back into the cave. They were now lost, and could not find their way back to the entrance.

Holmes and his friends showed the lost cavers the way back to the upper cave, but the group soon took a wrong turn in the Entrance Maze and was in danger of becoming lost once again. Kevin White showed the spelunkers the correct route while the rest of the cavers exited the cave. Holmes gave

the group another talking-to, and invited them to go caving with experienced cavers and learn better caving techniques.

Marshall Holmes, "A 'Near Incident' in Sharps Cave," The West Virginia Caver*, December 1997, v15n6, p. 13.*

Comments: Holmes was certain that a rescue would have resulted had his group not been there to lead the spelunkers out from the Halloween Room. They were wandering in circles and would soon have exhausted their batteries and become stranded.

26 October
J-4 Cave, Pennsylvania
caver fall

A group of teenagers was exploring the cave when a girl fell about eight feet and broke her arm. Three of her companions left the cave to get sticks to make a splint. At the entrance, they encountered a group of cavers entering the cave. When they heard of the accident, two of the cavers went to assist while two others went to a nearby house and called 911. The cavers helped the girl out of the cave, reaching the entrance just as emergency response personnel were arriving.

Robert W. Jones, Incident report, 9 November 1997.

Comments: The teenagers did not have proper caving equipment. The injured girl was wearing a baseball cap, and her partner was wearing a bicycle helmet.

1 November
Fern Cave, Alabama
difficulty on rope

While on a trip to descend the 404-foot drop in Surprise Pit, a caver (32) became stuck just below the lip when she could not get the rope to feed through her rack. She was reportedly afraid of heights, and had tried to go over on her knees. She slid down the slope and wound up with her rack pinned at the lip. She became concerned, and did not want to continue the descent, but did not feel comfortable making a changeover on rope to climb back up. Scott Fee was able to attach two ascenders with long slings above the stranded caver, allowing her to climb back up over the lip. The group then left the cave.

Scott Fee, Incident report, 11 January 1998.

Comments: Fee notes that a modification in the rigging would have made the lip easier to cross. It is alarming that a caver who is afraid of heights and feels uncomfortable doing a changeover on rope would contemplate doing a 400-foot pit. Cavers should perfect their technique on smaller drops before attempting the big ones. Things feel very different when you have the weight of 400 feet of rope hanging below.

1 November
Illinois Caverns, Illinois
caver fall

Mark Jones was leading seven students on a novice caving trip when one of the girls tripped on the sharp lip of a pothole in the stream passage and twisted her leg. She immediately went down, and was in obvious pain. They decided that she would need assistance getting out. They were about one-hour's travel from the entrance, so Jones sent three boys out to get help.

After they left, Jones stabilized the injured girl's leg by strapping it to her other leg with two belts. Then they began carrying her toward the entrance, taking turns to let everyone rest. After about 45 minutes, the girl began to get cold, so Jones covered her with a thermal blanket. On the way out they were met by Marc Tiritilli, a caver who had been leading another group touring the cave. He had encountered the three boys on their way out, and had come to help. Soon after that, volunteer firemen began to arrive. They had been called by the park ranger after the boys told him of the accident.

The firemen had brought in a wire Stokes litter. They placed the injured girl in the litter, using coats for padding. Working together, the cavers and firemen carried the litter through the cave and out the entrance. An ambulance was waiting outside and transported the girl to the hospital, where her injury was diagnosed as a strained ligament.

Mark Jones, "Illinois Caverns Rescue – November 1, 1997," Mark Twain Grotto Echoes*, February 1998, v5n1, p. 2.*

Comments: Jones notes that as a result of the rescue he now carries in his pack several items that he would have found useful on the trip, including: a better first aid kit; a long section of one-inch tubular webbing; extra batteries; a plastic trash bag (in addition to the thermal blanket); extra gloves; and a hat. He also observes that "the NCRC training proved invaluable to the two experienced cavers leading the rescue" and recommends the training to all rescue personnel in cave areas. The fire department was not well equipped for the cave. Cavers could help them obtain better equipment and training.

2 November
Fern Cave, Alabama
fatality, caver fall, lost control on rappel

David Cole (24), Jennifer Foote (23), Alexia Hampton (35), Reid Hampton (40), Lane Purser (54), and Lynn Purser (44) entered the Fern Sink entrance of Fern Cave at about 11:00 a.m., planning to descend a 404-foot drop in Surprise Pit. A sizeable waterfall was pouring into the entrance sink as a result of the previous day's rainfall. They climbed down into the sink and made their way through 800 feet of narrow stream passage to the Waiting Room, where the stream drops into the 437-foot shaft.

The 404-foot rig point is reached by crawling through a slot along the wall and traversing an exposed ledge around the pit for about 30 feet to a natural bridge across the pit. There are several possible rig points, and the group chose the most frequently used one, located at the far end of the bridge, well

away from the waterfall. Several bolts in the wall provide anchors for the drop.

Cole rigged a line across the ledge traverse so that everyone could remain clipped in while moving out to the bridge. He then rigged the pit with a new 600-foot caving rope. He also rigged a short rope in the pit for assistance in crossing the lip or taking photographs. Both ropes had knots tied in their ends. Cole reminded everyone that the long rope was brand new, and would therefore be slick and likely to give a fast rappel.

Cole decided to remain on top until the others went down. Foote had little vertical experience, and did not plan to do the pit. Lynn Purser rappelled first, followed by Lane Purser and then Reid Hampton. None experienced any problem descending. The area at the bottom of the pit was windy and cold, with lots of spray and mist from the waterfall. The rope landed partway up a tall breakdown slope known as Cuddingtons Cairn. As the cavers got off rope, they moved up the slope to get out of the rockfall zone and watch the next person descend. They did not use bottom belays.

Alexia Hampton went next. She was an experienced vertical caver and had done many pits, including several over 100 feet deep and two pits over 200 feet deep. This was her first trip to Surprise Pit, and her first pit over 250 feet deep.

Hampton rigged in using five stainless steel bars of her six-bar rappel rack. She did not ask for or receive a belay, and did not use any self-belay device. Hampton eased over the edge and began her descent without difficulty. Cole watched as she descended the first 200 feet.

Reid Hampton and the Pursers watched the rappel from below. Everything appeared normal until Alexia was about 50 feet from the bottom. At that point, they heard her cry out, and saw her fall as she lost control of her rappel. She struck the floor with a violent impact, tearing one boot from her foot, and sustaining compound fractures of her lower left leg as well as other injuries. She was knocked unconscious by the impact. The time was 1:15 p.m.

The others rushed down to her, fearing from the sound that she must be dead. She was still breathing, however, and regained consciousness after a few minutes. She was in severe pain from her injuries, and complained of pain in her left femur, as well as in her abdomen.

At the top, Cole heard Hampton's cry, followed by a loud impact as she stuck bottom. There were more cries from the bottom. He then heard Lynn Purser calling to him to go for help, but felt he needed to know what had happened before doing so. He waited a few minutes, and heard Lane Purser call for him to come down quickly.

Cole rigged in and went to the bottom. Hampton was conscious by this time, and aware of her situation. The cavers moved her carefully away from the rope to a flat spot about three feet away. They covered her with an emergency blanket, and Cole started out for help. He climbed out of the pit as quickly as he could and left the cave with Foote following. After running down the mountain to the vehicles, he used Foote's cell phone to call a cave rescue team member in Huntsville. He then called the county Sheriff's office and reported the accident.

Cole then took a sleeping bag, backpacking stove, and another emergency blanket and went back to the cave and down the pit. Hampton was covered with the sleeping bag and blanket. Lane Purser went out for more sleeping bags while the others remained with Hampton. At about 4:45, Cole climbed out to look for Purser and the sleeping bags. He found Purser just arriving at the pit, ready to take the bags down to Reid Hampton and Lynn Purser, who were becoming cold.

Shortly after, rescuers began to arrive at the pit. Cole explained the situation, and he and Foote went outside to answer questions and help brief the rescuers. Cave rescue teams from Alabama, Tennessee, and Georgia worked through the night to bring Hampton out. Two EMT's were sent down the pit to care for her as she was placed in a litter and hauled up the 404-foot pit. She was then carefully moved across the exposed ledge traverse around the pit and into the Waiting Room.

Rescuers carried her through the narrow stream passage, reaching the bottom of the entrance sink at about 1:00 a.m. Just as rescuers were about to move her through the entrance, Hampton stopped breathing. She was quickly passed up out of the sink to the surface, where medical personnel tried to revive her. They were unsuccessful. It is believed that she died from internal injuries and bleeding. She survived for almost 12 hours after the fall.

1. *John Van Swearingen IV, "Analysis of the Tragedy at Fern Cave, Alabama,"* NSS News*, May 1998, v56n5, p. 146.*
2. *David Cole, "Accident in Fern Cave,"* Southport Digs*, November/December 1997, v3n13, p. 11.*

Comments: Hampton had sufficient training and experience to safely do the pit. She had the proper equipment. No one knows why she lost control of the rappel only 50 feet from the bottom. Some of those involved in the trip and ensuing rescue operation believe that she was probably struck by a falling rock or clump of mud, which could have stunned her and caused her to lose control.

When she struck bottom, her rack was still attached to the rope with five bars. Her right hand had blisters under her glove, indicating that she tried to grip the rope to regain control during the fall. She did not know or was not able to tell her companions what caused the fall.

It is very important to realize that free-hanging rope weight reduces as one rappels down a deep pit. This makes a big difference in the amount of friction that a rack produces. A caver may have to remove bars at the top of a drop in order to move, then *add* bars towards the bottom of the drop to get more friction.

At the top of Surprise Pit, Hampton would have had about 25 pounds of rope beneath her. At 50 feet above the floor, she would have had about 3 pounds. This is a large difference, and it can be very difficult to jam the bars upward hard enough to compensate. Because Hampton had not previously done a drop of this length, she may not have been aware of this phenomenon or may have forgotten it.

If a bar cannot be added, an emergency technique is to quickly wrap the rope around a leg by spinning the ankle around the rope. This may cause severe burns, but is preferable to an out of control rappel. The technique requires

both practice and awareness that the hazard can occur at the end of a long drop.

Hampton's fall might have been prevented, stopped, or at least slowed by a bottom belay or a self-belay device. Cavers should give serious thought to this incident and to their own safety procedures in pits.

22 November
Laurel caverns, Pennsylvania
caver fall

Tim Billek (20) was exploring Laurel Caverns with six other college students on a trip led by experienced caver John Chenger. At about 1:00 p.m. Billek stepped into a shallow pothole in the packed sand floor and fell, injuring his left ankle. He was unable to bear weight on the ankle, which was very painful. They decided to wait a few minutes to see if the pain subsided.

After about ten minutes, Billek's ankle was splinted with a SAM splint and wrapped with duct tape. Chenger and other members of the party began helping Billek out of the cave, with assistance from a group of boy scouts who were on a separate trip. The route to the entrance was about 1,400 feet long with over 300 feet of elevation to gain.

Once the group had Billek moving, Chenger went ahead to the Ballroom where a telephone is located. He called out to the surface and requested help. When he returned to the group, he found that Billek was moving more quickly than expected, and was able to exit the cave largely under his own power. No further assistance was needed.

John Chenger, "Laurel Caverns Self-Rescue," The West Virginia Caver*, February 1998, v16n1, p. 11.*

22 November
Reeves Cave, Indiana
fatality, illness, heart attack in cave

A caver suffered a heart attack less than 100 feet from the entrance on the way out of the cave. Local fire department emergency medical services personnel responded, but were unable to resuscitate the man. No other information was available.

Jim Johnson, Incident report, undated.

14 December
unidentified sinkhole, British Columbia, Canada
caver fall

Dick Garnick, Mike Fraley, and Larry McTigue were trying to locate a large sinkhole reported to the Canadian Ministry of Forests by a timber cruiser. It was said to be taking a stream and blowing cold air when it was discovered. They had good directions and a map, and found the sink without difficulty. It was about 50 feet in diameter and 25 feet deep.

McTigue started down into the sink to look for cave at the bottom. As he made his way down the steep slope, he reached for a handhold on the rocks. What appeared to be a solid part of the bedrock rim of the sink turned out to be a loose block held only by dirt and moss. The instant McTigue put his weight on it, the rock came loose. He fell about six feet to a ledge, landed on his feet, and pitched headfirst into the sink, with the 100-pound rock in pursuit. After tumbling another 15 feet down the 45-degree slope, McTigue was struck in the back by the rock. The blow sent him sliding another six feet headfirst into a pile of rubble at the bottom of the sink.

McTigue was lying head down at a 45-degree angle. He moved to right himself from the uncomfortable position. The pain was so severe that he thought at first that the boulder had broken his spine. He was able to move his arms and legs, and able to turn over and sit upright. His glasses had been lost in the fall, and he could not see.

Fraley heard the fall and came to help. He located McTigue's glasses, and helped make him more comfortable as he rested and tried to regain his composure. Garnick arrived, and when McTigue felt ready, the other two helped him try to climb up out of the sink. The pain was intense, and McTigue didn't think he was going to be able to make the climb. Garnick decided to go for help while Fraley stayed with McTigue.

After more rest, and with assistance from Fraley, McTigue was eventually able to climb out of the sink. It was getting late, and the two men did not want to spend the night out in the cold waiting for help, so they began making their way back to the vehicles several miles away. After a five-hour ordeal, they were met by rescuers on the ridge above the parking area. McTigue was taken to a hospital, where he was treated and released.

Larry McTigue, "Accident in Canada," Cascade Caver*, January/February 1998, v37n1&2, p. 3.*

20 December
Morrells Cave, Tennessee
caver fall

Mark Ankers (16) was a beginning caver on his first trip with a local grotto. He was wearing a construction type hard hat with no chinstrap and carrying a hand-held flashlight.

About one hour into the trip he was crossing a tilted slab when he lost his footing and slid out of control about ten feet down the 50-degree slope. He received a cut across the bridge of his nose and injured his leg and his head. His glasses were broken in the fall, and probably caused the cut on his nose. One of the cavers had a first aid kit, and was able to clean and bandage the cut. The glasses were repaired with duct tape. Ankers exited the cave without further assistance.

Ted Durney, Incident report, 1 February 1998.

Comments: The trip was a grotto trip led by NSS members, but Ankers was not properly equipped. Durney notes that Ankers had good footwear, but that his use of the hand-held flashlight prohibited the use of one of his hands to arrest his fall. The cheap hard hat was also not a good idea. As NSS members, are we not obligated to make sure the people we take caving are properly equipped and trained?

22 December
Crossroads Cave, Virginia
lost, stranded, inadequate equipment

Mike Hall, John Spain, and Mike Poland entered Crossroads cave to go exploring, but became disoriented and could not find the way out. After wandering for a time, they decided to sit down and conserve their light and energy. They had left word that they were going caving, and that they would be back Sunday evening. When they did not return by Monday, they were reported overdue.

Authorities alerted cave rescuers, who went to the cave and found the young men huddled near the register. They were escorted from the cave and given food and warm clothing.

Ted Andrus, "Another Crossroads Cave Rescue," Blue Ridge Grotto The Carbide Dump*, January 1998, v33n1, p. 7.*

Comments: There was some confusion as to which cave they were in. When you leave word where you're going, make sure you identify the cave correctly.

23 December
Freemans Pit, Indiana
caver fall, rappelled off end of rope

A caver was injured by a 25-foot fall, which occurred when he rappelled off the end of his rope in the 98-foot pit. His companions called for help. Rescuers placed the victim in a litter and hauled him up the pit. He was transported to a hospital for treatment.

1. Frank Reid, Incident report, 24 December 1997.
2. Anmar Mirza, Incident report, 24 December 1997.
3. Jim Johnson, Incident report, undated.

Comments: X-rays showed compression spinal injuries and stress fractures in several vertebrae. The caver was treated and released that evening.

The caver was very lucky – a 25-foot fall can be fatal. Once again we are reminded of the importance of a tying a knot in the end of the rope.

1998 Accident and Incident Reports

15 January
Cueva de Horror, San Luis Potosi, Mexico
bad air

David Cole (24) and Lane Purser (53) entered a cave in the bottom of a large sink. The cave takes a large amount of water and large amounts of organic debris are found in certain areas. After a series of climbdowns, they descended a 21-foot pit. Several hundred feet later they came to a 27-foot pit. While setting a bolt at the top, Cole began to feel overheated.

After rappelling to the bottom, both Cole and Purser began sweating profusely and had difficulty breathing. A lighter would not light at the bottom of the pit, suggesting a low oxygen level. They decided to exit the cave. Cole spent the longer time on bottom, and felt lightheaded even after climbing back up. He had difficulty standing and walking, and wound up crawling the next 1,000 feet at a very slow pace.

David Cole, Incident report, 17 January 1998.

Comments: See the December 1997 issue of *American Caving Accidents* for a description of the "Bic test" for bad air. See also Bill Mixon's follow-up article on page 6 of this issue. The oxygen level was probably well below 17%. The minimum safe level is considered by many to be about 19%. When you suspect bad air – leave immediately.

24 January
Saltpeter Cave, Kentucky
fatality, illness, heart attack in cave

Frank Reid was co-leading a novice caving trip in Saltpeter Cave, Carter Caves State Park, for the annual Crawl-a-thon. The cave is shown commercially, and there is no strenuous caving required. The group was about to leave the cave when Reid was suddenly taken ill and collapsed near the entrance. Members of the group, which included EMT's and a medical student, immediately began CPR. Additional people with emergency training were nearby, and also assisted. Ambulances arrived about 20 to 30 minutes after the incident began and transported Reid to a hospital, where resuscitation efforts failed.

Jim Currens, Incident report, 26 January 1998.

Comments: Frank was a well-known and much-loved member of the caving and cave rescue community. He was an NCRC instructor for many years.

31 January
Tom Pack Cave, Tennessee
caver fall

Larry Church, Richard Blackburn, and four other cavers were exploring Tom Pack Cave when they came to a climb-up about 500 feet into the cave. As Church started up, a ledge he was standing on broke off and he fell about two feet to the floor. As he fell he grabbed at the ceiling to stop the fall, dislocating his shoulder in the process. He landed on the injured shoulder, breaking the ball joint at the top of his arm.

Blackburn went ahead to another group of cavers who were surveying to let them know what had happened and get some webbing. The cavers used the webbing to make a sling and immobilize Church's injured arm. Church was able to exit the cave with a little assistance from the group at climbs. He was taken to a hospital for treatment.

1. Richard Blackburn, Incident report, 6 February 1998.
2. Larry Church, Incident report, 23 February 1998.

Comments: The incident is a reminder to us all that even a small fall can cause serious injury.

14 February
My Cave, West Virginia
caver fall

While on a grotto–sponsored trip, Chuck Lamb slipped and fell down a hole in the Dune Room, dislocating his shoulder. He was able to exit the cave with assistance from his companions. No other information was available.

Doug Moore, NCRC Eastern Region web site, undated.

16 February
Small Wonder Cave, New York
bear encountered in cave

Four cavers encountered a bear in Small Wonder Cave, one of the Four Little Indians caves in southern Albany County. After Ed Lucas rolled a rock into the steep fissure entrance, Jim Gleason crawled in and saw an awakened bear looking at him, eight feet away. Two ten-year-old girls, Jill Donahue and Angela Lucas, were behind Jim, and Ed was about to start in. All the humans left the area quickly.

Chuck Porter, "Northeast News," Northeastern Caver*, March 1998, p. 4*

Comments: Always be alert to the possibility of animals in cave entrances. Large or small, they can cause problems if they feel threatened.

28 February
Skagnasty Cave, Tennessee
illness

Charlie Cole was with a large group of cavers touring Skagnasty cave. About ten minutes into the cave, they came to a small crawlway opening into larger trunk passage. Cole became anxious in the crawl, and backed out. He was sweating profusely and having difficulty breathing. Eric Anderson helped him away from the crawl and sat with him as he rested.

David Anderson and several other cavers soon arrived and asked if they needed help. It was quickly apparent that Cole was both deaf and unable to speak. Using notes, he indicated that he was feeling ill, had chest pain, was on medication, and needed assistance to leave the cave.

After some rest, the other cavers stayed with Cole as he started out. He lost his breath easily and had to be pulled up two short climbs. The trip back to the entrance took about an hour. Once outside, Cole recovered his composure. He told the others that he'd had two heart attacks previously.

David Anderson, Personal communication, 2 March 1998.

Comments: Cavers who have health issues should probably let their companions know about them in advance.

14 March
Clarksville Cave, New York
rockfall

Mike Nardacci and Bryan Robinson were leading a group of scouts on a trip to the cave. Both men had led many such trips at the cave over the years. Nardaccci and seven scouts entered at about 10:30 a.m., followed by Robinson and the remainder of the group. As the second group made its way down the steeply sloping entrance, a large boulder broke loose from the wall and slid down the slope toward the scouts below.

Robinson saw the boulder start to slide, and rushed forward to get one boy out of the way. He managed to push the boy to safety, but was struck by the boulder and momentarily pinned. As it settled into a more stable position Robinson was freed, but the impact caused injuries including a dislocated shoulder, broken arm, and broken thumb. The boulder came to rest in a precarious position at the top of a slippery slope leading down into the Big Room where other scouts were waiting at the base of the entrance climb.

A sling was fashioned from the straps of a cave pack, and Robinson was able to climb back out of the entrance on his own. After making sure that the boulder was stable, the adults escorted all the scouts out of the cave. Robinson was taken to a hospital for surgery to repair his broken arm and shoulder.

Mike Nardacci, "Clarksville Cave Accident," Northeastern Caver*, March 1998, p. 8.*

Comments: Local cavers went to the cave later that afternoon and pushed the boulder the rest of the way down into the entrance so that it presented no further danger. An investigation the following day determined that the boulder weighed approximately 1,400 pounds. The boulder had appeared to be a solid section of bedrock. Nardacci and others suspected that repeated freezing and thawing of water in surrounding cracks had loosened it. Temperatures during the previous week had been very cold, following a period of warm, wet weather.

As Nardacci writes in his report, "Bryan is a very good caver who performed heroically at the time of the incident. Had he not rushed forward, the scout might have been hit and severely injured. What might have happened if the boulder had not lodged where it did is far too unpleasant to think about."

11 April
unnamed cave, Indiana
caver fall, inadequate equipment

Brad Cunningham (14) and his cousin Michael Lawyer (17) entered the cave on Saturday afternoon to go exploring. They had been in the cave before, and had been stopped by a 30-foot pit. This time they came equipped with a knotted 3/8-inch nylon line obtained from a hardware store.

The boys traversed over 1,400 feet of tight, wet canyon and stream passage to get to the pit. They anchored the rope at the top, and Cunningham attempted to descend hand-over-hand. He could not hold on to the thin rope, and began to

slide, burning his hands. When he lost his grip, he fell to the bottom and injured his leg. Lawyer left him some extra clothing and went out to call for help.

Authorities were contacted at 6:00 p.m. and called in cave rescuers, who arrived at 7:15 p.m. The first rescuers reached the pit at about 8:00 p.m. Anmar Mirza rigged a proper caving rope, descended the pit, and found Cunningham stranded, but not seriously injured. The sediments at the bottom of the pit had broken his fall, and he suffered only a sprained ankle.

Cunningham was fitted with a splint, which was padded and secured with duct tape to form a sort of "walking cast." Mirza outfitted Cunningham with a Texas climbing system and held him out of the waterfall as he climbed the pit. Rescuers helped Cunningham over the lip and escorted him out of the cave. He reached the surface at 10:15 p.m. and was taken to the hospital by his parents.

1. *Jim Johnson, Incident report, 4 December 1998.*
2. *Anmar Mirza, Personal communication, 13 April 1998.*
3. *Terri Jo Cooper and Jodi Burck, "Bedford teen rescued after falling in cave," Bloomington* Herald-Times*, 12 April 1998, v32n31, p. A1.*

Comments: The boys did not have helmets or other proper caving equipment. It was fortunate that Cunningham was able to walk out with assistance. The report notes that a full carry-out in a litter would have taken many hours.

25 April
Hanors Cave, New York
stranded

George Allen, Chris Nicola, and Bob Cohen planned to do an entrance-to-entrance through-trip in Hanors Cave. The trip involves some difficult chimneys and a tight squeeze where the passage connects to the bottom of the Cave Disappointment entrance pit. They decided it would be easier to go in the Hanors entrance and rappel or down-climb the chimneys, then climb out the 50-foot pit at the Cave Disappointment entrance.

They rigged the 50-foot drop at the Disappointment entrance, then entered the Hanors entrance, using another rope as a rappel line at a 12-foot chimney. When they reached the squeeze opening into the room at the bottom of the entrance pit, Allen discovered that he could not fit through the crack.

They returned to the chimney, where they found it very difficult to climb back up, even with the rope hanging down. The rope was in a narrow part of the crack and they could not use their ascenders to climb it. By standing on Allen's shoulders, Cohen was able to get up. But after repeated attempts, neither Allen nor Nicola could get up the climb.

Allen suggested that they go get some help from other cavers known to be nearby. Nicola returned to the Cave Disappointment entrance, went through the squeeze, and climbed out of the pit. On the surface he met Cohen, who had exited via the Hanors entrance.

The two rounded up some cavers and additional equipment and went back to rig the chimney for Allen. They used a crowbar wedged across the top of the chimney to redirect the rope out of the narrow part of the crack so that Allen could use his ascending gear to climb up. He was soon out, and the cavers exited without further incident.

George Allen, "Assistance in Hanors Cave," Northeastern Caver*, June 1998, p. 44.*

Comments: If you're not sure you can get through, it is wise to rig in such a way that you are sure you can get back out the way you came in. This is a nice example of the use of other nearby cavers to effect a quick rescue using a minimum of resources.

26 April
Hidden River Cave, Kentucky
illness, passed out in cave

It was reported that during an NCRC weekend cave rescue seminar a student passed out for unknown reasons. The student had to be carried out of the cave in a litter and taken to the hospital by ambulance. No other information was available.

Jim Johnson, Incident report, undated.

3 May
Colisimo Cave, Pennsylvania
possible rabies exposure

Tim Marlett was leading a group of four cavers including Troy Wilber (12) on a survey trip in the cave when they encountered a bat flying in the ten-foot tall canyon passage. Marlett pointed out the bat, and the group continued its survey work.

The next day, Wilber told Marlett that he had a wound on his hand and that he thought it was a bite from the bat. Marlett thought that the wound appeared to be an abrasion, and was more likely due to one of the many squeezes in the cave, but advised Troy to see a doctor immediately. The doctor examined him and administered the required series of rabies shots.

Tim Marlett, Incident report, 7 May 1998.

Comments: Wilber was on his very first caving trip. He claimed that the bat brushed his hand, but denied making any motion toward the bat. Marlett felt that the boy may have been frightened and lifted his hand for protection, accidentally contacting the bat. Since they could not be sure, the rabies treatment was necessary.

19 May
Morris Cave, Vermont
entrapment

Obediah Raciot was leading a group of 11 college students on a beginner caving trip when the group encountered two 25 to 30 year old flashlight-carrying, helmetless cavers near the register. After some discussion, the groups went their separate ways. When the college group made their way out, they were surprised to find that the passage had been sealed with rocks from the outside. After quite a bit of work, they were able to

clear the obstruction and exit. There was no sign of the flashlight cavers.

Greg Raciot, "Morris Cave Incident," Vermont Cavers Association Newsletter*, June 1998, v8n3.*

Comments: Some cavers make a point to record the license numbers of unfamiliar vehicles seen at popular cave parking areas. In cases of theft, vandalism, or mischief such as this, that information can be very handy.

23 May
Cumberland Caverns, Tennessee
illness

Larry Matthews was leading a trip to the Great Extension section of the cave when he began feeling weak, dizzy, and over-heated. He was having trouble with his new caving light, and one boot was coming apart. He decided that he could not continue the trip, and told the others that he needed to go out. Two members of the group helped him back to the commercial tour trail, where he told them that he would rest a while and then make his way out. He felt he would be OK by himself and told them to go on and continue their trip.

After resting, Matthews started out, but had a hard time on his own. He eventually made it out and back to the ticket office, where he rested and drank two bottles of water. It took him about two hours to recover.

Larry Matthews, "Self Rescue (Sort-Of) in Cumberland Caverns," TAG-Net #1448, 25 May 1998.

Comments: Matthews felt that the illness was probably due to the fact that he takes medication to control his blood pressure, and that the prescription had recently been changed. He had experienced a similar problem 18 months earlier on his first caving trip after starting medication for the condition. He had been exercising regularly before the trip, and did not anticipate any problem.

24 May
Cave Hill Cave, Illinois
lost, stranded, inadequate equipment

A group of five adults (ages 21 to 40) and one child (9) entered the cave at about 3:00 p.m. on May 24. They wore lightweight clothing, with some wearing only shorts, T-shirts, and tennis shoes. They did not have helmets or other proper caving equipment. When they failed to return to their campsite, family members called authorities and reported the group overdue. The State Police and Illinois Emergency Management Agency requested the assistance of the Department of Natural Resources Mine Inspectors Rescue Team early on the morning of May 25.

At about 6:30 a.m., the mine rescue team arrived at the cave, where state police and other emergency services personnel were waiting. After interviewing family members for information about the missing group, the rescuers hiked to the entrance equipped with helmets and lights and carrying first aid supplies. They also carried a 1,000-foot lifeline.

They reached the cave entrance at 7:10 a.m. and entered the cave, unfurling the lifeline as they went. They followed what appeared to be the main route, calling out to the lost party and listening for any response. As they neared the end of the lifeline, they heard an answer to their calls. They found the lost group about 150 feet away, huddled together on a ledge. The batteries had run out on three of their five lights. They were suffering from mild hypothermia, but were otherwise unharmed. Rescuers led the group out of the cave.

Liz Pensonau, "They Were at the End of Their Rope," Outdoor Illinois*, July 1998, p. 7.*

Comments: The spelunkers entered without proper equipment and training for safe caving. Each caver should carry three sources of light, each one adequate to permit a safe exit from the cave. The primary caving light (at a minimum) should be mounted on the helmet to leave the hands free. They should also have been wearing helmets, and carrying some food, water, and extra clothing. Shorts, T-shirts, and sneakers were not appropriate caving attire for this cave.

The rescuers also could have used some training in cave rescue techniques. What would they have done if the lost party had been 2,000 or 5,000 feet back in the cave instead of 1,000 feet? The use of "lifelines," while standard in industrial rescue operations, is usually not practical in cave rescue.

24 May
Hughes Cave, Alabama
lost

Rescuers were called out to locate a missing and overdue party in the cave. The missing individuals were quickly found wandering in circles in the lower cave. It was reported that they had been consuming alcoholic beverages.

Marc Salverson, "General Meeting Minutes, June 3, 1998," Huntsville Grotto Newsletter*, June 1998, v40n6, p. 3.*

Comments: It was not clear from the report whether or not they were actually lost.

13 June
Bowden Cave, West Virginia
flooding, brief entrapment

Thirteen cavers entered the cave via the main entrance for a survey trip, while another group went to survey at the Bear Heaven entrance. The first group went up the Watercourse, then split into four teams. After surveying for a while, the team in the stream passage noted the water rising and becoming louder.

After some discussion, they decided to have all four teams meet near the Pendant Room. Two flashlight cavers also appeared, and announced that the Watercourse was impassable due to high water. The group contemplated trying to make their way to the third entrance, but decided that it was a long trip and they were not sure they could find the route. They decided to monitor the water level and wait until it dropped enough to let them go back out the main entrance.

Some of the cavers waited at the rendezvous area, while others passed the time surveying. The water level dropped a few inches each hour. Eventually, they decided it had fallen enough to attempt the Watercourse. They water was chest-deep and strong in the passage, and some of the cavers had difficulty hanging on. One caver lost her grip in the last ten feet of the passage and was flushed out under water. The rest of the group made it back through and all exited via the main entrance.

The teams working in the Bear Heaven entrance area reportedly heard "a wall of water" coming and made a quick exit ahead of the flood.

Pauline Apling, "Bowden Cave Trip, June 13, 1998," West Virginia Caver*, August 1998, p. 15.*

Comments: There had been thunderstorms and heavy rain the night before. It rained heavily for two and a half hours after the cavers entered the cave. Apling recommends paying close attention to the weather forecast before venturing into this cave. That's good advice for all stream caves.

11 July
Bartons Cave, Pennsylvania
caver fall

A caver fell somewhere beyond the Mail Slot and was injured, requiring evacuation. Several rescue groups were reported to have responded, but no details were available.

Doug Moore, Incident report, NCRC Eastern Region web site, undated.

18 July
Keyhole Cave, New York
stuck in crevice

Craig Douglas (24), Buster Miller, Jennifer Russell, and Jessica Douglas entered Keyhole Cave at about 11:00 a.m. Saturday morning. They had been to the cave the previous year, and had returned hoping to bottom the cave this time. The cave is 113 feet deep, contains several small pits and climbdowns, and is body-tight for most of its 370-foot length. The bottom is reached by descending an eight-foot pit opening from a tight crevice in a one-foot high crawl.

Douglas and his companions made their way down through the cave without incident until they arrived at Paul's Pipe, the tight crawl leading to the final pit. Douglas crawled through to the top of the pit to examine and rig the drop. As he slid his legs through the crevice, he found that one foot was restricting the movement of his other leg. When he moved that foot, his right leg became jammed in the crevice. His knee was caught by a constriction in the bedrock walls.

Douglas spent about 15 minutes trying to free his leg, with some assistance from Miller. As he became tired, he realized that he needed to focus on getting back into an upright position so that he was not left hanging head-down over the pit. He managed to turn his leg enough to right himself, but was still stuck. They realized that they would need tools and assistance, so Russell was sent out to call for help.

At about 4:00 p.m., Russell reached the home of Emily Davis Mobley, the property manager. She told Mobley what had happened, and Mobley notified authorities and started the rescue callout. Mobley then sent Russell and another caver back to the cave with food and supplies for Douglas, and instructions to try to keep him warm and get him into a stable, horizontal position.

A large-scale rescue developed, eventually involving more than 100 people. The tight cave passage kept some cavers from even entering the cave, so small cavers were recruited from across the region. They worked through the night and all day Sunday trying to free Douglas, with little progress. The efforts were hampered by the narrow crevice, and rescuers could only work with one hand at a time. They used drills and later an air chisel to chip away at the walls on either side of Douglas' knee.

Hypothermia was a serious threat, as Douglas could not move around to keep warm. Rescuers placed a carpet under his hips and legs and wrapped his torso in a space blanket to try to protect him from the cold, wet rock. An electrical line was installed and used to power a heat gun, as well as drilling equipment.

During the night, rescuers noticed that people were beginning to have trouble breathing while working in the lower regions of the cave. An oxygen monitor was brought in, and they found that the oxygen level was down to 16.9% at one point. They suspected that the breathing difficulty was being caused by a buildup of carbon dioxide in the cave. A ventilation system was rigged to blow fresh air through hoses down to the bottom of the cave.

After many hours of work, Douglas was able to move his leg, but still could not pull it free from the crevice. Eventually, he was able to take the drill himself and work from below while hanging into the pit. At about 8:30 p.m. Sunday evening he was finally able to pull his leg out of the crack. Rescuers helped him back out of the crawl and into a small room where he was given food and water and allowed to rest.

Douglas was exhausted from his entrapment and the struggle. The circulation in his right leg had been impaired for over 30 hours. After several hours rest, he started making his way back to the surface at about 1:00 a.m. Monday morning. He needed assistance from rescuers at the climbs and pits, but had to move himself through much of the tight passage. He reached the surface at about 9:15 a.m. Monday morning.

Douglas was taken by ambulance to the hospital, where he received a fasciotomy (a longitudinal incision on both sides of his calf) to relieve pressure due to swelling, improve circulation, and allow removal of dead tissue. The first incision was closed on 22 July, and the second was closed on 27 July after the swelling subsided.

1. *Chuck Porter, et. al., "Rescue at Keyhole Cave,"* The Northeastern Caver*, September 1998, v29n3, p. 78.*
2. *Craig Douglas, Letter to the Editor,* The Northeastern Caver*, December 1998, v29n4, p. 114.*
3. *Jay Lindsay, "Rescuers pull spelunker out of cave," Associated Press, 20 July 1998.*

Comments: Douglas spent about 43 hours in the cave. It was fortunate that the distance to the entrance was short

enough to allow rescuers to run power and air lines into the cave. Hypothermia was a major concern, not only for Douglas, but also for some of the rescuers who were in the cave for long periods. Rescuers also installed a bolt and used ropes attached to Douglas' harness to help support him and keep him upright.

The decision to allow Douglas to rest before exiting gave him some recovery time before the strenuous trip out. It would have been extremely difficult, if not impossible to carry him out in a litter.

18 July
Moaning Cavern, California
caver fall, lost control on rappel

Moaning Cavern is a commercial cave which offers rappelling as a high adventure experience. Vittoria Bossi (32) had been to the cave twice before to rappel the 180-foot pit entrance. These two visits, the most recent being in 1994, were her only experience with rappelling.

Bossi was fitted with a harness and rappel device, and employees helped her rig for the rappel at the top of the pit. As she backed down towards the lip, she felt that something was not right, and that the rappel was "going too fast." She called up for help, but no one heard her. She was near the lip where the drop breaks into a 120-foot free-fall. She decided that "it was just my own fear" because she had not rappelled in four years, and talked herself into continuing.

As she went over the lip and her full weight came onto the rappel rack, she lost control and fell. She held onto the rope below the rack and tried to pull on it as she had been told, but was unable to slow her descent. An employee waiting at the bottom of the drop pulled on the rope to give a bottom belay. Bossi struck the cave wall and then landed on the bottom, fracturing her skull, two vertebrae in he neck, and one ankle.

The employee kept her from sitting up, and made her lie still while help was summoned. Emergency personnel were called, and cavern employees worked with the mountain search and rescue team to place her in a litter and carry her back up the long spiral staircase and out of the cave. She was taken by helicopter to a hospital for treatment. She was expected to make a full recovery.

1. *Scott Mobley, "Rescuers race clock to save caver," Calaveras Enterprise, 24 July 1998, p. A1.*
2. *Scott Mobley, "Injured caver blames rigging for accident," Calaveras* Enterprise*, 7 August 1998, p. A1.*

Comments: It was not clear from the reports just what kind of rappel device Bossi was using. It is described several times as a "pulley device," which sounds like a bobbin-type descender, but later is mentioned as having "rungs," which is more suggestive of a rappel rack.

Either way, it appears clear that the rappel device was not providing enough friction, and that Bossi did not understand its operation well enough to adjust it. There was also some confusion as to whether or not the cavern employees were bottom-belaying the rappel from the beginning, or whether someone rushed over to apply a belay after the fall started. Given her lack of experience, Bossi should have been belayed from above or below. It also appears that proper rappel signals were not used.

Bossi's spinal fractures were in the same location as those suffered by actor Christopher Reeve. She felt that by keeping her from moving or trying to sit up, the employees who helped her saved her from paralysis or death. In a fall like this, spinal injuries are very likely, and it is best to send for trained medical personnel and not move the victim unless his or her life is in immediate danger.

A 180-foot pit is not an appropriate place to teach rappelling or to provide outdoor adventure experiences for tourists. Beginning rappellers should be belayed - the bottom belay is very useful for this. All rappellers should understand how their equipment works, how to increase and decrease friction, and how to avoid or stop an out of control descent.

23 July
Dislocation Cave, Alaska
caver fall

William Curry and eight other cavers finished up a survey trip in this newly discovered cave on Kosciusco Island and were climbing out the entrance. Curry was climbing up the seven-foot entrance climb using an "arm bar" maneuver when his right leg slipped, throwing his weight unexpectedly onto his right shoulder and causing dislocation of the shoulder joint as he fell.

The other cavers helped Curry out of the entrance and immobilized his arm and shoulder using a cloth sling, hemlock branches, and a backpack frame. They cleared a path for him as he hiked back to the vehicles, then drove him back to camp. Boat transportation to the nearest town was arranged, and he was driven from there to the hospital in Craig, where his shoulder was set and treated. The journey took over nine hours.

William Curry, Incident report, 4 November 1998.

26 July
Blue Spring Cave, Tennessee
slipped, near miss at pit

Jeanne Kell was in a group of cavers touring the cave. The route required traversing around the edge of a pit using a rope anchored to the wall. The pit has a flowstone lip described as "two-and-a-half to three feet wide, and very slippery." On the way in, the group crossed without incident. On the way out, however, everyone had wet boots, and the flowstone was even more slippery. Kell was almost across when she slipped. She kept her grip on the rope, and was steadied by another caver who was close enough to grab her. They made their way out without further incident.

Pete Kinsey, "Caver Makes a Big Splash, Blue Springs Cave Trip," Spencer Mountain Grotto Mud & Rope*, v3n8&9, p. 4.*

Comments: This incident is included as a reminder. If there is enough danger to warrant installing a traverse line, cavers should probably clip in while crossing. All it takes is a carabiner and some tubular webbing – items that should probably be in every caver's pack anyway.

2 August
Big Four Ice Caves, Washington
fatality, ice fall

Catherine Shields (27) was killed when an arch of ice and snow two to four feet thick and six to eight feet wide collapsed and fell on her at the entrance to a large ice cave on Big Four Mountain. Shields had hiked up to the cave with family members to show them the cave. As she walked beneath the arch, it collapsed, burying her in blocks of snow and ice. She suffered broken bones, internal injuries, and a skull fracture, and died at the scene.

1. *Dale Steinke, "Accident at Ice Cave takes hiker's life,"* Everett Herald*, 3 August 1998.*
2. *Chris Solomon and David Berger, "Woman dies at Big Four Ice Caves,"* Seattle Times*, 3 August 1998.*

Comments: The cave is a very popular destination for hikers, and has been the site of several such accidents, including one on July 25, 1996 reported earlier in this issue. There was another incident, previously unreported, in October 1995, in which a section of the cave collapsed on a woman named Giovanna Benfro (28). She escaped with cuts to her head. The entrance was posted with warning signs after the 1996 incident. This was the first recorded fatality at the cave.

8 August
Surprise Cave, New York
entrapment, key broke off in lock

David Borger, Stu Syms, and three other cavers entered Surprise Cave for an easy caving trip. Two in the party were first-time cavers. The cave is gated, and they locked the gate behind them as they entered to prevent unauthorized access. They spent several hours caving and had an uneventful trip, until it was time to exit. When Syms turned the key to unlock the gate, it snapped off in the lock.

They tried for over an hour to get the lock open, with no luck. Borger decided to try and squeeze through a small opening between the gate and the cave wall. After stripping off his coveralls and equipment, he was able to get through, sustaining some bruises and abrasions during the effort. Borger called the local fire department, and firemen were able to cut the lock off with a power saw. The others then exited unharmed.

1. *David Borger, Incident report, 1 March 2000.*
2. *Stu Syms, Incident report, 20 September 1998.*

Comments: Borger reports that the lock was an old one which had been repeatedly soaked by spring floods. He suggests keeping gate locks well maintained and lubricated.

When entering through a gate, cavers should always assess the state of the locking mechanism. A few experimental openings and closings can reveal problems that are more enjoyable from the outside looking in.

11 August
Coons Cave, Indiana
stranded in pit, inadequate equipment

A thirty-one year-old man was stranded in the cave when he was unable to climb his homemade rope ladder at the entrance pit. Rescuers fitted him with a harness and hauled him out. He was exhausted but uninjured.

Jim Johnson, incident report, undated.

Comments: The stranded man had no caving experience and did not have proper equipment.

5 September
Sharps Cave, West Virginia
caver fall

Kathleen Sharkey (49), entered the cave in a group of eight cavers led by Frank Tirado and George Palmos. Palmos and Tirado were cavers of many years experience, while Sharkey and several others in the group were novices. Sharkey was wearing a plastic, construction-type hardhat with an elastic chinstrap. The helmet did not fit well, and kept sliding down over her eyes whenever she bumped it on the ceiling or looked down.

The group followed a passage leading down into a fissure, but soon decided to backtrack and take another route. As Sharkey climbed back out of the fissure, she looked down to find the next foothold. Her helmet slid down as before, but the brim struck the rock, pushing her head backwards. She lost her grip and fell backwards into the fissure, landing on her back on a ridge of rock. As she landed, the force of the impact knocked the helmet from her head.

Tirado had gone ahead after pointing out the climb to Sharkey. He heard the fall and her cry, and rushed back to help. He found her lying at the bottom of the fissure. She felt pain between her shoulder blades and her head hurt from the impact. After a few minutes, she was able to sit up, though it was very painful. She decided she could make it out with some assistance. The others helped her up the climb and out of the cave, taking care to minimize movement of her back.

An ambulance was summoned, and the medical technicians fitted her with a spine splint to immobilize her head and neck. She was taken to the hospital, and was initially thought to have broken several ribs at the point where they meet the vertebrae. Later examination determined that she suffered only severe bruising.

Frank Tirado, Incident report, 2 October 1998.

Comments: Sharkey feels that her helmet choice was the cause of her fall. After her experience she decided she would "definitely invest in my own good helmet" before caving again. As pointed out in previous issues of *ACA*, cheap helmets with elastic chinstraps do not provide adequate protection for caving. A climbing or caving helmet with an inelastic chinstrap would have remained in place before and during the fall. A good helmet is well worth the investment. It's a lot cheaper than a trip to the emergency room.

Cavers should also be aware of the risk involved in moving a person who has fallen and is complaining of back or neck pain. The possibility of spinal injury must always be considered. Moving a person with spinal fractures can damage or even sever the spinal cord. Training is required to evaluate an accident victim for such an injury. As in the Moaning Cave incident reported previously, the wisest course may be to go for help and return with trained personnel and a spinal immobilization device.

3 October
Cassell Cave, West Virginia
stranded, inadequate equipment

Jason Wicken (19), Buddy Hames (19), and Gabriel Bernert (18) rappelled into the 96-foot pit entrance on Saturday intending to exit via the lower Stream Entrance. They found the way blocked by flood debris. They did not have climbing equipment, and were stranded until Monday, when rescuers found them after they were reported overdue.

George Dasher, "Rockin' Chair," The West Virginia Caver*, v17n1, p. 9.*

Comments: Always carry your climbing rig with you when vertical caving. You should have both ascending and descending gear ready while on rope. You never know when you may need to change from rappel to climb, or make other maneuvers. And you certainly don't want to be stranded like these guys. They thought the route was permanently blocked, but cavers familiar with the cave expect to dig through such debris as part of a routine trip there.

3 October
J-4 Cave, Pennsylvania
caver fall

A group was exploring the cave on Saturday during the MAR convention weekend. A caver fell about 20-30 feet down a slope, injuring his leg and back. Other cavers present were able to help him walk out on his own. He was met by an ambulance at the entrance and taken to the hospital. He was reportedly seen back at the convention on crutches that evening.

Doug Moore, Personal communication, 16 March 2000.

12 October
Bowden Cave, West Virginia
lost

At 7:00 p.m. Sunday evening three people from Salem, West Virginia, entered Bowden Cave carrying only flashlights. The following morning they were reported overdue, and local cave rescue groups were called in by the Volunteer Fire Department. When a quick search of the entrance area failed to find anyone, a more detailed search of the five-mile long cave was initiated. At the same time, due to the size of the cave system, rescue groups that had been placed on standby were called in. As these groups started to arrive on scene, word came from the cave that the three individuals had been located and were being escorted from the cave under their own power.

Doug Moore, Personal communication, 13 October 1998.

13 October
Neversink Pit, Alabama
tree fall in pit

Several cavers were taking turns rappelling and climbing the large open-air 162-foot pit, when the cavers at the top heard a rock break loose and fall from an area on the south edge of the pit. They yelled "Rock!" to warn those below, then watched in disbelief as a 75-foot tall, 18-inch diameter tree broke loose from its base and fell into the pit. The tree landed in the "safe" area where cavers normally stand on bottom to watch other cavers on rope. Two cavers were on rope when the tree fell, but no one was on the bottom. No one was injured.

Evelyn Townsend, Incident report, 2 November 1998.

Comments: Caves are natural erosional features. This pit has a 30-foot by 60-foot opening located in a slightly larger diameter sink. Anything on the rim of or inside the sink is going to wind up on bottom sooner or later. This is something to be aware of in any pit. The tree was dead, and was already hanging over the pit. Its roots had been undermined by the growth of the sink. In years past, cavers used it as a rig point.

13 October
unnamed sinkhole, Florida
stranded, fell in sinkhole

Sean Collins (17) was rescued by emergency personnel after falling into a 40-foot deep sinkhole outside Gainesville. Collins was reportedly exploring around the deep hole when he lost his footing and fell in. No other details were available.

"Dangling paramedic saves stranded teen," Florida Local News, Yahoo! web site, 13 October 1998.

24 October
Pinnacles Cave, Nevada
stranded, difficulty on ladder, inexperience

David Starling, Claire Jacobi, and Gene Frodsham, all experienced cavers, planned a quick trip to Pinnacles Cave (120-foot entrance pit, two drops). They arrived at the cave at 10:00 a.m. Gear was scattered near the mouth, including two coils of cable ladder. Voices were heard below and they were informed that there were eight people in the cave. Two ropes were rigged in the pit: one to a pulley above the mouth and dropping into the cave and another to a tree and a rock on the south side of the pit.

Frodsham's group rigged two ropes for their own descent. They caught up with the first group and waited while they went through the Corkscrew, then talked with them in the Lunch Room. There were seven people in the group. Three had previously been in the cave but were not very experienced cavers. The others had no previous caving experience.

Frodsham's group went on to the end of the cave and returned. Starling gave one person from the other group a headlamp and was asked to drop their ascending gear when he reached the surface. This caused the experienced cavers some concern. Frodsham's group finished exiting the cave at 4:10 p.m. and lowered the other group's ascending gear as requested. The gear was a crude arrangement of webbing and prusiks.

Frodsham and his companions waited an hour while the leader of the other group exited, taking 30 minutes to climb the first 70 feet. They helped by rigging the cable ladders while the other group leader rigged the belay. One person successfully came up the ladder. The second was stranded on the ladder when the belay, rigged to a knob at a ledge along the mouth, came loose. The Gibbs ascender being used became jammed at the pulley over the mouth of the cave, allowing the climber to drop about 40 feet during the slipping and fouling of the belay.

The group leader, who was belaying, called down to have the climber attach himself to the ladder. Frodsham pointed out that if anything went wrong the climber would not be able to go up or down. Soon after, the leader called down to the climber that he was unable to free the belay rope because of the climber's weight.

Frodsham took over, and rigged the end of the belay rope through a rappel rack attached to a tree near the mouth of the cave. Starling and Jacobi stayed to untangle and tend the belay, while Frodsham rigged on rope and descended to the climber. The climber had attached his harness directly to the ladder with a locking carabiner, using no pigtail, and was stranded about 15 to 20 feet above the floor. He had been in that position for over 20 minutes.

An ascender was rigged from his harness to one of the other ropes. The locking carabiner was jammed, defying attempts to open it, and was finally opened with pliers sent up from the party below. The climber was suspended from the safety, with the ladder as backup, while the belay rope was released and re-rigged. Starling and Jacobi then used the rappel rack to lower the climber on the belay line.

One member of the group was sent up the ladder on belay. Frodsham noticed that one of the cavers, an 11-year-old boy, was shivering uncontrollably, so the boy was prepared for the next ascent. The belayers virtually pulled him from the cave. The once-stranded climber said he did not have the strength for the ladder. Frodsham fitted him with a ropewalker system and he climbed out on his own.

The remaining people in the group were sent up the rope using the ropewalker, finally exiting the cave just before 9:00 p.m. De-rigging was completed quickly and all were on the paved road to Las Vegas by 9:30 p.m. One of the group members had instructed his wife to call the police if he was not home by 10:00 p.m. The quick intervention of the cavers of the Southern Nevada Grotto averted an official rescue and kept the relieved party from endangering themselves in attempts to free the climber and the belay rope.

Gene Frodsham, Incident report, undated.

Comments: Frodsham's group did a good job of managing a potentially serious incident. The full description is included to illustrate an effective small-party rescue.

Frodsham writes: "After the trip was organized, the one experienced person had declined to go and the others did not cancel the trip. The leader knew how to rig and did the above-ground rigging well, but not the belay; he was not properly prepared to hold the position of leader.

"The cave is not a beginners cave and the four neophytes had no business being there. None of the group even recognized the first signs of hypothermia in the child. The leader's ascending system was crude and the cable ladder inappropriate for inexperienced adventurers. The cave requires more than the thread-bare minimum of equipment the group possessed."

25 October
Whitings Neck Cave, West Virginia
caver fall

Four cavers were in the back of the cave on Sunday when a young man fell and struck his head. His companions called for help, and he was carried out by the local fire department in a three-hour rescue operation. No other information was available.

Doug Moore, NCRC Eastern Region web site, 27 October 1998.

28 October
Spring Hill Saltpeter Cave, Tennessee
fatality, caver fall, inadequate equipment

Jason Bishop (14) and two friends entered the cave mid-day on Wednesday. They had only one flashlight between them, and had no helmets or other caving equipment. They were making the steep and slippery descent from the entrance down to the main passage when Bishop lost his footing and fell. He tumbled about 50-feet down the rocky slope, sustaining multiple injuries. Help was summoned, and Bishop was taken by helicopter to a hospital about an hour after the accident. He died two days later from injures sustained in the fall.

David Straight, Incident report, 12 November 1998.

Comments: Bishop and his companions clearly did not have proper training or equipment for safe caving. This accident resulted in a lawsuit against the cave owners by Bishop's family. The suit is ongoing as of March, 2000.

30 October
J-4 Cave, Pennsylvania
caver fall

A Bloomsburg University student fell about 40 feet down a hole near the Goliath formation and broke her ankle. It was reported that the group leader was helping the group get over and past the hole by spanning it with his legs. The girl made it over the hole, which is about two and a half feet in diameter, but lost her footing and slid between the spotter's legs.

Authorities were alerted and called in cave rescuers, who carried her out of the cave. No other details were available.

Elizabeth L. White and William B. White, "J-4 Cave Rescue: October 30, 1998," Nittany Grotto News*, v46n1, p. 16.*

31 October
Pyeatts Cave, Arizona
illness, exhaustion

Fifteen cavers were engaged in a cleanup trip in the cave, removing spray paint and trash. After lunch most of the crew left, but six cavers decided to stay and tour the 1,600-foot-long cave. Two in the group were seventh-grade students, about 12 years of age.

On the way out, two of the adults noticed that one of the students was stumbling. She said she was tired and feeling sick. As they helped her over to a place where she could lie down and rest, they realized that she was completely exhausted. They still had a lot of caving to do to reach the entrance, including a 20-foot climb, a 30-foot traverse, and several ledges to cross.

They considered sending out for help, but the student said she would rather try to get out with their help. For the next two hours, they crawled, walked, and carried the girl out of the cave. They exited at about 7:30 p.m., and took the girl to the nearest hospital. She was treated with IV fluids for severe dehydration. In later discussion, they realized that no one had seen her drinking very much during the trip.

Steve Willsey, Incident report, undated.

Comments: The cavers noted that they should have been more alert to the condition of the young cavers, asking them how they were feeling throughout the trip. Had they done so, they might have realized the situation earlier and made the girl drink more water, or started out before she became ill.

October
Gabinarraca Cave, Costa Rica
illness, histoplasmosis

Gabinarraca Cave (also known as Venado) is the only show cave in Costa Rica. The cave is privately owned, and is visited by more than 500 people each week. Guided tours are offered daily, and visitors are provided with boots, lights, and helmets. In 1998, the regular tour covered about 1,200 meters of passage in the 2,741-meter long cave and lasted two and one-half hours. The cave harbors an estimated population of more than 4,000 bats.

Following an October 1998 visit to the cave by a school group of 61 children and 14 adults, 35 members of the group reported a flu-like illness. Symptoms developed several days after the caving trip. Two members of the group were hospitalized and were diagnosed with Acute Histoplasmosis. Despite annual visits by the school, no illness had been reported previously. Many in the group had visited the cave before with no ill effects.

The week before the visit, Hurricane Mitch had passed through the area with heavy rains which caused severe flooding in the cave. Large amounts of debris washed through the cave and out the entrance. The children who were most affected had gone through some muddy crawls and "played in the mud."

1. *Carlos Goicoechea, Incident report, undated.*
2. *Marshall Lyon, Investigation summary, US Center for Disease Control, 29 June 1999.*

Comments: As a result of the outbreak, a study was done by the U.S. Centers for Disease Control. The analysis showed that the persons most affected were more likely to have crawled in the cave, or to have visited the last room in the wet part of the cave. They were also less likely to have been exposed to chickens at home, or to have visited the dry part of the cave. Affected persons were also less likely to have washed their hands after exiting the cave or before eating. Investigators suggested that certain activities, such as crawling, and certain environmental factors, such as heavy rains, may increase the risk of Acute Histoplasmosis when visiting bat caves.

Following the study, the tour was limited to 17 participants per group, and shortened to 700 meters and 1.5 hours duration. All participants are now required to wear masks in the cave and to shower after exiting.

5 November
3-D Maze Cave, Virginia
caver fall

Brett Van Zandt (22) was injured in a 30-foot fall in the cave. About 40 cave rescuers and emergency personnel worked for four hours to bring him to the surface. He was taken to a hospital, where he was treated and then discharged the next day.

1. *George Dasher, "Rockin' Chair,"* The West Virginia Caver*, v17n1, p. 9.*
2. *Doug Moore, Incident report, NCRC Eastern Region web site, undated.*

21 November
Cumberland Caverns, Tennessee
fatality, heart attack in cave

Harris Renfroe (59) was with a church group on a guided tour of the undeveloped section of the cave when he suffered a heart attack. The group was moving through a section of smaller passage about 1,000 feet from the developed section of the cave at about 7:30 p.m. when Renfroe suddenly collapsed. Some of the group members began CPR while the guide and several others went for help.

Emerging into the developed section of the cave, they encountered Kris Beckwith, an employee and caver, who called 911 and notified other Cumberland Caverns staff. When the first emergency medical technician arrived, Beckwith took him and his equipment into the cave and to Renfroe, arriving at about 8:30 p.m. Group members were still performing CPR, but Renfroe had no pulse. They continued CPR until the arrival of additional medical technicians, who took over. Eventually, the efforts at resuscitation were halted.

The group began attempting to move Renfroe toward the entrance, but could not make much progress without a litter. Cave rescuers, who had been called earlier, arrived and took over the evacuation, exiting the cave at 3:00 a.m.

23 November
Torpedo Tube Cave, New York
animal trap found in cave entrance

While crawling through the leaf-filled cave entrance, a caver felt something unusual in the leaves. It turned out to be a small animal trap. Fortunately, the trap was old and not set.

Paul Steward, Incident report, 25 November 1998.

Comments: Steward observes that to a trapper, a cave entrance might seem like a pretty good place for a trap. Cave entrances have both cave and surface hazards.

28 December
Peppersauce Cave, Arizona
caver fall

Charlie Bellanger (47), Rob Roberson (44), Clint Bellanger (17), Nick Roberson (14) and David Miller (14) of Boy Scout Troop 264 were on their first caving trip in Peppersauce Cave. Peppersauce is probably the most-visited wild cave in Arizona. Each had a helmet with chinstrap and at least three sources of light. All were wearing tennis shoes. A scout remembered this from the caving presentation to the troop by NSS member Ray Keeler.

After three hours of exploring, some of it crawling over the muddy slopes due to lack of traction, they were directed over to the Pool Room by another group. A ladder constructed

1. *Duane Sherrill, "Heart attack claims man in cave," McMinnville* Southern Standard*, 25 November 1998.*
2. *Kris Beckwith, "Accident at Cumberland Caverns," TAG-Net #1629, 26 November 1998.*

of 2x4's with rungs of 1x3's had been placed at the nine-foot overhung nuisance drop. All five descended the ladder and looked around the room, then started up the ladder to return to the Big Room.

Bellanger was last up. While climbing out near the top, his foot slipped off a step. He tried to stop his fall with his left hand on a higher step. He turned as he fell, and managed to avoid falling to the bottom. As he fell, however, Bellanger broke his left humerus (upper arm bone) into six pieces.

Three men from another group in the cave came over to help. A rope from the nearby Rabbit Hole was brought over and a loop was tied under Bellanger's armpits. He was then hoisted up the drop backwards (so he could help with his feet on the ladder) and helped back to the Big Room.

Bellanger, an ER Physician's Assistant, thought that the shoulder could be dislocated, so Roberson tried to reduce the arm in the Big Room. After realizing that the arm was fractured and not dislocated, they used a sweat shirt as a sling. Bellanger then started out, assisted by his companions. The group took 45 minutes to get to the Big Room. They reached the entrance in two hours.

Ray Keeler, Incident report, 28 December 1998.

Comments: Keeler writes: "My stressing three lights and boots was obviously not enough." Proper footwear is an important element of safe caving. When giving presentations on caving to youth groups, it's a good idea to put important information in writing so that it can be given to their parents.

1996 Cave Diving Incidents

22 September
Paradise Springs, Florida
fatality, silted out, no guideline

Two open-water divers entered Paradise Springs in Marion County. They entered the cave portion of the spring without a guide line and descended to a depth of 148 feet. They apparently silted out the system and got separated. One diver attempted to exit, but became wedged in a crack and was unable to get free.

His diving partner saw him disappear in the silt cloud and thought the cave had collapsed on him. She ascended to the surface to obtain help. Rescue divers responded, arriving an hour later. They entered the cave and located the diver, but were unable to retrieve the body. The NSS Cave Diving Section Recovery Team was called.

The Recovery Team responded and found that the cave had not collapsed. The diver had wedged himself into a small crevice. He apparently thought he could not get free. He released his harness, backed out, and started a free ascent (holding his breath) without any light. His body was found at about the 44-foot level.

Henry Nicholson, Incident report, 23 September 1996.

Comments: The news media reported the cause of the accident as collapse. A later report corrected the error.

There have been many similar incidents involving divers who have open-water certification but no training or certification in cave or cavern diving. Cave diving requires special equipment and training beyond that which is required for open water certification. Use of guidelines to provide direction in zero-visibility conditions is just one of those specialized techniques.

30 December
unidentified sea cave, California
fatality, cause unknown

Peter Yan (33) was among 30 passengers on a three-day chartered dive boat trip. He was diving without a partner near

Diabolo Point on Santa Cruz Island when he was reported missing. He was found in the underwater cave 15 minutes later, unconscious and not breathing.

San Diego Union-Tribune*, 30 December 1996, p. A-3.*

Comments: The newspaper article notes that Yan was the third diver to die at the spot in December.

1997 Cave Diving Incidents

17 August
Four Sharks Blue Hole, Bahamas
fatality, narcosis

Rob Parker (35) and Dan Malone entered Four Sharks Blue Hole on an exploration and survey dive. The cave is incompletely explored, and extends to depths greater than 300 feet. Their dive plan allowed for a penetration of up to 1,200 feet with bottom time of 40 minutes at a maximum depth of 250 feet. In addition to standard cave diving equipment, they carried multiple cylinders of different gas mixtures to be used at various depths and staged for decompression.

They entered the cave at 8:00 p.m., breathing compressed air and leaving mixed gas (EANX 80) and oxygen cylinders near the cave entrance at a depth of 30 feet for decompression. They descended through the large main cavern to a fissure at the back of the cavern about 300 feet from the entrance and at a depth of 120 feet. There they left two more mixed gas cylinders (EANX 36) for decompression during their exit.

The fissure is a vertical fracture about two feet wide at its entrance and varying in width from two to 20 feet. Its depth is unknown. A permanent guide line was in place and was used throughout the dive. They proceeded into the fissure and through a 30-foot long restriction, following the guide line about 175 feet along the fissure to another restriction followed by larger passage at a depth of 150 to 170 feet. After breathing one-third of their air stage, they switched to Trimix cylinders (15% oxygen, 40% helium, 45% nitrogen) eight minutes into the dive and at a depth of 220 feet, as planned.

At 12 minutes they reached the end of the fixed line. Malone tied on a new reel and they proceeded. The passage at this point was 15 to 20 feet wide with no floor in sight. At 20 minutes, they tied off the line and began their exit, surveying back to the end of the original line. During the survey, the regulator on one of Malone's Trimix cylinders failed, but he was able to continue using his other cylinder and did not inform Parker.

The divers began their ascent following the fixed line, intending to change back to compressed air at 220 feet depth. Malone ran out of Trimix early and switched to air at 250 feet. Parker switched at 220 feet as planned. There, they communicated for the last time, both indicating that they were OK.

Swimming in single file with Parker in front, they passed under a boulder and ascended to a depth of about 180 feet. At that point, Malone noticed Parker beginning to sink, still breathing. He swam after Parker, catching him by the ankle and stopping the descent at a depth of about 230 feet. Malone then grabbed Parker by his buoyancy compensator and began swimming back to the line. Kicking strenuously and using his power inflator, Malone towed Parker back up to the line. In the process he lost both of his fins.

Back at the guide line, Parker regained consciousness and began to swim on his own. The line led into a restriction which could be passed above or below the line. Parker entered the restriction swimming about a foot above the line. Malone entered just below it and proceeded. By then, Malone was down to 300 psi in his air cylinder. When last seen, Parker was swimming and appeared to be negotiating the restriction.

Malone proceeded through the restriction and pulled himself on through the narrow passage and back to his decompression tank at a depth of 120 feet at the main cavern. He took two breaths from the tank, then turned back to the fissure, shining his light into it and looking for Parker. Malone waited for five minutes, but Parker did not emerge from the fissure.

Malone then swam out into the cavern where support divers Tom Iliffe and Gene Flipse were waiting. He spent three hours and 20 minutes in decompression.

Parker's body was recovered on August 19 by Brian Kakuk, Dan Malone, Stephanie Schwabe, and Tom Iliffe. He was found head down and facing back into the cave in a 24 to 30-inch wide vertical restriction at a depth of 149 feet. Due to the tight passage, Kakuk and Malone were unable to read the pressure gauge on his air tank. Parker's equipment was removed to help move him through the passage, and was to be retrieved later. Kakuk and Malone moved the body through the restriction about 175 feet to the main cavern and passed it to Schwabe and Iliffe. Kakuk and Malone went back for Parker's equipment, which could not be found. It had apparently dropped into the deep fissure and could not be recovered.

1. *US Coast Guard Report of Marine Accident, case number MC97011765, 17 August 1997.*
2. *Gavine Newman, Incident report, 26 August 1997.*
3. *Brian Kakuk, Recovery report, 23 August 1997.*

Comments: No autopsy was performed, but the divers involved believe that Parker was suffering from nitrogen narcosis, and that he became disoriented and wedged in the fissure. Kakuk notes that while Parker was a very accomplished and experienced cave diver specializing in deep blue holes, with more than 1,000 dives logged, he had done relatively little diving over the previous ten years. He had logged several dives in the two weeks preceding the accident, but no recent dives to the depths attained on August 17.

27 December
Jackson Blue Spring, Florida
fatality, embolism or heart attack

Gene Fussell (41), Larry Fussell, and Forrest Wilson entered Jackson Blue Spring on a practice dive. All three were certified and experienced caver divers. Wilson and Larry

Fussell were practicing for an upcoming trip to Mexico. Gene Fussell had not done any cave diving in the past year. None of the divers had been to the cave before, so they planned to do an "easy tourist dive" to 130 feet and exit.

About ten minutes into the dive, Gene Fussell signaled that he wished to return to the surface. Most of the exit was normal, until they reached the beginning of the permanent dive line. At that point, Fussell drifted to the ceiling, pointed to his chest, refused buddy breathing, and required assistance exiting. He reached the surface first, where he dropped his regulator and called for help.

The other divers surfaced within seconds, and found him unconscious. They began CPR while towing him to shore. Paramedics were summoned and arrived about ten minutes after the divers surfaced. Fussell was transported to a hospital. He suffered repeated cardiac arrests during and after transportation. He died in the hospital about 18 hours after the incident.

1. Forrest Wilson, Incident report, 27 December 1997.
2. Heather Choat, Aquanaut email list, 30 December 1997.
3. Forrest Wilson, telephone interview, 22 February 1998.

Comments: Choat and Wilson report that the autopsy lists the cause of death as barotrauma – air embolism. Choat reports that the autopsy found air in the heart and water in the lungs. Both report that Fussell had recently been diagnosed with hypertension, and had consulted his physician, who gave him the OK to dive. He had scheduled an electrocardiogram, however. Wilson also observes that Fussell was breathing hard during his ascent, which would tend to make embolism less likely to occur, and suggests that he might have suffered a heart attack.

1998 Cave Diving Incidents

12 December
Wakulla Springs, Florida
decompression sickness

John Vanderleest and Andrew Poole entered Wakulla Springs on a support dive during the Wakulla 2 Expedition. They dove to 89 meters and spent 47 minutes placing radio beacons and laying guide line before returning to the surface. Two hours after the dive, Vanderleest began to experience symptoms of decompression sickness, manifested as pain in his right leg. A decompression habitat was available at the site, but was not yet ready for use. Vanderleest, accompanied by team physician Dr. John Zumrick, Poole, and hyperbaric chamber operator Joe Dituri, was taken to a medical facility in Tallahassee for hyperbaric treatment. He was discharged on 15 December following successful treatment. Vanderleest was advised by the attending physician to refrain from diving for several months.

Daily Updates, 12-15 December 1998, Wakulla 2 Expedition web site, www.wakulla2.org.

Comments: The report notes that Vanderleest may have omitted some decompression stops. The report also notes that diving operations were suspended following the incident until the expedition's floating decompression habitat was ready for use. The expedition's diving protocols were modified to help prevent further incidents.

Caving-related or Outside Incidents, 1996-1998

29 December 1996
unspecified mine shaft, New Jersey
stranded, inadequate equipment

Four men were rescued from a mine shaft in Morris County after they rappelled to the bottom of the 100-foot shaft without any ascending gear. They were unable to climb the walls, which were covered with moss, water, and ice. They were stranded in the shaft for about 12 hours before being rescued. They had no lights or other safety equipment.

1. Northeast News, Northeastern Caver, *March 1997, p. 4.*
2. Trentonian*, 31 December 1996.*

Comments: This was not really a cave rescue, but is similar to the many "stranded in a pit" incidents. The four were described as "spelunkers."

3 November 1997
unidentified cave, Indiana
body found in cave

Robert Turben (30) ended a four-day search for his missing wife, Jennifer Purcell Turben (31), when he led police to the cave where he had hidden her body. He had strangled her with an electrical cord in the kitchen of their mobile home following an argument. He then placed her body in a black canvas bag and hid it in the cave about eight miles outside town. He initially told police that his wife had run off after an argument and had not returned.

Sara Combs, "Estranged husband ends search by leading police to body in cave," The Corydon Democrat*, 12 November 1997, v141n40, p. 1.*

February 1998
unspecified cave, Pennsylvania
body found in cave

The body of Lisa Marie Shirley (18) was found in a cave near Bell Township in Westmoreland County, Pennsylvania. It was believed that she was murdered elsewhere and hidden in the cave. Her alleged boyfriend, Jason Lorelli (23), was later arrested by police.

Kim Metzgar, "Woman's body found in Westmoreland County Cave," The Loyalhanna Troglodyte*, Spring 1998, v11n3, p. 9.*

Comments: The "cave" was later determined to be an abandoned mine opening. It is not included in the accident statistics.

17 March 1998
unspecified cave, Tennessee
body found in cave

The body of Mark Daniel Holmes (36) was found in a cave near Smithville on March 17. Newspaper reports stated that Holmes, a member of a group known as "the Radical Faeries," lived at a nearby gay commune called Idyll Dandy Acres. Holmes, also known as "Earth," was last seen by his friends as he left for a walk on March 15. He died of burns and smoke inhalation, and his death was ruled a homicide.

"Gay Commune Resident's Body Found Burned in Cave," Southern Voice*, 26 March 1998.*

27 June 1998
Windy Mouth Cave, West Virginia
drowned on hike from cave

On Saturday, June 27, Michael Hostetler (24) drowned while crossing the Greenbrier River below the mouth of Second Creek after a caving trip in Windy Mouth Cave. It is believed that he stepped off a ledge and could not shed his pack and clothing before he sank into a deep pool.

George Dasher, "Rockin' Chair," West Virginia Caver*, August 1998, p. 12.*

Comments: When crossing deep water, it is wise to loosen your pack or other equipment so that you can quickly jettison it if you fall in or lose your footing. Wet equipment can drag you down or impede your ability to swim to safety.

22 August 1998
unspecified cave, Tennessee
fell off ATV outside cave

Chuck Smith, Kevin Chandler and a large group of cavers were visiting some new caves reached by a long, steep hike down the mountain. Smith and several others decided to use all-terrain vehicles to make the trip easier.

The ATV crew had a lot of difficulty getting their vehicles down the hill and to the cave, but persisted, arriving 30 minutes after the cavers who walked. On the way back up the mountain, Smith and Chandler were injured when their ATV flipped and fell on them as they attempted to climb a very steep section of the hill. Chandler received only minor injuries, but Smith took a severe blow to the head resulting in a broken nose, facial cuts, and other abrasions.

Fortunately, Smith was wearing his caving helmet, which provided some protection. They made their way back up to the cars, and Smith was driven to a hospital for treatment.

Jerrell Killian, "The Most Dangerous Part of Caving," Spencer Mountain Grotto Mud & Rope*, v3n8&9, p. 5.*

13 October 1998
unspecified cave, Vermont
body found in cave

The skeletal remains of Michael Trombley (49) were found in a cave near Plainfield in September. Newspaper reports indicated that Trombley had been released from prison the previous fall after serving a 15-year sentence for the 1983 shooting of a police officer. He had apparently been camping in the cave for some time, and had a small stove, sleeping bag, and clothing at the site. The cause of death was unknown, but authorities were quoted as believing that he died of carbon monoxide poisoning. He had not been seen in over six months.

"Skeletal remains found in cave," Lawrence Massachusetts Eagle Tribune*, 4 October 1998.*

Comments: It was later reported at the Vermont Cavers Association meeting that the cave was believed to be just a small overhang.

The National Cave Rescue Commission

The National Cave Rescue Commission (NCRC) is a volunteer group developed to train cave rescue personnel throughout the United States. It is part of the NSS, and is a unit Education Division within the Department of the Administrative Vice-President. The NCRC does not perform cave rescues. It organizes, develops, and provides training in cave rescue techniques; maintains lists of cave rescue trained persons; and can help locate rescue resources in times of need. Most NCRC-trained cavers do participate in rescues, but not as part of the NCRC. They work as members of their local rescue squads, civil defense units, or cave rescue groups. The NCRC also works to:

- Maintain good working relationships with other rescue-oriented individuals, organizations, government agencies, and sources of specialized equipment and services (e.g., the Air Force Rescue Coordination Center and Center for Mine Safety and Health Administration).
- Maintain current files of possibly useful equipment (including, but not limited to, underground communications equipment, cave oriented medical kits, etc.) or services which can be obtained through the above sources.
- Develop and maintain a limited supply of certain equipment such as special rescue litters and vertical rescue gear in key locations throughout the country.
- Increase the number and proficiency of cave rescuers across the U.S., by sponsoring training sessions and seminars, and by encouraging other caving, rescue, or EMS organizations to sponsor such educational programs.
- Encourage international cooperation by developing contacts with cave rescuers and rescue agencies in other countries, by preplanning with these groups where U.S. involvement is anticipated, and by inviting participation of cave rescuers from other countries in NCRC seminars.

Organization

The NCRC is led by a Board of Regional Coordinators. The Board includes a National Coordinator, Training Officer, Medical Officer, and Diving Officer (each of whom coordinates resources and activities at a national level), and Regional Coordinators for each of ten regions in the United States and its territories. Board members are nominated by cavers and cave rescue personnel, and must be approved by the NSS Board of Governors. The NCRC depends on many volunteers with no official position whose special knowledge, talents, or contacts make the network more effective.

Training

The NCRC sponsors a weeklong Cave Rescue Operations and Management Seminar each year which is held in various locations around the U.S. The seminar serves as a "boot camp" of cave rescue and involves three levels of training. Cave rescue is constantly evolving, and the most up-to-date techniques are presented each year. In addition to the annual national weeklong seminar, the NCRC regions sponsors regional weeklong seminars, regional modular seminars (taught over a series of weekends), courses in small-group and self-rescue techniques, and weekend cave rescue orientation courses.

NCRC seminars consist of extensive classroom and field work designed to maximize the learning experience. The cave rescue programs provide studies in underground environments, vertical rescue, pulley systems, extrication techniques, basic medical principles, communications, and management of cave rescue operations. Emphasis is placed on practical skills and techniques, with realistic exercises in a variety of cave environments. The seminar provides basic and advanced material for students who typically include cavers, emergency services personnel, and emergency managers. During the eight days of the seminar, students receive about 100 hours of instruction, and are “on the move” from early morning well into the evening. The NCRC uses and teaches the Incident Command System (ICS) used by fire departments, rescue squads, and other emergency agencies and services.

Upcoming Courses

Cave Rescue Operations And Management Seminar 2000 (National Week-Long Course)
July 15-23, 2000, Beverly, West Virginia.
Course Fee: $370 – includes all meals and lodging during the seminar ($395 after June 1, $30 extra for non-NSS members)
For more information, contact John Appleby (tel. 215-541-4994, email: applebjb@apci.com) or
John Massa (tel. 704-892-6077, email: jmassa@millerorthoclinic.com).

Introduction to Cave Rescue (One-Day Course during the 2000 National Speleological Society Convention)
June 28, 2000, Dailey, West Virginia
Course Fee: $10, limit 30 participants
See the NSS Convention Web site or contact John Punches at John.Punches@orst.edu for additional information.

For more information on NCRC operation, activities, and training see the web site at www.caves.org/io/ncrc.